



COLOR REPRODUCTION SUPPORTED BY THE THOMAS BEAUVAIS FUND

FIG. 1A. About one minute into the attempted predation of a *Phrynohyas venulosa* by a *Leptophis ahaetulla*: fresh secretion is still coming off the frog's back. Two coils of dried secretion can clearly be seen tightly wrapped around the snout of the snake, limiting the movements of its mouth and obscuring its view.

FIG. 1B. About one minute after the predation attempt: by rubbing its head against treebark and by chewing movements of its jaws, the snake got rid of most of the secretion. The last coil of dried secretion is just hanging on, including a big chunk inside the snake's mouth.

point it appeared as if the head of the *L. ahaetulla* was tightly bound with plastic rope. Suddenly the *P. venulosa* freed itself and hopped to safety. The *L. ahaetulla* was still hanging from the barbed wire and trying to get rid of the hardened mucus. The mucus had accumulated mainly on the snake's nose, around its head, and in its mouth and was very sticky and tough. The *L. ahaetulla* had to rub its head against the tree and move its jaws horizontally and vertically again and again to remove it. After about two minutes the *L. ahaetulla* got rid of most of it, except for a big chunk in its mouth. Then it became aware of our presence and moved up the tree. When it reached a height of 3 m, its mouth seemed fully free of dried mucus.

It appeared as though the *P. venulosa* was deliberately shoving the mucus towards the snake's head, as its feet collected mucus when moving towards the snake. I am unaware if there are reports of poisonous amphibians that actively transfer their skin secretions, but that appears to be the case in this observation.

Submitted by **JEROEN VERHOEFF**, Vossenstraat 40, 3131CW, Vlaardingen, The Netherlands; e-mail: info@jeroen-verhoeff.com.

PLATYMANTIS VITIANA (Fiji Ground Frog). **FROGLET MORPHOLOGY.** *Platymantis vitiana* is an endangered anuran found only on four small outer islands in Fiji including Viwa, Taveuni, Gau, and Ovalau. On Viwa Island (a 60-ha island, 30 km NE of Suva and 0.95 km from mainland Viti Levu, Fiji), *P. vitiana* shares its natural habitat with invasive *Bufo marinus*. *Bufo marinus* is a prolific breeder while *P. vitiana* is a seasonal breeder (Narayan et al. 2010. Gen. Comp. Endocrinol. 166:172–179). Eradication plans for *B. marinus* on Viwa include chemical use and trapping of toadlets and adults. As a precautionary conservation measure, translocation of a sub-population of *P. vitiana* adults and froglets will be necessary prior to eradication of *B.*

marinus. In this process and during eradication, misidentification of *B. marinus* toadlets with froglets of *P. vitiana* is likely to affect the *P. vitiana* population and also shadow the outcome of the eradication programs. Therefore, we attempted to find morphological features of *P. vitiana* froglets for rapid identification in the field.

A clutch of *P. vitiana* eggs was monitored on Viwa Island up to hatching of froglets on 12 Dec 2007. Simultaneously, tadpoles of *B. marinus* were also monitored in a nearby natural pond on Viwa Island up to four weeks.

Bufo marinus eggs typically underwent a tadpole metamorphosis while eggs of *P. vitiana* metamorphosed directly into newly hatched froglets without a tadpole stage. Morphologically, the hatchlings of both *P. vitiana* and *B. marinus* are of similar size (mean = 8 mm SVL) and have the second digit of both the anterior and posterior limbs longer than the rest of the digits. Each anterior limb has four digits while each posterior limb has five digits. Furthermore, the hatchlings of both species have blackish-brown or greenish striped patterns on the upper surfaces of both anterior and posterior limbs. However, a morphological feature diagnostic of *P. vitiana* froglets was identified. A butterfly pattern of five brown raised warts on the dorsal head region, forming a circle with one brown raised wart in the center, was observed in all *P. vitiana* froglets (Fig. 1). However, metamorphs of *B. marinus* of similar age only have greenish raised warts distributed along the head-vent margin.

These morphological features thus can be used to identify metamorphs of *P. vitiana* in the field and help to avoid misidentification with those of invasive *B. marinus*. This study is the first record of morphological characteristics of *P. vitiana* froglets and



COLOR REPRODUCTION SUPPORTED BY THE THOMAS BEAUVAIS FUND

FIG. 1. A group of newly hatched *Platymantis vitiana* froglets (N = 5) on soil substrate on Viwa Island. Note the characteristic butterfly pattern on the dorsal head region of each froglet.

it has useful implications for future eradication efforts of *B. marinus* in the Fiji Islands.

Submitted by **EDWARD J. NARAYAN** (e-mail: e.narayan@griffith.edu.au), and **JEAN-MARC HERO** (e-mail: m.hero@griffith.edu.au), Environmental Futures Centre, School of Environment, Griffith University, Gold Coast Campus, QLD 4222, Brisbane, Australia.

PROCERATOPHRYS MELANOPOGON (Black-bearded Horned Leaf Toad). **DEFENSIVE BEHAVIOR.** *Proceratophrys melanopogon* is a small to medium-sized cycloramphid anuran that belongs to the *Proceratophrys appendiculata* complex (Prado and Pombal 2008. Arq. Zool. 39:1–85). Species within this complex are characterized by the presence of palpebral appendages and cryptic coloration resembling fallen leaves (Prado and Pombal 2008, *op. cit.*; Toledo and Haddad 2009. Int. J. Zool. 2009:1–12). *Proceratophrys melanopogon* mainly inhabits leaf litter on the forest floor in Atlantic Rainforest areas of southeastern Brazil (Izecksohn et al. 1998. Rev. Univ. Rural, Sér. Ciênc. Vida 20:37–54; Prado and Pombal 2008, *op. cit.*).

On 4 Dec 2009 at 1430 h, we observed defensive behavior displayed by *P. melanopogon* upon capture. After grasped with the hand, the specimen flattened its body and stretched out its legs, keeping this position until being released on the ground (Fig. 1). The observation took place near a permanent pond in Serra do Brigadeiro State Park, an area of montane rainforest in municipality of Araponga, state of Minas Gerais, Brazil (20.7219°S, 42.4786°W, elev. 1320 m, SAD1969).

This defensive behavior has been called stiff-legged (Sazima 1978. Biotropica 10:158) and was reported for other horned leaf toads, including *P. appendiculata* (Sazima 1978, *op. cit.*) and *P. boiei* (Toledo and Zina 2004. Herpetol. Rev. 35:375). Similar behaviors for other leaf-litter anurans (e.g., *Dendrophryniscus leucomystax*, *D. brevipollicatus*, *Scythrophrys sawayae*, *Stereocyclops parkeri*) has been regarded as behavioral convergence given that leaf-litter inhabiting species are subject to similar predation pressures (Bertolucci et al. 2007. Alytes 25:1–2; Garcia 1999. Herpetol. Rev. 30:224; Sazima 1978, *op. cit.*; Toledo and Zina 2004, *op. cit.*).



FIG. 1. *Proceratophrys melanopogon* (25.9 mm SVL) from Minas Gerais, Brazil displaying stiff-legged defensive behavior.

The adaptive value of this behavior might be in enhancing crypsis among fallen leaves, confusing visually oriented predators (Sazima 1978, *op. cit.*; Toledo and Zina 2004, *op. cit.*), and/or inhibiting ingestion by predators (Angulo and Funk 2006. Herpetol. Rev. 37:203–204; Azevedo-Ramos 1995. Rev. Bras. Biol. 55:45–47).

We thank the Instituto Estadual de Florestas (IEF) and Universidade Federal de Viçosa for logistic support, and Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for fellowships granted to MRM.

Submitted by **MARIO RIBEIRO DE MOURA** (e-mail: mariomoura@gmail.com), **DIEGO JOSÉ SANTANA**, **SARAH MANGIA**, and **RENATO NEVES FEIO**, Universidade Federal de Viçosa, Departamento de Biologia Animal, Museu de Zoologia João Moojen, 36570-000, Viçosa, MG, Brazil.

RHINELLA MARGARITIFERA (NCN). **PARASITES.** The *Rhinella margaritifera* complex is widely distributed in Latin America, occurring throughout the Amazon Basin and parts of Panama (IUCN, Conservation International, and NatureServe 2004. Global Amphibian Assessment. <www.globalamphibians.org>. Accessed 03 Dec 2004). Although amphibians are known to be parasitized by larvae of numerous fly species, this is a poorly studied area of amphibian biology. In Europe, North America, and India, amphibians are commonly attacked by larvae of several blow flies (Calliphoridae) and flesh flies (Sarcophagidae; Bolek and Coggins 2002. J. Wildl. Dis. 38:598–603; Dasgupta 1967. Parasitology 52:63–66; James and Maslim 1947. J. Washington Acad. Sci. 37:366–368; Strijbosch 1980. Oecologia 45:285–286), and in Australia amphibians are infected with larvae of grass flies (Chloropidae; Schell and Burgin 2001. J. Parasitol. 87:1215–1216).

In Neotropical regions, cases of flesh fly parasitism in anurans have been recorded from *Atelopus* spp. in Costa Rica (Crump and Pounds 1985. Parasitology 75:588–591), *R. granulosa* in Venezuela (Lopes and Vogelsang 1953. An. Acad. Brasil. Ciências 25:139–143), *Rana catesbeiana* in Brazil (Souza et al. 1990. Mem. Inst. Oswaldo Cruz 84:517–518), *Eleutherodactylus* sp. in Panama (Dodge 1968. Ann. Entomol. Soc. America 61:421–450), *Proceratophrys* in Brazil (Lopes 1981. Rev. Brasil. Entomol. 41:149–152), and *Epipedobates* spp. (Hagman et al. 2005. Phyllomedusa 4:60–73). Here, we offer a first report of parasitism of *R. margaritifera* by flesh flies.

On 16 August 2007 at 1000 h, we found an adult *R. margaritifera* (42.9 mm SVL, 6 g) in Floresta Nacional de Caxiuana, near the municipality of Portel (1.96000°S, 51.6152778°W; elev. 20 m), State of Pará, Brazil. The specimen was hidden within the dry leaves and twigs of *terra firme* forest ground. During preservation we observed 21 flesh fly larvae leaving the body of *R. margaritifera* through the cloaca. The larvae were preserved in 70% alcohol.

We deposited the *R. margaritifera* and flesh fly larvae in the herpetological (MPEG 21938) and entomological collections, respectively, of the Museu Paraense Emílio Goeldi, Belém, State of Pará, Brazil. Marinus S. Hoogmoed verified identification of the frog.