

**Species:** **Marginated tortoise**  
*Testudo marginata*

**Description:** This species takes its name from its extremely flared, serrated and projecting rear marginal scutes. The carapace is mainly black/brown with yellow or orange markings which darken with age. The plastron is much lighter, being olive/yellow with large brown or black triangular markings on the larger scutes. The males are longer in shape with more pronounced flaring of the carapace than the females who are broader in girth. Marginata are also one of the largest species of the Testudo genus.



Marginata inhabits central and southern Greece and some of the Greek islands. They were historically introduced into Sardinia and Tuscany, Italy. Their typical habitat is evergreen scrub land in hilly, rocky areas close to agricultural land. This species is relatively rare and is listed in CITES Appendix II.

#### **General Husbandry Requirements:**

All tortoises have very specific husbandry requirements, and they will suffer from illness and stress-related disorders if their needs are not met. Access to an outdoor enclosure in a sunny area is vital (please consider this before buying a tortoise), and the larger they grow, the more of the garden they will need. A tortoise that is denied outdoor access will inevitably suffer from metabolic bone disease (MBD), due to lack of UVB, and related health problems. It will also seriously reduce their life span and make them very unhappy.

Hatchling tortoises are particularly vulnerable to dehydration and require a bath at least once a day, fresh water always being available too at any age. Once they are adults, a bath once or twice a week is all that is necessary.

#### **General Housing:**

**Indoors:** Any indoor tortoise enclosure should be as big as possible: tortoises need lots of space or they will become stressed and very bored. An open-topped, deep-sided tortoise table is essential for this species. Indoor rabbit cages are good for hatchlings and juvenile tortoises, however, and an old bookcase or chest of drawers laid on their backs, are cheap, spacious and environmentally friendly. Keep in a well-ventilated room, out of draughts and away from direct sunlight.

Tortoises like to bury down for the night -- they need to do this to thermoregulate and it also helps to minimise dehydration. Provide a deep substrate of sterilized soil, deep enough so that they can completely cover themselves. Avoid pet shop substrates such as alfalfa (rabbit pellets), calci-sand, bark chippings, and sawdust, completely, as many can give off toxic fumes when damp, are harmful if ingested and some, like calci-sand, can be fatal.

**N.B. Hemp has sharp particles which can easily cause serious damage to tortoises and it can sometimes prove to be fatal especially if ingested and as such is not recommended for use as a substrate.**

Use small rocks, flattish stones, slate and upturned flower pots to add interest, break up the line of sight and also help keep the tortoise's nails and beak trim.

**Outdoors:** Try to make the tortoise's outdoor enclosure as big and as interesting as possible. Tortoises love to explore and hide so ensure they have several 'hides' they can retreat to when the sun gets too hot or the rain gets too heavy! Plant the



enclosure with a variety of tortoise-friendly weeds and flowers, with shrubs like hebes to hide under. They also need a waterproof, dry, heated, animal-proof shelter to sleep in (a cold frame or greenhouse is generally preferred).

#### **Hatchling Housing & Hatchling Care:**

Baby tortoises are entirely self-sufficient upon hatching. Their diet and husbandry requirements are the same as adults, although some extra care is required due

to their small size and growth requirements. Indoor accommodation will need to be provided for the cooler Spring and Autumn months and secure outdoor accommodation. The hatchlings should be outside as much as possible, weather permitting, as the UVB light emitted from the sun, even on a cloudy day, is far superior to that of any lamp. If the daytime temperature is over 17°C (63°F) it is warm enough for even very young tortoises to be outdoors, and they can stay out 24/7 once the overnight temperatures exceed about 13°C (55°F).

Hatchlings are best housed in smaller, portable enclosures that can be lifted indoors and outdoors when required. Sterilised soil, with small plants for young tortoises to graze on, making sure plenty of shade, shelter and fresh water is always available. For a more permanent enclosure for hatchlings, a child's sandpit, converted raised brick flower bed or butler sink are ideal. Please remember to drill drainage holes to avoid flooding in the event of an unexpected downpour. A wire 'rabbit pen' style of enclosure is **NOT** suitable as tortoises can see through them and will constantly try to get out, the wire mesh allows them to climb and they can dig out under them.

Wherever the tortoise is, it needs to be protected from other pets and wild animals. Unfortunately, many loving family dogs will look at the tortoise as a chew toy and could inflict horrific, and often fatal, injuries. There are always the exceptions to the rule, but as a whole, dogs and tortoises don't mix. Hatchlings have soft plastrons and require very gentle handling; children should always be supervised around tortoises, and particularly hatchlings. Large birds are also a threat to young tortoises outdoors, so netting or wire lids on enclosures are vital. Rats and foxes will also kill tortoises: check that nothing can dig its way into the cold frame or greenhouse.

**Diet and Feeding:** This is essentially the same as for an adult tortoise - please see the 'Feeding and Dietary Supplement' section. A combination of the correct diet, not overfeeding, access to UVB light and correct supplementation is required for healthy growth.

The question is often asked, 'how much should I feed my hatchling?' It is not easy to give a definitive answer, as the rate at which a Marginated hatchling grows can depend on a number of factors, such as amount and protein content of food, temperature, activity levels, and some will just be genetically larger than others. As a

rough rule of thumb for a hatchling tortoise, offer as much food as would cover the shell. If it is all eaten in less than 10 minutes, it probably isn't enough, if there is still food there after 30 minutes, it's probably too much! A better indicator is to keep records of weight using digital scales as these weigh in 1gr. increments, and are widely available as kitchen scales. Aim for a weight gain of around 2 - 3gr. per month in a hatchling tortoise - if much more or less weight is gained within the 4-week period, adjust the amount of food offered.

Tortoises are natural grazers, and by offering two smaller amounts morning and afternoon, this will mimic conditions in the wild. A light sprinkling of Nutrobal should be used on the food daily - if the leaves are wet the powder will stick better, and the hatchling will also take up more water. Cuttlefish bone in the enclosure will be appreciated, and although not the best source of calcium, it is a good way of keeping the beak trimmed.



Dehydration is a real danger for hatchlings, particularly when kept indoors under lights. As mentioned above, the tortoise will need to be bathed on a daily basis. This is not to keep it clean, but to encourage it to drink. This should be done using a container deep enough so the tortoise can't climb out – margarine or ice cream tubs are ideal. Fill with tepid water, only deep enough to reach up to chin level or where the top of the shell meets the bottom. Place the tub in a warm area near the light so the water doesn't get too cold, and leave the hatchling in there for 15 to 20 minutes. It will normally have a drink each time, stretching the neck out with the head under the water, and if the throat is watched carefully, the tortoise can be seen swallowing the water! It may also use this as an opportunity to go to the toilet - this is a survival instinct from the wild, as coming from arid areas, it won't expel fluid unless it can be replaced. A white substance may be seen when it passes urine: this is called urates, and should be the consistency of egg whites or emulsion paint. If the urates are at all gritty or lumpy, this is a sign that the tortoise is starting to become dehydrated, and this needs to be remedied urgently by bathing more often, i.e. twice daily, wetting the food, or offering a high liquid food such as cucumber. If nothing is done, the bits of grit will form larger lumps inside the tortoise, until a stone is formed, and once it gets too big to be passed, this is often fatal for the tortoise. Fresh water should always be available at all times in a shallow dish.

In the wild, hatchling tortoises would spend a lot of their time hidden away from predators: if they are not allowed to hide away, this will increase stress levels for them. Ensure that the substrate is deep enough to allow burying (this will also help with dehydration as it allows them to thermoregulate) and that they have shady areas to hide, as well as basking places.

**Cleaning:** If fed a high fibre diet (i.e., recommended weeds and wild flowers) the tortoise's digestive system is quite slow, so keeping clean is an easy process. You can 'spot pick' bits of poo, old food etc., on a daily basis, and clean the water dish. Clean the slates at least every month and completely change the substrate after about 3 months and use a mild disinfectant such as F10, Virkon or Tamodine to clean the tortoise table. The hatchling will not generally need any cleaning - if the shell does become dirty use clean water and a soft brush (i.e. a child's toothbrush) to



clean. Never use any oils etc., as these will block the pores, attract the dirt and prevent proper thermoregulation.

**Juvenile Housing:** As the hatchling begins to grow, allow it more room to explore -- boredom will make the tortoise unhappy. Be warned that tortoises are very good climbers, so keep plants/bridges etc away from the perimeters of your enclosure or it will use them as a ladder to escape. Not only will wire lids protect it from predators, but they will help to keep it in too. The enclosure needs to have high solid sides - if the tortoise can see through a barrier, it will try to get through it, which will cause unnecessary stress. Log roll is ideal and the boundaries can be changed as the tortoise grows.

**Adult Housing:** An adult will naturally need as much of the garden as can be allowed, variety and space are paramount for the tortoise to enjoy the rest of his long, long life. Secure all boundaries, as they have very strong legs and can easily dig their way out. A greenhouse or cold frame with a simple basking lamp and access to the garden is ideal for a Marginated tortoise.

**Heating and Lighting:** Ultra violet light (UVB range) is vital for all tortoises, as it plays a huge role in the production of vitamin D3 which is essential for the correct formation of bony tissue. Natural sunlight is THE best source of UVB, so as much access to this as possible is extremely important. However, it is not always possible to have the tortoise outdoors all the time (e.g. over-wintering) so a high quality UVB combined heat/light bulb or a full spectrum fluorescent tube will be needed.

A full spectrum tube needs to be as close to the tortoise, without actually touching it, as possible, as UVB diminishes the further away the tube gets. These tubes do not emit heat so a separate basking lamp would also be necessary. Most fluorescent tubes have a life-span of around 6 months (the exception being the 10.0 tubes, which can last for up to a year)., The UVB output of a tube deteriorates from day one of use, so bear this in mind if a tube is decided upon.

It isn't necessary to buy a special reptile basking lamp: a simple 40W or 60W spot bulb will be fine. Please ensure that all lights are securely fixed to reduce the risk of fire. The alternative is a self-ballasted mercury vapor lamp, an 'all-in-one' heat and UVB bulb. These need to be used with a ceramic bulb holder designed for the correct wattage, and they also have a high UVB output. These bulbs are very popular with keepers and many have commented on noticeably increased energy levels of their tortoises compared to using fluorescent tubes. They can be used with an on/off timer, but not with a thermostat. Once the bulb is switched off, it needs to cool down before it will switch back on. The desired temperature can be achieved by raising or lowering the height of the lamp.

Whichever method is chosen, aim for between 28°C (82°F) – 30°C (86°F) under the heat source, making sure it is positioned at one end of the enclosure. This will allow the tortoise to maintain its own temperature gradient, as it can move into the cooler end at around 20°C (68°F) when it needs to. In a centrally heated house, tortoises don't need any additional night time heat, unless the temperature will fall below 10°C (50°F), as it is actually beneficial for them to feel the coolness of night approaching; it's very natural and normal to them. Even in the Mediterranean it can get quite chilly during the night.

Outdoors the tortoise will require additional heat for during the night, and to warm up on cloudy, cooler days. A basking bulb, in a holder, suspended from the roof of the

cold frame or greenhouse will allow the tortoise to warm up upon waking on such days. Tubular heaters, ceramic heat emitters and fan heaters will all provide a gentle background heat, and several are often used for large greenhouses, as it is essential the temperature doesn't drop below 10°C (50°F) in their sleeping quarters during the night.

**Humidity:** The Marginated tortoise does not live in a humid environment. Damp clay soil and grass will encourage shell rot. Although they love a cool shower from the hose on a hot summer's day, damp conditions should be avoided. Shell rot can also occur if substrates are constantly damp.

**Hibernation:** *Testudo marginata* are a hibernating species. Please refer to our guidelines on Hibernation.

**Feeding and Dietary Supplements:**

A tortoise has a huge variety in its diet in the wild, as hundreds of weeds and flowers are consumed. Try to provide as much variety as possible on a daily basis. Here is a list of some of the foods the Marginated tortoise will enjoy:



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|---|-------------------------------|
| Dandelion - flowers and leaves                      | Landcress                     |
| Grape leaves  | Clover                        |
| Plantain  | Cats ears                     |
| Sow thistle   | Lavatera - flowers and leaves |
| Bittercress   | Pansies/viola                 |
| Dead nettle   | Nasturtiums                   |
| Vetch   | Welsh Poppies                 |
| Mulberry leaves                                     | Rose petals                   |
| Hibiscus - flowers and leaves<br>(a firm favourite) | Rough Hawkbit                 |
| Honeysuckle - flowers only                          | Wild Mallow                   |
| Hollyhocks  | Wild strawberries             |
| Campanula (another favourite)                       | Evening Primrose              |

It is also recommended that you sprinkle a 'weed mixture' generously around the enclosure.

**Foods to avoid:** **DO NOT** use any commercial tortoise pellets: they are very high in protein, addictive and don't resemble anything the tortoise would eat in the wild! A Marginated tortoise must have a high fibre, low protein diet so **pellets should be avoided**.

**MEAT** - of any kind. Marginated tortoises are strict vegetarians - they obtain all the protein they need from the vegetation they eat and the odd slug or snail they come across.



**FRUIT** does not play a large part in their diet - the odd piece of fallen, ripe fruit would be consumed in the wild but generally try to avoid fruit as it will upset their gut and can cause loose faeces (naturally this applies to tomatoes too).

**SUPERMARKET GREENS** such as cabbage, broccoli, kale - these are members of the '**brassica**' family and can prevent the tortoise from absorbing calcium (although small quantities of kale are acceptable).

**SPINACH:** Spinach and chard are also high in oxalates, which bind with calcium to give insoluble calcium oxalate and thus interfere with calcium absorption.

**ICEBERG LETTUCE** has no nutritional value at all and is almost entirely water.

Apart from over-wintering a tortoise, when perhaps weeds are hard to find, it shouldn't cost a penny to feed the tortoise - everything can be grown in the garden.

Please go to [www.tortoises.net](http://www.tortoises.net) and [www.tortoise.trust.org](http://www.tortoise.trust.org) for a '**plants to avoid**' list.

### **Mineral and Vitamin Supplements**

UVB levels in the tortoise's natural habitat are vastly higher than anything we experience in the UK, so its food must be lightly dusted with a vitamin and mineral supplement which contains vitamin D3 and calcium, such as Nutrobal.

### **Hatchling and Juvenile tortoises**

In Northern climates a mineral and vitamin supplement such as Nutrobal or Reptavite should be offered to all growing tortoises on a daily basis for the first 3-4 years of life and after this it can be offered three times a week. This should be lightly sprinkled on the tortoise's food.

NB. If the tortoise is kept outside of the UK, where the climate is similar to its natural habitat, and it is maintained outdoors where it can synthesise its D3 requirements from the UVB component of solar radiation, then the frequency of additional supplementation of D3 can be reduced.

### **Adult tortoises**

Mineral and vitamin supplementation for adult tortoises in the form of Arkvits or Nutrobal can be lightly sprinkled daily on to the food.

### **Tortoises of all ages**

In addition, all tortoises, whatever their age, will benefit by some calcium supplementation in the form of limestone flour (or another form of pure calcium carbonate) and this can be sprinkled lightly on to the daily feed. Limestone flour is available from most equestrian stockists and is recommended due to its high calcium content and the fact that it is easily digested.

Cuttlefish, which contains calcium, should be made available at all times, and although it is not as easily digested as limestone flour, it is a good way of keeping the beak trimmed.

When providing mineral and vitamin supplementation it is important that the manufacturer's instructions be followed to avoid the possibility of over dosing.