

Flowers and Forcing Flowers



Left: A small and fat GBald in October 2015 with its first flower bud.
Right: The specimen in November 2015 with the flower open. The diameter of the specimen is about 1.7 inch, assuming the pot is 2.5 inch in diameter.

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

Introduction

The material in this section discusses flowering among GBalds, PMags and PClavs in the hot and humid urban lowland of tropical Klang Valley, Malaysia. Cacti cannot experience clear climate cycles here. If you live in a location with a different climate, this material may or may not be relevant to you due to differences in cacti behaviour in different climates.

Klang Valley is generally hot and humid all year around – one cannot really say there are seasons with different weather. Sure, Peninsular Malaysia often experiences drought in the middle of the year, while late in the year, the east coast usually get hit by monsoons. There are no monsoons in Klang Valley, but there are droughts, heat waves, and bouts of rainy weather. Also, the microclimate in urban areas and rural areas are different. Urban Klang Valley is always dusty, more and more prone to heat waves, and there is far too much concrete. Smaller towns and rural areas may have milder weather, with less urban heat island effect, less dust and cleaner air. Your mileage will vary.

Nicknames for Scientific Names

PMag = *Parodia magnifica*

PClav = *Parodia claviceps*

GStella = *Gymnocalycium stellatum*

GBald = *Gymnocalycium baldianum*

MGeo = *Myrtillocactus geometrizans*

GSteno = *Gymnocalycium stenopleurum*

This naming scheme is purely for convenience. Just think of them as webchat nicknames.

Flowering Behaviour of GBalds



First bud ever for this GBald at 3.1 inch in diameter, March 2014.

Healthy GBalds that are growing strongly will flower when they are about 2–3 inch in diameter. In the above picture, the actual diameter may have been about 10% less because the bulk of the specimen is much closer to the camera lens in the macro picture shot.



Second bud ever for this GBald at 2.0 inch in diameter, March 2017.

This specimen is at the lower end of the usual “first flower” diameter range – the dried remains of the first flower dropped off not long before the picture was taken. The soil mix is probably black soil, burnt soil, coco peat and perlite. The specimens were most likely getting magnesium and Thrive Flower & Fruit because I only got the micronutrient microgranules in mid-2018.

Whether the month of the first flower – March – is significant or not is an open question. On the next page, you will see another “first flower” specimen for March 2017. If you want me to put a finger on the cause of this possibly coincidental timing, I would point my finger at the minor heat wave that always occurs in urban Klang Valley around the Chinese New Year holiday period¹.

According to my 2020 spreadsheet, there were 3 GBald specimens that first flowered in the January to June 2020 period. Two of them had their flowers open in March 2020, while the third one had its first flower open at the start of June 2020. The weather from March to May 2020 was also often hot because of reduced vehicular traffic in Klang Valley². So hot weather may well push growing GBalds into flowering mode.

1 See the chapter on Useful Concepts for a discussion of this urban climate phenomenon.

2 This is due to the coronavirus.



First bud ever for this GBald at 1.4 inch in diameter, March 2017.

This is an even smaller specimen, showing off its first bud, in the same month of March. Sometimes GBalds can surprise you and produce a flower when they are much smaller than 2 inch in diameter.

There is, however, a downside to early flowering in GBalds. Such specimens do not flower consistently, as if the first flower was an anomaly, a one-off. This is why I prefer to put the normal flowering size of GBalds at 2–3 inch in diameter. Normal-sized mature specimens that are growing strongly will flower again and again. Don't expect small specimens to flower again and again. And of course, large specimens can produce a lot of flowers, so size matters.

Here in Klang Valley, Malaysia, GBald flowers open in the afternoon and close in the evenings. On some specimens, flowers open a couple of hours earlier while on other specimens they may open very late. Flowers open for 5–7 days on average³. In mild weather, a flower will sometimes last up to 9 days. However, if the weather becomes rainy, cold and cloudy, flowers will not open at all. They will stay closed all day.

³ I will provide data and charts in a future edition.



Oh, a section on flowering without flowers? Sorry. Here, have a picture. 6 flowers on the GBald specimen that was once grafted. *Size matters*. (May 2020)

Things do not always go smoothly with GBald flowers. GBalds do not have unlimited resources. Sometimes a specimen will produce many flower buds. Then some of these buds will dry up and drop off because the plant could not maintain all of them. This does not happen with PMags and PClavs – I don't remember seeing even a single aborted flower bud on those plants. For GBalds, if every bud dries up, it may indicate that there is a serious problem with the plant.

While the freely-flowering trait of GBalds is attractive, it would not be wise to market GBalds as a regular houseplant. To be successful with GBalds, the customer or gardener must understand the lifecycle of this species and be able to manage the resulting complications. Without the requisite knowledge, unsuspecting customers or inexperienced gardeners will eventually run into trouble.

In this form, GBalds will never be a zero-effort houseplant. It works well, if you know what you are dealing with. Remember, always work smart and make your efforts count. My records show 92 GBald flowers in 2019. That total was exceeded in the first 4 months of 2020.

Accidental Flower Forcing: PClav



Buds and one offset appearing on PClavs, August 2014.

Before this event, I did not properly care for my PClavs so that they grow well and produce flowers. At that time, my perception was PClav is a tough desert plant that will do well even with minimal care, and large specimens will flower occasionally from time to time. If the large PClav flowered, then I considered myself lucky, for in tropical Malaysia there are no clear seasonal changes for cacti to experience and plants do not get a winter's rest. This view was reinforced by looking at PMag, PClav and *Parodia leninghausii* specimens in my visits to Cactus Valley and other cactus and succulent themed attractions in Cameron Highlands. Many of those specimens had flower buds or dried flowers, but open flowers were few and far in between. Of course, now I know better.

The PClav specimens in the picture above are rooted offsets. They do not have a very healthy green colour because they did not get the best care. These specimens had also been *rested* among other plants, with their roots bare and crumbling, for a few months while I took my time deciding what to do with them.

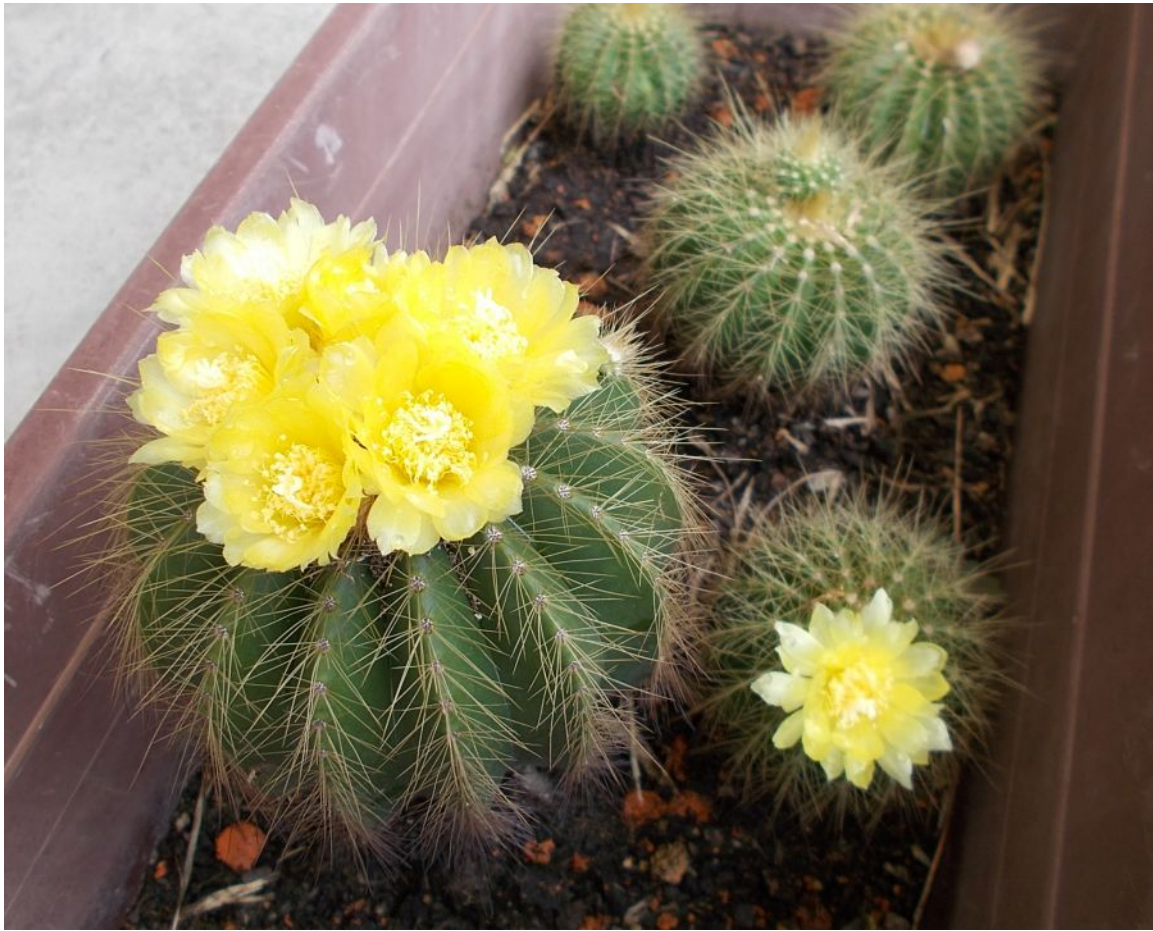
I finally put them into an old planter box in a mix of black soil and burnt soil. Then they were placed out in the open, exposed to the sun and rain. It's to toughen them up to become proper desert plants. The desert plant theme is a very strong influence on one's cultivation methods, good or bad.



A month later, the flower buds and the single offset has become obvious. (Sep 2014)



In October 2014, just before the flowers opened for the first time. The bigger specimen has grown considerably larger in a couple of months.



Six flowers on one PClav, seven in total. (October 2014)

A month later (picture on previous page) it has become clear that a period of rest can do wonders for PClavs. The specimen with 6 flower buds is the same one as the PClav that was repotted and sprouted five offsets. So in 2014, it had been accidentally pushed to flower for the first time.

When the flowers opened (picture above), they did not look like normal PClav flowers. The proportions and shapes were slightly off. So the specimens may have been on the small side for flowering PClavs. By measuring the size of the specimens compared to the size of the planter box, the diameters of the two specimen in the above picture are about 4.0 inch and 1.9 inch.

After this round of flowers, the specimens did not flower again. Due to downsizing of my collection, I no longer have the smaller specimens. As for the largest specimen, its next round of flowers was in August 2018, nearly 4 years after this October 2014 round of forced flowers.

This accidental event hints that even small-sized PClav specimens can be manipulated to produce flowers. All they need is some rest, then let them grow again. Without this artificial prompting, small PClavs probably won't flower. Of course, if you have a large specimen, you won't need this kind of forcing at all. But it does show that low temperatures simulating winter conditions during a resting period is not necessary in the case of PClavs. I have also repeated this experiment successfully in 2018 – this will be discussed in a later section.

Accidental Flower Forcing: PMag



Oh, the PClav behaviour was interesting. Let's take a spare PMag and try some more 'resting'. Here is the test: a fairly large PMag resting on a plastic cookie container. In the background is a large bag of "burnt soil" – actually a kind of fired clay used as soil amendment – that is common in Malaysia. (February 2015)

Around February 2015, I tried a simple experiment with a PMag. Since PMags are somewhat related to PClavs, it may be possible to replicate flower forcing on a PMag. One good-sized specimen was selected and placed in an empty plastic cookie container. Note that here I am trying to push a large and mature PMag to flower whereas the PClavs that got accidentally forced were quite small. During this time, *Parodia* flowers were a rare treat, so this is a valid thing to try. After a while, all but the largest roots crumbled away. Since I am paranoid about spider mites, I gave the specimen irregular sprayings of plain tap water. The PMag later sprouted some offsets. Well, sprouting offsets from the base is normal behaviour for a mature PMag.

In August 2015, after 6 months, I took the PMag out of the plastic container in order to repot it back into a normal soil mix to restart growth. The numerous small offsets were annoying, so I removed all of them. That was when I noticed something was *different* about these offsets:



Weird offsets from the resting PMag specimen. Many offsets have what looked like dried flowers. The one in the center is a flower bud, but since it is now on a tiny offset all by itself, it did not open. (August 2015)



A closer look at some weird offsets. (August 2015)

It looks like *mature* PMags can be forced. But this particular forcing behaviour is quite novel. The offsets sprouted on the PMag stem near the throat of the container, so they could not be seen clearly. But since the container is made of clear plastic, the offsets could get some sunlight. The offsets also got small amounts of water through water sprays intended to wash off dust. In addition to that, there were periods of hot and humid conditions, because excess water from spraying drained into the plastic container and later evaporated. The rest of the specimen was normal, no growth was seen, and there were no flower buds near the apex area or the main growing point.

I have not repeated this experiment to replicate the accidental outcome, mainly because my PMags and PClavs already perform very well when they are of a good size and are well cared for. I do not have any record of the outcome of my original experiment, which was to force flowers by resting and then potting up the PMag specimen. In 2017, I ran a second experiment which I will discuss in a later section.

This behaviour is extremely interesting, and it also does not involve low temperatures, so perhaps both PClav and PMag do not need a cold winter's rest. In practice, forcing techniques are not necessary for PMags and PClavs because healthy specimens of good size are capable of flowering all year round while they are producing new growth. For smaller specimens, it may be better in the long run to focus on growing them bigger rather than interrupting growth to get a few flowers.

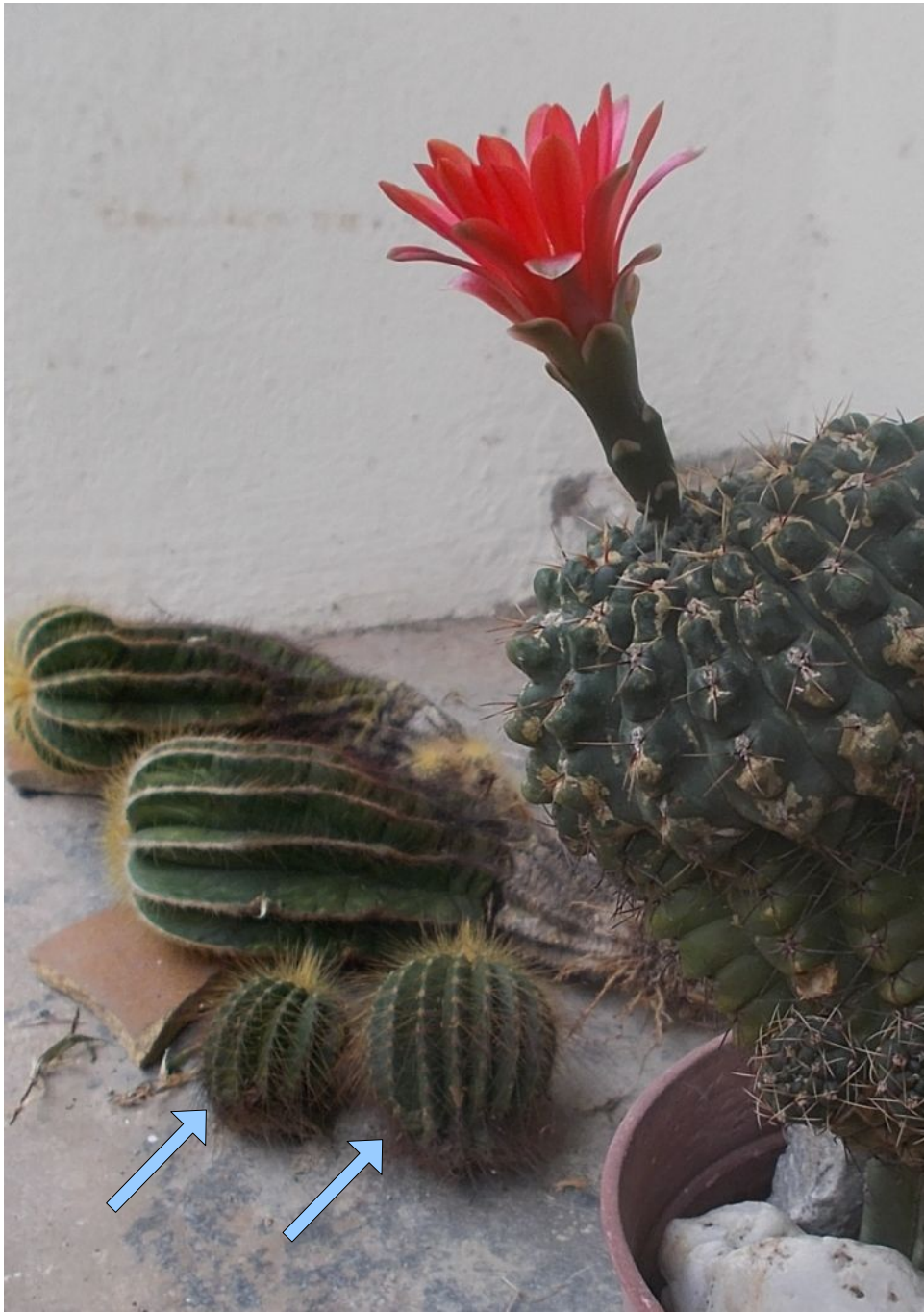
Flower Forcing Attempt: PClav



You've already seen this specimen being repotted in the chapter on Repotting Cacti. The two old offsets (arrows) were detached and left to dry and rest. The wounds look big and nasty because the offsets have been growing for a long time, but it's really no problem. The scars will dry up and shrink in time. (April 2018)

Forcing flowers in PMags or PClavs faded into the background after 2015 because I was focused on the problem of nutrition for cacti. Later, the performance of my two large PMag and PClav convinced me that growing a large *Parodia* is better in the long run compared to artificially forcing flowers. If they can flower almost every month in a tropical climate, why bother with forcing?

When repotting the PClav that was pushed to flower in 2014 (picture above), an opportunity to experiment presented itself. This specimen had 2 offsets that were growing for a long time and were large for PClav offsets. Both were detached and left to dry so that the wounds heal. They were then left to 'rest' without soil. Perhaps they got the occasional water sprays to clean off dust.



The two PClav offsets (arrows) shown resting one month after being detached. The two PMags were also being rested, both eventually flowered but their behaviour was different compared to the PClavs. (May 2018)

This treatment did not led to roots produced by the two PClav offsets. After about 2½ months, they were finally potted up (picture on next page.) Not long after that 2 flower buds were seen on the larger of the two specimens. Bam! Like clockwork.



They were finally potted up about 2½ months after being detached. (June 2018)



In early August 2018, two flower buds appeared on the larger specimen.



By the end of August 2018, both specimen have flower buds. If you compare this to the picture from June, it is clear that both plants have grown considerably.

At just 4½ months since being detached, both specimen were sporting flower buds (picture above.) Both specimens were growing strongly since being repotted. Pushing PClavs to flower in the tropics appears to be really easy. In habitat, the changing seasons would presumably push the plants to produce flowers. In a tropical climate, resting works. No cold weather is required.

While forcing PClavs allows you to enjoy some flowers, it is not an ideal process for the plants. The flower buds were slow to develop. The larger specimen took about 2 months to go from tiny bud to open flower. That's not too bad, but a large PClav does it faster. The smaller specimen however took over 4 months. I'm sure GBalds or *Gymnocalycium*s in general would have aborted such a flower bud ages ago. Apparently these *Parodias* like to hang on to their flower buds.

Also note the absence of densely-packed wooly areoles at the top of the specimens (see pictures on the next page.) On normal PClavs, flower buds open quickly so flowers always appear at the top of the plant. These two however took such a long time that the flower buds are no longer at the top. New growth comes from the growing point at the top, so the flower buds are 'pushed' lower.



In early October 2018. There is a distinct lack of wooly areoles.



The flower buds on the larger PClav are ready to open. (October 2018)

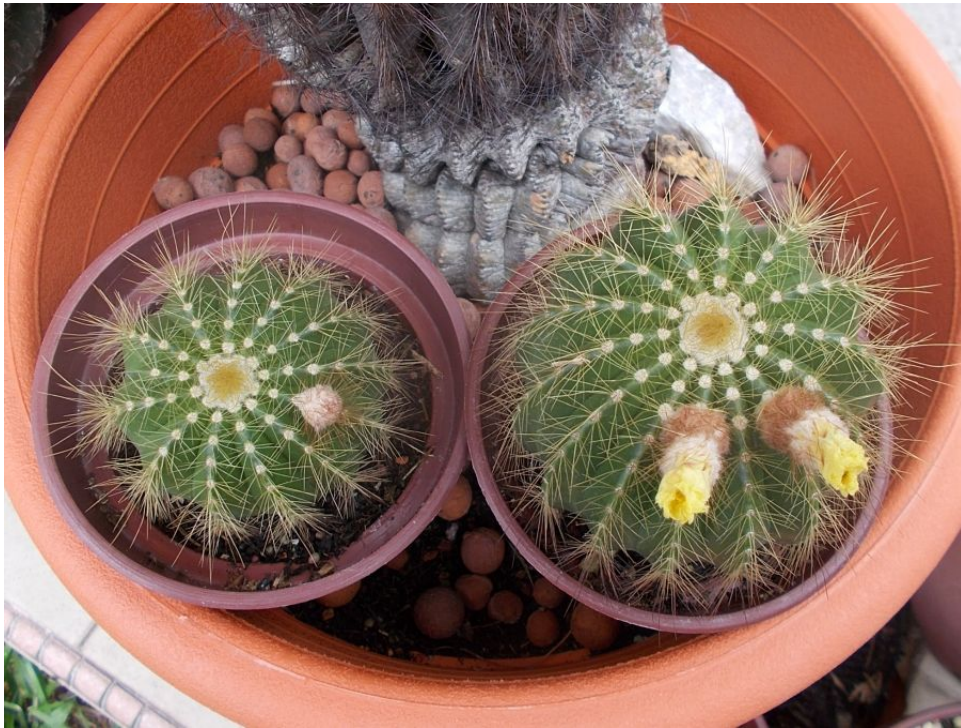


Two days later. Two flowers open on the larger specimen. They look like normal PClav flowers, so it's all good. The only thing missing versus larger PClavs is the lack of wooly areoles at the top of the specimen. (October 2018)



The specimen is about 2.6 inch wide and 2.5 inch tall. (October 2018)

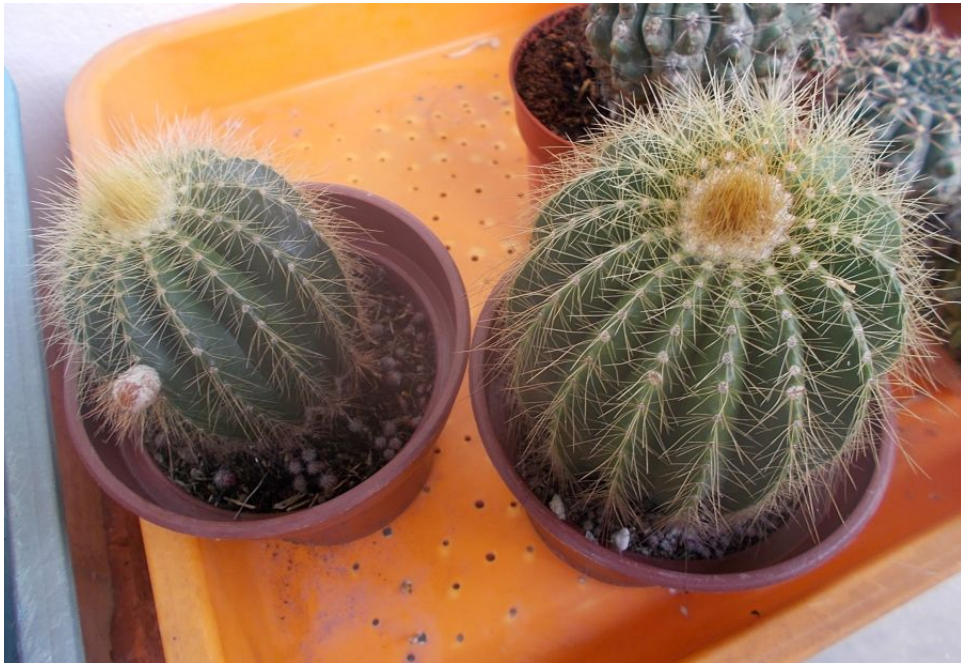
The above shows that it is possible to get a PClav from a detached offset to a flowering specimen in just under 7 months. However, the smaller specimen took about 2 months longer to achieve this. So forcing flowers from PClavs is best done on plants a bit larger than 2 inch in diameter.



The two flowers have dried up. (October 2018)



In late November 2018, the flower bud on smaller specimen is still not ready to open. Because both specimens were steadily growing, the locations of the buds and flower scars appear to move lower.



In late December 2018, the flower bud is now quite large. Note the volunteer PClav seedlings clearly visible in the smaller pot.

In late December 2018, both specimens were moved to the trays of GBalds because volunteer PClav seedlings were discovered in both pots. When ripe, a PClav seed pod will split and hinge upwards, spilling some seeds below. The volunteer seedlings were due to seeds from the big PClav – take note of the location of the two pots in earlier pictures. The new location has more shade so that the conditions are milder for the seedlings⁴.

The flower bud is quite big now, and it will open not long after this. By now, it has been about 4 months since the bud was first detected. This is an unnaturally long time for a PClav flower bud to grow. Due to the growth of the plant itself, the flower bud is not pointing upwards like most PClav flowers but it is now pointing almost horizontally.

A possible partial reason for the slow progress of the flower bud on the smaller specimen is the bigger exposed soil area of its pot. The hot tropical climate tends to dry exposed soil quickly. Dry soil conditions was more serious just after repotting, when the specimens were still quite small. In about 6 months from the time it was repotted, both specimens have grown considerably.

By measuring the small specimen and its pot in the pictures, its diameter can be estimated at 2.0 inch at the time the flower bud was first detected, increasing to 2.3 inch at the time the flower opened. So a 2 inch diameter PClav could barely produce a flower⁵. If you have a specimen that is 3 inch or more in diameter, then pushing the plant to flower ought to be quite easy.

4 Survival of the seedlings was not a top priority. I have collected quite a lot of PMag and PClav seeds that I can sow at any time. But trying to maintain a bunch of accidental seedlings outdoors is a useful exercise all the same.

5 Well-grown GBalds often flower at around 2 inch in diameter. Possibly, such South American cacti have enough resources to produce a flower at this minimum size. Measuring volume may be better, but that's more appropriate for someone who's taking scientific data. Measuring diameter is much easier.



The flower on the first day it was open. (January 2019)

The flower of the smaller specimen finally opened in early January 2019, about 8½ months from the time it was detached as an offset. This flower is slightly abnormal compared to normal PClav flowers. The flower petals are slightly smaller and maybe more narrow. With normal care, both specimens have not flowered since. A little bit of rest really does wonders for PClavs.

Flower Forcing Attempt: PMag

The following chronicles an attempt to force a couple of PMags to flower. There were two rest periods, the first which started in September 2016. No flower buds appeared after both rest periods, even though there was plenty of new growth.



Potted up in May 2017 after resting with root bare for about 7 months.



In February 2018, resting with bare roots again during the time when all the GBalds were undergoing some kind of dormancy.



Potted up again in June 2018.



After 2 months, there is plenty of growth but no buds. (August 2018)



The two specimens in November 2018, now located with the larger *Parodias*.

After 5 months since the second rest period, there has been plenty of growth, but no flower buds. By contrast, the two small PClav offsets produced buds in just 2–3 months. By now, the PMags are quite large and may be approaching the size when a PMag might just flower on its own.

Of course, this was not a very good experiment. In the picture above, the soil mix in both pots look rather poor. Soil without a mulch for protection will dry quickly in the hot tropical weather, creating a dry crust on the surface. So there are many factors that could have affected the experiment. Still, I hoped that the PMags would respond like the two PClavs.

Another complication was that the two specimens turned out to be somewhat root-bound. I repotted them (see pictures on the next page) after noticing there were many roots on the surface of the soil mix. The specimens were large and they had 5 months to grow.



Repotting the specimens in November 2018.



Closeup of the root balls. (November 2018)



By January 2019, offsets can be seen at the base.



After 6 months, they look very much like mature PMag specimens. (July 2019)

What worked for PClavs does not appear to work for PMags. Finally, a flower bud appeared on the larger of the two specimens after 14 months since the second rest period. Resting does not work, then. By now, the specimens are fully grown PMags with blue-green stems, woolly areoles near the top, and many offsets at the base.



The first flower bud on the larger of the two specimens. (August 2019)



The diameter of the specimen is about 3.7 inch. (September 2019)



The height of the specimen is about 6.0 inch. Note the wrinkles – it's not being grown under ideal conditions. (September 2019)

Never mind about the failed flower forcing experiment. Here, we can see that a PMag may be willing to flower when they are about $3\frac{1}{2}$ inch wide or 6 inch tall. If we subtract the resting periods, there was maybe 2 good years of growth. Although the specimens were larger than typical commodity cacti specimens, it looks as though it may be possible to get a commodity cacti PMag to flower in maybe 4 years⁶, with good nutrition and care. They will also need to be repotted 2–4 times.

6 If that's too long to wait, grow PClavs. Remember, we can make a $2\frac{1}{2}$ inch wide PClav flower in less than 1 year.



The first flower opening on the larger specimen in September 2019. The other specimen wasn't very far behind – it flowered just 15 days later.

There is a hint that both specimens *did* get a bit of a push – the flowers were smaller than normal PMag flowers and the specimens did not continue to flower regularly after that. If we can optimize the conditions needed to push these PMags, then perhaps we can force smaller specimens to flower quickly and reliably.

PMag and PClav Flowers



A bee in one of two PMag flowers, March 2019.

So far, I have tried the resting method for forcing flowers on two PClavs and two PMags. All of them eventually flowered. The method works very well on PClavs, while PMags may need a different kind of forcing method. Only one of the four has flowered more than once – the biggest specimen among the four, a PMag. Rather than forcing these *Parodias* to flower, these days I prefer to grow them big so that they do the flowering part on their own accord, without needing a push.

PMag and PClav flowers will open around 10am. Often, flowers will close in the evening and they will open again the next day. PMag and PClav flowers usually last 2 days. On rare occasions some flowers may last 3 days. Sometimes the yellow colour of the flower will fade after the first day; when you see the flower open the next day it may have turned into a very light yellow colour.

Bees have visited PMag and PClav flowers on many occasions. I have no idea if the flowers produces nectar, but if you put your nose very close to PMag or PClav flowers that attract bees, you can often smell a faint floral aroma. At other times, many months will pass without a single bee attracted to these flowers.



Six of the PClav flower buds will open the next day. Another four smaller flower buds are visible. There may be two viable seed pods hidden under the bristles and wool of the two dried flowers. (December 2019)

The largest PClav specimen tends to be the most interesting specimen among my *Parodias* because it is very prolific at flowering. It is a large plant that is a single stem with one active growing point at the top, so almost all activity is focused there. The largest PMag by contrast has to spread its resources among several stems.

While these specimens are impressively productive, there is room for improvement. I am probably still under-feeding my cacti. PMags and PClavs have an extensive root system compared to the weak root systems of GBalds, so they can absorb more nutrients. Optimal care for PMags and PClavs will be different from optimal care for GBalds.



The big PClav with six flowers open in December 2019.

In general though, *size matters*. Large plants have lots of resources. Large and healthy plants of these three species that are growing strongly may produce flowers all year round in the tropics. ♦

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Colophon

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