Keeping of Thick-tailed gecko, *Underwoodisaurus milii* (Bory de Saint-Vincent, 1823) at BION Terrarium Center

Ivan Neizhko[1], Oleksii Marushchak[2], Yuliia Troshchinkova[3]

[1] – Laboratory curator**,** BION Terrarium Center, Kyiv, Ukraine

[2] – Head, Research and Development Department, BION Terrarium Center, Kyiv, Ukraine

[3] – Senior Keeper, Laboratory of Desert Reptiles, BION Terrarium Center, Kyiv, Ukraine

Underwoodisaurus milii (a gecko species from Carphodactylidae family) is commonly known as the thick-tailed or barking gecko, thanks to its distinctive plump tail and sharp, barking defensive call. This gecko is endemic to Australia (Southern Australia from central Queensland through New South Wales and much of semi-arid Western Australia, as far north along the coast as Shark Bay) (https://reptile-database.reptarium.cz/species?genus=Underwoodisaurus&species=milii). It is also found at the Houtman Abrolhos and the Archipelago of the Recherche (Fig. 1). They inhabit deserts and semi-deserts of Australia, often covered with bushes, xerophytic low-growing forests, rocky areas of semi-deserts, dry sclerophyllous forests and shrubs (Wilson, Swan, 2010; Cogger, 2014).

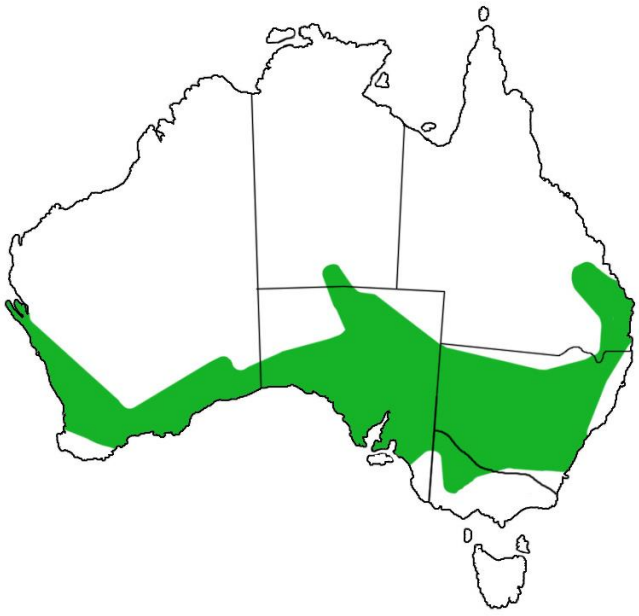

Figure 1. *U. milii* natural distribution (https://coolcompanions.com.au/blog/thick-tailed-gecko).

Figure 2. *U. milii* young pair.

Figure 3. *U. milii* adult pair; a male has visible hemipenal bulges (marked with a red circle).

These geckos are orange-brown with rows of light dots and sometimes dark brown with noticeable white transverse stripes. The convex scutes located on the upper side of

the body are characteristic and give the outer integument of the lizards a rough appearance (Fig. 2, 3). The tail is slightly shorter than the body, very thick at the base and thin at the end, flattened in the dorsal-ventral direction. The head is large, with convex black-gray eyes with characteristic vertical pupils (Fig. 4). The legs are long and thin, with claws on the toes, without suckers. Males, as a rule, are much smaller than females, and their heads are larger. Also, males have well-seen hemipenal bulges under the tail base, which can be seen from the age of 6 months. In addition, they have femoral pores on the inside of their hind legs. These pores are used to secrete musk. Also, males are generally darker and tend to have darker and broader tail base. For the first week after hatching, the young have a slight pinkish tint. *U. milii* usually grows to a total length (including tail) of 120–140 mm (4.7–5.5 in). The weight of adults is 20-25 g. The body color is pink; brown is also noticeable on the back and head. The tail is thick, dark, almost black, in color. The body and tail are covered with small white specks. The paws are quite large (Ijzendoorn, 2007; Oliver, Bauer, 2011). In captivity they live for 8-10 years.

Figure 4. Close look at *U. milii* eye.

U. milii have the habit of licking their eyes after eating, apparently to keep their eyes clean, like many other gecko species. The gecko may also make a whistling or squeaking noise, mainly to scare away predators.

It is one of the few species of geckos that do not eat their molts. It is important to ensure that it is positioned correctly, especially in the area of the fingertips and eyes. The presence of shedding residue can cause loss of fingertips or eye problems. Normal shedding occurs every 3-4 weeks. They can gather in groups in daytime shelters.

This gecko is listed in IUCN Red List under the status “Least Concern”. Such harmful impacts as annual & perennial non-timber crops, livestock farming & ranching and energy production & mining tend to be the ones threatening the wild populations of these geckos (https://www.iucnredlist.org/species/178261/83324444). Additionally, due to ban of export of Australian species, the only source of healthy and adapted animals is legal herpetoculture. Therefore, sharing information on proper keeping and workable breeding techniques is of particular importance for saving this species *ex situ*.

Keeping and breeding requirements

Keeping. Keeping requirements are pretty similar to those for other *Nephrurus* species (Laube, Porter, 2004). We keep adult geckos in horizontal terrariums or ferplasts (Fig. 5). Required space is 40x40 cm (15.74x15.74 in) per individual. 70 l volumes will work perfect for a pair. We use 2-4 cm (0.79-1.57 in) layer of coarse sand as a substrate or paper instead of substrate, but in this case, we place a moist chamber filled with 1:1 mix of coconut substrate and sand, which is used also as an egg-laying chamber. Decoration includes several ceramic or wooden shelters (Fig. 6) and a water dish with drinkable, regularly changeable water. Some types of sand consist of sharp-edged particles, that can cause traumas on the geckos’ limbs and belly. This should be taken into consideration when choosing the sand for the terrarium (calcium sand, reptisand etc.).

Figure 5. Lab with volumes for *N. cinctus, N. levis, N. amyae and U. milii* breeding.

Lighting. Lighting period is 12-14 hours during breeding season (from 7:00 am to 9:00 pm) and 10-12-hour daylight hours (from 7:00 to 19:00) the rest of the time until

wintering. No basking lighting is used, but on one corner of the terrarium (usually under one of the shelters) we have a heat cable (30W), that provides +30 - +32 °C (86.0-89.6 F). We do not use UVB lighting with no harmful effects on breeding or well-being of the animals, however using UVB 5.0 or 10.0 for several hours a day cause no harm and may be beneficial for the geckos. The cable is equipped with thermo-regulator as the geckos don't like over-heating.

Figure 6. *U. milii* on a rock inside a decorated enclosure.

Temperature. Daytime temperature is +24 - +28 °C (78.8-82.4 F), nighttime - +22 - +24 °C (71.6-75.2 F). One should provide temperature gradient in the terrarium, from +28 to +24 °C (82.4 to 75.2 F). Temperature at the wintering time (2-4 weeks) is about +18 - +20 °C (64.4-68.0 F). After slight hibernation we smoothly increase temperature to +26 - +28 °C (78.8-82.4 F) and the daylighting period to 14 hours.

Humidity. Humidity level is 40-50% with 2-3 spraying sessions per week.

Water. Water dish is mandatory with regular change of the water.

Diet. Their diet should be as varied as possible. The set of food objects includes house cricket (*Acheta domesticus* Linnaeus, 1758), banana cricket (*Gryllus locorojo* Weissman & Gray, 2012), two-spotted cricket (*Gryllus bimaculatus* De Geer, 1773), wax moth and mealworms (but no more than 1 time per week as due to the high fat content, the gecko's liver can be harmed). Some animals are used to be fed with tweezers, which can be useful if you want to track the feeding process. All insects must be gut-loaded before being offered to the geckos. Feeding sessions: adults (every other day

we give 3-4 food objects, depending on the condition of the animal); babies (every day, 3 food objects). Uneaten food must be removed from the terrarium on the next day.

References

1. Cogger H. G. 2014. Reptiles and Amphibians of Australia, 7th ed. CSIRO Publishing, xxx + 1033 pp.
2. Ijzendoorn M. V. 2007. Underwoodisaurus milii. Lacerta 65 (2): 60-67.
3. Laube A. & Porter R. 2004. Captive Maintenance and Breeding of Some Ground Dwelling Australian Geckos Part IV: Underwoodisaurus milii (Bory de Saint-Vincent, 1823) and Underwoodisaurus sphyrurus (Ogilby, 1892). Gekko 4 (1): 23 – 32.
4. Oliver P. M., Bauer A. M. 2011. Systematics and evolution of the Australian knob-tail geckos (Nephrurus, Carphodactylidae, Gekkota): Plesiomorphic grades and biome shifts through the Miocene. *Molecular Phylogenetics and Evolution*. 59 (3): 664–674.
5. Rösler H. 2019. Comparative studies on the extracorporal development of soft- and hard-shelled gecko eggs (Squamata: Gekkota): 1. Underwoodisaurus milii (Bory de Saint-Vincent, 1823) (Carphodactylidae) Sauria 41 (1): 13 – 21.
6. Swan M. Keeping and breeding Australian lizards. 1st ed. ISBN 978 0 9803667 1 6 (pbk.). – Mike Swan Herp. Books. – Lilydale, Viktoria, Australia. – 2008. – 615 p. with illustrations.
7. Wagner E. & Lazik C. 1996. Husbandry and reproduction of Australian geckos of the genus *Nephrurus*. Reptiles May: 56-67.
8. Wilson S. & Swan G. 2010. A complete guide to reptiles of Australia, 3rd ed. Chatswood: New Holland, 558 pp.