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Article · December 2008

DOI: 10.5167/uzh-9003

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EAZA Amphibian TAG Husbandry guideline for

Mantella laevigata (Methuen & Hewitt 1913)



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SECTION 1. BIOLOGY AND FIELD DATA

BIOLOGY

1.1 Taxonomy

ORDER	Anura
FAMILY	Mantellidae
GENUS	Mantella
SPECIES	laevigata
SUB-SPECIES	-
COMMON NAME(S)	Climbing Mantella, Green-backed Mantella, Folohy golden frog

1.2 Morphology

Size: 24-30 mm

Weight: 1.2 – 2.0g

Colour: The anterior part of the dorsum is lemon yellow to greenish. The yellow colour either ends in a semicircle or narrows to the vent, becoming a thin line. Arms, legs, venter and flanks are black. Blue spots are present on hands and feet and all ventral surfaces, except the throat. Iris dark without light pigmentation.

Tympanum distinct, about 2/5 of eye diameter. Tibiotarsal articulation reaches the eye.

Fingers with terminal disks.

Sexual dimorphism: Males slightly smaller, more streamlined. Difficult to determine sex unless males can be observed calling (Staniszewski 2001).

Similar species: *M. betsileo*, *M. viridis* and *M. expectata* differ by having blue spots on the throat, less extended terminal finger disks and usually a light line along the upper lip.

Mantella sp. is similar in colouration but lacks extended finger disks and has a frenal stripe (Glaw & Vences 2007).

1.3 Physiology

Ectothermic.

1.4 Longevity

No information

FIELD DATA

1.5 Conservation status/Zoogeography/Ecology

DISTRIBUTION: Northeast coastal region of Madagascar (Glaw and Vences 2007 1999). From Marojejy south to Folohy (where its habitat has been degraded), and occurs from 0-600 m asl. It is known from more than five localities and probably occurs at more sites than are currently known.

HABITAT: A denizen of lowland forests from sea level to at least 500m (Glaw and Vences 2007), this species has also successfully encroached into disturbed or degraded forest such as bamboo groves (Daly et al., 1996).

POPULATION: It is locally abundant.

CONSERVATION STATUS: IUCN Red list: NT

1.6 Diet and Feeding Behaviour

FOOD PREFERENCE: Small invertebrates, ants, termites and flies (Glaw and Vences 2007). Tadpoles are omnivorous and readily eat eggs and embryos of the same species.

1.7 Reproduction

DEVELOPMENTAL STAGES TO SEXUAL MATURITY:

AGE OF SEXUAL MATURITY

SEASONALITY OF CYCLING: main season october – march (Glaw and Vences 2007)

GESTATION PERIOD/INCUBATION: Tadpoles hatch within 48h at 25.6°C (Staniszewski 2001)

CLUTCH/LITTER/BROOD/OFFSPRING SIZE/NUMBER: Clutch size 1-3 (mean 1.3) (Heying 2001).

BIRTH/HATCHING DETAILS AND SEASONS

1.8 Behaviour

ACTIVITY: Adults were found on the forest floor, climbing up to 4m on trees and in water filled tree-holes or bamboo nodes. Height of the tree-holes ranged from 10-350cm above ground, and tree-hole size was very variable (diameter 3-12cm, depth up to 30cm). Calls can be heard throughout the day but not during night. Frogs seems to be purely diurnal (Glaw and Vences 2007).

LOCOMOTION:

PREDATION:

SOCIAL BEHAVIOUR: Males affect their reproductive success through direct male-male competition over defended resources and by providing paternal care in the form of egg attendance, or through indirect feeding, by which the male deceives a courted female into ovipositing into a well already containing one of his tadpoles. In order to become and remain territorial, a male must win fights. There is little evidence of male mate choice in this species (Heying 2001).

SECTION 2. MANAGEMENT IN ZOOS OR AQUARIUMS

2.1 ENCLOSURE

Terrarium of the arboreal type (Staniszewski 2001).

2.1.1 Boundary

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2.1.2 Substrate

The substrate could consist of small lava stones (up to 1cm), covered with soil (2cm) and finalised at most places with moss. In this case water can drain freely. There should be plenty of leafy plants, where the frogs can hunt or hide. A number of branches and logs should be offered and some artificial breeding opportunities like small damp plastic boxes.

2.1.3 Furnishings and Maintenance

M. laevis needs some climbing apparatus like leafy trees with some branches, also bamboo or artificial structures (plastic tubes) can be used. Those serve also as hiding places.

2.1.4 Environment

Temperature should range between 20-26°C, dropping 2-4°C at night. Frogs can stand temperatures up to 30°C and down to 17-18°C for a certain time without problems (Glaw et al. 2000). Humidity ranges from 80 to 100%.

2.1.5 Dimensions

50x60x100cm to 100x60x35cm.

2.2 FEEDING

2.2.1 Basic Diet

The principal food consists of small insects as springtails, freshly hatched crickets and fruit flies (*Drosophila melangolaster*). A case of enrichment and assurance of sufficient food supply is to attract flies by fruit boxes in the terrarium. In this case, flies can circulate freely in the terrarium and food is always available for the frogs.

2.2.2 Special Dietary Requirements

Springtails (Collembola) should be offered for juvenile frogs.

Tadpoles can be fed with spirulina algae tablets (Tetra PlecoMin) or unfertilized eggs of adults.

2.2.3 Method of Feeding

Food is offered three times a week. Food is dusted with vitamin/mineral powder once a week.

2.2.4 Water

Water should be offered in form of small pools and in several small breeding boxes (film caps) at any times.

Sprinkler irrigation should be done daily in the rainy season.

2.3 SOCIAL STRUCTURE

2.3.1 Basic Social Structure

Against former estimations, Heather Heying revealed that males show territorial interactions, more over that male combat is commonplace and involves wrestling intruders from distinct territories (Staniszewski 2001).

2.3.2 Changing Group Structure

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2.3.3 Sharing Enclosure with Other Species

Not recommended

2.4 BREEDING

2.4.1 Mating

Males defend resources, which females attract to oviposit. In most cases courtships begin with an advertisement call of a male, often from a raised perch, which might be a resource either. Females may answer by approaching. The male initiates the first contact by putting his throat either on the top of the females head or her dorsum. At this point, his vocalizations change at this point from a louder, two-note advertisement call to a softer, often single-note courtship call. After a few minutes the male leads the female to a potential oviposition site. If the female accepts the well, she remains in it, the male amplexes her and an egg is laid. During amplexus, eggs are laid above the water line in water filled tree holes (Heying 2001). The trigger for reproductive behavior is not clear. Subtle changes in temperature, rainfall and even rainfall temperature as well as increase in food can bring bout courtship in captivity.

2.4.2 Pregnancy/Egg Laying and Incubation

Females deposited eggs singly in small shallow water pools near a water source. Mean clutch size consists of 1.29 eggs (Heying 2001). Embryogenesis lasts almost seven days (pers. obs.). About 90 days after hatching, metamorphosis takes place.

2.4.3.

No contraception is possible.

2.4.4 Birth/Hatching

Freshly laid eggs are exceptionally sensitive to any kind of disturbance (Heying 2001, pers. obs.), for this reason, they should not be immersed before the first tadpole stadium. Otherwise this could lead to high mortality rates.

2.4.5 Development and Care of Young

The eggs should be left in place while they develop and then removed to a rearing tank after the embryo reaches the hatching stage. Each tadpole should be housed individually due to cannibalism between tadpoles of this species.

2.4.6 Hand-Rearing

Hand-rearing could be easily done in an external breeding station. In this case, each tadpole should be housed in an own rearing tank (e.g. a plastic caps), filled with water and leafs. Water should be changed twice a week and tadpoles should be fed three times a week with a spirulina algae product (e.g. Tetra PlecoMin).

Tadpoles, which already show the final coloration, should be settled to a small aquarium. This aquarium should be positioned in a way that $\frac{3}{4}$ of its bottom is filled with water and the other space is covered with rocks and moss; in this case the recently frogs could easily emerge the water.

2.4.7 Population management

Highlights the breeding strategy of the species from a population management point of view (e.g. what is the RCP status and target population, etc.). Also refer to the amphibian population management guidelines:

<http://www.amphibianark.org/pdf/Aark%20material/AArk%20Amphibian%20Population%20Management%20Guidelines.pdf>.

2.5 BEHAVIOURAL ENRICHMENT

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2.6 HANDLING

2.6.1 Individual Identification and Sexing.

The sex is difficult to differentiate. Both sexes share the same coloration. Males sometimes can be determined from their calls. Non-calling males can also be misinterpreted as females.

To the knowledge of the authors, no kind of marker is available for this taxon.

2.6.2 General Handling

In capture this animals do not imply any danger to man. For both, keeper`s and animal`s welfare, the handling should be reduced to a minimum of disturbance and with great care.

2.6.3 Catching/Restraining

The mantella skin is highly sensitive and trying to catch these small frogs could lead to serious injuries. If handling is absolutely necessary, it is certainly advantageous to capture mantillas in a plastic box and use surgical gloves.

2.6.4 Transportation

Because of their small size, mantellas are delicate and should be handled only when absolutely necessary and then with great care and wet, gloved hands.

When being transported they should be packed into plastic cartons with sufficient air holes, the type used for invertebrate live food are ideal, and cushioned with damp moss or damp toxin free paper tissues. This is to prevent desiccation and injury during transport.

All transportation should conform to the Welfare of Animals during Transport Order 1994, and IATA regulations if being transported by air. An 'Animal Transport Certificate' should accompany the animals during their journey and their containers should in no way compromise their welfare.

All mantellas are listed on CITES.

2.6.5 Safety

Captive mantellas lose their toxicity (Daley et al. 1997), suggesting that building blocks for the alkaloids are dietary.

2.7 VETERINARY: Considerations for Health and Welfare

For captive-bred mantellas illnesses are rarely a problem. If illness appears, in most cases this is due to an oversight in environmental or climatic conditions (HRMSS), negligence in sanitation (Scratching disease), stress due to a number of factors (e.g. transportation) and an unhealthy or unbalanced food (Avitaminosis B, Obesity). Endoparasites, protozoa and bacteria can inflict healthy animals, either.

2.8 SPECIFIC PROBLEMS

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2.9 RECOMMENDED RESEARCH

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SECTION 3. REFERENCES

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