

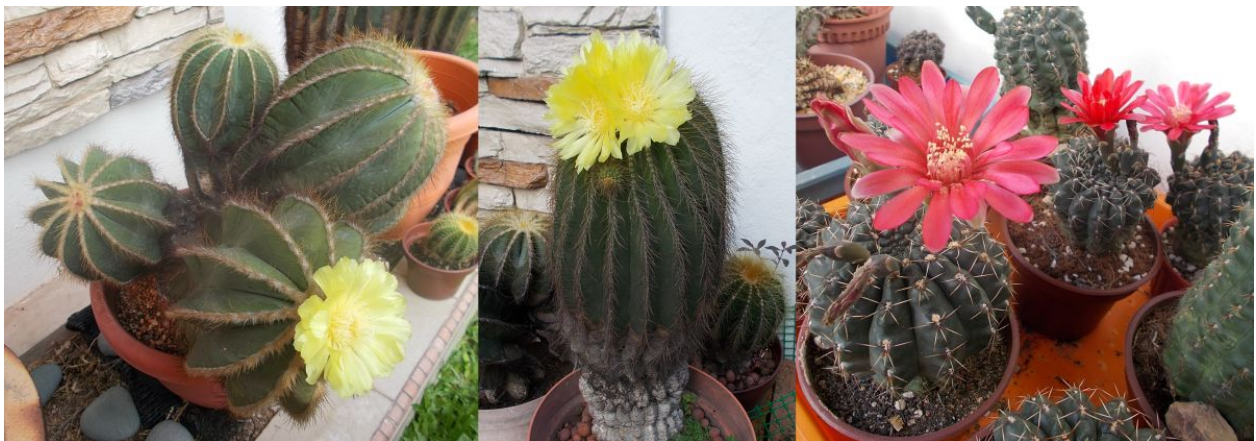
# The Winners

*The following piece is part of a collection of writings published on the Practical Small Cacti Malaysia site.*

## Here are the Winners Survivors

Let's get straight to the point. Here are three species (whose scientific names I have shortened to nicknames – PMag, PClav and GBald) that survived uneven care in a hot, dusty and humid tropical climate in urban Klang Valley, Malaysia. *Mature* plants of all three species are at worst moderately easy to grow. Healthy and strong mature plants that are growing well *will produce flowers* in the tropics. There is one other species (MGeo) that I grow and propagate because it is useful.

A few other species may also be willing to flower, but most of them proved to be harder to maintain given a lack of agricultural chemicals. Some large types, like *Hylocereus undatus* (the dragon fruit cactus), are just too big to maintain for most urban gardens. We will look at them later.



**Left:** A big PMag in February 2019. There are flower buds on the other stems.

**Middle:** A big PClav in November 2016 with four flowers open.

**Right:** Three GBald specimens flowering in April 2017.

Well, the first two are really mid-sized plants, so I totally lied about the ‘small cacti’ bit. They are still small when compared to a large tree-like *Opuntia*. Growing a mid-sized specimen is better than struggling to keep cacti with soft stems in the long term. Also, I don't have a large cactus collection. When a collection is too large, it's very hard to care for all of the plants properly. Pests can become established in weaker plants, and they can use that as a springboard to attack other plants. In time, even healthy plants can succumb to an infestation.

All three species have strengths and weaknesses; there is no single perfect species. They are arranged in this order because PMag and PClav are in the same genus – they are related to each other. With these three species, you can grow specimens in your tropical garden that can perform just like the nice pictures of flowering cacti you see in books and on the Internet.

## Nicknames for Scientific Names

PMag = *Parodia magnifica*

PClav = *Parodia claviceps*

GBald = *Gymnocalycium baldianum*

MGeo = *Myrtillocactus geometrizans*

A similar key to names will be added in following chapters. This naming scheme is purely for convenience. It is not standard botanical practice. Just think of them as webchat nicknames.

Notes: When someone talks about ‘Myrtillocactus’ they usually mean MGeo. PMag and PClav used to be under *Notocactus* as *Notocactus magnificus* and *Notocactus claviceps*, respectively. PClav is often placed under another species, as *Parodia schumanniana* subs. *claviceps*, but cacti researchers Anceschi & Magli accepted PClav as a species in a 2018 publication (see website below). The PClav picture in *The Illustrated Encyclopedia of Cacti* by Innes & Glass looks very similar to my plants. As taxonomists gather more data on these plants, PClav’s scientific name may stabilize on one or the other. Normal folks will probably be using the *Parodia claviceps* name for a long, long time.

## Very Important Websites

While you might get distracted for hours looking at pictures of flowering cacti on the Internet, here are two websites that you must visit. One is the Encyclopedia of CACTI at LLIFLE, which is a good genus and species reference for cactus enthusiasts:

<http://www.llifle.com/Encyclopedia/CACTI/>

The other website may be even more important:

<http://www.cactusinhabitat.org/index.php?p=home>

[cactusinhabitat.org](http://www.cactusinhabitat.org) is the website of Giovanna Anceschi & Alberto Magli. They are cacti researchers and there are a lot of pictures of cacti in habitat on the website. I will say this:

**You must see the [cactusinhabitat.org](http://www.cactusinhabitat.org) pages on PMag, PClav and GBald. These are cacti from South America, that is why they are more willing to flower when cultivated in the tropics. They are not desert plants. Read the pages on both websites and study the habitat pictures. The first step in cultivating these species well is to understand their natural habitat.**

As for MGeo, it is a Mexican cactus. It will be treated separately since I do not grow it for flowers; I have other uses for it. I think there is a possibility that MGeo can flower in the tropics, but you need to try growing it in the ground<sup>1</sup>. Since I can’t maintain that kind of big cactus, I won’t try it. Also, I have good reasons to generally ignore North American cacti – that will be discussed later.

In a nutshell, our strategy is to grow a few South American species of cacti that are willing to flower in the tropics. That’s an oversimplification, because there are plenty of details to cover. Next, we will briefly examine each species. Future chapters will discuss everything in more detail.

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<sup>1</sup> Search for *Hylocereus undatus* images: the productive dragon fruit plants are all growing in the ground, not in pots.

## *Parodia magnifica* (PMag)



Here you go, this big PMag specimen's best performance, March 2019. I have a digital picture of a PMag in a 2 inch pot from June 1999, plus a probable identity match in a June 2003 pix, so this specimen may well be over 20 years old.

*Parodia magnifica* (PMag) with its distinctive bluish-green colour is the first of our picks. Look up the species on LLIFLE and [cactusinhabitat.org](http://cactusinhabitat.org). Where did they say it was from? Rio Grande do Sul, the southernmost state of Brazil. The climate of Rio Grande do Sul? Wikipedia says **subtropical!** And the pictures of PMag in habitat? Plenty of *green* forest scenes, with the cactus occupying the more rocky areas in a hilly terrain.

So PMag lives in a climate that's pretty close to tropical. Perhaps its habitat is better characterized as 'hilly subtropical'. This is a *botanical jackpot* for urban gardeners in the tropics. Plus it's big and strong enough to survive in its subtropical ecological niche – all the better to survive the dangers in a tropical urban garden. No wonder it is so willing to flower in a tropical garden. Although the big PClav produces more flowers, the big PMag (picture above) is no slouch. I repotted it in April 2017 and it has steadily increased flower production with a better soil mix and better nutrition.



Many large specimens at Cactus Valley, Cameron Highlands, in 2002. There are two PMags in the picture (red arrows) but now I know that these aren't happy plants. Note the wrinkles on the PMag in the foreground. I guess they are doing it wrong.

Why am I getting flowers on my PMags all the time while there are none on the specimens in the picture above? I've checked my old Cameron Highlands pictures, I cannot find a single PMag in bloom, and only a single picture had a PMag with a dried pod. Think of all the potential wasted by growing subtropical PMags like North America desert cacti!

Although a PMag can be fairly large, I would still call it a mid-sized cactus because generally one person can still move a PMag pot. Note that we are talking about a mature specimen. So all you need to do is buy a juvenile specimen that is sold as commodity cacti in 2 inch pots, then grow it to maturity. A juvenile specimen will have the same wide ribs and are more green than bluish-green in colour. Or, you can probably buy a big one in Cameron Highlands.



**Left:** A juvenile PMag, June 1999. (It's an old 320 x 240 digital camera pix with poor colour!) **Right:** Probably the same specimen, 11 months later, May 2000. Those *Mammillarias* were more beautiful but did not survive in the long term.



A second PMag with a flower in the process of opening, April 2019. The flower bud extends and increases in size markedly in the last 24 hours before opening. At the 9 o'clock position are two small PMag rooted offsets.

If you are worried that growing a mature PMag specimen will take a long time, do not despair. As a subtropical species of cactus, PMag is used to pockets of organic-rich soil among the rocks in its habitat. Specimens will respond to fertilizer feedings. So this is a species that you can force-feed to make it grow faster. There will be some risk of course, but risk can be managed.

For example, in the picture above, I was lazy and kept the two small offsets in normal garden soil. Fungus gnats (or sciarid flies) love very damp to wet soil; by July both offsets were dead. That was reckless gardening. Mature specimens are much harder to kill. Before I appreciated the importance of learning about their habitat, I got bored and left the big PMag along with the big PClav out in the garden, in the rain and sunshine, with little fertilizing, for a few years. Both survived; the PMag did not flower during this time while the PClav flowered maybe once. Scale insects don't appear to like PMags, but PMags can still be damaged by spider mites if they are dusty for too long.

We'll discuss cultivation issues in detail in a later chapter.

## *Parodia claviceps* (PClav)



The big PClav specimen with three flowers, October 2017. I have a digital picture from June 1999 that shows a PClav specimen at least 6 inch tall. So by July 2019, this specimen is very likely quite a bit more than 20 years old.

*Parodia claviceps* (PClav) is another species of *Parodia* from Rio Grande do Sul, Brazil, and the province of Misiones, Argentina<sup>2</sup>. Look at the habitat pictures and you will see the same kind of hilly landscape with lots of green and some rocks here and there. These cacti also occupy hilly, rocky terrain where there is little soil and big trees don't grow. The climate of Misiones, Argentina? **Subtropical**, again! It's another *botanical jackpot* for us tropical urban growers.

A few other species of *Parodia* are closely related to PMag and PClav. One of them is a common commodity cacti, the Golden Ball cactus or *Parodia leninghausii*. This species has nice yellow spines and narrow ribs, probably because it occupies higher hill terrains compared to PMag or PClav. I have stopped growing this species because the narrow ribs are a good way to trap dust in a dusty tropical urban area. If you provide uneven maintenance, it will become a spider mite magnet. Spider mites are bad news and I don't want to attract bad news. So I won't grow *Parodia leninghausii*.

Other related species are *P. schumanniana*, a much larger cousin of PClav, and *P. warasii*, a cousin of PMag. These two are not common commodity cacti products so I don't know if they are available in Malaysia. Both PMag and PClav can be found in 2 inch pots; PMag is easier to find while PClav is not that common. But I did buy one PClav from a nursery in KL in September 2018 because I wanted more than just clones of my current specimens for pollination experiments.

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<sup>2</sup> Remember to study information on the species on the LLIFLE and [cactusinhabitat.org](http://cactusinhabitat.org) websites!



With four flowers, December 2017. Having one flower is pretty common...



There is one PClav (red arrow) in the picture from page 4. There is one other picture with a flowering PClav in my old Cameron Highlands pictures. The two plants marked with orange arrows have many more ribs, they look like *Parodia Schumanniana*. PClav produces offsets (pups) from the top; PMag produces offsets from the base.



A single flower, note the silky sheen of the petals in sunlight, September 2017. This is the fully-open silky flower look that some large *Parodias* have. Sometimes its flowers do not have this silky look; maybe it was short of some nutrition. Sometimes a flower turns a very light yellow, almost white, on the second day it is open.

Like PMag, PClav is a mid-sized cactus. With good nutrition and some prompting, I am confident that a mature specimen that is at least 6 inch tall will be willing to flower. Generally, a larger specimen will produce more flowers. Mature PClav specimens will also tolerate fairly rich soil, and they can be heavily fed. They may not be as pretty as those *Mammillarias*, but I'll pick my PClavs over *Mammillarias* any day. At least I can adequately maintain these plants.

In the past, I grew my large PClav in the sun and rain for a while. As previously mentioned, it flowered very reluctantly during the years it was exposed to the elements. The hard corky or woody base of the stem is the result of this harsh treatment – wild PClav specimens that hang from rocky slopes have the same look. The upside of this is that it made the base of the plant very unpalatable to bugs. My collection had a mild case of scale infestation in late 2017... and I did not find any scale insects on my PMag and PClav specimens. There was another scale infestation in late 2019... still none on PMag and PClav specimens. But in early 2020, one PClav had a minor scale infestation – it may have been weaker or stressed. So PClavs (and PMags) are not totally immune to bugs.

Anceschi & Magli wrote about PClav in *The Cactus Explorer*, a free online cactus and succulent journal. Get the PDF, it's well worth a read. See: Giovanna Anceschi & Alberto Magli, **Observations Concerning *Parodia* (*Eriocactus*)**, *The Cactus Explorer*, No. 7, February 2013.



## *Gymnocalycium baldianum* (GBald)



Three GBald specimens in bloom, March 2017. The one with a single flower is quite small, probably less than 2 inch in diameter. The specimen on the right has flowers with more petals than normal – it may be a commercial hybrid.

At one point, I thought *Gymnocalycium baldianum* (GBald) was the ideal cactus species for the urban tropical garden. While the red flowers are very nice, I no longer consider GBald as the top dog.

First things first, from LLIFLE we find out that GBald's natural habitat is in the grassy highlands of Catamarca Province, northwestern Argentina. This time, [cactusinhabitat.org](http://cactusinhabitat.org) isn't as helpful, there are only a few pictures of wild plants among rocks. But it's enough to show that this species hides most of its body in the ground; only the topmost portion of the plant is exposed to the sun.

Wikipedia's page on Catamarca Province is not very helpful to us, because the province has many climate zones. Instead, read this book (it is a copyrighted book but the PDF can be read for free):

URL: <https://www.cactuspro.com/biblio/en:mauseth>

James D. Mauseth, Roberto Kiesling & Carlos Ostolaza, **A Cactus Odyssey**.

It's a *very good book* and you should read the entire book. But for our purposes here, see the part starting on page 260 (PDF page 276). GBald's high altitude (about 5000 feet or 1500 m) grassy habitat had been replaced by potato fields in many places. Moisture is not a problem, then. So it's not a desert plant either – I think of the climate as a kind of 'highland savanna'.

From these sources, we can piece together GBald's lifestyle. While moisture is not a problem, it's not bountiful either. The wind and sun can be harsh on a highland plateau. In order to survive, GBald did not evolve to become a large and tough plant that can withstand wind and sun exposure. Instead, it hides most of its body *in the ground* and leaves a small portion exposed. The exposed portion is green for photosynthesis and flowers will appear from the top as well. All those Internet pictures of beautiful GBald in pots (and on these pages) does not reflect how the plant lives in its natural habitat!

As for the hidden portion of the plant, it does not grow a taproot like some species of cacti. Instead, the lower part of a GBald will *shrink and pull the plant downward* into the ground in the dry season. In the past, I assumed that all cacti with ribs will deflate when water is scarce; I assumed wrong. And ladies and gentlemen, this is where it gets complicated for tropical urban gardeners.



A GBald about to be repotted, July 2019. This specimen was flowering even though it keeps losing its fine roots in a soil mix with too much organic soil.

Look at the picture above. The top 1 inch of the plant is the healthy green part that will be above ground in its natural habitat. On the right is the shrunken, somewhat corky, lower stem. *It was once a green stem.* Its shrinking action is the 'muscle' that pulls the plant into the ground in dry conditions. Although GBald is prone to losing its fine roots in soils with a lot of organics, it has a few sturdy anchor roots to hold the plant in place while the lower stem does "the shrinking thing".

In the middle is the part of the stem halfway between normal and shrunken. The problem is, this plant was grown in a tropical climate, so is the middle part normal or abnormal? Maybe I'll find out one day. In the meantime, I think this portion of the plant is a ticking time bomb. It's being dismantled. Nutrients are moving upwards and it is turning corky. The skin is softer than normal, as if there is empty space below the skin. I have cut other specimens, and that part has spongy tissue, often with large air pockets. What does this mean? It means that the stem is on its way to becoming mostly dead – it will have little or no regeneration capability. It has just enough life to maintain the vascular tissues that connects the top part of the plant to the roots. *It will never turn into a green stem again.* And when insects or fungi strikes the weak middle part, it's **game over**.

Why are those GBald pictures on the Internet so perfect then? The answer is in the Mauseth book. *Commercial growers keep their plants in the growth phase* and never allows the plant to go dormant and shrink. The beautiful specimens are either the ones which never had a chance to shrink, or the shrunken stem has been hidden away in the pot. Also, most people will not share pictures of plants they deem to be in bad condition, so what you see are the nicest specimens.

One thing you will notice when you do an Internet picture search for GBalds is that most of the pictures are of young plants. There are very few pictures of old specimens. This is quite surprising for a species that most sources deem to be very easy to grow. What does this tell you? It means that many people may actually have trouble keeping this species alive for many years. I think the reason for this is the *vulnerability of the shrinking stem*. Consider the following picture:



Surprise! There is something unusual at the base of this somewhat old GBald. At first I thought it was tipping over due to old age. A new stem seems to be breaking out from *under* its skin. Regular offsets or pups do not look like this. Apparently the GBalds themselves think that old specimens are expendable. Also note the colour of the stem – only the top 1 inch is a healthy green colour (May 2019).

That looks pretty suicidal to me. Shrinking the stem is a cunning trick, but it seems the resulting plant is not very durable. So GBald is a species that *lives fast and dies young*. But before the plant dies it must procreate vigorously in the space of a few seasons, otherwise the species will go extinct. This may be why GBald is unusual in its willingness to flower – it’s an outlier even within its own *Gymnocalycium* genus. The “willingness to flower” bit is good for us gardeners. But the “shrinking stem” bit is not so good in a humid tropical climate.

Now, assume we still want to grow some GBalds for their flowers. For the urban tropical gardener, what are our options? First, you can try to maintain growth forever. That was what I tried to do, until late 2017, when every single one of my GBald plants went into some kind of dormancy while I was dealing with a mild scale infestation. All of them stopped growing and I pulled most plants out of their pots to minimize contact with moist soil. I don’t know what triggered dormancy. But in the following months, I did lose two or three plants to rot while they slowly started to grow again.

So GBalds may go dormant and shrink in the tropics. During the shrinking process or the recovering process that follows, they might succumb to bugs or fungi. If you're like me, I spray them regularly to wash off dust, or they might get rain splatter, or there were wet and humid days – don't be surprised if you lose one or two specimens. Now, the second solution: make more plants. Just multiply them faster than you kill them, simples. We'll discuss that later.



The flowering specimen on the right is one long stem – it's what happens when you keep the specimen in the growing phase for a long time. Still, it wasn't 100 percent healthy – the lower stem (not visible) is yellowish and has shrunk a bit. Also, back then I often use a somewhat rich soil mix – this is a risky thing to do<sup>3</sup>. (April 2016)

So here's the deal: To enjoy big red cactus flowers in a tropical garden, you need to manage the complications that arise from GBald's habit of shrinking its lower stem. Don't get too attached to any single specimen; this is not a species that has evolved to live a very long time. Keep a few plants, so one dying won't be a disaster. Unless someone manages to breed a GBald cultivar that does not do the shrinking trick, *ever*, we have to live with the complications.

On the plus side, a healthy specimen that is growing strongly can be prolific at producing flowers. Flowers last at least five days and are often orange-red on the first day they are open (see the above picture.) Flowers also grow continuously; they are smallest on the first day and get a bit bigger every day. By the third day or so, they may turn into a shade of pink. On cold and cloudy days, the flowers may not open widely. When the weather is sunny and mild<sup>4</sup>, flowers may last eight or nine days.

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<sup>3</sup> I was trying to speed up growth. It's a somewhat risky way to get many flowers and large plants quickly.

<sup>4</sup> Mild weather in urban Klang Valley, Malaysia. This means there is rain on some days, there are usually plenty of clouds, the wind cools your face, and it is possible to work in the garden for hours without worrying about heatstroke.



Good-sized GBalds for sale in November 2020 at a plant nursery<sup>5</sup> in Klang Valley. I have not seen any GBalds for sale for what seemed like years, then suddenly a whole bunch of them appear<sup>6</sup>. Perhaps someone asked for the species...

I used to see quite a number of GBalds sold as commodity cacti years ago. Now they are not so common. It's not in the usual mix of commodity cacti sold in hypermarkets. Sometimes though, you may encounter a nice shipment of GBalds (picture above.) As of 2020, I regard such shipments as uncommon in Klang Valley, Malaysia, but this may change in the future. So if you really want to grow GBald, you'll need to do more legwork, or you can sweet talk the nursery folks into stocking it – show them this website, the documents and the pictures.

GBalds flower on their own accord; I don't know of any forcing method. But if you channel your inner Dr Frankenstein you can get a GBald from a small offset to a flowering specimen in a bit over 1 year. This is where MGeo comes in.

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<sup>5</sup> Glorious Nursery in Subang Jaya, Selangor. Nice folks.

<sup>6</sup> Interestingly enough, I didn't see any flower buds or evidence that any had flowered. Given their large size (note the 2 inch pots at right), at least some should have flowered by now. Perhaps the growers' priority was to get these plants to a certain size in the shortest possible time, and the cultivation conditions promoted stem growth over flowers.

## ***Myrtillocactus geometrizans* (MGeo)**



A GBald on an MGeo, Nov 2016. It pays to be a botanical Dr Frankenstein. On the right is a normal small MGeo. The graft was done in March 2014; the original diameter of the GBald was about half an inch. First flower was in June 2015.

*Myrtillocactus geometrizans* (MGeo) is a large candelabra-shaped plant in its natural habitat, but I always keep mine small and in pots. New growth is bluish. They are found in many areas of Mexico, and has adapted to different climates. Older stems may turn woody, and woody stems are very resistant to pests and diseases. MGeos are sometimes used as a living fence in Mexico.

As you can guess in the picture above, I keep MGeos primarily as stock plants for grafting. Moon Cactus producers usually use *Hylocereus trigonus* as the stock plant, but I like my MGeos because I grew them from seed. I also trim any long spines for safety reasons (the *deadly sharp* central spine can grow up to 2 cm long.) The trimmed spines can be used as spikes to hold a graft in place. When set in a handle, a large spine makes a very good tool for the manual removal of scale insects – they are much sharper and more durable than a bamboo toothpick.



**Left:** Just after grafting<sup>7</sup>, March 2014. **Right:** MGeo seedlings, July 2000.

Grafting will be discussed in a future chapter, though I must add that grafting is not something I do regularly or have a lot of experience in because I do not have a ton of plants to slice up.

The MGeos originally came from seeds. Many years ago, Horti (a Malaysian brand of packet seeds that is commonly found at retail) I think sold packets of mixed cactus seeds that included MGeo seeds. So they are actually lucky survivors of my attempts at growing cacti from seed. As of mid-2019, an online check shows that there is still a mixed cactus product for sale, but MGeo is not in their listed species. Still, you can substitute MGeo with certain other cacti if you want to do grafting.

MGeo is very easy to grow and will even survive rich organic garden soil. However, scale insects may attack stressed specimens.



Mixed signals: maybe the MGeo stock doesn't want to go dormant (Dec 2017). The GBald looked like it went dormant, but there were flowers every month.

<sup>7</sup> The thread is elastic. I found it in the sewing section of a hypermarket. Easier to use than rubber bands.

## Maintainability of a Cactus Collection



Cactus Valley in Cameron Highlands, Malaysia, 2002. It's all very nice, but can you maintain something like this in urban Klang Valley? Note: There are a lot of *Parodia leninghausii* specimens (columnar with yellow spines) in the middle of this picture.

What about all the other species of cacti, some of which are very beautiful even without flowers? Well sure, there is nothing to stop anyone from growing those. The issue is: Will you be able to care for the plants adequately in the long term? My choices were guided by some constraints and threats. The major constraints are: (1) the hot, humid and dusty urban lowland tropical climate, and (2) a policy of not using strong agricultural chemicals. The major threats are: (1) accumulation of dust attracts spider mite attacks, and (2) very spiny or wooly species or species with soft stems are next to impossible to clean if scale insects attack.

Species with narrow ribs or deep tubercles<sup>8</sup> or wool are good at trapping a layer of air – and dust. Dusty plants will attract spider mites, and then patches of brown scarring will appear on your nice specimens. Both spider mites and scale insects tend to attack the most susceptible plants first, that is, the weaker specimens or specimens with soft stems. Many *Mammillarias* have soft stems. The question is: Will you be able to maintain a collection of such cacti? Remember, the bugs can use a weak specimen as headquarters to mount a sustained attack on your other plants.

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<sup>8</sup> *Mammillarias* are not ribbed but they have tubercles.



In PMag, PClav and GBald, we tropical growers have been extremely lucky. They are not huge specimens. The first two have tough skin for mature plants. These three species also have wide and shallow ribs. Dust removal is easy: healthy plants don't mind a weekly spray of water. Pick up a pot and you can see all of the stem<sup>9</sup>. More importantly, you can easily reach and clean almost all parts of the stem. My plants survived a mild scale infestation (scale insects almost always target the softer species, namely GBald) by way of manual removal of scale (using an MGeo spine tool) and by several light sprays of a household water-based insecticide. So the bug threat can be managed.

The *maintainability* of these three species is one big reason why these days I do not care about experimenting with other species of cacti that flower in the tropics such as some *Mammillarias*. There are plenty of things to do with these three species – while I've enjoyed plenty of flowers, there are other things that are not working out perfectly. PMag and PClav specimens have fewer issues compared to GBald specimens.



A larger picture of the GBald specimens from page 1, April 2017. This looks nice, but things are not perfect. In the last few years, practically all GBald seed pods have aborted themselves, even with manual pollination, so I have no GBald seeds at all.  
Note the failing pods at the lower left of the picture.

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<sup>9</sup> But we can't see what is in the soil. It's very hard to have bug-free soil in the tropics, but one can discourage bugs by reducing the content of organics in the soil and making sure it drains well so it's not wet for a very long time.



A larger picture of the GBald specimen with five flowers from a few pages back, April 2016. This also looks nice, but look inside the flowers – the stamens did not mature, so zero pollen. In mid-2019, the grafted GBald specimen also started to produce the occasional flower with some immature stamens. This behaviour is puzzling.

On the plus side, rich soil and heavy feeding supports more flowers than a safe soil mix that is low in organics and light feeding. For the latter, I've had more aborted flower buds. To get more flowers, we must get nutrition into that stem. One way is to graft the GBald. The other way is through the roots by changing the soil mix or feeding strategies. Some changes may heighten the risk of bug or fungi attacks. A rich soil mix is risky but *very tempting* – you can get 7 or more flowers on one stem.

It all boils down to what was mentioned in earlier chapters: Here I provide a mishmash of knowledge, it is up to you to decide how you want to run your cactus collection. If you want to grow fine, healthy specimens or flowering specimens, then you must do some planning on how you can properly maintain a collection of a certain size over say, 5 to 10 years. My efforts sometimes did not go according to plan, but often you learn something along the way. As the Eisenhower saying goes: Plans are useless, but planning is indispensable. Keep an observant eye on your cacti and be flexible.

Next, we will look at other species of cacti that have been known to flower in the tropics. ♦

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