

# Golden tail gecko

## The Care and Husbandry of *Strophurus* Geckos

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### Species Descriptions

The *Strophurus* genus comprises two general groups separated by their usual habitat niches. The terrestrial forms have been covered in a previous article. This article will concentrate on the arboreal species. Some taxonomists have attempted to split the terrestrial and arboreal species of *Strophurus* apart and place this arboreal group in its own genus *Strophurus* with the distinguishing characteristic being the possession of caudal tail glands. Whilst this is a suitable distinguishing character, the variation within the *Strophurus* group suggests that this is not the ideal separating feature to distinguish all members from the terrestrial species. For example, *S.elderi* (Jewelled Gecko) does possess tail glands but behaves and is physically more similar to the terrestrial species than the other arboreal species with which it has been clumped. For the sake of my own stubbornness I will refer to these species as arboreal *Strophurus* in this article.

This group comprises 16 species ranging in size from the smallest, *S.taeniatus* at 44mm SVL to the largest, *S.ciliaris* (Northern Spiny Tail Gecko) at 89mmSVL. A typical specimen of 60 mm SVL will weigh on average only 5-7 grams.

The majority of species within the group are referred to as spiny tailed geckoes. These are predominantly slender, silver grey (although within some species there is colour variation including red, white and chocolate brown) with variable rows of spines on the upper surface of the tail. The back is patterned with spots, blotches, zig zags or lines of black or dark grey. The other species are referred to as striped geckoes (multiple full length yellow, brown or grey stripes), golden tailed geckoes (heavily patterned with black and white and gold) or jewelled geckoes (silver grey with minute white spots). Selection for extreme colour patterns (brighter colours, more extensive banding or stripes) within each species can result in populations of "better" coloured specimens being produced.

As mentioned above, these species possess a series of tail glands. Individual species have the ability to either squirt or smear these gland contents on an attacker. If grasped, stressed or otherwise unhappy, the tail glands (located between scale rows) discharge a sticky amber fluid not unlike golden syrup in texture. This dries like sap on exposure to the air. The tail secretion is quite pungent and is irritant to the eyes and mucous membranes (from personal experience). This provides the gecko with some anti predator mechanism although many wild specimens still have regenerated tails suggesting that it does not work all of the time. Captive specimens rarely discharge their tails unless severely harassed or unwell. I have found dead specimens coated in a layer of dried tail secretion presumably having discharged their tails in the throes of death. The spiny tailed forms are tail squirters and may raise their tails and eject secretion up to 60 cm from their position. The jewelled geckoes, golden tailed geckoes and striped geckoes are "smearers" and wipe the secretion onto the attacker (a slightly riskier approach one would think).

As well as differences between species, individuals within a single species show considerable variation in their tail spine morphology. The spines differ mostly in position and colour. This creates a minefield with respect to determining subspecies within a species. I have seen two individuals of the same species in the wild collected only metres apart with opposite colouration in regards to tail spines (one has all yellow spines, the other all black spines). This is in my opinion a poor method of distinguishing geographical subspecies in species such as *S.ciliaris* (Northern Spiny Tail Gecko) The shape of the scales between the spines should be considered more reliable. *S.taenicauda* (Golden Tiled Gecko) may have individuals with the golden stripe covering only the dorsal surface of the tail whilst other have the golden stripe extending to the nape of the neck. Even within a single individual there may be diurnal colour variation. A single specimen of *S.ciliaris* (Northern Spiny Tail Gecko) may change from white to grey to brown depending on ambient temperature, light, background colour and mood within a single day. The back pattern will also change in the same individual.

Only two species are considered to have described subspecies. *S.ciliaris* (Northern Spiny Tail Gecko) is separated into two populations but realistically there should be at least one or two other subspecies described. *S.ciliaris ciliaris* is predominantly northern in its distribution whilst *S.ciliaris aberrans* is southern. *S.c.ciliaris* is said to have predominantly yellow or orange tails spines and has flat granular scales between those spines. *S.c.aberrans* is said to have predominantly black tail spines and the scales between those spines are slightly

raised (sub conical). Although I have not seen *S.c.ciliaris* in the wild I can confirm that both black and yellow spined *S.c.aberrans* can be found on the same stretch of road. There is also a Queensland population that further confuses the issue.

*S.spinigerus* (South West Spiny Tail Gecko) is also separated into two subspecies. *S. spinigerus spinigerus* (from the lower west coast of WA and adjacent hinterland ) bears a broad dark grey dorsal stripe. *S. spinigerus inornatus* (from the south east and interior of WA) lacks the dorsal stripe. *S.taenicauda* (Golden tailed gecko) should, in my opinion be split into two subspecies based on tail morphology. The normal recognised form has it tail pattern reticular as for the rest of the body. Individuals from the far north of the range have tails banded circumferentially with black and white bands. *S. intermedius* (Southern Spiny Tail Gecko) also has significant variation enough to warrant at least subspecies differentiation between individuals from north western NSW, SA and central NT (where they are not even supposed to be found according to the texts). Hatchlings of this group are superficially similar to the adults. Generally they are less patterned and paler in the plain coloured species but are often darker in heavily patterned species such as *S.taenicauda* (Golden Tailed Gecko). Hatchling SVL's are, on average, 30-40% of adult SVL.

### **Distribution and Habitat**

These species are distributed over much of Australia's mainland (absent only from Tasmania, South-eastern Victoria and the Eastern coastline). They are predominantly geckoes of arid and semi-arid in the southern part of the range but occupy more humid habitats in the North of the range. They inhabit areas of woodland, grasslands and open country. They shelter beneath bark, in tree hollows or sleep by day on the stems and branches of grasses and shrubs. The characteristic posture is head pointed down. By night, most species forage in the upper branches of shrubs or trees. They also forage whilst travelling on the ground to move from tree to tree. Some species inhabit exclusively hummock grasses and *Spinifex*.

### **Dietary Requirements**

All species within this group will accept any small insect. Their natural diet consists of small arthropods particularly cockroaches, crickets, grasshoppers, beetles, moths and spiders. Species such as *S. elderi* (Jewelled Gecko) feed heavily on termites but will also eat small arthropods. In captivity, all species can be fed on crickets, cockroaches, moths, flies and waxmoth larvae. Small hatchlings may be fed on small crickets, cockroaches and termites. For adults, these should be fed every 4-7 days in summer and every 7-10 days in winter (although they may not accept food for short periods during this time). Juveniles should be fed every 2-4 days and ideally this should be continued all year round. Food items should be approximately 60% of head size although individuals will tackle and consume much larger items given the opportunity. This is not so much of a problem in adults but not recommended in juveniles. I have had one incident where a juvenile (4 months) *S. ciliaris* (Northern Spiny Tail Gecko) developed a stomach impaction from a large cricket due to the fact that it was unable to digest the highly keratinous head shields of the cricket. I have also seen numerous incidences of spinal paralysis in juveniles presumably associated with spinal compression caused by the upward pressure of large food items (in the stomach) on the overlying spine. It is assumed that these individuals are marginally calcium deficient (metabolic bone disease) and thus have comparatively weaker vertebral columns. Food items should be lightly dusted with a suitable calcium and vitamin supplement every 2nd or 3rd feeding. If UV light is not supplied this may be considered more important than if a UV light source is regularly available.

### **Sexing**

Adults may be sexed by the presence of enlarged hemipenal bulges in males. Females of this group will show some enlargement in the "hemipenal" area but these are usually a smooth enlargement without any central depression. Males of this group possess unique (for each species) "cloacal spurs" consisting of an arrangement of spines 2-3 times larger than the surrounding scales. Depending on the species, the spine cluster may involve 2-7 enlarged scales. They are positioned near the top of the hemipenal bulge near where it contacts the hind leg. If these are visible in female animals they are positioned similarly but are rarely more than 50% larger than the adjacent body scales. Some males may undergo an apparent seasonal reduction in hemipenal bulge size. Although the hemipenal bulge bulk may be reduced , the central depression and tubercles remain as indicators. Unlike the terrestrial *Strophurus* species no resting colour dimorphisms are noted between sexes. Males are not necessarily better coloured than females in any species. Juveniles of this group can generally be sexed once they

have attained 50-70% of adult SVL (attainable with good feeding in 6-12 months).

### **Housing**

Although primarily arboreal (tree climbing), these species also move about on the ground at night when moving between trees and when feeding. Enclosures should therefore allow for both habits. Enclosure space is used well so enclosures need not be particularly large. A pair of medium or large species can be kept in an enclosure with a floor area of 20cm x 20cm and a height of 30 cm. Excessively large enclosures will make it more difficult for the inhabitants to catch their meals before the insects have rid themselves of calcium or vitamin powders.

Plastic terrariums, fish tanks or plastic tubs are all suitable for these species. These species may be housed as pairs, trios or males with multiples females (up to 4). Upright branches of a width similar to the tail width should be provided and should be placed horizontally, vertically and at oblique angles. These may be dry branches permanently fixed within the enclosure or fresh leafy branches of *Leptospermum*, *Casuarina*, *Melaleuca* or *Callitris* can be used and then replaced every few weeks. These gecko species either adopt a vertical (head down) posture or a horizontal posture when resting. They have superb climbing ability and can climb glass (although not with the ease of *Oedura* species). They will often seek refuge at the top edge of the wall where it meets the enclosure lid. Spinifex grass or other firm tussocky grass (such as *Lomandra confertifolia* or *Themeda* spp.) should be provided for species such as *S.elderi* (Jewelled Gecko) or the Striped gecko species. Unlike the terrestrial species, this group are not particularly shy (or at least rely on the misconception that they are well camouflaged) and therefore enclosures can be designed such that the animals are visible for much of the time. Some dark hide areas should however be provided.

Floor substrate is not overly important and any sand or loose clean litter is suitable. Heating is not essential but some species do enjoy basking (presumably they do this in the wild whilst hanging upside down in tree branches). A low wattage basking lamp can be provided. Alternatively, heat can be provided using self regulated heat strip or heat tape, vertically along a wall. A summer maximum temperature of 28-30°C is recommended and winter temperatures may be allowed to fall to 15-20°C. Juveniles should ideally be heated year round. Some keepers feel that the provision of UV light has benefits for juveniles and breeding females of these species. A lamp of minimum 5% UVB may therefore be provided but is not essential if adequate calcium and vitamin D3 is provided via the diet.

### **Reproductive Behaviour**

These species have a general breeding season from September to February but can extend this period of activity to August to April in response to good environmental conditions (primarily rainfall). Courtship in this group is similar between species and involves the male licking then grasping the female over the shoulders and neck. In an observed *S. taenicauda* (Golden Tailed Gecko), the male also twisted the tail tip around the females tail and branch.

Although the juveniles of these species will grow rapidly (achieving breeding size in 12-18 months), most species do not mature until at least 2 years of age. Breeding size is achieved at approximately 80% of expected adult SVL. Breeding pairs or groups may be housed together all year. Separation and cooling is utilised by some breeders but is not considered essential to success. Breeders in northern Australia find that some of their species will breed 12 months of the year if given the opportunity (particularly *S. ciliaris* (Northern Spiny Tail Gecko). If cooling has been utilised, breeding will occur within 4-6 weeks of temperature elevation above 25°C.

Gravid females will develop an obvious bulkier abdomen but this is a less striking enlargement than in terrestrial species due to the longer body shape. The abdomen skin is less translucent than in other species so the eggs may not be visible through the abdominal wall in some individuals. Clutch size is usually 2 eggs although occasionally only 1 egg will be laid.

Females in the wild lay their eggs in soil cracks, in the walls of disused large animal burrows and presumably in the soft soil at the base of trees and under debris. In captivity, these species are thankfully more co-operative than their terrestrial counterparts. They will accept any container filled with a semi moist medium such as sand/peat mix, sand/vermiculite mix or sphagnum moss. A container allowing a substrate depth of 5-10 cm is ideal and the eggs are usually laid at the bottom of the container. The eggs are slightly sticky when first laid and subsequently the substrate will stick to the eggs. It is not necessary to attempt to clean the eggs before transfer to an incubation container. If a container is not supplied, females will lay in an area of moist substrate.

Eggs should be incubated in vermiculite:water or perlite:water mixed at a 1:1 ratio by weight (or 1:10 by volume). A temperature of 27-30 °C is preferred. Incubation at room temperature can be successful but it will

increase incubation considerably and may leave the eggs more susceptible to fungal attack. The eggs of these species will expand considerably during incubation (as much as 50% increase in width and 25-30% increase in length).

The eggs may develop an almost transparent shell when at peak pre-hatch expansion. Incubation of these species is usually quite simple but in hot humid weather I have encountered hatching problems. Eggs will initially sweat as expected 24-36 hours before hatching. If this sweating extends beyond this period (sometimes 3-5 days) then it is likely that there is a problem. These eggs invariably fail and when opened contain a fully developed juveniles that is bloated with fluid. I am not sure if this is due to an inability to lose sufficient fluid due to high environmental humidity or if fluid loss mechanisms are damaged due to high temperatures or if the shell membrane structure is in some way damaged. This is more of an issue in northern states. I have not had the ability to move an egg to a drier container at the appropriate moment to see if this will save a hatchling.

Some species (in particular *S.ciliaris* (Northern Spiny Tail Gecko)) may produce multiple clutches every 3-6 weeks (5-7 clutches in southern states but up to 10 clutches in northern collections). Excessive breeding will ultimately shorten the lifetime breeding span of a female and resting them after 3-4 clutches is recommended. Spermatozoa storage does occur and this means that separated females may still produce fertile clutches. Some incidences of egg binding have been noted in prolific females but this is less common if UV light is supplied to the breeding females.

Hatchlings can be removed from the hatching container after 24 hours and should be placed in small enclosures with both floor level hides and climbing branches. In these species floor substrate is unnecessary for hatchlings. As the hatchlings mature, climbing branches are used more often. The provision of supplementary UVB light does seem to reduce the incidence of metabolic bone disease and rickets in these species. Breeding data for selected species is provided below:

<b>Species</b>
<b>Breeding Season</b>
<b>Incubation Period</b>
<b>(at average incubation temperature)</b>
<b>Minimum Interclutch Interval</b>
<b>Egg Size</b>
<b>(average width x length in mm)</b>
<b>SVL/TL</b>
<b>(average in mm)</b>
<i>S.ciliaris</i>
Aug-Mar
50-80 Days
21-42 Days
9.0 x 16.5
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<i>S.taenicauda</i>
Oct-Jan
48-72 Days
21-42 Days
9.5 x 15.0
29/44
<i>S.intermedius</i>
Sep-Feb
59 Days
21-35 Days
9.0 x 14.5
28/48
<i>S.williamsi</i>
Sep-Jan
43-48 Days
24-42 Days
9.0 x 15.0
26/45

### **Status in Captivity**

Arboreal *Strophurus* geckoes are relatively popular due to their highly visible habits and in some species due to their attractive colouration or structural features. *S.ciliaris* (Northern Spiny Tail Gecko) and *S.taenicauda* (Golden Tailed Gecko) account for around 90% of those in captivity but other species are slowly increasing in numbers. Current individual state legislations may prohibit or restrict the keeping of some of these species (e.g. Golden tailed geckoes are prohibited in Victoria and restricted licence in QLD). These species generally live for 4-8 years in captivity with an average productive period of 5-6 seasons being common. although specimens in excess of 10 years of age exist and some of these are still producing viable offspring