Passiflora
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sub sole sub umbra virens

THIS MONTH'S ISSUE *Passiflora* 'Silly Cow'
Passiflora cristalina, a new species.
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Letter From the Editor

Taxonomy (from Ancient Greek: taxis "arrangement"and Ancient Greek: nomia "method") is "the science of identifying and naming species, and arranging them into a classification." -Wikipedia.

This systematic classification of organisms was originally based on their visible similarity—as observed in herbaria specimens. The weakness of this approach is that organisms that look very similar may not be closely related. For example one non-poisonous species of snake may mimic another poisonous species. Cladistics, also known as phylogenetics, is a more modern way of analysing taxonomic relationships using objective quantitative analysis of data usually from DNA and RNA sequencing. The information gained from these studies can then be used to tweak the existing taxonomic classifications. Put simply a clade is a group that genetic analysis suggests has a single common ancestor.

In herbaria, plants collected in the field are spread flat, often on sheets of newsprint, dried and pressed. For many of us, sitting in a herbarium closely inspecting these dried up bits of old foliage has little appeal, and yet there are botanists who will cross the world with anticipation to examine such specimens, driven by their obsession to classify and group or divide the particular species in which they specialise. Where does this drive come from? A popular toy for children is the shape-sorting box, the joy of putting the square, triangle and circle into the right holes is plain to see. Yet why is this so satisfying? At the most basic level it is a matter of survival. The ability to tell friend from foe is essential, woe betide those who get it wrong. And there is more to it, does the bottle in the garage contain lemonade or Paraquat? Can you differentiate blackcurrants and blueberries from deadly nightshade fruit? Indeed is a particular wild mushroom safe to eat? Even a professional mycologist cannot be sure, there are some Genera which are common and edible in Europe but are dangerous to eat in the United States. So the ability to correctly classify everything we can in the world around us is of enormous importance to our survival. There are also medical implications as more and more plants including *Passiflora* are being analysed. For example, the cancer drug Taxol originally came from the Pacific yew tree. If taxonomists can identify its closest relatives perhaps other similar or even better drugs can be discovered.

So next time you think of taxonomy as being a dry and dusty pastime, although at some level it is, remember it can also be a matter of life and death….

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We invite submissions from all *Passiflora* enthusiasts, from cartoons, garden tales, recipes and growing tips to articles about new species and hybrids and reports of wild collecting trips. Please contact any of the editorial team above. Even if you have not written anything before we are here to help.

Articles in any language are welcome but will usually be translated and published in English only for reasons of space. We reserve the right to edit or refuse articles but ask contributors to note that we are not set up to offer scientific peer review. Please note that contributors will currently not be paid. Letters to the editor for publication are also welcome.

Note that new species should first be submitted to the appropriate scientific botanical journals so that the validity of the name is established, after which time we may carry an article about them. If you wish to formally register a hybrid, which is optional, you should apply to the *Passiflora* Cultivar Registrar who, if your application is accepted, will publish your hybrid in the *Passiflora* Society International Journal & Newsletter.


Passiflora 'Silly Cow'

Contents Issue 3

Passiflora cristalina

A new species of Passiflora (Passifloraceae) from Mato Grosso, Brazil.

By
John Vanderplank & Daniela Zappi

Passiflora cristalina Vanderplank & Zappi (2011) was discovered by Dr. Daniela Zappi in the Amazon rainforest of Mato Grosso while working with a team from the Fundação Ecológica Cristalino, University of São Paulo and Royal Botanic Gardens, Kew (United Kingdom) who were conducting a detailed vegetation survey of the Parque Estadual Cristalino in Northern Mato Grosso (Zappi et al. 2011). Like so much of South America this area of protected natural forest is under constant pressure from agriculture, logging and homesteading. The vegetation of this part of the Amazon is poorly documented and the survey has greatly improved the scientific knowledge of the area, some 3500 specimens representing 1,377 species named so far (Milliken et al. 2011), were collected during the survey which are now being identified at Kew and the Instituto Nacional de Pesquisas da Amazônia, of which at least six species are new to science. The results of this work are now being used by the local government agencies to develop a management plan for the protected area.

Introduction

Passiflora L. is a genus of mostly perennial climbers, a few small trees, shrubs, herbaceous vines and even annuals comprising 537 species (Vanderplank 2007) which are divided into four subgenera, *Astrophea* (DC.) Mast., *Deidamioides* (Harms) Killip, *Decaloba* (DC.) Mast. and *Passiflora* L. (Feuillet & MacDougal 2004). Subgenus *Passiflora* is the largest with 252 species, which consists mainly of large and medium size vines with large, showy flowers endemic exclusively to the New World. In publications prior to 2004 virtually all the large red flowering species of the lowland tropical forests were placed in subgenus *Distephana* (Juss.) Killip (1938) which included well known species like *P. coccinea* Aubl. and *P. vitifolia* Kunth. In the new classification of 2004 Feuillet and J. M. MacDougal divided *Distephana* into two supersections, *Coccinea* and *Distephana.*

Passiflora cristalina © 2011 Elizeu Junior de Freitas

There remain only five species in supersection *Distephana* (DC.) Feuillet & J. M. MacDougal (2004) where *P. cristalina* sp.nov. is placed with *P. amicorum* Wurdack, *P. bomareifolia* Steyerm & Maguire, *P. ernesti* Harms, *P. variolata* Poepp. & Endl. and *P. glandulosa* Cav. on account of its simple, entire, ovate leaves, and its two series of corona filaments, the inner series being membranous for about half its length. Although *P. cristalina* is a highly distinctive species because of its very long peduncles and variegated fruit it is very similar to *P. glandulosa,* a species common to the Guianas and the Amazon basin, in leaf type and colour and in having large bright red flowers of very similar appearance. For these reasons this species may well have been overlooked in the field as being distinct especially when not seen in flower or fruit.

Passiflora cristalina Vanderpl & Zappi sp.nov. is placed in supersection *Distephana* Feuillet & MacDougal (2004). Vine scrambling, mostly glabrous. Stem strong, terete. Stipules linear-subulate, soon deciduous. Petiole 8-12 mm long with two adjacent elliptic sessile nectar bearing glands 1.5-3 mm from base. Leaves ovate, coriaceous, abaxial surface nitidus, adaxial surface glaucous with red veining 7-9 x 1-4 cm, margin shallowly crenate, acute at apex, rounded at base. Peduncles solitary, glabrous, terete to apically winged, dull red, 10-17 cm. Bracts free, lanceolate, green 3-5 mm long with two prominent olive green glands at base, deciduous. Flowers held erect before and during anthesis, becoming pendulous as the ovary develops. Calyx-tube urceolate, glabrous, bright red 10-11 mm long, 7-8 mm diameter at widest point. Sepals

linear-oblong 3.3 x 0.9 cm, bright red within, dull red outside, slightly keeled with sepal awn 2-3 mm long. Petals linear-oblong 3.1 x 0.8 cm, bright red both surfaces. Corona filaments in two series, outer series, free, 12-13 mm long, very pale pink as flower opens and later red, inner series 10 mm long, lower 1/3 -2/3 membranous and distal part free. Operculum suberect, 3 mm long, curved, base membranous, distally filamentose. Androgynophore erect, 3.7-4.0 cm long; filaments 5mm long, green above, anther-corona clearance 2.4-2.8 cm. Ovary obovate, 4-5 mm long, pale green. Styles pink or red 2.5-3.0 mm long. Stigmas olive green. Fruit obovate, pendulous 4.5 x 2.8 cm, richly variegated with pale green blotches in six well defined sections; exocarp strong, brittle 0.3 mm thick; mesocarp densely spongy 2-3 mm thick; endocarp a thin translucent bag. Seed Seed symmetrical or slightly asymmetrical, ovate with crenate margin, obtuse triangular chalazal beak, shallowly convex in cross-section with reticulate surface on each side, 6.0-6.5 mm x 3.5-4.0 mm x 1.0-1.5mm.

Key to species of supersect. *Distephana*

1. Petals white (Venezuela)	*P. amicorum*
1. Petals pink, rose, bright red or orange red.	2
2. Outer corona filaments all free	3
2. Outer corona filaments fused for more than half their length	4
3. Floral-tube cylindric, 15-25 mm long; peduncles 1-8 cm long (Guianas, Amazonian Brazil)	*P. glandulosa*
3. Floral-tube urceolate to campanulate, 10-11 mm long; peduncles 10-17 cm long (Mato Grosso Brazil)	*P. cristalina*
4. Leaves narrow, oblong lanceolate > 5 times longer than wide (Venezuela)	*P. bomareifolia*
4. Leaves obovate, < 3 times longer than wide	5
5. Floral-tube 3-5 mm long; peduncles 1-4 cm (Brazil)	*P. ernestii*
5. Floral-tube 7 mm long; peduncles 3-8 cm (Guianas, Amazonian Brazil, Colombia, Peru and Venezuela)	*P. variolata*

A new species of Passiflora (Passifloraceae) from Mato Grosso, Brazil.

Passiflora cristalina © 2011 Elizeu Junior de Freitas

Distribution. Parque Estadual Cristalino, Mato Grosso State, Brazil, between 300-350 m alt. Growing at the edge of disturbed Amazon rainforest on sandy soil, flowering and fruiting during the dry season, August. In 2010 more plants were recorded in three locations in the Alta Floresta Forest, Brazil.

Etymology. The specific epithet refers to a local blackwater river, Rio Cristalino that gives its name to the protected area where the plant was found, the Parque Estadual Cristalino.

Discussion. *Passiflora glandulosa* and *P. variolata* are very similar in leaf shape and flower form and colour, both are recorded with considerable variation in leaf shape and flower colour within the species and both are endemic in part to the same areas of the tropical rain forests of the Guianas and the Amazon basin. These species have been the subject of much recent debate over the possibility of there being one or two more distinct species within what is considered as natural species variation. To illustrate this point: recently two taxa were given provisional species names on account of their differences from the recorded norm, but both have now been reduced to synonyms of these species by their respective authors. The fact that this new species, *P. cristalina* has been discovered in Brazil with leaves almost identical to *P. glandulosa* and *P. variolata* therefore comes as no great surprise. In herbaria collections the variation in sterile material of *P. glandulosa* is considerable and sometimes it is difficult to accept that they represent only one species. In lowland tropical forests the flowering of many *Passiflora* species is erratic, not seasonal, or annual and some may not flower for years. Flowering seems to be initiated by prolonged dry periods and changes in temperature; there may also be other factors that trigger the blooming of these species like light intensity and day length. Many *Passiflora* species are rarely observed flowering because the flowers are displayed at the top of the canopy where they can attract the attention of their favoured animal pollinator; our records of their flowers come from the rare occasions when they are observed flowering on low branches at the forest edge along side a new road or track. However *P. glandulosa* is one of the few species that flowers in low light conditions often one or two metres above ground level, sometimes in thick forest where the light conditions are so poor that even at mid-day it is not possible to take good photographs with a hand held camera. If *P. cristalina* is a species that needs a high light intensity to initiate flowering, and normally flowers at the top of the canopy, it must be considered fortuitous that it was discovered at the forest edge.
Interestingly *P. cristalina, P. longicuspis* Vanderpl. and *P. curva* Feuillet, all produce flowers where the corona filaments can change considerably in colour from the flower opening to anthesis and from day to day depending on sunshine and temperature. In the case of *P. longicuspis* and *P. curva* the colour change can be so dramatic that one could doubt they were the same species.

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Passiflora cristalina © 2011
Elizeu Junior de Freitas

Passiflora 'Silly Cow'

A new hybrid from Myles Irvine


Named in June 2011 in honour of my dear friend Jana-Marie Štípská.

Image copyright Marie Štípská

P. 'Silly Cow' © 2012 Myles Irvine

My particular focus, especially bearing in mind that the UK has recently come through two very hard winters, is to breed hardy polyploid crosses. These cultivars will never have the exciting palette of vibrant pinks and reds of the more exotic tropical *Passiflora*, as generally they need to have either *P. caerulea* or *P. incarnata* in the parentage to ensure some degree of hardiness. I guess the nearest we have to a hardy red cultivar is Tim Skimina's lovely dark red and white *P.* 'Lady Margaret', but, as with most plants including *P. incarnata* in the parentage, our winters in the UK are too wet for it to be considered hardy in our climate.

Passiflora 'Silly Cow' is one of my new polyploid crosses. It is a large vigorous free flowering vine and is hardy to -8°C 18°F or lower. The flowers are sturdy, usually single but occasionally in pairs; buds held upright, proud of the foliage, on peduncles up to 16 cm long which bend under the weight of the flower when it opens; they are intensely perfumed, up to 13 cm in diameter with strong corona filaments and petals; the flowers reflex fully and they stay open for several days; the androgynophore, anther filaments and style are light green with light violet speckling that is more intense on the style; there is plenty of pollen present on the well-formed anthers; the sepals and petals are wide and white with both having variable light lavender flecks to the edges; the sepals are fleshy with their abaxial surface being green with light violet flecks and long claw-like awns; there are dark maroon almost black eyelash-like inner corona filaments protecting the androgynophore, a short upright dark maroon intermediate row, about 5 tiny short intermediate rows then two rows of strong circumferentially wavy but straight outer corona filaments up to 6 cm and 8 cm in diameter, both banded dark maroon in the centre to almost black then with a slim band of white to light purple then an intense blue with white flecks to the apex; the bracts are 3cm x 2.3cm, peduncle up to 15cm; the stems are maroon and strong and there are attractive shiny dark green leathery leaves up to 17cm x 20cm with usually three, or sometimes four or five, wide lobes joined from a quarter to a third of the way up the leaf; the leaves have wavy edges and strong crimson veins; petiole 10cm or more; usually one pair 4mm long petiole glands near middle of petiole. Stipules 2.4cm x 1cm. Fruits rarely, with oval fruit up to 7cm and ripening to yellow orange.

For wholesale enquiries in the UK and Europe please contact Nick Reece at Jackdaws' Field Nursery

www.jackdawsfield.co.uk.

Passiflora lutea 'Sapelo' © 2012 Dan Long

Little Wonder

The Discovery of *Passiflora lutea* 'Sapelo'

By Dan Long

I'm always exploring for plants. No matter where my adventurous life takes me, I'm on the lookout for exciting new botanical life. Unfortunately, my life just doesn't afford me the opportunity to explore exotic jungles or rare, mountain ecosystems for those very special plants. That doesn't stop me! A few years ago, while driving my tired smelly son and his tired smelly friends back from a weekend music festival in Tennessee, I spotted a beautiful rose on a hillside by the highway. They were mystified when I excitedly pulled over and ran up the hill with my camera and pruners to see *Rosa setigera*. Many times I just snap a few pictures but this time I took some cuttings. It was a particularly nice form that we now offer to our rose and native plant enthusiasts. That's right, I'm a nurseryman. I should have mentioned that before. Since our focus is on vines and climbers, those are almost always the things that turn my steering wheel or kayak paddle to one side. On another occasion, we were on the Broad River in Georgia when I spotted something amazing from a distance. It looked like a *Wisteria* but it was reddish in color! My kids, conditioned to this by now, groaned and paddled on down the river while I pulled over to see. They were grateful not to be tethered by seat belt to my little adventure for once. Upon closer inspection I realized it was the native ground nut, *Apios americana*. Naturally, I snipped a little bit and took it home. It's important to note that my nursery is not the kind that would visit a native population and harvest plants for sale. There are a few places doing that sort of thing but I find it immoral. I never collect more than a few cuttings or a handful of seeds and propagate from that for our stock.

We've been very busy these last few years moving the family and nursery to a new home in Georgia, USA. Most every day involved running the business or building nursery structures. In the middle of all that I had a long weekend away with the family camping on a little island off the coast of my new home state. Sapelo Island is a quiet place with access only by ferry boat and very few tourists are allowed. It has an interesting history involving enterprising wealthy plantation owners and others. There's a small population of descendants of former slaves that live on the island and a marine research facility. There are some interesting things to see so the group we camped with rented a pickup truck from one of the residents and we went adventuring away from the campground. Naturally, while bouncing around in the back of a beat up pickup on sand and oyster shell roads, I didn't see much. We stopped and saw an old plantation or two and a couple of lighthouses. Then we went off the road into the woods to see a prehistoric Native American site called a shell midden. Essentially, it's a giant ring of old shells 80 feet across and up to 10 feet high. It was abandoned hundreds of years ago at least, so it's completely overgrown. Archaeologists know it was man made and they lived inside the ring in pre-Columbian times. The purpose of the ring is debated. Some theorize it was a defensive work against

Sapelo Island© 2012 Dan Long

raiding tribes while others feel it was just a convenient place to dump the remains of dinner just outside the community compound. Shell middens exist along many coastal areas but this was my first. Except for the obvious shape (a small hill in the shape of a ring) it's impossible to tell from the rest of the woods in the area. So we walked around while one from our group who knows about these things explained the construction and other elements to us. I was fascinated by the anthropological part of the story but my surroundings were much more interesting. Being that far south and right on the Atlantic coast, the climate is nearly sub-tropical. Live oaks dominate the canopy on that part of the island. They are draped with copious amounts of Spanish moss and often covered on the tops of their long horizontal branches by Resurrection Fern. At ground level, there is a mix of palmettos and various other shrubs. Through most of the shrubs and up into the trees, vines grow with abandon.

Wandering around a bit, I found crossvine, several small peas, a few species of briar, some wild yams and others I didn't recognize immediately. Then, while standing in the middle of the midden, I came face to face with a *Passiflora*! I didn't see it for what it was at first because it was a bit ragged. Finding a plant in the wild can be that way. It didn't enjoy the improved soil, regular water, sunlight and care of a gardener but I could tell it was something special just the same. It was November so I didn't expect to see flowers and I couldn't find any fruit either but the foliage was intriguing to say the least. It was about 4 inches across with three very long, narrow lobes and beautiful markings down the center of each. I didn't know what it was but knew I had to try to get a sample. I followed the stem down to the ground and scratched open the sandy soil a bit. Sure enough, I was able to find a bit of a runner with some roots. I pulled it and tucked the soil back over the base of the vine. I carried my prize back to the campground in a scrap of plastic I found in the truck and tucked it into our cooler for the remainder of our trip.

Back at the nursery, I potted it up and waited. And waited. I was almost sure it hadn't survived the trip when, in spring, it popped one tiny stem up and sprouted a few tiny leaves. They had the same linear leaflets and variegation I had seen, so I knew I hadn't mistakenly pulled up some errant bit of *Kudzu* or something else from the middle of the midden. That first year it didn't grow much. I think it was in recovery from its near death experience. Last year I decided it had grown enough to pot up and it immediately rewarded me with copious growth. I'm no *Passiflora* expert but I had never seen any leaves like these on a native. I theorized that it might be a chance hybrid or possibly even a new species. The leaves had long narrow lobes and kept the variegation well on every leaf. It was not lost on me that this was somewhat similar to *P. lutea* which made me think of the chance hybrid theory. It grew with great vigor but the stems didn't get longer than about 6 feet. It did begin sending runners out to the sides of the pot and up. A few popped out the drainage holes, too. Then it bloomed and the flowers were exactly the same as *P. lutea* that I had seen around Georgia already. Actually, the flowers seemed a little larger to me but that may have been

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Passiflora lutea
'Sapelo' buds © 2012
Dan Long

the careful growing conditions I was giving it compared to the ones I had seen in the wild.

With the help of a friend, Eric Wortman now President of the Passiflora Society International, I was able to contact the official Passiflora Cultivar Registrar Dr Les King and then John MacDougal PSI Taxonomist who was kind enough to fill me in on many details about *Passiflora* lutea and how it relates to my plant. He explained that he had seen many forms of the species but never one quite like this and he felt it was a very nice one ("Well, you have found the prettiest *P. lutea* ever.") Based on that information, I decided to go ahead with the registrar's suggestion of a cultivar name. *Passiflora lutea* 'Brushwood' was suggested but I wanted it to be something related to the island. I had considered 'Geechee', which is the name the locals call themselves. This is to distinguish themselves from other 'Gulla' communities on the string of barrier islands along the coast there. In the end I thought 'Sapelo' was right. The registration process was easy and the Registrar was very helpful, too.

Now we are working to produce this at the nursery to share its beauty with the native plant and *Passiflora* enthusiast communities as soon as possible. We've also sent plants out to gardeners in an array of climates to determine its hardiness and suitability. *P. lutea* is said to be hardy up to zone 5 but the provenance of this plant may mean it won't take that much cold.

It's a lot of fun finding new (and not so new) plants anywhere I go; even when I only collect pictures. *Passiflora lutea* 'Sapelo' is the only one that has been recognized as a new plant but it's wonderful to find beauty and richness worthy of sharing anywhere I go. Every outing is an adventure!

Dan Long is owner of Brushwood Nursery, a mail order nursery specializing in vines and climbers.

www.gardenvines.com

Passiflora lutea 'Sapelo'
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Passiflora lutea 'Sapelo'
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The Kids © 2012
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Studies on *Passiflora amabilis*

the man-made natural hybrid?

Fig. 1 Passiflora amabilis. The Garden. London, 1899.

Red flowered *Passiflora* are very popular with growers as they are so striking and *P. amabilis* fits the bill perfectly. The beautiful bright red flowers have a large white corona with a touch of purple, complimented by a sweet scent making it a must have for every *Passiflora* fanatic. The large green vine, with its nice ovate-lanceolate green leaves and easy flower production make *P. amabilis* a valued specimen for every botanical or private collection... but why has no one ever heard of it?

P. amabilis is a complicated species which is actually nearer to home than most *Passiflora* enthusiasts imagine. "The original description of the species was made by Andre Guillemin in 1846, and reads as follows."

Passiflora AMABILIS hort. ex Lem. Flore des Serres et des Jardins de l'Europe 3:209. March 1847 TYPE: The species is described from a cultivated specimens. Cote d'Azur, April 1846, Andre Guillemin (HOLOTYPE: US; isotypes: MO, KEW)

Plant glabrous throughout; stem very slender, terete or subterete; stipules ovate-lanceolate, about 1,5 cm long, 2 to 3 mm wide, acuminate, subfalcate, soon deciduous; petioles slender, 1,5 to 4 cm long, bearing 1 or 2 pairs of sessile glands; leaves ovate-oblong or ovate-lanceolate, 7 to 12 cm long, 4 to 9 cm wide, acute, entire, subcordate, penninerved or subtrinerved, membranous; peduncles solitary, 3 to 4 cm long; bracts ovate, about 2 cm long and 1,5 cm wide, borne at the base of the flower; flowers spectacular, 8 to 9 cm in diameter, red with white; calyx tube short-tubular, about 1,5 cm long and 1,5 cm wide at the throat; sepals linear-oblong or linear-lanceolate, about 3,5 cm long and 1 cm wide, dorsally short-awned, bright red within, whitish red to green without; petals subequal to the sepals, 3,4-3,3 cm long, 0,8 to 0,9 cm wide, bright red throughout and on both surfaces; corona in three series, the outermost series 2,5 to 3 cm long, radiate, occassionally slightly dolabriform and wavy at apex, white to whitish cream, with little purplish tint in apical third; the second series about 1 to 1,2 cm, erect, slightly liguliform, white to whitish cream throughout; the innermost series inclined, about 1,5 cm long, white; operculum erect, about 6 mm high, obscurely filamentose at the very margin; limen erect, minute, about 4 mm high, closely surrounding the androgynophore, 5-dentate; androgynophore long, 3,5 to 4 cm, green throughout; anthers greenish yellow; ovary ellipsoid, green, glabrous; stamen green; fruit green to greenish yellow when mature, 3-3,5 x 4,5-5,5 cm, ellipsoid to ovoid, glabrous, exocarp coriaceous, mesocarp soft, white to whitish, seeds black.

In both the works of Killip and of Lemaire this species is stated as a horticultural hybrid between *P. princeps (P. racemosa)* and *P. alata*. Dr. C.S. Suckati (1953) reported specimens of *P. amabilis* in the wild from Parque Nacional da Tijuca and Morro da Caixa Dagua, two closely located forests surrounding Rio de Janeiro in Southern Brazil. This is also the home of the purported parent species, *P. racemosa* and *P. alata*. Both Masters (Flora Brasiliensis 1872) and Harms (Naturlichen Pflanzenfamilien 1893) mentioned Southern Brazil as the indigenous distribution area of *P. amabilis*. However, without good cultivated specimens or more detailed information about a living population, *P. amabilis* remains a mystery.

Fig. 2 Passiflora amabilis.
© 2011 Yero Kuethe

Unfortunately, *P.* amabilis disappeared into the background and remained unresolved for a long time. Then, in 2003, this species showed up again, and this time in cultivation. Most surprisingly, it wasn't a specimen which came from a population in its indigenous habitat. Piet Moerman, *Passiflora* expert from the *Passiflora*Hoeve in The Netherlands, succeeded in crossing *P. racemosa* and *P. alata*, the purported parents of *P. amabilis*, producing a hybrid he called *P.* 'Wilgen Heintje'. This hybrid is now very popular in cultivation, and can be found in many private and botanical collections. With the right treatment, fruits with fertile offspring can be produced as well. Therefore, it is more than likely that *P. amabilis* is a phylogenetic result

Fig. 3 Herbarium specimen of Passiflora amabilis. Held by The Royal Botanic Gardens, Kew.

Kew
ROYAL BOTANIC GARDENS

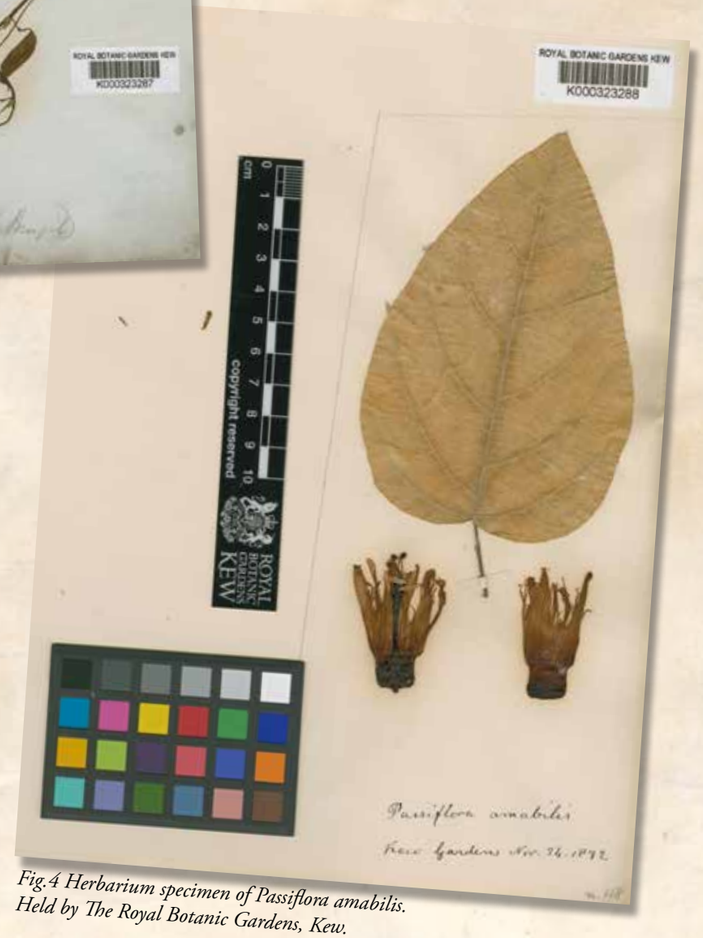

Fig.4 Herbarium specimen of Passiflora amabilis. Held by The Royal Botanic Gardens, Kew.

of a natural cross between *P. racemosa* and *P. alata. P.* 'Wilgen Heintje,' if it is indeed a clone of *P. amabilis,* has been proven to be self-perpetuating, and so therefore *P. amabilis* may be able to survive in the wild without human influence. Whether the population does still exist depends on many different things. Deforestation and habitat fragmentation due to agricultural development is unfortunately the most rampant cause of species extinction, so the future existence of this population is doubtful.

Still the question remains: Who described the species, and even more importantly, from which specimens? The type specimens were assigned from a cultivated collection in a French Botanical Garden in Cote d'Azur. However, was the species hybridized in France by the breeder and author of *P. amabilis*, or was it collected as a naturally hybridized species in Brazil? If it was collected from a wild population near Rio de Janeiro, were we able to recognize hybrids back in the 1840's? I don't think so.

Back then, growing decorative plants at your house or property was not as popular is it is today. Most people

Fig. 2 Passiflora amabilis
© 2011 Yero Kuethe

in Brazil collected their needs from the nearby forests, perhaps only growing crops of commercial value, like *P. alata* for their fruit or as herbs. *P. racemosa* is not commercially valued for its fruit, but for its decorative flowers and may have been cultivated by enthusiasts who admired the unique racemes back in the 1840's. The chances that the two species actually hybridized in that time are slim, but possible. More detailed and professional observation of the natural population is necessary to confirm this theory. Till then, we will struggle to establish the facts from the options that are:

1- The species is being described from cultivated specimens, (most likely from France).
2- The species has been reported from a wild population.
3- The species is definitely a hybrid between *P. racemosa* and *P. alata.*
4- The species was recognized as a hybrid before it was described.
The *Passiflora* Project International is intent on solving this mystery by organising an expedition to these two parks, and attempting to relocate this population found in 1953.

Coming soon:
The continuation of the magnificent work of Elsworth Killip PPI Monograph on the *Passiflora* genus

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inside out

Notes on indoor cultivation of Passiflora

By **Dr Les. A.King**

Eden Project Cornwall
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Summary

There can be considerable variations in the growth habit and morphology of passion flowers depending on whether they are grown outdoors or under glass. This report is not an exhaustive account of the factors involved, but provides a few examples from the author's experience, including: colour of flowers and foliage; peduncle length; the texture of leaves; and overall vigour. It is concluded that the current descriptions of some cultivars could be misleading if they are to be compared with plants grown under different conditions.

Introduction

In the temperate zones of the Northern hemisphere, most major collections of *Passiflora* are found in glasshouses; only a few species and hybrids can withstand winter conditions, and temperate zone summers are not reliably warm enough or long enough for some species to thrive. For example, *P. racemosa* only rarely flowers when grown outdoors at high latitudes. More extreme cases are shown by tropical species in Supersection *Distephana*, where high temperatures and high humidity are required both by day and night and throughout the year. By contrast, many enthusiasts maintain outdoor collections, which may or may not be provided with some form of winter protection. There are many factors that determine growth and structure including: light intensity; maximum and minimum temperatures; diurnal temperature changes; humidity; growing media; root restriction; availability of water and nutrients; and the increased problems under glass of pests such as red spider mite and woolly aphid.

Located in the United Kingdom at 51°N, I have grown a wide range of passion flowers both outdoors and under glass over the past 16 years. Outdoor temperatures in summer are typically around 20°C, but winter frosts are common and minimum temperatures can be lower than -0°C. In the conservatory, even with good ventilation, summer temperatures often exceed 30°C but, because of an opaque roof, measured light levels average around 10 - 20% of those outside. This experience has provided an opportunity to investigate the growth of a number of species and hybrids under different conditions. In the absence of large scale trials, these observations are largely anecdotal.

Results

Vigour

Regardless of where they are cultivated, plants allowed an unrestricted root run in soil with adequate water and nutrients generally perform better than those confined to containers in multi-purpose growing media. As noted above, many species can only be grown successfully under glass, but some perform less well under these conditions. Whereas indoor cultivation can extend the flowering period of the more tropical *Passiflora*, I have found that, if winter protection can be provided, there is little to be gained by cultivating the hardiest taxa under glass. This is particularly true of *P. caerulea* and some of its hybrids.

Foliage colour and texture

Depending on the growing conditions, considerable differences are found in the colour and texture of the foliage of many taxa. As a general rule, leaves of plants grown outside are often larger, darker green and have a more leathery texture. This is shown especially by several hybrids of *P. caerulea* as well as species such as *P. actinia* and *P. tetrandra*. In some plants, higher light levels lead to a purple colouration of buds and other new growth probably due to increased production of anthocyanins. Figure 1 shows the buds of the unregistered hybrid *P.* 'Polaris' when grown inside and under full sunlight.

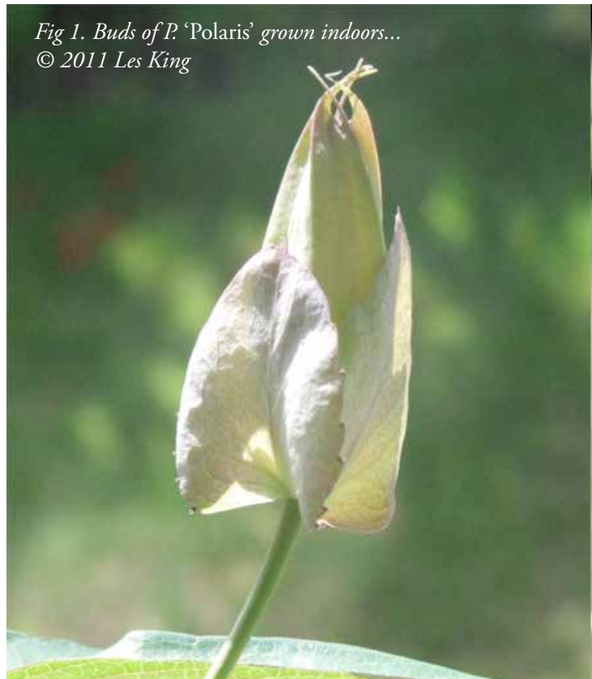

Fig 1. Buds of P. 'Polaris' *grown indoors...*
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...and outdoors.
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Flower colour

The ancestry of *P.* 'Berkeley' is unknown, but on the basis of its morphology and hardiness it appears to be a hybrid of *P. subpeltata* and *P. caerulea.* The flower colour of *P.* 'Berkeley' shows considerable variability, and this is related to the conditions under which it is grown. The corona filaments of plants grown outside have a variable blue banding, see Figs. 2a and 2b) while those grown under glass are almost pure white, see Fig. 2c

Fig 2a. *P.* 'Berkeley'.
Flower (Grown outside)
Image by Martin Murray.

Fig 2b. *P.* 'Berkeley'.
Flower (Grown outside)
Image by Sally Levinson.

Fig 2c. *P.* 'Berkeley'.
Flower (Grown inside)
Image by Dr Les King.

Fig 3a. *P.* 'Amethyst'
Flower (outside)
Image by Martin Murray

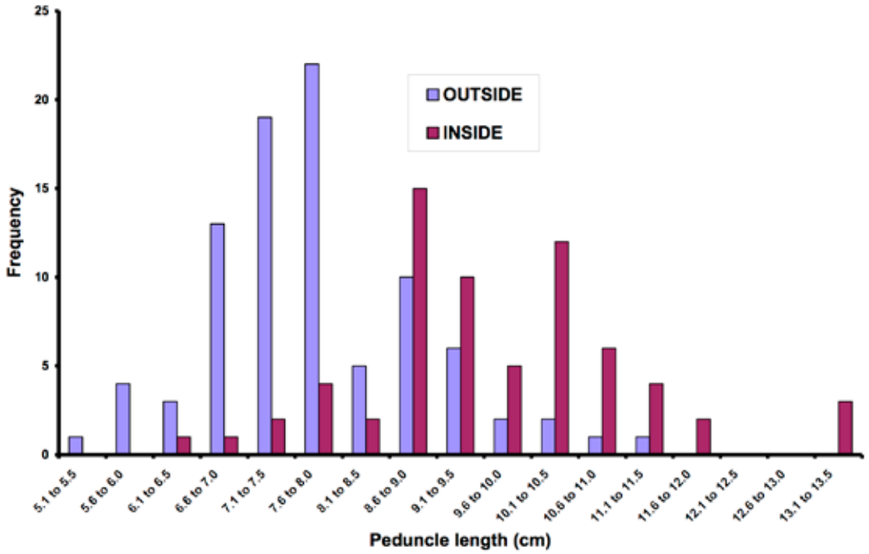
In *P.* 'Amethyst', a different form of colour variation can be unambiguously associated with temperature. Flowers that develop late in the year in cold weather exhibit white petals and sepals (see Figure 3). This is not a function of low light levels in winter months since plants grown in winter in a heated conservatory have a normal colour.

Figure 3a shows the normal flowers of *P.* 'Amethyst'. Figure 3b shows the effect of low temperature on colour.

Fig 3b. *P.* 'Amethyst' Flower (Grown inside) and the effect of low temperature
Image by Dr Les King

Peduncle length

When grown indoors, the flowers and foliage of *P.* 'Amethyst' appear similar to outdoor specimens except that outdoor cultivation generally produces plants with shorter peduncles. Figure 4 shows the frequency distribution of peduncle length for the two groups. Measurements, to the nearest 0.1cm, were made 1-3 days following anthesis in July and August. Most outdoor peduncles were less than 9cm, whereas indoor peduncles were usually more than 9cm. The mean lengths of the two samples were 7.83cm (N = 89) and 9.66cm (N = 67) respectively. The difference (1.83cm) is statistically significant (P < 0.0001).



Discussion

Frequency distribution of peduncle length in *P.* 'Amethyst' for plants grown outside and inside

The increase in peduncle length of *P.* 'Amethyst' under low light might be detectable with other cultivars, and is presumably a form of etiolation, an effect caused by low light levels leading to pale spindly growth. The purple colouration of new growth may be an adaptation to protect against light damage, while higher light levels will lead to greater starch production in leaves and a consequent increase in size and thickness.

The differences described here may have wider significance. The morphological descriptions of some plants, such as in cultivar registration, could be unreliable when used to identify plants grown under different conditions. It is also possible that similar effects might be present in wild-collected specimens of *Passiflora* species, where light levels at the forest floor are usually much lower than those at forest edges or in the canopy. The wide range in peduncle length of *P.* 'Amethyst' (5.5cm to 13.5cm) and seasonal variations in both flower colour and shape might occur in other species and hybrids, and casts doubt on the value of a single measurement of any aspect of a plant when characterising the morphology of a specimen.

Dr Les King is a chemist and forensic scientist and an amateur *Passiflora* grower. He was the Passiflora Cultivar Registrar from 2004 to 2011. http://www.passionflow.co.uk/reg.htm

Dr Les King

a leading chemist and forensic scientist and an amateur *Passiflora* grower. He was the cultivar Registrar from 2004 to 2011.
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In a bit of a Jam

By Rosie Gan

How much more satisfying can it be to a *Passiflora* gardener than to enjoy not only the beauty of the bloom, but also the fruits of her labour…literally!

My vines have fruits of two different colours, the reason being they are vines from two different varieties of *Passiflora*. I am told they are both varieties of *P. edulis*. I have not been able to differentiate the flowers which turn into green fruits from those that turn into purple/red fruits.

To me, these vines are truly delightful. They have lovely flowers which begin as elegant long buds which open up to reveal a magical bloom with waving white tendrils reaching out from the circle of a deep purple halo. In the heart of the bloom are the precious golden pollen grains encrusted on the five anthers attached to five speckled arms which keep them secure yet available for dissemination.

When the flowers fade and the tiny young fruits emerge, as a gardener I get to experience the joy and promise of parenthood! Here come the babies, utterly cute and adorable. In a flash, it seems, they are fully grown and ripe for the picking.

But wait, you wouldn't want to do that. If you pick the fruit from the vine, they are bound to be sour to the taste, so it is a better idea to wait for the fruit to fall. They might look past their prime, but they'll taste sweeter.

There are usually a lot of fruit to gather once the fruiting season begins, so apart from making fruit juice, you might want to have passion fruit jam which you could bottle and give to friends and neighbours.

It is actually very simple to make. You'll only need three other ingredients (eggs, sugar and butter) apart from the passion fruit.

The first time I tried out the recipe, I made a small portion. I used :
5 passion fruit, 1 cup of organic brown sugar, 2 eggs, 1 thumb-sized dollop of canola butter

Method

1. Cut the passion fruit into two and extract the fleshy, juicy part of the fruit, including the seeds.
2. Beat the eggs.
3. Put all the ingredients into a bowl and mix them well.
4. Pour the mixture into a bowl and place the bowl in a pot of boiling water.
5. Boil over medium heat for about 15 -25 minutes.

Note: If you prefer to use the microwave, just pop your bowl of the mixture into a microwave on medium heat for about 8 minutes. You'll need to remove the bowl to stir each minute.

Here's the outcome of my first attempt. I used the microwave method. The jam was a dark brown, since I used brown sugar. If you want a yellowish jam, use white sugar, and opt for the boiling method. You'll have a more translucent passion fruit jam.

Now you're ready for the most satisfying sensation of all… savouring the fruit of your labour. This jam is deliciously tart. Serve on toast, or Graham crackers, or scones… whatever you like. It goes well with tea, or coffee. Enjoy!

Rosie Gan
A garden and travel-blogger, she has 25 years of gardening experience. She writes about botanic and private gardens that she visits in her travels.
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Passiflora curva

A new species in subgenus *Passiflora* supersection *Coccinea*, found in French Guiana.

Passiflora
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