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## AN ACCOUNT OF THE CARE AND BREEDING OF *HETRIXALUS ALBOGUTTATUS* (BOULENGER, 1882), ALONG WITH A DESCRIPTION OF THE TADPOLE

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The Genus *Hetrixalus* are small to medium sized (18-40 mm), brightly coloured Madagascan treefrogs belonging to the large African family *Hyperoliidae* (Glaw & Vences, 1992).

Glaw & Vences (1992), give a full diagnostic description of this endemic genus. It is speculated that *Hetrixalus*, along with other endemic Malagasy Anuran sub-families, evolved in-situ after the island separated from mainland Africa (Duellman & Trueb, 1986).

*Hetrixalus* occur outside of forest, being adapted to open savannah habitats, in eastern Madagascar (Glaw & Vences, 1992), with the climate being warm and humid, with annual rainfall being 1500-3000 mm, distributed throughout the year (Preston-Mafham, 1991).

It appears that this particular species has been (or is) seldom imported. The first authors were lucky enough to purchase two pairs in October 1995. Glaw & Vences (1992), in their introduction on the genus, state that males possess a yellow throat patch, this was not apparent in these specimens, however the sexes became distinguishable by the more rotund appearance of the females.

### HOUSING

All four specimens were housed in a front-opening glass vivarium 45 x 45 x 60cm high. A glass strip sealed across the base provided a water area 45 x 12 x 12cm at the front; the rear land section was formed as follows:- a 2cm layer of large aquarium gravel 1cm of activated aquarium charcoal, covered by soil-based potting compost and topped with medium aquarium gravel which is finished off just below the level of glass strip. The land area sloped slightly towards the rear. The rear wall was covered with a slab of compressed cork granules, which had been roughened to provide a natural appearance. Furnishing consisted of driftwood, well soaked, and cork bark 'logs'. The land area was planted with Sweetheart vine (*Philodendron scandens*), Peace lilies (*Spathyphyllum spp*) and Ribbon plants (*Dracena sanderiana*) in the substrate and two Bromeliads set into the cork logs. (N.B. Planting should be done before adding the final layer of gravel). The water level was maintained approximately 1 cm below the top of the glass strip. Although the water area was planted with *Elodea spp.* regular water changes were required due to crickets drowning, in spite of a Styrofoam raft and overhanging leaves. As the plants thickened up the *Philodendron* leaves were positioned so they actually hung in the water.

The vivarium was situated in a warm room, which meant that additional heating was unnecessary. A 45cm full-spectrum tube, fixed inside the vivarium provided sufficient light for the plants – this had to be switched off in hot weather to prevent the temperature rising above the desired maximum. It is not claimed that full-spectrum light is essential for these frogs, which are strictly nocturnal but the authors use it for diurnal frogs such as *Dendrobatidae* and frogs which ‘bask’ in hot sunlight e.g. *Hylidae* and *Chiromantis spp.* A daytime temperature of around 26°C, dropped to around 18°C (with slight variations) at night. A photoperiod of 13 hours was maintained.

## BREEDING

Regular spraying kept the land area wet with resultant high humidity (80-85%). Around the beginning of August 1997 spraying was withheld until the 20th September 1997. The water level gradually dropped to 1.5 cm but the land area retained sufficient moisture to prevent the plants from wilting. During this period, the previous daily feeding was reduced to once every five days or less if uneaten crickets were observed. The dry spell coincided with hot weather – the light was frequently switched off, but temperatures frequently rose to 28-29°C. Regular heavy spraying and feeding resumed on 22nd September 1997, by which time the temperatures were back to normal and the water level had been restored. From 30th September sporadic calling occurred overnight, especially in the early hours of the morning. Calling increased in frequency from 6th October and the first spawn was observed on the 11th October 1997. Most of the black eggs were adhering to *Philodendron* leaves below the water level – those above the water rapidly developed fungus, and a substantial number which had sunk to the bottom of the water were greyish in appearance and did not develop.

Hatching occurred around three to five days later. Tadpoles were difficult to spot due to being only 5-6 mm in length and remaining motionless during the day unless disturbed. Finely ground tropical fish flake food was provided daily but the large numbers of tadpoles soon necessitated removal of some to plastic aquaria containing 10 cm of water. The other tadpoles eventually had to be removed due to fouling of the water area in spite of regular water changes. Metamorphosis took between 112 and 120 days; the froglets measured on average 12 mm snout to vent (SVL) and a head width of 4.5 mm (n=5). Although Styrofoam rafts were provided the froglets preferred to climb up the aquarium sides. Those which remained longer in the main vivarium tended to be stunted, probably due to inadequate nutrition – because of the fouling less food had been supplied. Any surviving young exhibited poor growth rates and did not attain full size.

The majority of the froglets thrived in a moist vivarium feeding on *Drosophila* and small crickets dusted with multivitamin/calcium supplement.

At metamorphosis the coloration of the froglets was light cream, the dorsum having a ‘pearly sheen’, with a pale-greenish dorso-lateral stripe outlined in darker coloration running from each nostril to the posterior end. As growth progressed the line began to break up to become uneven. The body darkened slightly and large numbers of tiny black dots appeared. Gradually the adult coloration of gold spots on a black background was assumed. This was first observed on the 19th March 1998, although the orange areas, exhibited by the adults, remains pale at the time of writing (Mid-May 1998).

Periodic calling from the young frogs commenced on 15th March 1998, usually after spraying. Glaw & Vences (1992) noted that sexual maturity in wild specimens can be achieved in 4 months, for the closely related *Hetrixalus boettgeri*. However in *H. alboguttatus* this is considerably quicker, between four and six weeks in captivity for male specimens.

**Table 1.**

Measurements in mm for tadpoles of *Heterixalis alboguttatus*, raised in an aquarium

CHARACTER	Mean Measurement (mm) at Stage 25	Mean Measurement (mm) at Stage 38
	(n=4)	(n=9)
Total Length	11.5	38
Body Length	4	11.5
Internarial Distance	1	2.5
Interorbital Distance	1.5	4
Eye-nostril Distance	1	1.5
Dorsal Caudal Fin Height	0.5	2
Caudal Musculature Height	0.5	3

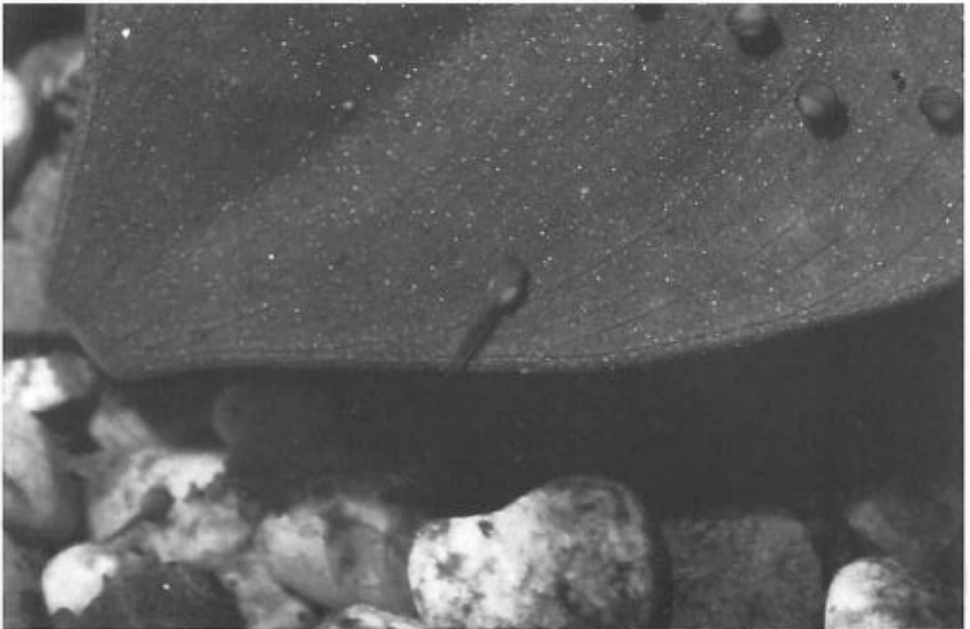


Plate 1. *Heterixalus alboguttatus* eggs and tadpole.



Plate 2. *Hetrixalus alboguttatus*, a newly metamorphosed froglet, note the lack of dorsal markings



Plate 3. *Hetrixalus alboguttatus*, adult coloration just beginning to show behind the eye

Although the adults are strictly nocturnal the young specimens come out at feeding time, sometimes even waiting for food. However, this could be due to increased competition as several are housed together.

### **THE TADPOLE OF *HETRIXALUS ALBOGUTTATUS***

The tadpole of *Hetrixalus alboguttatus* is unknown, (Glaw & Vences, 1992). Following successful captive reproduction of this species, by the first authors, the following description was made. It is based on 4 tadpoles of *Hetrixalus alboguttatus* at stage 25 of Gosner (1960).

#### **BODY MORPHOLOGY**

Body oval in dorsal view, moderately depressed (wider than deep), body is deepest and widest at about 50% length of body; body length about 35% of total length; eyes dorsolateral, directed laterally; nostrils dorsolateral, directed anterolaterally, equidistance between snout and eyes; internarial distance is less than interorbital distance; chondrocranial elements visible through the skin of head; spiracle sinistral (left), spiracle opening directed posterolaterally, at about mid-length of the body; dorsal fin arises prior to the body-tail juncture, at 50% of tail length dorsal fin height is equal to caudal musculature depth, ventral fin about 50% of caudal musculature; tip of tail rounded.

#### **COLORATION IN LIFE**

The coloration was recorded in stage 25 larvae. Dorsum is dark fawn in colour with numerous darker brown stippling, Caudal musculature is pale fawn, with the caudal fin lacking pigmentation. Venter is pale and semitransparent, with heart, intestines, and oral musculature visible.

#### **OVAL MORPHOLOGY**

The following description is based on a stage 38 (Gosner, 1960) tadpole. This was chosen in preference to those at stage 25 because at the lower stages of development the oral structure was less well developed.

Mouth is small (18% of maximum body width), ventral, directed anteroventrally. One upper and three lower tooth rows. Rows on posterior labium shorter than the anterior. All tooth rows uninterrupted, third posterior row approximately 2/3 of second row, second row with medial V-shaped arrangement, equivalent in size to first posterior tooth row. Anterior tooth row larger than beak, with broad terminal V-shapes.

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