

DYING FROGS IN WESTERN COLOMBIA: CATASTROPHE OR TRIVIAL OBSERVATION? (Ranas muertas o moribundas en el occidente de Colombia: ¿catástrofe u observación trivial?)

por

John D. Lynch¹ y Taran Grant²

Resumen

Lynch J.D. & T. Grant: Dying frogs in western Colombia: Catastrophe or trivial observation? (Ranas muertas o moribundas en el occidente de Colombia: ¿catástrofe u observación trivial?) Rev. Acad. Colomb. Cienc. **22**(82): 149-152.1998. ISSN: 0370-3908.

El descubrimiento de ranas muertas o moribundas de siete especies de los bosques nublados en julio de 1997 durante una época inusualmente seca en la Serranía de los Paraguas podría ser una indicación de la ruina de una fauna muy rica. Estudios subsecuentes sugieren que las poblaciones están sanas y que las observaciones son triviales.

Palabras claves: Declinaciones de anfibios, Andes, Centrolenidae, Hylidae, Leptodactylidae

Abstract

The encounter of dead or dying frogs of seven cloud forest species in July 1997 during an unusually dry period in the Serranía de los Paraguas could be an indication of a collapse of a rich fauna. Subsequent study suggests that the populations are healthy and that the observations are trivial.

Key words: Amphibian declines, Andes, Centrolenidae, Hylidae, Leptodactylidae

Introduction

Between 25 and 27 July 1997, TG, JDL & Paul Gutiérrez visited the crest of the Serranía de los Paraguas

(sitio El Boquerón) on the frontier between departamentos del Chocó and Valle del Cauca, Colombia (4°44.2' N, 76° 18.3' W to 4°44.5' N, 76°17.8' W). On previous visits (1991, 1995), JDL had found the climate exceptionally wet (daily rains, area bathed in clouds most of the day and night) with numerous small streams crossing the road. However, in July 1997, the area was notably dry with little or no cloud cover and no rains. Most streams were dry (or exhibited no obvious flows) and those with flows were

¹ Profesor Asociado, Instituto de Ciencias Naturales, Universidad Nacional de Colombia

² Estudiante pregrado, Departamento de Biología, Universidad del Valle, Cali

reduced markedly in volume. Local inhabitants told us that the *verano* had lasted for approximately one month. During our reconnoiter of the area on 25 July 1997, we encountered several dead and dying frogs either on the road surface (*Gastrotheca antomia*) or in the pools remaining in the streams having little or no flows. On 26 and 27 July two other dead frogs were found. Each dead frog showed no gross evidence of injury. The observation of approximately 10-12 dead (and dying) frogs contrasts with the experiences of JDL who in 30 years of field work had never seen more than 2-3 dead/dying frogs in a single field season aside from winter-killed *Rana* in the early spring in the USA. Much attention has been given in recent years to a "global" phenomenon of declining populations of amphibians yet JDL had not noticed such declines in amphibian populations during the past 20 years in Colombia aside from reduced activities (temporary difficulties finding animals) during the episode of El Niño in 1992 (contra the observations in neighboring Ecuador, **Coloma**, 1995:63-64, and Venezuela, **La Marca & Lötters**, 1997).

The searches for frogs during the morning and afternoon of 25 July resulted in the discoveries of all but two of the dead/dying frogs. We also found living but emaciated *Colostethus lehmanni* under rocks and logs and noted the apparent absences of species usually abundant under rocks and debris alongside the road. Paul Gutiérrez and TG searched explicitly for *Colostethus* along the roadside for ca. 3 kilometers and up several streambeds while JDL prepared trails for nocturnal searches (one trail up the forested slopes of Cerro El Inglés away from streams and two trails up streams within 0.5 km of the forest trail).

The El Boquerón area has a substantial (38 species known) frog fauna (collections between 2000 and 2200 m) consisting of three bufonids (*Ateopus chocoensis*, *A. sp.*, and *Rhamphophryne sp.**), five hylids (*Hyla columbiana*, *H. larinyopygion**, a species of the *Hyla bogotensis* group, *Gastrotheca antomia**, *G. guentheri*), three dendrobatids (*Colostethus agilis*, *C. atopoglossus*, *C. lehmanni**), six centrolenids (*Centrolene buckleyi**, *C. geckoideum**, *C. grandisonae**, *Cochranella armata**, *C. griffithsi**, *C. ignota*), and 21 leptodactylids (*Eleutherodactylus acatallelus**, *E. angustilineatus**, *E. babax*, *E. brevifrons**, *E. cerastes*, *E. chrysops**, *E. deinops*, *E. erythropleura**, *E. gracilis**, *E. kelephus**, *E. mantipus*, *E. myops**, *E. palmeri**, *E. phalarus**, *E. ptochus**, *E. quantus**, *E. restrepoi**, *E. silverstonei**, *E. thectopternus*, *E. w-nigrum**, and *E. xylochobates**). Initial collections (28 species) were made in the mid 1980s (Michael Alberico, Jorge Restrepo, & Philip Silverstone) followed by an extensive collection in 1991

(31 species), a brief visit in 1995 (16 sp), another in 1996 (25 sp), and the 25 species (marked with asterisks in list above) taken in 1997 (including one not previously known for this site).

We visited El Boquerón specifically to search for additional material of six then-undescribed *Eleutherodactylus* and found all six. The observations during the day of 25 July caused us to be concerned that few frogs might be found during the night. However, on the night of 25 July we spent approximately four hours searching for frogs and collected more than 300 individuals in the forest and along one stream including all species found dead except *C. geckoideum* and *E. xylochobates*. An estimated additional 100 frogs were observed and handled but not collected. Also remarkable about the site was the absence of calling of centrolenids, *Colostethus*, and *Eleutherodactylus angustilineatus* and *E. brevifrons*, species normally heard daily. During our stay at El Boquerón, we took 25 species of frogs (see species list above; those marked with an asterisk were collected in 1997). The 13 species we did not find are rare historically except for *Cochranella ignota* and *Colostethus atopoglossus*. Our failure to collect *C. ignota* may well reflect our use of a single stream at the site (in previous years it was found along different streams than the one we worked). Prior experience suggests that different species of centrolenids occupy different streams, perhaps due to some biological exclusion (pers. obser., pers. comm., Pedro M. Ruiz). *Colostethus atopoglossus* had been very abundant at the site along the road; in the absence of streams and rivulets crossing the road, one does not expect to find this semi-aquatic species. JDL may have observed one in a seep on a steep hillside in the forest but the specimen escaped before it could be identified positively (it could have been a *C. agilis*).

Results

The dead and dying frogs observed in 1997 included seven species: *Centrolene geckoideum* (Centrolenidae), *Gastrotheca antomia* (Hylidae), *Eleutherodactylus chrysops*, *E. gracilis*, *E. myops*, *E. w-nigrum*, and *E. xylochobates* (Leptodactylidae). Specimens are identified using field numbers. Those identified as TG and PG will be deposited in the Universidad del Valle collection and those identified as JDL will be deposited in the Instituto de Ciencias Naturales collection.

Centrolene geckoideum

One dead adult female (TG 971, 76 mm SVL) was found in a pool ca. one meter deep on the first stream

above the casa at Las Amarillas. She showed no obvious pathology and contained eggs that appear mature. This animal is larger than the maximum known size for females of this species (Rueda-A., 1994). No calls were heard of this species during our visit (in contrast to previous visits to the site) nor were any other individuals seen.

Gastrotheca antomia

Three dead adult males were found on the road (JDL 21262, 54 mm SVL, TG 972, 60 mm SVL, PG 015, 56 mm SVL). These all appear to have died within 24 hrs of being found (in one case, we had walked that section of the road less than a day before the corpse was found). Each animal is well muscled and shows no evidence of starvation. These fall within the size range reported for adult males (Ruiz-C. et al., 1997). Adult males called very sporadically every night during our stay (in contrast to observations of much more intense activity in 1991 and 1995) and one adult female carrying embryos was found. In addition, we found several recently born young in the forest.

Eleutherodactylus chrysops

One adult (TG 973, 51.9 mm SVL) male was found in a pool. The adult male was dying (the animal could not right itself and made only feeble movements). This recently described species was not previously known from the site (Lynch & Ruiz-C., 1996). During collecting the night of 25 July, two additional adult males (JDL 21155-56, 54.0-57.5 mm SVL) and one juvenile male (JDL 21072, 16.7 mm SVL) were found.

Eleutherodactylus gracilis

One large adult female (not kept) in an advanced state of decomposition was found in a pool. Adults and juveniles were very abundant along one stream that we sampled, as they had been in 1991 and 1995. This is a species of streams and was not observed in the forest away from streams.

Eleutherodactylus myops

A single large adult female was found dead beside a pool (TG 1082, 19.7 mm SVL). She is larger than the largest female captured of the species (Lynch, 1998). This species was abundant in the forest as well as along a stream we worked. Although a concerted effort was made to collect this species, JDL's impression is that it was more common in 1997 than it had been in 1991 or 1995.

Eleutherodactylus w-nigrum

One large adult female (TG 1019, 80 mm SVL) was found dead 27 July in same the pool where the *Centrolene geckoideum* had been found two days earlier. During our visit, males called sporadically from vegetation along the roadside. We observed very few individuals along streams but did encounter very small juveniles there. The species appears much less common than it had been during previous visits.

Eleutherodactylus xylochobates

One juvenile female (TG 1081, 41.2 mm SVL) was found on a rock. She was collected in spite of the fact that she was dead and is badly decomposed. The collector did not make explicit notes as to where she was found but we surmise that she was taken in the same stream as the *C. geckoideum* and *E. chrysops*. No other individuals of *E. xylochobates* were observed during our stay.

A few other frog remains were found in the pools (or dried on the surfaces of rocks that had previously been under water) but these were so decomposed (and incomplete, apparently due to scavenging by an Andean catfish, genus *Astroblepus*) that they were merely noted and not collected (hence, we cannot comment on their identities except that they appeared to be species of *Eleutherodactylus*).

Discussion

Dr. Karen Lips (*in litt.*) told JDL of parallel observations in Panamá and suggested that the observations of late July 1997 on the Serranía de los Paraguas represent early observations of a process of local extinction. Dr. David Green (*in litt.*) suggested that some "protozoan" pathogen was responsible. Additionally, we are aware of one other site on the Cordillera Occidental where frogs became inexplicably rare/absent in the past 24 months. A site under study by Dr. Fernando Castro and Wilmar Bolívar at finca San Pedro, near Queremal (municipio de Dagua, Valle del Cauca) experienced dramatic reductions in abundances of several common frog species and local disappearances of others during 1996 (pers. observ., TG). That observation stands in marked contrast to comparable sites in the region where no reductions were detected over the same time frame.

The Colombian frog fauna is the most diverse on the planet (Ruiz-C. et al., 1996) and the possibility of precipitous declines causes much alarm because the cloud forest faunas are remarkable for their high levels of en-

demicity (Lynch et al., 1997). As a reaction to our initial observations, Conservation International dispatched an accomplished collector (José Vicente Rueda) to the Serranía de los Paraguas in early September. He reports (*in litt.*) that the "normal" climate had been restored and that no dead or dying frogs were seen. In November 1997, TG returned to the site briefly and noted that conditions were "normal", including that centrolenid frogs were calling along the several streams.

Our initial interpretation of these data (and our current view) was that dead and dying frogs, especially large individuals, might reflect normal mortality made more obvious by the failure of streams to wash the bodies away. This does not account for the *Gastrotheca antomia* found dead on the road. *Gastrotheca antomia* is commonly found in terrestrial bromeliads at this site and JDL inspected a dozen or so bromeliads and found all completely dry. We interpreted the dead *G. antomia* as individuals who were desiccated and had fled their bromeliads before dying on the road where they were obvious to collectors (we made no effort to walk comparable distances within the forest looking for dead frogs on the forest floor). That we found frogs abundant on the night of 25 July suggested to us that the observation of dead frogs was of little note. Our present estimate is that the observations of dead and dying frogs in July 1997 represent trivial ones but continued monitoring is planned for each site in an effort to understand these puzzling observations.

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