Ophiophagy and egg-eating in *Mannophryne* cf. *trinitatis* (GARMAN, 1888)

Amphibians are considered to be feeding opportunists with their diets reflecting the availability of food of appropriate size which seems to be a basic constraint in amphibian diet (DUELLMAN & TRUEB 1986). As to cases of snake-eating (ophiophagy), *Leptodactylus pentadactylus* (LAURENTI, 1768) has been reported to predate on adult *Imantodes cenchoa* (LINNAEUS, 1758), *Rana catesbeiana* SHAW, 1802 on *Micrurus*, *Pyxicephalus adspersus* TSCHUDI, 1838 on *Hemachatus* and some Malaysian toads of the genus *Bufo* commonly feed on Flowerpot Blind Snakes, *Rhamphotyphlops braminus* (DAUDIN, 1803) (GREEN 1997). Dendrobatid diet has been studied for some species (e.g., PRADERIO 1985; PIÑERO & DURANT 1993; PIÑERO & LA MARCA 1995), however, to our knowledge, no case of ophiophagy has been reported for members of the family Dendrobatidae.

Amphibian eggs predation by anurans has also been documented, however egg-eating may not be related exclusively to feeding. WELLS (1978) noticed that captive females of *Dendrobates auratus* (GIRARD, 1855) destroyed and ate eggs deposited by conspecific females. ZIMMERMANN (1976) and WEYGOLDT (1980) commented that male *Dendrobates pumilio* SCHMIDT, 1857 tended to eat conspecific eggs fertilized by other males. Gut dissections of *Nephelobates alboguttatus* (BOULENGER, 1903) showed frog eggs and larvae remains (PIÑERO & LA MARCA 1995); these authors concluded that egg–eating behavior probably is more frequent than currently known. According to WELLS (1978), eggs-eating is a potential form of female-female competition.

Here we report on two conspicuous instances of alimentation (ophiophagy and egg-eating) in *Mannophryne* cf. *trinitatis* (GARMAN, 1888) which were noticed when collecting frogs of the genus *Mannophryne* for a molecular phylogenetics study.

Predators and prey specimens of the ophiophagy case were deposited in the amphibian and reptiles collection of the "Museo de la Estación Biológica de Rancho Grande" (EBRG), at Maracay, Venezuela. Predator specimens of the egg-eating case were deposited in the herpetological collection of the "Laboratorio de Biogeografía, Universidad de Los Andes, Mérida, Venezuela (ULABG). Digital photos were taken with a Sony Mavica® camera. Poor resolution pictures for printing were used to make ink-draw pictures at scale, and original photographic documentation was deposited in the "Museo del Intituto de Zoología Agricola" (MIZA), "Universidad Central de Venezuela". Technical equipment for measurements: GPS Garmin® 12, Texas Instruments® digital thermohygrometer, Casio® digital altimeter, Mitutoyo® digital caliper for lengths ≤ 30 mm, and a calibrated ruler for lengths > 30 mm.

On May 7th, 2002, between 10:15 and 12:35 after heavy rainfall, we watched *M.* cf. *trinitatis* at a stream located at 10°43'N; 62°48'W, at an elevation of 186 m a.s.l., approximately 4.2 km airline from San Juan de Las Galdonas (Muncipio Arismendi) on the road to Aroa, in Sucre State, Venezuela.

During a 23 minutes period (11:22 to 11:45) we observed and photographed one adult male and six adult females of *M.* cf. *trinitatis* on a rock trying to devour a juvenile blind snake (fig. 1, only four frogs are represented). The rock was roughly 150 cm in diameter. Two frogs competed in fighting for prey, and actively pursued a juvenile individual of *Leptotyphlops goudotti* (DUMÉRIL & BIBRON, 1844). The stressful movements of this serpent on the rock attracted the frogs. Eventually some of the frogs captured the snake (fig. 2). Although up to 40% of the body length of the prey was ingested by the frog, head first, the snake managed to escape. Two frogs were seen trying to ingest the prey simultaneously, each frog from one end of the snake's body. The snake finally escaped and dropped into the stream pond. Three of the frogs swimming in the pond found it quickly, chased the snake to the other side and managed to capture it once again.

At the time of observation there was a high density of frogs at the site and more than 20 calling males were present in an area of about 28 m^2. The environmental conditions were as follows: water temperature, 25°C; air temperature, 32°C, relative humidity, 81%. The voucher predator, *M.*

Fig. 1: Four out of seven individuals of *Mannophryne* cf. *trinitatis* (GARMAN, 1888) chasing and trying to devour a juvenile *Leptotyphlops goudotti* (DUMÉRIL & BIBRON, 1844). Sketch drawn from a photograph.

Fig. 2: *Mannophryne* cf. *trinitatis* (GARMAN, 1888) trying to swallow a juvenile *Leptotyphlops goudotti* (DUMÉRIL & BIBRON, 1844). Sketch drawn from a photograph.

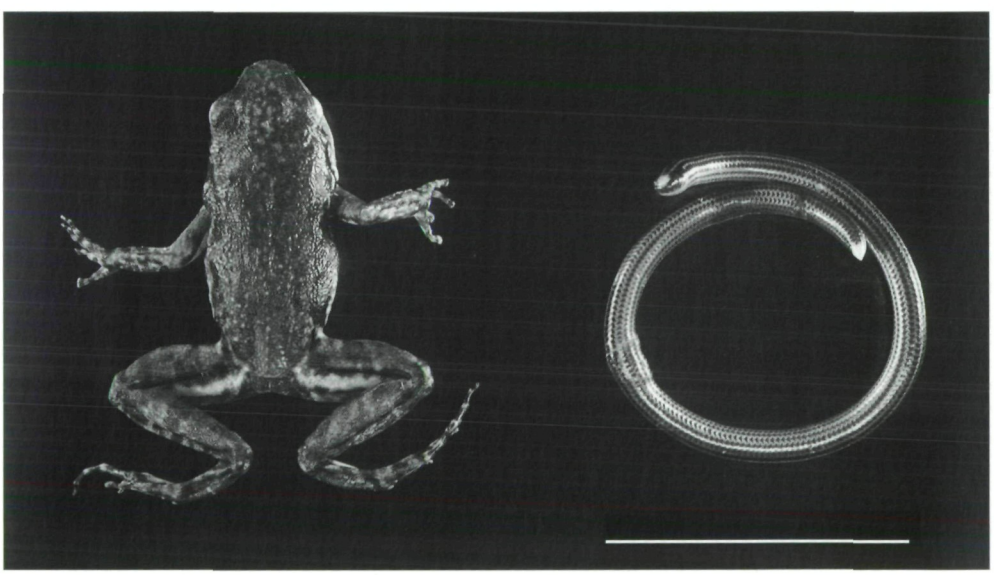

Fig. 3: Predator and prey: the specimens of *Mannophryne* cf. *trinitatis* (GARMAN, 1888) and *Leptotyphlops goudotti* (DUMÉRIL & BIBRON, 1844) involved in the ophiophagy case. Length of bar represents 2 cm.

cf. *trinitatis* (EBRG 4620) was 23.7 mm in snout-vent-length, while the prey, *L. goudotti* (EBRG 4216) had a total length of 80.5 mm (fig. 3). It was, however, not verified weather the frogs actually could have swallowed the prey, but it is highly likely that small-sized blind snake individuals could eventually be eaten. We think that *L. gou-*

dotti is not a frequent but rather an occasional prey of *M.* cf. *trinitatis*. Blind snakes, *Leptotyphlops macrolepis* PETERS, 1857 and *Liotyphlops* sp., have been observed to abandon their burrows in urban areas after heavy rains, when the soil is saturated with water, thus being an easy prey to their predators (Jesús MANZANILLA, unpublished data for Aragua State, Venezuela). Perhaps this could also apply to the case described in the present paper.

A few minutes after the ophiophagy observations, and only a few meters upstream, we came upon another particular case of feeding behavior. During the capture and identification of a female *M.* cf. *trinitatis* (ULABG 5007) found on the leaf litter nearby the stream (about 3.5 meters from the water course), she regurgitated two unidentifiable gelatinous eggs, maybe of her own species. The environmental conditions were the same as previously mentioned. Eggs ingestion by the female *M.* cf. *trinitatis* could be interpreted as a non-alimentary behavior, some kind of reproductive competition (see WELLS 1978) rather than predation. However, more information is needed to understand this behavior.

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On the distribution and natural history of *Hyla miyatai* VIGLE & GOBERDHAN-VIGLE, 1990 in Amazonian Ecuador

Several species of tree-frogs inhabit the western Amazonian lowlands (eg. 45 hylids sympatric at the Tiputini Biodiversity Station, Ecuador; CISNEROS-HEREDIA 2003); but our knowledge on this diverse hylid fauna is still limited. *Hyla miyatai* VIGLE & GOBERDHAN-VIGLE, 1990 was described from the Garzacocha area in Amazonian Ecuador and has been subsequently reported from few additional localities, all widely-separated: Iquitos, Perú (RODRIGUEZ & DUELLMAN 1994); Amazonas, Colombia (RUIZ-CARRANZA et al. 1996); and Rio Juruá, Brasil (GASCON 1996). No additional records have been reported from Ecuador and our knowledge on the biology of this species is very poor. Here I report some observations on the natural history of *H. miyatai* and three additional localities for the species in Ecuador