New records of *Phyllonastes* HEYER, 1977 from Ecuador and Peru

The genus *Phyllonastes* HEYER, 1977 as currently defined comprises seven leaflitter and semifossorial taxa; including one lowland species (*Ph. myrmecoides* [LYNCH, 1976]), and six species distributed along the Andes of Ecuador, Peru, and Bolivia (*Ph. carrascoicola* DE LA RIVA & KÖHLER, 1998, *Ph. duellmani* LEHR, AGUILAR & LUNDBERG, 2004, *Ph. heyeri* LYNCH, 1986, *Ph. lynchi* DUELLMAN, 1991, *Ph. lochites* [LYNCH, 1976], and *Ph. ritarasquinae* KÖHLER, 2000) (FROST 2004). LEHR et al. (2004) cited only one species (*Ph. lochites*) from Ecuador, but two species have been reported from this country: *Ph. lochites* and *Ph. heyeri*, both from the southern Andean slopes (LYNCH 1986; COLOMA 2005-2006).

Leaflitter or fossorial anurans are usually small, reclusive and not readily detected by most general collecting methods used in regular Neotropical herpetological surveys. Knowledge on these species is rather poor and it is not unexpected that new species and new distribution records will be found with the use of methods that focus on terrestrial amphibians (e.g. pitfall traps). The examination and identification of preserved material in museum collections may also provide additional opportunities to refine our knowledge of species distributions. Herein, we provide the first reports of *Ph. myrmecoides* from Ecuador and *Ph. lochites* from Peru, with some comments on the diversity of the genus in both countries.

Specimens were either collected by hand or using pitfall traps. Pitfall traps were filled with a solution of 40% ethanol and biodegradable liquid soap. The following abbreviations are used in the text: DFCH-USFQ = D. F. CISNEROS-HEREDIA's collection, Universidad San Francisco de Quito, Quito, Ecuador; USNM = National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA. The terminology for vegetation formations is based on the classification system proposed by SIERRA et al. (1999).

Phyllonastes myrmecoides: This species occurs in the lowland Amazon basin, with records in northeastern and southeastern Peru (Departments of Loreto, San Martin, Huánuco, Cusco, and Madre de Dios – RODRIGUEZ et al. 1993; RODRIGUEZ & CADLE 1990; ALONSO & DALLMEIER 1999; DOAN & ARIZABAL 2002; LEHR et al. 2004), western Brasil (State of Amazonas – HOOGMOED & LESCURE 1984), southeastern Colombia (Department of Leticia – LYNCH 2005), and Bolivia (Departments of Cochabamba and La Paz; REICHLE et al. 2004). Four specimens of *Ph. myrmecoides* (DFCH-USFQ TB200-203) were collected at the Tiputini Biodiversity Station, province of Orellana (00°37'05''S, 76°10'19''W, ca. 230 m a.s.l.), Ecuador, between 18 and 22 April 2000 by D. F. CISNEROS-HEREDIA and S. CÁRDENAS (Fig. 1). These specimens coincide well with the original description of *Ph. myrmecoides* by LYNCH (1976), and are identical to specimens of *Ph. myrmecoides* from lowland Peruvian localities (USNM 127181, 332985, 538241-538242). These specimens represent the first country record and an extension of about 400 km E from the closest known locality of the species in the Department of Loreto, Peru. The specimens were collected in pitfall traps set in the ground of primary Lowland Evergreen Non-Flooded forest (terra firme).

Phyllonastes lochites: This species occurs in the subtropical slopes (900-1700 m a.s.l.) of the Cordillera Oriental, Cordillera del Cutucú, and Cordillera del Condor in Ecuador (LYNCH 1976; DUELLMAN & LYNCH 1988; ALMENDARIZ 1997). REYNOLDS & ICOCHEA (1997) reported on a *Phyllonastes* sp. (USNM 525543) collected on 20 July 1994 at the base camp "Alfonso Ugarte" (= Puesto Vigilancia 3, 03°54'S, 78°25'W, 1138 m a.s.l.) in the Peruvian side of the Cordillera del Condor, upper Rio Comainas, Department of Amazonas, Peru (Fig. 1). This specimen was subsequently identified as *Ph. lochites*, providing the first record of the species from Peru.

Three new species of *Phyllonastes* from Ecuador are currently under study. One taxon (*Phyllonastes* sp. A) is known from the Rio Guajalito Protector Forest (78°49'W, 0°14'S, ca. 2000 m a.s.l.), the only *Phyllonastes* from the northwestern slopes of the Andes (LYNCH & DUELLMAN 1997: 54). Despite several surveys on the

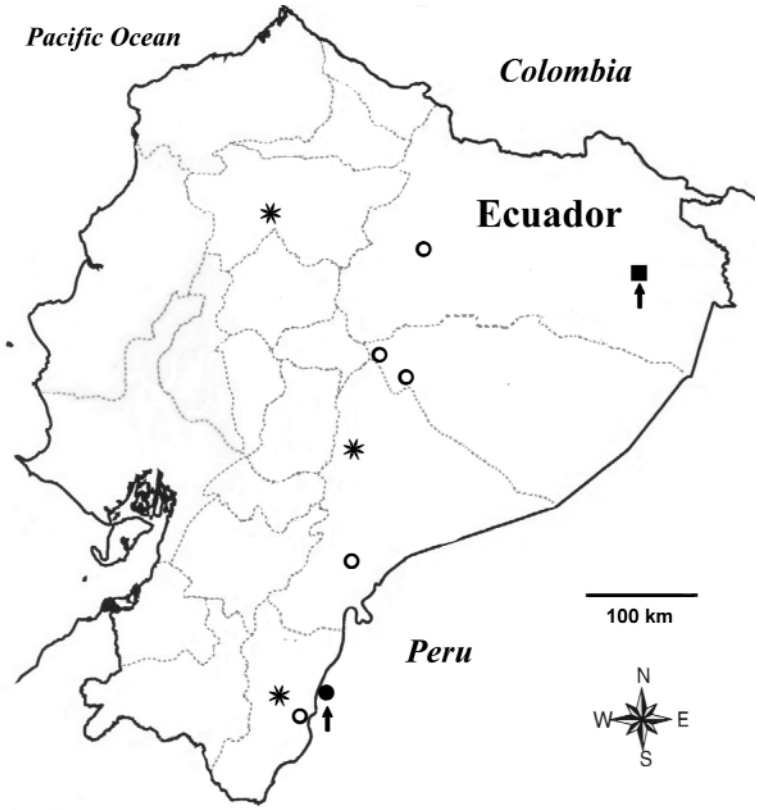

Figure 1: Distribution of *Phyllonastes myrmecoides* (■) and *Ph. lochites* (● ○) in Ecuador and northern Peru. ■ ● – examined material, ○ – literature records. ✷ – the undescribed taxa from the Rio Guajalito Protected Forest, and from the central and southern Cordillera Oriental.

herpetofauna of the Rio Guajalito area since 1997, the species remained known from just a few specimens collected in two ravines with abundant leaflitter in cloud forest. It is being described by Luis COLOMA and John LYNCH (L. COLOMA pers. comm. 2003). Two undescribed species occur in the central and southeastern Andean slopes of the Cordillera Oriental of Ecuador. They are similar to *Ph. myrmecoides* but differ in some morphological, coloration and ecological characters: *Phyllonastes* sp. B inhabits altitudes of ca. 1200 m a.s.l. in Foothill Evergreen forests, and *Phyllonastes* sp. C inhabits altitudes of ca. 600 m a.s.l. in low Foothill Evergreen forest (A. ALMENDARIZ, in prep., D. F. CISNEROS-HEREDIA in prep.). Thus, currently the Ecuadorian frogs of the genus *Phyllonastes* include three described species (*Ph. heyeri*, *Ph. lochites*, *Ph. myrmecoides*) and at least three undescribed taxa.

Two more species of *Phyllonastes* from Peru await description. One taxon (*Phyllonastes* sp. D) is an undescribed species from the Peruvian side of the Cordillera del Condor area (likely to be present also in southeastern Ecuador) (M. HARVEY & R. W. MCDIARMID in prep.). Another undescribed form, similar to *Ph. myrmecoides*, is known from the Department of San Martín, at altitudes ca. 1600 m a.s.l. (K.-H. JUNGFER & E. LEHR pers. comm. 2005). Thus, currently the Peruvian frogs of the genus *Phyllonastes* include five described species (*Ph. duellmani*, *Ph. heyeri*, *Ph. lynchi*, *Ph. lochites*, *Ph. myrmecoides*) and at least two undescribed taxa.

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REFERENCES: ALMENDARIZ, A. (1997): Overview of the herpetofauna of the western slopes of the Cordillera del Cóndor; pp. 80–82, 199-201. In: SCHULENBERG, T. S. & AWBREY, K. (Eds.): The Cordillera del Cóndor region of Ecuador and Peru: A biological assessment. Rapid Assessment Working Paper No. 7. Washington, D.C. (Conservation International). ALONSO, A. & DALLMEIER, F. (Eds) (1999): Biodiversity assessment and monitoring of the lower Urubamba region, Perú: Pagoreni well site assessment and training.- SI/MAB Series No. 3. Washington, D.C. (Smithsonian Institution / Man and Biosphere Biodiversity Program). COLOMA, L. (2005-2006): Anfibios de Ecuador. Ver. 2.0., web document accessible at < http://www.puce.edu.ec/zoologia/vertebrados/amphibiawebec/index.html > Quito (Museo de Zoología, Pontificia Universidad Católica del Ecuador). DOAN, T. M. & ARIZABAL, W. (2002): Microgeographic variation in species composition of the herpetofaunal communities of Tambopata region, Peru.- Biotropica, Connecticut; 34: 101–117. DUELLMAN, W. E. & LYNCH, J. D. (1988): Anuran amphibians from the Cordillera de Cutucú, Ecuador.- Proc. Acad. Nat. Sci. Philadelphia, Philadelphia; 140 (2): 125–142. FROST, D. R. (2004): Amphibian species of the world: an online reference. Version 3.0 (22 August, 2004) < http://research.amnh.org/herpetology/amphibia/index.html > New York (American Museum of Natural History). HEYER, W. R. (1977): Taxonomic notes on frogs from the Madeira and Purus rivers, Brazil.- Papéis Avulsos de Zoologia, Sao Paulo; 31: 141–162. HOOGMOED, M. S. & LESCURE, J. (1984): A new genus and two new species of minute leptodactylid frogs from Northern South America, with comments upon *Phyzelaphryne* (Amphibia: Anura: Leptodactylidae).- Zool. Mededel., Leiden; 58: 85–115. LEHR, E. & AGUILAR, C. & LUNDBERG, M. (2004): A new species of *Phyllonastes* from Peru (Amphibia, Anura, Leptodactylidae).- Journal of Herpetology, Salt Lake City; 38 (2): 214–218. LYNCH, J. D. (1976): Two new species of frogs of the genus *Euparkerella* (Amphibia: Leptodactylidae) from Ecuador and Perú.- Herpetologica, Emporia; 32: 48–53. LYNCH, J. D. (1986): New species of minute leptodactylid frogs from the Andes of Ecuador and Peru.- Journal of Herpetology, Salt Lake City; 20 (3): 423–431. LYNCH, J. D. (2005): Discovery of the richest frog fauna in the world – An exploration of the forests to the North of Leticia.- Revista de la Academia Colombiana de Ciencias Exactas, Físicas y Naturales, Bogota; 113: 581–588. LYNCH, J. D. & DUELLMAN, W. E. (1997): Frogs of the genus *Eleutherodactylus* (Leptodactylidae) in western Ecuador: systematics, ecology, and biogeography.- Nat. Hist. Mus., Univ. Kansas, Spec. Publ., Lawrence; (23): 1–236. REICHLE, S. & AGUAYO, R. & CORTEZ, C. (2004): Geographic distribution: *Phyllonastes myrmecoides*.- Herpetological Review, New Haven; 35 (3): 283. REYNOLDS, R. P. & ICOCHEA, M. J. (1997): Amphibians and reptiles of the upper Rio Comainas, Cordillera del Cóndor; pp. 82-86, 202-206. In: SCHULENBERG, T. S. & AWBREY, K. (Eds.): The Cordillera del Cóndor region of Ecuador and Peru: A biological assessment. Rapid Assessment Working Paper No. 7, Washington, D. C. (Conservation International). RODRIGUEZ, L. O. & CADLE, J. E. (1990): A preliminary overview of the herpetofauna of Cocha Cashu, Manu National Park, Peru, pp. 410-425. In: GENTRY, A.H. (Ed.): Four Neotropical rainforests. New Haven (Yale University Press), pp. xiii + 627. RODRÍGUEZ, L. O. & CORDOVA, J. H. & ICOCHEA, J. (1993): Lista preliminar de los anfibios del Peru.- Pub. Mus. His. Nat. Univ. Mayor de San Marcos, Lima; 45: 1–22. SIERRA, R. (Ed.) (1999): Propuesta preliminar de un sistema de clasificación de la vegetación para el Ecuador continental. Quito (Proyecto INEFAN/GEF-BIRF y EcoCiencia), pp. 194.

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