

### Aspects of captive husbandry of Taylor's Bug-eyed Frog, *Theلودerma stellatum* (Taylor, 1962)

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TAYLOR'S Bug-eyed Frog (*Theلودerma stellatum*) is a small Rhacophorid listed as Near Threatened on the IUCN Red List as the extent of its habitat is declining and becoming increasingly degraded (IUCN et al., 2006). It has been recorded in eastern Thailand and south of central Vietnam and southern Laos (Orlov et al., 2002). Recently *T. stellatum* has been recorded in Eastern Cambodia (Stuart et al., 2006). It is found from 300-1,500 m above sea level (IUCN et al., 2006). *T. stellatum* inhabits lowland rainforest and montane forest, and has been found in rubber plantations (IUCN et al., 2006). In Cambodia *T. stellatum* was found in hilly evergreen forest mixed with Bamboo and deciduous trees (Stuart et al., 2006). This species is one of relatively few amphibians which breeds in water-filled tree holes (Duellman & Trueb, 1994), and does so in both living and fallen, rotten trees.

*Theلودerma stellatum* has a triangular head and prominent eyes (Fig. 1). The toes are webbed but the fingers are free. Each toe terminates in a large disc. Specimens measure up to 39 mm (snout vent length) when full grown. The dorsal surface is dark brown to black in colour. On lighter coloured substrates cream and grey blotches may appear. The ventral surface is dark with light reticulations. Males have pale nuptial pads on the inside of the thumbs; these are more obvious in the breeding season. The call of the male is a 'Peep' sound.

In the wild, amplexant pairs and calling males can be found from May and June. Clutches and tadpoles of different stages can still be found in December. Eggs are laid in small clutches of six to eight above the water on the inside of water-filled tree holes (Orlov, 1997). Eggs measure 3.5 mm in diameter. Tadpoles drop into the water after hatching. They possess a mosaic of feeding structures associated with the extremes

of microphagy and macrophagy (Wassersug et al., 1981).

Lifespan and age at sexual maturity in the wild have not been reported. The maximum lifespan in captivity is also unknown; to date captive individuals have been recorded to live five years (Ilze Duncce, pers. comm). Sexual maturity can be reached in five to six months in captivity (water temperatures 21-26°C).

#### CAPTIVE HUSBANDRY

##### Management

At Durrell captive bred individuals of this species have been housed and bred in plastic containers (Pal Pens™), measuring 350 x 200 x 300 mm. The Pal Pens were filled with water to a depth of 4 cm. Lengths of cork bark and inverted Coconut shell halves, each with a single aperture, were provided as refugia for the frogs. Artificial plants were submerged to provide additional refugia (Fig. 2). One group was housed in a more sanitary set up with a pile of small rocks in place of the coconut shell hides. The room this species was housed in was heated to between 23 and 27°C (night/day summer) and 20 and 25°C (night/day winter). A Reptisun™ 2.0 strip light was used for lighting.

Powder free latex gloves are used at all times when servicing amphibians at Durrell. All animals were visually inspected every two days. On these days the enclosure and all furnishings were thoroughly scrubbed (with a brush and water, no chemical cleaners or disinfectants were used).

*Theلودerma stellatum* were fed on live invertebrates, predominantly Crickets (*Gryllus assimilis* and *Gryllus bimaculatus*) and occasionally the Cowpea Beetle (*Callosobruchus chinensis*). Juvenile animals were fed on live pin head crickets and Fruit flies (*Drosophila hydei*). All food items were dusted with Nutrobal® (vitamin and

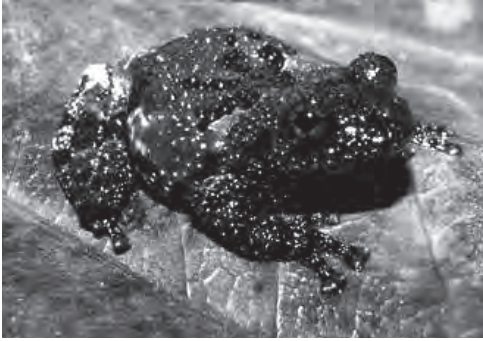


Figure 1. Juvenile *Theلودerma stellatum*.



Figure 2. Housing for *Theلودerma stellatum*.

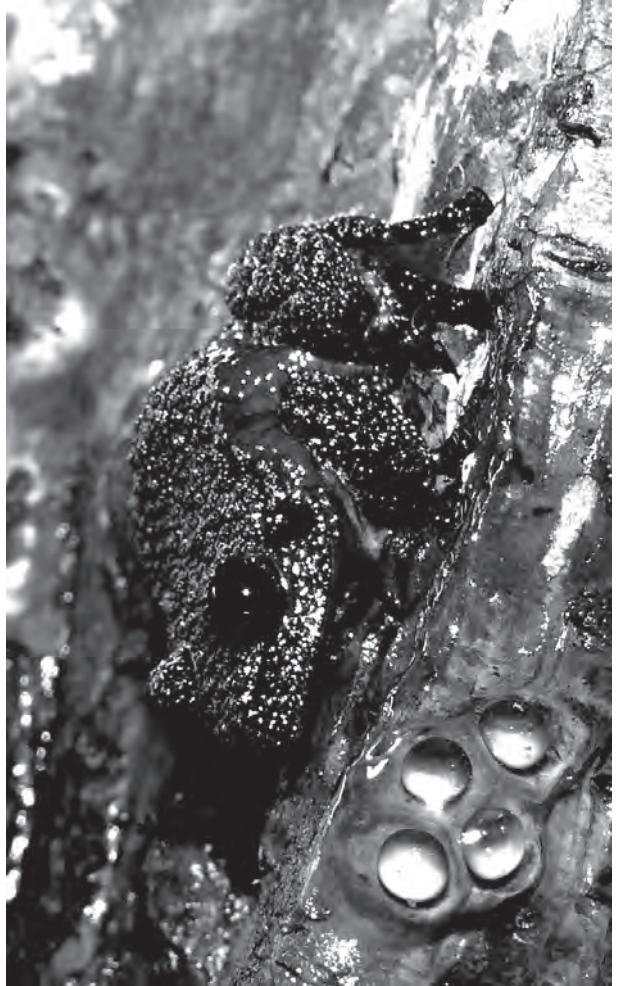


Figure 3. *Theلودerma stellatum* with eggs.

mineral supplement) immediately prior to being fed. Adults frogs were fed every three to six days (depending on season and condition); juveniles up to six weeks of age were fed daily.

### Reproduction

*Theلودerma stellatum* bred during the warmer months (April through to October). Interclutch intervals were, on occasion, as brief as ten days. Amplexus was axillary. Despite breeding in tree holes in the wild, in captivity *T. stellatum* readily oviposited on any surface over-hanging water (Fig. 3). Eggs were usually left in-situ because they frequently went mouldy if removed from the adult enclosures. As adult frogs were often observed

sitting next to or even across the egg clutches, we speculated that the adult's secretions might prevent the eggs from going mouldy. It should be noted, however, that when small rocks were used as oviposition sites in place of cork bark and coconut shell (Fig. 2), eggs hatched successfully even when removed from the enclosure.

Tadpoles hatched after ten days, and dropped down into the water. After hatching, tadpoles were transferred to a glass tank measuring 400 x 250 x 250 mm. Tap water was used to rear tadpoles, and oak leaves were added to soften the water. Partial (20-30 %) water changes occurred two to three times per week. Air stream sponge filters were used for filtration and were cleaned in water removed

from the tank at each partial water change. The water was not heated and ranged in temperature from 23-26°C. Tadpoles were fed on a powdered tadpole food (components: ground tropical fish flake, grass pellet, Trout pellets, Tubifex, River Shrimp, *Spirulina* algae and Cuttlefish bone). They metamorphosed in approximately 75 days at the above temperatures.

Metamorphs were housed in small Pal Pens in groups of up to 8 (groups were divided amongst larger Pal Pens as individuals grew). These were set up in the same way as the adult enclosures, but with shallower water (2.5 cm in depth). The metamorphs were raised at the same temperature as the adults (23-27°C), and were provisioned with a Reptisun™ 2.0 strip light. Metamorphs were fed daily until about six weeks of age with pin head crickets and (occasionally) *Drosophila* spp. All food items were dusted with Nutrobal®. After eight weeks, the feeding interval was gradually increased to once every three days.

### Health

This species is hardy, although other institutions have reported metabolic bone disease in some specimens.

All imported specimens were treated for *Batrachochytrium dendrobatidis* (Chytrid fungus) by bathing them in Itraconazole solution (1 part Itraconazole: 99 parts water) for five minutes daily

for 11 days. There was zero mortality of specimens during this treatment.

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