

The taxonomic status of *Rhaebo anderssoni* (MELIN, 1941) (Anura: Bufonidae)

CÉSAR L. BARRIO-AMORÓS & SANTIAGO CASTROVIEJO-FISHER

Abstract. *Bufo anderssoni* MELIN, 1941 is synonymised with *Rhaebo guttatus* (SCHNEIDER, 1799) based on direct comparison of the holotypes of both and fresh material. All characters of the former fall within the intraspecific variation of *R. guttatus*. The few characters used in the original description to distinguish *anderssoni* from *guttatus* (narrower interorbital space, smaller tympanum and smaller size) are not considered important interspecific differences, but rather dependent on ontogenetic development.

Key words. Amphibia, *Rhaebo guttatus*, synonymy, Neotropics.

FROST et al. (2006) reviewed the taxonomic classification of the genus *Bufo* LAURENTI, 1768, and proposed the resurrection of the genus *Rhaebo* COPE, 1862 to name all the taxa included in the *Bufo guttatus* SCHNEIDER, 1799 species group (after FROST 1985; DUELLMAN & SCHULTE 1992). However, the taxonomic status of some of the species remains controversial. *Rhaebo anderssoni* (MELIN, 1941) was described based on one specimen from Taracuá, Río Uaupés, northern Brazil, under the name *Bufo anderssoni*. The species has only been mentioned in the scientific literature a few times since its description, and mainly in checklists (FROST 1985, 2006; RUIZ-CARRANZA et al. 1996; RIVERO 1961; PRAMUCK 2006; FROST et al. 2006).

MYERS & FUNKHOUSER (1951) thought *R. anderssoni* and *Rhaebo glaberrimus* (GÜNTHER, 1869 "1868") to be synonyms. RIVERO (1961) and, most recently, HOOGMOED (1990) (without examining type material; M.S. HOOGMOED, pers. comm.) considered *R. anderssoni* as a synonym of *R. guttatus* (SCHNEIDER), but this was not followed by subsequent authors (FROST 1985, 2006; FROST et al. 2006; PRAMUK 2006; RUIZ-CARRANZA et al. 1996). The status of *anderssoni* is more confusing, since ANDERSSON (1945) proposed a replacement name for the species as *B. melini*, as *Bufo anderssoni* BOULENG-

ER, 1883 (synonym of *B. stomaticus* LÜTKEN, 1862, from India) already existed. However, this suggestion was not broadly followed, because a difference of one letter (*anderssoni* vs. *andersoni*) is sufficient, sensu the ICZN (2000), to prevent homonymy.

Here we consider once more *R. anderssoni* (MELIN, 1941) as synonym of *R. guttatus* (SCHNEIDER, 1799). We have compared the holotypes of *R. anderssoni* (NHMG – Göteborgs Naturhistoriska Museet – 006; Fig. 1) with several specimens of *B. guttatus* (see Appendix), including the holotype (ZMB – Zoologisches Museum der Humboldt-Universität zu Berlin – 3517; Fig. 2), and all characters of the former fall within the intraspecific variation of *R. guttatus*. Indeed, the few characters MELIN (1941) stated as different from *R. guttatus* (narrower interorbital space, smaller tympanum and smaller size) are not considered important interspecific differences, but rather dependent on ontogenetic development. We consider the holotype of *R. anderssoni* to be an unsexed (we were not allowed to open the specimen) juvenile of *R. guttatus* (snout-vent length 51 mm; whereas adult females of *R. guttatus* can reach up to 189 mm, DUELLMAN 2005). We could not find a single consistent morphological character to allow differentiation between *R. anderssoni* and *R. guttatus*. The identification of

the holotype of *R. anderssoni* as a juvenile is justified on external measurements and body proportions (Table 1), color in preservative (both types have the same coloration, although the holotype of *R. guttatus* is somewhat darker) and the presence of characteristic external structures (both specimens have the same pattern in skin wart distribution, presence of a preorbital ridge, as well as hand and foot tubercles, although less conspicuously in the holotype of *R. anderssoni* which is likely a juvenile).

Rhaebo guttatus (Fig. 3) inhabits the Amazonian and Guiana Shield lowlands from French Guiana to Bolivia, east of the Andes (FROST 2006, LÖTTERS et al. 2000), and it is characterized by low interspecific variation.

Rhaebo glaberrimus is the most similar species, and was once (MYERS & FUNKHOUSER 1951) presumed to be a synonym of *R. guttatus* (as *anderssoni*); subsequent work

Tab. 1. Measurements (in mm) of the holotypes of *Rhaebo anderssoni* (NHMG 006) and *R. guttatus* (ZMB 3517). Snout-vent length (SVL); head length (from rictus to tip of snout, HL); head width (at the level of the rictus, HW); interorbital distance (IOD); eye length (EL); upper eyelid width (EW); eye to snout tip distance (ES); width of the terminal disk of the third finger (FIII); femur length (THL); tibia length (TL); foot length (FL); tympanum diameter (DT).

	<i>R. guttatus</i>	<i>R. anderssoni</i>
SVL	107.02	48.59
HL	27.1	14.14
HW	31.96	15.54
IOD	11.33	4.51
EL	9.92	6.61
EW	8.66	4.81
ES	7.39	3.02
FIII	1.91	0.52
THL	37.1	17.35
TL	38.52	17.63
ACL	19.92	8.96
FL	38.64	16.48
DT	5.45	2.4



Fig 1. Holotype of *Rhaebo anderssoni* (NHMG 006). Photo: SCF



Fig 2. Holotype of *Rhaebo guttatus* (ZMB 3517). Photo: SCF



Fig 3. An adult female of *Rhaebo guttatus* from Sierra de Lema, estado Bolívar, Venezuela. Photo: CLBA

(CHACÓN et al. 2001; LÖTTERS et al. 2000) indicated that it is indeed a distinct species. Although there is no known case of sympatry between *R. guttatus* and *R. glaberrimus*, this could be the case along some areas of the western Andean piedmont of the Amazon in

Colombia, Ecuador, Peru or Bolivia.

Due to these evidences and following the International Code of Zoological Nomenclature (ICZN 2000), the name of the species first described –*R. guttatus* (SCHNEIDER, 1799) – has priority.

Acknowledgements

SCF thanks GÖRAN NILSON from NHMG and RAINER GÜNTHER from ZMB for kindly loaning the specimens under their care. MATS ERIKSSON from the Museum of Evolution, Zoology (Uppsala, Sweden) greatly helped in managing the loans. We thank DARREL R. FROST, MARINUS S. HOOGMOED and JUDITH MANK for their helpful comments on the MS. Two reviewers greatly improved the manuscript. The work of SCF was financed by grants from the Stiftelsen Sven och Lilly Lawskis Foundation (Sweden), the Helge Axson Johnsons Foundation (Sweden) and the Swedish Research Council (granted to CARLES VILÀ).

References

- ANDERSSON, L. G. (1945): Batrachians from East Ecuador collected 1937, 1938 by ERLAND NORDENSKIÖLD and NILS HOLMGREN. – *Arkiv. För Zoologi.*, **3** (12): 1-19.
- CHACÓN, A., A. DÍAZ DE PASCUAL & C.L. BARRIO (2000 “2002”): Presencia de *Bufo glaberrimus* (Anura: Bufonidae) en Venezuela. – *Acta Biol. Venez.* **20**: 65-69.
- DUELLMAN, W.E. (2005): *Cusco Amazónico. The lives of amphibian and reptiles in an Amazonian rainforest.* – Cornell University Press. Ithaca and London: 433 pp.
- DUELLMAN, W.E. & R. SCHULTE (1992): Description of a new species of *Bufo* from northern Peru with comments on phonetic groups of South American toads (Anura: Bufonidae). – *Copeia* **1992**: 162-172.
- FROST, D.R. (1985): *Amphibian Species of the World.* – Allen Press Inc. & Association of Systematic Collections. Lawrence, Kansas.
- FROST, D. R. *Amphibian species of the world: an online reference.* – American Museum of Natural History: New York. [<http://research.amnh.org/herpetology/amphibia/index.html>]; [access: 15 January 2006]
- FROST, D., T. GRANT, J. FAIVOVICH, R.H. BAIN, A. HAAS, C.F.B. HADDAD, R.O. DE SA´, A. CHANING, M. WILKINSON, S.C. DONNELLAN, C.J. RAXWORTHY, J.A. CAMPBELL, B.L. BLOTTO, P. MOLER, R.C. DREWES, R.A. NUSSBAUM, J.D. LYNCH, D.M. GREEN & W. WHEELER (2006): The amphibian tree of life. – *Bulletin of the American Museum of Natural History* **297**: 1-370.
- HOOGMOED, M.S. (1990): Biosystematics of South American Bufonidae, with special reference to the *Bufo* “*typhonius*” group. – pp. 113-123 in: PETERS, G. & R. HUTTERER (eds.): *Vertebrates in the tropics.* – Mus. A. Koenig, Bonn, Germany.
- ICZN (2000): *Código Internacional de Nomenclatura Zoológica. Cuarta Edición.* – Museo Nacional de Ciencias Naturales, CSIC. Madrid.
- LÖTTERS, S., I. DE LA RIVA, S. REICHLER, & G. SOTO (2000). First records of *Bufo guttatus* from Bolivia with comments on *Bufo glaberrimus* (Amphibia: Bufonidae). – *Bonn. zool. Beitr.* **49**: 1-4.
- MELIN, D. (1941): Contributions to the knowledge of the Amphibia of South America. – *Meddelanden Göteborgs Musei Zoologiska Avdelning* **88**: 1-71.
- MYERS, G.S. & J.W. FUNKHOUSER (1951): A new giant toad from southwestern Colombia. – *Zoologica* **36**: 279-282+I plate.
- PRAMUK, J. (2006): Phylogeny of South American *Bufo* (Anura: Bufonidae) inferred from combined evidence. – *Zoological Journal of the Linnean Society*, **146**: 407-452.
- RIVERO, J.A. (1961): *Salientia of Venezuela.* – *Bull. Mus. Comp. Zool.*, **126**: 1-267.
- RUÍZ-CARRANZA, P.M., M.C. ARDILA-ROBAYO & J.D. LYNCH (1996): Lista actualizada de la fauna de Amphibia de Colombia. – *Rev. Acad. Colomb. Cienc.*, **20**: 365-415.

Appendix

Specimens of *Rhaebo guttatus* examined
ZMB 3517 (holotype of *Bufo guttatus*), “India Orientali”, stated to come from Suriname (Rivero 1961). Brazil: Amazonas: NHMG 006, Taracua, Río Vaupés (holotype of *Bufo anderssoni*). Venezuela: Estado Amazonas: MNHLS (Museo de Historia Natural La Salle, Caracas, Venezuela)

Short Communications

- 11616, Río Mavaca, 8 km from its mouth; MNHLS 10851, Santa Bárbara, confluence of the Orinoco and Ventuari, rivers; MNHLS 11730, 12056, Alto Río Cunucunuma; MNHLS 11741-42, Culebra, alto Río Cunucunuma; MNHLS 13914-18, Río Sätä, tributary of the río Ventuari, 25 km south of Cacuri; MHNLS 13934, Río Ventuari; MHNLS 13990-92, Unturán; MHNLS 16119, Salto Nieves, Río Cataniapo; MHNLS 16130, Río Cataniapo, below Salto Nieves; MHNLS 16593-94, Campment Manaka, at the confluence of the Orinoco and Ventuari rivers. Estado Delta Amacuro: MHNLS 12705-06, 12718, first rapid of Caño Acoima. Estado Bolívar: MHNLS 6218, Suapure, carretera a Caicara del Orinoco; MNHLS 9901, Caño Garzón, 18 km SE from Parguaza; 11919, Los Pijiguaos; MNHLS 12097, Río Majawvrana, tributary of the Erebató river, upper Río Caura; MNHLS 13391, Río Karuay, Gran Sabana; MHNLS 14735, Dedemay, Río Tabaro; MHNLS 14831, 14853, Río Cucurital; MHNLS 14895, middle Río Cucurital; MHNLS 14975, 15659-60, Indigenous community, rapids of Wareipa; MHNLS 15680, Purumay campment, 300 m, above Río Cucurital; MHNLS 16149, mouth of the Río Nichare, alto Río Caura.

Manuscript received: 24 March 2006

Authors' addresses: CÉSAR L. BARRIO-AMORÓS, Fundación AndígenA, Apartado Postal 210, 5101-A Mérida, Venezuela; E-Mail: cesarlba@yahoo.com; SANTIAGO CASTROVIEJO-FISHER, Department of Evolutionary Biology, Evolutionary Biology Centre, Uppsala University, Norbyvägen 18D, SE-752 36, Uppsala, Sweden; E-Mail: santiago.castroviejo@ebc.uu.se.