

Ball python set-up

Experienced snake-keeper Pete Hawkins explains how he houses his ball pythons, covering all aspects of this topic in detail, providing information that will also be useful when setting up enclosures for other reptiles as well.

Throughout the present century, the popularity of the ball or royal python (*Python regius*) has continued to grow, and these snakes are now very popular with novice snake keepers. This is quite different from the early years of the hobby back in the 1980s, when ball pythons acquired a reputation for being difficult to feed, displaying a tendency to lose their appetite. It's now realised this can be a characteristic of the species though, rather than a cause for serious concern in the vast majority of cases.

Their appeal

Today, these stocky pythons have a widespread appeal to all snake-keepers, partly because of the range of colour

varieties (or 'morphs') that have been created. In fact, ball pythons can rank as the most expensive species of snake in the world, with some of the rarest and most desirable colour variants selling for massive sums of money, measured in tens of thousands of pounds.

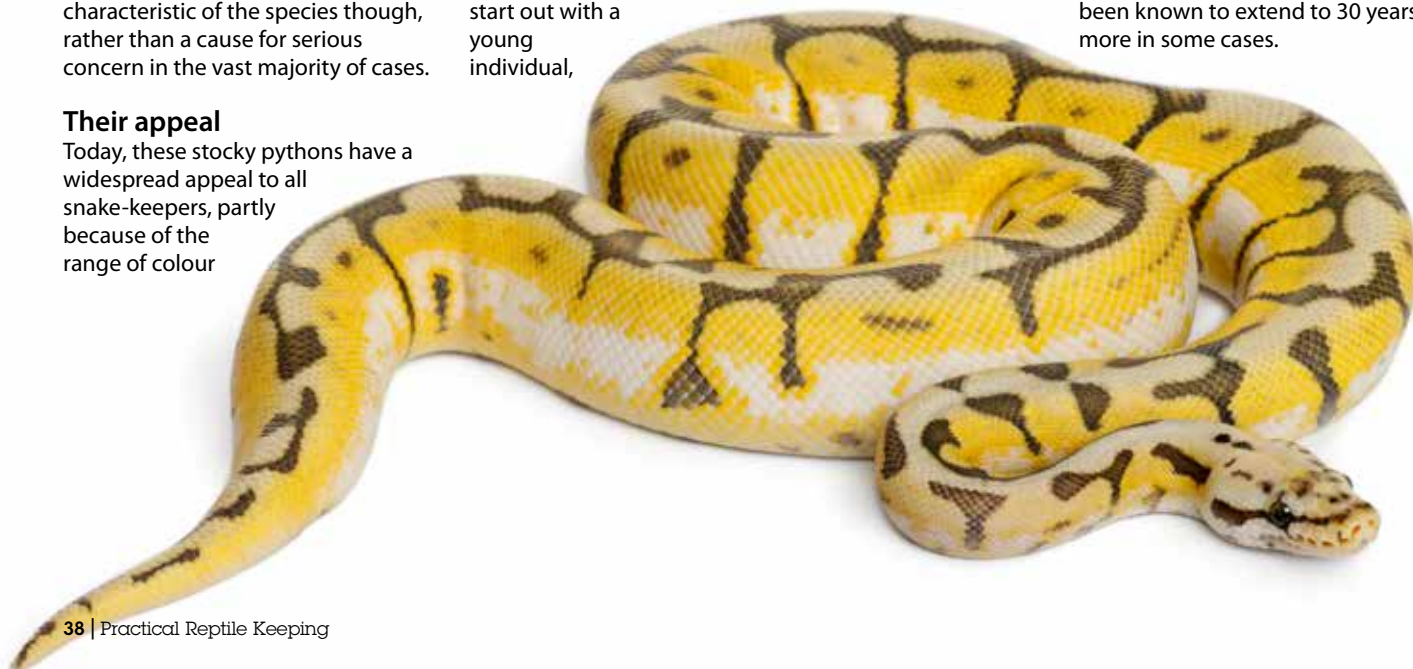
Although these snakes can prove to be shy, they are docile by nature too, and relatively slow moving. This means that especially if you start out with a young individual,

▼ **Ball pythons have a relatively stocky body shape. A young killerbee female, about a year old, is seen here.**

Photo courtesy Eric Isselee/
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handling should prove relatively straightforward, even if you are not used to handling snakes. One thing to remember, however, is never to grip a snake tightly. Otherwise, you could cause internal bruising, which can potentially have fatal consequences.

Another feature of ball pythons is that they are relatively long-lived as well, provided that they receive the right care. Their life expectancy has been known to extend to 30 years or more in some cases.





Size

People sometimes forget the likely adult size of a ball python, compared with that of a young snake. They will attain a typical length of around 1.5m (5ft), with females often growing larger than males. This will in turn need to be reflected in the size of their enclosure, which should be at least 1.2m (4ft) long in my view.

In the wild

Understanding the natural lifestyle of snakes, and the environment where they are to be found, helps to give invaluable pointers as to how they should be kept. Ball pythons occur in parts of West Africa, extending from Sierra Leone, Togo and Ghana to Nigeria, the Ivory Coast and Cameroon.

This is a widespread snake through its range, often being found in arid savannahs as well as more open grassland areas. It can also be encountered in woodland and fields, and ball pythons even venture quite close to human settlements where rodents are frequently to be found.

These snakes are nevertheless secretive in their habits, spending time hidden away often underground in the burrows of other animals. They will also seek retreats in termite mounds, and even climb trees, resting in hollows here, in spite of a popular view that these pythons do not climb. Their natural food consist of small mammals like rats and mice, as well as birds and lizards too, and they have even been known to feed on smaller snakes.

Enclosures

The housing of ball pythons can be a controversial subject, with both the size and type of the enclosure being a subject of considerable debate. Yet for me, even for a snake that naturally seeks out snug retreats in the wild, it is straightforward. A snake that grows to around 1.2-1.5m (4-5ft) in overall length should have space around it, and some height too, as

▲ A ball python out in the open.

Photo courtesy Northern Exotics/www.shutterstock.com



▲ Many of today's domesticated bloodlines of ball pythons are descended from Ghanaian stock.

Photo courtesy Naruedom Yaempongsa/www.shutterstock.com



◀ Do not forget to acquire a vivarium lock, so there is no risk of your snake being able to slip out of its quarters and escape.

Photo courtesy Sergey Novikov/www.shutterstock.com

Did you know?



▲ A ball python revealing why this species is so-called! Photo courtesy Master1305/www.shutterstock.com

The description of 'ball python' comes from the way that these snakes will tend to curl up into a ball, occupying a small space within a shelter or burrow. A ball python may also react like this if it is feeling threatened or stressed.

ball pythons will sometimes climb.

Therefore, as a minimum, I always recommend a 1.2x0.6x0.6m (4x2x2ft) setup, and actually opt for a slightly larger wooden enclosure for mine, measuring 1.5m (5ft) long. Although your snake will not use all this space every single day, it will be utilised when required, such as when stretching out to bask under an ultraviolet B (UVB) source, as explained in more detail later.

I generally keep my young snakes in breeder boxes or similar containers for the first 7-9 months or so. This is mainly because they are so small and often more nervous by nature than adults. A smaller, more confined set-up seems to calm them down at this age, compared with keeping them in larger surroundings. Once they are settled and feeding well, I then move the young pythons into their permanent accommodation.

Tubs, RUBs and boxes

I know keepers that use ventilated RUBs (which stands for Really Useful Boxes® - a brand of plastic boxes available in different sizes), and similar enclosures for their snakes without any issues at all. But personally speaking, I like to be able to see my set ups, looking at the

decor and the snake as it moves around its quarters, which is why a glass-fronted vivarium will always be my choice.

There is a fundamental difference between heating a RUB or tub, which will require a heat mat (under thermostatic control as ever), and a vivarium. In many cases, the heat mat is affixed either under or on the side of the unit, but for me, I prefer the heat source for my snakes being located above them, to replicate natural conditions in the wild.

My choice for this purpose is therefore either the Arcadia Deep Heat Projector (DHP) or a ceramic bulb as opposed to a heat mat. It worth pointing out that really only in a vivarium do you have the necessary height and space to supply overhead heat, with a tub of any kind opening from above, rather than from the side.

Many snakes, certainly when young, become nervous about a lid being taken off a box where they are housed, effectively exposing them. This is because they are instinctively conditioned to predators attacking them from above. As a result, this can cause stress, which may in turn trigger loss of appetite, and increases the risk of the snake striking out and biting you.

As already mentioned, when housing a baby ball python though, I

▲ Bear in mind that ball pythons will climb on occasions.

Photo courtesy Try Azmeer/
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▼ A different style of housing may be recommended for young ball pythons.

Photo courtesy Sorin Alb/
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will use a breeder box or a low-lidded Exo Terra Faunarium. I stick to the larger size of Faunarium, measuring around 46x30x17cm (18x12x6.5in), which suits a ball python at this early stage in its life and is a very secure unit, provided that you remember to ensure the top is pushed back firmly in place.

Heating and temperature

I keep the basking spot in the vivarium around 32°C (89.6°F), with the cooler end being around 25°C (77°F). This temperature is taken via a probe thermometer located just outside of the hide located at the basking spot, rather than using a dial-type thermometer which is nowhere near as accurate in my experience.

This temperature range is used by

many keepers - in no case though should the upper figure exceed 35°C (95°F). Yet as with any temperature reading, bear in mind that it can be affected by the heating method that you are using, and other factors including the position of the thermometer probe, and even the substrate used to line the floor of the enclosure.

As already mentioned, I use the 'heat from above' option with ball pythons in vivariums (and with other snakes too). The issue that I have with using heat-mats in such set ups is firstly that a heat mat located directly on wood or plastic (if using a tub/ RUB) is not ideal from a safety perspective.

In addition though, if the heat mat is being buried under a thick layer of substrate, preventing any natural



▲ Good environmental conditions are vital, to ensure that snakes shed cleanly in their quarters.

Photo courtesy LocalExposure/www.shutterstock.com



The overhead heating method is what I always recommend, once the snake is in its larger vivarium

airflow to it, that is also not ideal. Furthermore, with ball pythons being a large-bodied and often stocky snake, that's a lot of direct heat being directed on to the not-so-sensitive underside of the reptile, and it can give rise to quite severe burns.

The overhead heating method is what I always recommend, once the snake is in its larger vivarium. The Arcadia DHP (deep heat projector) is my preferred choice here, because this bulb gives out zero light and yet emits infrared A and B wavelengths which are highly beneficial, because they penetrate deep into the tissues.

Since I replaced my ceramic heaters with these bulbs a couple of years ago now, I've observed both increased and more intense basking sessions, as well as an increase in the overall activity of the snakes, which for me, represents a good thing.

Not that I had any significant issues in terms of using a ceramic heater (CHE) either, but as I say, I've noticed that the snakes do behave differently under the DHP system. Many ball python keepers still use a regular incandescent basking bulb (white light, not coloured), which is fine as well, and emphasises the natural day/

night (diurnal) cycle. The most important thing, whatever heating method is being used, is always to run it in association with an appropriate thermostat, as explained later in this article.

Night-time temperature

It is a good idea to allow a slight drop in temperature overnight, however, just as happens in the wild. This is possible with some thermostats, such as the Microclimate Evo thermostat, which allows you to set several temperature ranges throughout a 24 hour period if required.

Obviously, if you use a light-emitting bulb, then you will want this to turn off after 12 hours, in order to create that light/dark:day/night routine. So you can either turn to the

▲ Originating from a tropical area, ball pythons require a relatively stable temperature in their quarters, which does not drop back excessively at night.

Photo courtesy reptiles4all/
www.shutterstock.com

use of a CHE for night period, or if your room temperature remains high and falls no lower than 25°C (77°F) overnight, then no additional heat will be required until the morning, when the lighting and heating should be set to come back on again.

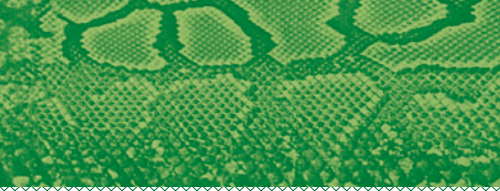
On the other hand, I know many keepers of ball pythons chose to keep the same temperature 24/7 via a CHE which is always operating, preferring instead to regulate the day/night cycle via the UVB (as explained later). Although no adverse effects have been reported with this method, I prefer to replicate typical day/night temperature fluctuations, and so I choose to opt for a cooler vivarium temperature overnight.

Thermostats

When it comes to safety, irrespective of your chosen heating method, a thermostat is an absolute necessity, to prevent the temperature in the vivarium becoming too hot, or conversely falling too low, which again is likely to have an adverse



Please note that when it comes to the use of overhead heating, you will need a suitable guard for your CHE/bulb or DHP. This must have holes small enough to exclude to your snake for reaching the heat source directly, or burning itself on the surround. This is still necessary, even although ball pythons are less arboreal than some other snakes. Suitable options are available from reptile stores or online.



impact on your snake's health.

For the heat mat providing warmth to a young ball python's Faunarium or RUB, an on/off stat can be used, although a pulse stat will be an even better choice. What the thermostat does, of course, is to regulate the power to the heat source, and so serves to maintain the temperature that you have set.

In short, an on/off or mat-stat unit does exactly that, providing the most basic level of control. It will remain on until the required temperature is achieved, whereupon it will then turn the heater off until the set up is cooler, before switching it back on again. I don't use these, because I find they are the most inaccurate of the three groups of thermostat that are currently available.

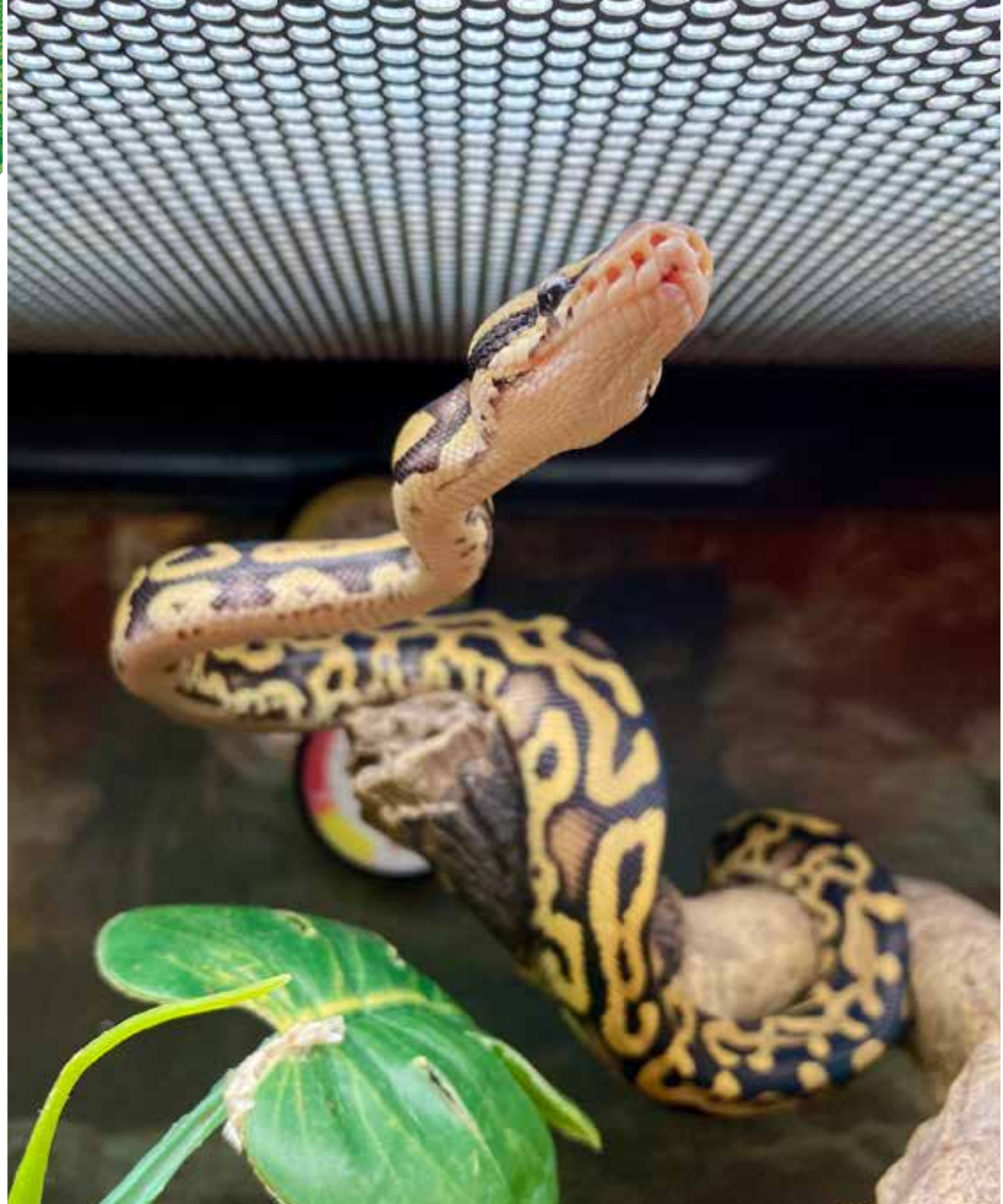
The pulse stat, as its name suggests, will pulse power to the heat source, thus keeping a more stable set temperature than the on/off stat. Dimming thermostats are very similar in their function to pulse models, but the power is reduced (and not switched off) once the set temperature is reached. The thermostat then gradually increases the power again in order to maintain the desired set temperature.

Basically, any light-emitting heat source should always use a dimming thermostat.

Other types of heater such as a heat mat or a CHE should be operated in conjunction with a pulse thermostat. For the Arcadia DHP system that I use, the bulb is controlled by using the Microclimate Evo thermostat. Why? Simply because this provides all three of the above-mentioned options available in one thermostat, making it the best stat on the market in my opinion. I opt for the dimming method with the DHP.

Positioning considerations

When it comes to locating the probe of the thermostat in the vivarium, I



find that I have greater control by placing it on a side or back wall in the basking area, as opposed to directly on the basking spot. If the probe is placed here, not only can the snake lay all over it and give you false reading, but this will also potentially cause the set up to become far too hot as well. There is an additional risk in that your snake may move the thermostat probe around over the floor area as well, shifting its position and thus the unit's ability to control the heat output.

▲ A thermostat is essential to regulate the temperature within the vivarium.

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shutterstock.com

► Ball pythons will bask when provided with UVB lighting in their enclosure.

Photo courtesy Brett Upshaw/
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◀ It is also now possible to monitor vivarium conditions remotely, using smart phone technology.

Photo courtesy zhu difeng/
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Bear in mind, however, that when placed on the wall, you will need to have it set a little lower in terms of the temperature requirement, given that the probe will be further away from the direct heat of the basking spot.

But the thermometer probe will then help to ensure that you have the correct temperature reading in the basking area. My thermostat is set around 28.5°C (83°F), which gives me the desired 32°C (89.6°F) basking zone. Some adjustments may well be needed in your own set up at the outset, to give you the right figure, but it is all straightforward and once it is sorted out, the system should operate without problems.

Day/night cycle

As briefly mentioned already, I feel the day/night cycle should be replicated in vivarium surroundings, given that we are essentially trying to mimic the snake's natural environment as far as possible. As mentioned already, I use the Arcadia DHP for heating purposes, but it emits no light so I rely instead on a linear UVB tube which operates during the day for 12 hours, and is

▲ Moss naturally helps to maintain the humidity in a ball python enclosure.
Photo courtesy Breck P. Kent/
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There is a direct relationship between humidity and the substrate you use, as well as the size of the set up

then switched off for the same period. My choice here is an Arcadia 6% T5, with a reflector.

This in turn gives creates a UV-index high level of around 1.5/2.0 in some areas of the setup which corresponds to the findings of Dr Gary Ferguson and his team in what are now known as "Ferguson zones". The question of whether snakes need UVB light is still disputed, but to me the answer is self-evident. They definitely do!

They are exposed to it in the wild, and they have the option in the vivarium - just as in the wild - as to whether to utilise it, and at what level of exposure, thanks to the presence of hides and foliage providing cover in their quarters. And I have witnessed not just ball pythons but other snakes utilising UVB provided in this way, confirming to me that is of benefit, both for the production of vitamin D3 and other key body processes.

Substrate and humidity

There is a direct relationship between humidity and the substrate you use, as well as the size of the set up. Even your geographical locality and the humidity in the room where the vivarium is being kept can be significant, and it is worth noting that some types of bedding such as aspen will not be the best choice for maintaining a steady humidity gradient in the vivarium.

A soil-based mix is far more suitable. I use a soil mix with a little play sand, added (at around a 70/30 ratio), to a depth of at least 13cm (5in) in the vivarium. The soil depth allows the snake to be able to burrow down a little, which it will do by turning round on the spot, creating a bowl-shaped depression here.

I also add some cypress mulch, with the cool area of the enclosure incorporating a large area of moss. Spraying this lightly on a daily basis will maintain a 50% humidity reading

on the hygrometer (humidity monitor) with little effort. Opting for a good size water bowl also aids the humidity. This figure fluctuates to an extent over a 24 hour period between sprays, as happens naturally.

If your humidity is a little higher, do not worry too much. High humidity is only really an issue if the air circulation in your set up is bad. This is when problems such as respiratory infections can arise.

Going bioactive

Another benefit of using a soil mix is that it also allows you to go bioactive. This is when you use the likes of creatures such as woodlice, springtails and mealworms (often collectively referred to as the 'clean-up crew' or CUC) to maintain a living eco-system within the enclosure. They will aid the disposal of the snake's waste by consuming it, as well as keeping the substrate healthy and aerated, which will also benefit the plants and moss within the setup, improving the snake's overall environment.

Nevertheless, I do advise that if you see any waste, then clean it up, or leave just a little. You'll often need to help the CUC, as they are only small, and snake waste can be pretty large. Their contribution is more in terms of maintaining the eco-system as a whole.

If you do opt for other substrates such as aspen, then you will need to check daily for waste and clean it up thoroughly without delay, so it poses no health problems. A word of caution about aspen: I do find some brands of aspen quite dusty, and this can irritate the snake's respiratory tract. I prefer Lignocel® for this reason, and use this for young ball pythons before they are moved to their permanent quarters.



▲ Ceramic dog bowls are ideal for ball pythons, as they are not easily tipped over and they can be cleaned without difficulty. Photo courtesy Africa Studio/www.shutterstock.com



A drawback of Lignocel® is that it is not great when it comes to maintaining a suitable level of humidity. But it is relatively cheap, and you can create a deep bed allowing your snake to burrow down, which it can do easily in this material, providing environment enrichment. In terms of maintaining humidity, you will need to include a moist hide in this case, as opposed to a moist area within the enclosure.

I would not recommend using newspaper as a substrate. It provides zero benefit to the snake, and the only benefit associated with its use is ease of cleaning. The same applies in my opinion to using bark or wood chip, because of the risk that your snake might swallow pieces, which will not be possible to digest.

Furnishings

When it comes to décor in the vivarium, you will need a water bowl, a couple of hides and some well-supported branches that will not collapse under the snake's weight. Positioning the bowl in the centre of the enclosure works best. If you locate it close to the warm end of the vivarium, you will find that this raises the humidity excessively.

You can then provide both a warm and a cool hide at opposite ends of the set up. These are essential, partly to provide privacy, offering the snake a sense of security in its quarters. But in addition, creating a moist hide when shedding is imminent will also make this process more straightforward too.

Choose a bowl that is large enough for the snake to soak in easily. I find a large ceramic dog bowl is the best

▲ Fallen branches can be used in the vivarium, but they should be cleaned thoroughly first.

Photo courtesy Pykodelbi/www.ahutterstock.com



▲ Springtails help to recycle waste matter within the vivarium. Starter packs of springtails which you simply need to add to the substrate can be obtained from reptile outlets.

Photo courtesy Holger Kirk/www.shutterstock.com

choice, being heavy enough not to get tipped over. Your snake will also be able to soak itself easily here too.

Ball pythons will soak themselves for a long periods, from time to time. This is particularly common during the warmer summer months, and also when the snake is due to shed.

Soaking can cool the snake down, and facilitate shedding as well.

When it comes to logs and branches, you can simply buy these from reptile outlets, although I prefer to collect my own. I stick essentially to oak and birch. If you collect already fallen branches that are well away from road, and in a safe pesticide-free area, this should be fine. Nevertheless, it is always best to wash off the wood under a hot shower for a few minutes, and subsequently spray it with a reptile-friendly F10 veterinary grade disinfectant, before finally allowing it to dry off completely in a well-ventilated area.

It is then a matter of arranging the branches within the vivarium so as to allow the snake to optimise its heat



▲ Carex grass is available in an attractive variegated form and can provide cover in a vivarium. Photo courtesy Gardens by Design/www.shutterstock.com

Beware of cheap artificial plants, not intended for use in vivarium surroundings.

Photo courtesy bennie/www.shutterstock.com

and UVB exposure safely. Wood of this type can also be used to provide more hiding options in the enclosure for this relatively shy species. Natural décor will also be used when the ball python is shedding. It will rub itself on the branches just as occurs in the wild, helping to remove the old skin.

Plants

When it comes to plants, I tend to opt for smaller succulents or air-plants, such as aloes which will not be damaged by your snake. Various forms of echeveria represent another good choice. In addition, grasses that are suited to more arid environments, such as carex, can thrive in a ball python set-up. You'll also find pothos or devil's ivy will do well in an enclosure of this type. All of these generally only require a quick spray down a couple of times a week at most, so they are easy to maintain.

The chances are that at some point, of course, the live plants will die off. This may be influenced by how much your snake crawls and lies on them, so it is a good idea to keep them in

areas of the vivarium where this is less likely to happen, in corners perhaps, where grass can look very effective.

On the other hand, you can choose from a very wide range of artificial plants today, including grasses and vines. I've honestly seen some beautiful artificial arrangements within a vivarium, utilising the space and providing enrichment for the occupants.

However, I would definitely not advise getting cheap plastic plants that can be found online and in some shops. Stick instead to those that are branded for use in reptile enclosures. The reason is simple - these have been tested to withstand all the various conditions of a set up, in terms of the humidity and heat for example, and will have been designed to make them easy to clean.

It is simply not worth the risk of obtaining a potential fire hazard or a bacterial breeding ground simply to save a relatively small amount of cash. The snake's health and well-being should always take priority.

Cleaning

As already mentioned, your choice of substrate will directly impact on the amount of cleaning and maintenance that is required. Although the CUC will help in a bioactive set-up, it will take several months for their numbers to build up, allowing them to be as effective as possible. Always be prepared to remove any large amounts of waste that you spot, however, checking for this on a daily basis.

Furthermore, inspect the vivarium every two weeks or so for any left-over deposits of rodent fur. This is not only indigestible to the snake, but the CUC will not eat it either. When you spot dried tight bundles of fur therefore, just pick them up and dispose of them.

Cleaning of the bowl and hide is straightforward. I use F10SC veterinary grade disinfectant. I spray



▲ It can help to have a range of different creatures within the CUC - tropical woodlice of various types can be a valuable addition.

Photo courtesy RealityImages/www.shutterstock.com

this on to the item, leave it for a minute and then rinse and wipe clean. Whichever brand of cleaner that you use, always choose one produced for use in vivarium surroundings, so that you can be certain it will be safe. Always follow the instructions carefully as well.

In conclusion

Since its vivarium will be a forever home for your ball python, aim to ensure that the accommodation is spacious, and at least 1.2m (4ft) in length. It is simply not true that these snakes get scared in large enclosures, and hide away all the time. Remember that this is an instinctively shy species that will hide away a fair amount anyway, even in the wild. But given the space and ample retreats of various types in the quarters, these snakes will be more confident and visible as a result.

Providing UVB helps in this way too, encouraging the snake to come out into the open. It is wonderful watching a 1.5m (5ft) ball python stretched out along the length of the vivarium, basking under the UVB in early morning and late evening.

Always think of your snake's needs first and foremost when designing a suitable space for your pet. Never forget that it is a set up for your ball python, and not really for you! Providing that you adopt this approach, when planning and setting up the enclosure, then ultimately, the snake inside should thrive without problems. ✦

** For more information, check out Pete's Facebook group at www.facebook.com/groups/snakenetwork*

◀ Pothos in its various forms will usually grow well in vivarium surroundings, requiring little more than regular spraying. Photo courtesy usmee/www.shutterstock.com

