The species-rich genus *Eleutherodactylus* is the major component of the amphibian fauna in each of the Greater Antillean islands. In Cuba 84% of the amphibian species belong to this genus, with remarkably high levels of endemism and small distribution ranges (Hedges, 1999; Hedges, Duellman and Heinicke, 2008). In recent years, an increase in the explorations of less-studied areas has resulted in significant extensions in the distribution of several species (Rodríguez and Alonso, 2003, 2006; Rodríguez, Vences and García, 2011) but still, our knowledge about the geographic distribution of most of the Cuban amphibians is far from being complete.

*Eleutherodactylus glamyrus* Estrada and Hedges 1997, is a montane frog from Cuba with a distribution restricted to the areas above 800m a.s.l in the Sierra Maestra mountains, from Minas de Frio in the West to La Bayamesa massif in the East (Díaz and Cádiz, 2008). It is very abundant in this area and males vocalize from leaves and branches in the understory of pine forests, montane rainforests and elfin forests (Alonso, Rodríguez and Márquez, 2007). Morphologically, *E. glamyrus* is very similar to the wide ranging *E. auriculatus* from which can be diagnosed by its longer and slower-rate advertisement call (Estrada and Hedges, 1997; Díaz and Cádiz, 2008). More recently, its specific status was confirmed with the analysis of mitochondrial DNA sequences (Rodríguez et al., 2010) which also showed a slight divergence between populations in the Turquino and La Bayamesa massifs (Rodríguez et al., 2010). In congruence with this finding, analysis of advertisement calls have shown a slight bioacoustic divergence between the populations of these two massifs in terms of call rate, call duration and call rise time (Rodríguez, De la Nuez and Alonso, 2010).

Between 10–15 of May 2010 we conducted a survey of amphibian species in the area of Loma del Gato, in the Sierra del Cobre massif, Santiago de Cuba province. At dusk of May 13th, 2010, we observed several vocalizing males of *Eleutherodactylus glamyrus* in the ascent trail on the northern slope of Pico El Gato (20.01364 N, 76.04809 W; at an altitude of 844m a.s.l.). Very close to this site, two additional point-localities for *Eleutherodactylus glamyrus* were acoustically confirmed, one at the summit of Pico El Gato (20.01038 N, 76.03860W; 1019m a.s.l.) and another at Loma La Juana (20.01877 N, 76.05437 W; 900m a.s.l) (Fig. 1; black dots).

In the first locality, we also recorded the vocalizations of 11 males at dawn (5:00-6:30hrs) using a Marantz PMD 430 tape recorder with a Sennheisser ME-66 shotgun microphone and a Marantz PMD 660 digital recorder with a Sennheiser ME-80 shotgun microphone. In each instance, the microphone was pointed at the focal male at a distance of approximately 50 cm and the acoustic signals were recorded during 2-5 minutes. The males were all calling from leaves in horizontal position (Fig. 2a), at a height of 1.2 ± 0.5m (mean ± SD) above ground, with an air temperature of 19 ± 0.2°C. Upon recordings, the males were captured and sacrificed in a chlorobuthanol solution and later fixed and preserved in 70% ethanol. Voucher specimens are deposited at the Zoological Collection of the Institute of Ecology and Systematics, Havana, Cuba (CZACC14.14150-60). The following species were also observed in the surroundings of this locality: *Eleutherodactylus atkinsi*, *E. auriculatus*, *E. cuneatus*, *E. dimidiatus*, *E. gundlachi*, *E. ionthus*, *E. limbatus*, *E. ronaldi*, *E. ricordii* and *Osteopilus septentrionalis*.

The recorded calls agreed with published descriptions of the species’ call (Alonso, Rodríguez and Márquez, 2007; Díaz and Cádiz, 2008) (Fig. 2b) and in the field, the diagnosis of *Eleutherodactylus glamyrus* was confirmed.
facilitated by the presence of syntopic calling males of *E. auriculatus* whose calls were much shorter and emitted at a faster rate, as originally described by Estrada and Hedges (1997). Measurements of relevant call features (digitized and processed as in Rodríguez, De la Nuez and Alonso (2010)) yielded values of call rate (min – max = 45.96 – 60.60 calls/s) and dominant frequency (3.036 – 3.338 kHz) that broadly agree with the values reported by Rodríguez, De la Nuez and Alonso (2010) for 74 individuals from three populations in the Turquino and La Bayamesa massifs. However, the values obtained for call duration (128.4 – 243.1 ms) were greater than those reported by these authors (66.2–117.3 ms), an important acoustic divergence suggestive of isolation between populations, which should be confirmed using an appropriated statistical framework to remove the potential effects of temperature and male size.

The new localities reported herein extend the distribution of the species 53 km to the east, from the previous easternmost locality of Maria Tomasa, Guisa, Granma (Díaz et al., 2005) in La Bayamesa massif (Fig. 1). Considering altitudinal requirements of this species

Figure 1. Geographic distribution of *Eleutherodactylus glamyrus*. The expanded topographic map shows the previously known localities for the species, as compiled by Rodríguez (2012) (white circles) and the new localities reported herein (black circles). The 800m a.s.l. contour line is highlighted in red.

Figure 2. An *Eleutherodactylus glamyrus* male (CZACC14.14153) calling in the forest along the trail to Pico El Gato, Sierra del Cobre, 844m a.s.l. (a) and the oscillogram (top) and spectrogram (below) of an advertisement call of the same male (b). Spectrogram settings: 1024 points FFT, Hanning window, 98% overlap). Photograph by A. Rodríguez.
New localities for *Eleutherodactylus glamyrus*

(Estrada and Hedges, 1997; Alonso, Rodríguez and Márquez, 2007; Díaz and Cádiz, 2008), the inspection of a topographic map suggests that additional localities for the species could be found between La Bayamesa and Sierra del Cobre, approximately in areas above 800 m a.s.l., but a wide distribution gap between these two areas can also be inferred (Fig. 1). This gap could result in an important limitation of gene flow within the species, as our bioacoustic data suggest, and future studies on the evolution and conservation of this form should address this issue.

*Eleutherodactylus glamyrus* is considered an endangered (EN) species (Hedges and Díaz, 2004) and was recently reassessed as vulnerable (VU) in a national red list assessment of Cuban vertebrates (Rodríguez, 2012). Due to its restricted altitudinal range, most of its distribution lies within the climatic niche of the pathogenic fungi *Batrachochytrium dendrobatidis* (Rödder et al., 2009) and this same feature make it highly vulnerable to the predicted effects of global warming (Wake and Vredenburg, 2008; Blaustein et al., 2010). In light of these global threats, geographic distribution data are critically important and the discovery of these new localities can have relevant implications for the future preservation of *E. glamyrus*.

**Acknowledgements.** We thank G. Hecheverría García and workers at the “Loma del Gato – Monte Libano” ecologic preserve for the facilities conceded for the fieldwork. J. Lóriga, J. Lastre López, and O. Triay Limonta provided helpful assistance in the field. Fieldwork was partially funded by the Deutsche Gesellschaft für Herpetologie und Terrarienkunde (DGHT) and IdeaWild foundation provided important recording equipment. We thank A. Fong and an anonymous reviewer (DGHT) and IdeaWild foundation provided important recording equipment. We thank A. Fong and an anonymous reviewer (DGHT) and IdeaWild foundation provided important recording equipment. We thank A. Fong and an anonymous reviewer (DGHT) and IdeaWild foundation provided important recording equipment. We thank A. Fong and an anonymous reviewer (DGHT) and IdeaWild foundation provided important recording equipment. We thank A. Fong and an anonymous reviewer (DGHT) and IdeaWild foundation provided important recording equipment.

**References**


