



The identity of *Rana lutea* Molina, 1782 (Amphibia, Anura)

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Abstract

Rana lutea is one of the two anuran species described in 1782 by the Chilean born priest and naturalist Juan Ignacio Molina, and its nomenclatural history is confusing. After a detailed revision of the pertinent literature, we demonstrate that *Bufo thaul* Schneider, 1799, is a junior objective synonym of *Rana lutea* Molina, 1782, but based on the usage of both nomina, we revert the precedence and consider *Rana lutea* Molina, 1782 as a nomen oblitum whereas *Bufo thaul* Schneider, 1799 is a nomen protectum. Thus, the authorship of the species currently known as *Pleurodema thaul* (Lesson, 1826) changes to *Pleurodema thaul* (Schneider, 1799).

Key words: Anura, Leiuperinae, Leptodactylidae, *Pleurodema thaul*, synonymy

Introduction

The Jesuit Juan Ignacio Molina (1740–1829) was the first South-American born naturalist who applied consistently the Linnaean system of binominal nomenclature in his descriptions of plants and animals (for biographical data, see Briones Toledo 1986). His *Saggio sulla storia naturale del Chili*, published in Italian in 1782, contains a section on Chilean reptiles, noting the presence of: (1) two species of turtles, one marine, “le Coriacee”, and another inhabiting the freshwater lakes of the south, “le Lutarie” (never recorded posteriorly), that can be assimilated respectively to the Linnaean species *Testudo coriacea* and *T. lutaria*; (2) a terrestrial lizard named *Lacerta palluma*, the nomenclatural status of which was stabilized by the International Commission on Zoological Nomenclature (ICZN) in its Opinion 2118 (Anonymous 2005); (3) the *Salamandra acquatica nera* already described by Feuilleé (1714), that Molina assimilated with the species that Linnaeus (1758) named *Lacerta caudiverbera* (see Myers and Stothers 2006 for its subsequent history), and (4) one snake, mistakenly identified as *Coluber aesculapii* (i.e., *Coluber* 176-42 following Linnaeus notation). Regarding anurans, Molina mentioned the presence of two frogs, “la Esculenta” and “la Temporaria” (probably referring to the European frogs *Rana esculenta* and *Rana temporaria* of Linnaeus), a terrestrial toad (as “Rospi terrestri”) apparently identical to those from Italy, and two other aquatic anurans, named “Arunco” and “Thaul” by local Araucanians.

Rana arunco (Molina 1782: 216) was characterized as a little bigger than *Rana temporaria*, possessing the same color and four palmate limbs, the anterior with four fingers and the posterior with five toes, with almost imperceptible claws; another vernacular name for this species was “Genco”, translated as “the father of the waters”. The second species, locally named “Thaul”, was described under the nomen *Rana lutea* (Molina 1782: 216), and was characterized as similar to but smaller than *Rana esculenta*, with completely yellow and warty skin and limbs similar to those of the Arunco, although the toes were not completely joined by a membrane.

As noted by Hachim Lara (2008), an early Molina manuscript along with all his material possessions were confiscated before his departure to Italy due to the Jesuit expulsion from the Spanish domains by King Carlos III in 1767. Thus, both nomina were published based on Molina’s remembrances (not on actual specimens), and no

name-bearing types have been kept. However, the fate of the two species nomina was completely different. While *Rana arunco* is considered a valid species (under the current combination *Rhinella arunco*), the identification of *Rana lutea* is troublesome.

After its original publication, *Rana lutea* Molina, 1782 was cited by Gmelin (1788: 1050), adding to the original the fact that the last phalanges of digits were free, Suckow (1798: 71), who just translated Molina's description to German, Shaw (1802: 176), who added a comment about molting, and Lesson (1828, 1831; see below).

The conflict started when Schneider (1799: 227) mixed up scientific nomen and vernacular name, using the binomen *Bufo thaul*. His characterization of this taxon was based on the description of *Rana lutea* Molina, 1782, although this latter nomen was not mentioned. Schneider also cited two other descriptions that *might* apply to this species, but he expressed doubts about this: *Rana papillosa* Anonymous, 1787 (attributed to Houttuyn), and several figures in the plates of Seba (1734). The nomen *Rana papillosa*, identified as Museum Huttuini N°120, and described as completely yellow, with black spots and a dorsum completely coated by rough papillae, was published in a work later rejected by the ICZN in Opinion 380 (Anonymous 1956). As for the figures of Seba, they were published in a pre-Linnaean work where binominal nomenclature was not used. The (virtual) syntypes of *Bufo thaul* Schneider, 1799 are therefore the same as those of *Rana lutea* Molina, 1782, but these are two independent nomina: *Bufo thaul* is not a nomen novum for *Rana lutea*, as the latter nomen was not mentioned by Schneider.

"*Bufo thaul* (non J. G. Schneider 1799), R. P. Lesson in: Voy. Coquille, v. 2i p. 64 Rept. t. 7 f. 6" was included into the synonymy of *Pleurodema bibroni* by Nieden (1923), until Donoso-Barros (1969) assimilated the taxon to the species currently known as *Pleurodema thaul* (Leptodactylidae: Leiuperinae). This is a polymorphic frog which inhabits southwestern Argentina and almost all the Chilean territory (Cei 1962; Ferraro & Casagrande 2009), and its nomen was attributed to Lesson (1826). As we consider this authorship inaccurate, the aim of this contribution is to clarify this subject.

Materials and method

All pertinent literature where "thaul", *Rana lutea*, *Bufo thaul* or their subsequent combinations were mentioned was carefully examined to establish the authorship of the nomen currently considered valid under the combination *Pleurodema thaul*.

Results and discussion

As we have seen, *Bufo thaul* Schneider, 1799 is a junior objective synonym of *Rana lutea* Molina, 1782, and the shared name-bearing types of both are now lost. Incidentally, the specimen "Museum Huttuini N°120" could not be traced in the collections of the Zoölogisch Museum, Amsterdam (Dr. R. Vonk, pers. comm.), of the Rijksmuseum van Natuurlijke Historie, Leiden (Dr. R. de Ruiter, pers. comm.), or of the Muséum national d'Histoire naturelle, Paris (Dr. A. Ohler, pers. comm.), but even if it was found this would have no nomenclatural consequences as it was not a specimen originally examined by Molina and virtually referred to in the original description. The same would apply to the specimens figured by Seba.

Later, the name *Bufo thaul* Schneider, 1799 was used by Merrem (1820), Schinz (1833) and Girard (1858), and a common thread to all of them is that no actual specimens were used and, consequently, no new characters were added. Moreover, Molina's nomen *Rana lutea* was barely used again, with the exceptions of Lesson (1828, 1831) and its mention in a few recent online databases such as *ITIS* [http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=773750] and *Animalbase* [<http://www.animalbase.uni-goettingen.de/zooweb/servlet/AnimalBase/home/speciestaxon?id=28406>].

Subsequently, the Pharmacist René Primevère Lesson, zoologist on board of the French frigate *La Coquille*, did a redescription of *Bufo thaul*, providing a clear illustration of the specimen. Problems related to this work start with the publication date. In fact, the zoological section of the journey around the world of *La Coquille* was published in 28 issues, later collated and bound in two text volumes and a hand-colored atlas. The epithet *thaul* (either in combination with *Rana* or *Bufo*) is mentioned in pages 6 and 64 of the first part of the second volume, and in plate 7 of the atlas. According to Cretella (2010), the issue 11, containing plate 7 of the atlas, was published

on May 30, 1829, issue 17 (erroneously numbered 16; pages 1–24) on May 26, 1830, and issue 25 (pages 25–240) on October 13, 1831. Therefore, the illustration (Lesson *et al.* 1829) antedates the redescription (Lesson 1831).

This contribution originated the misunderstandings that surround the nomen of the species presently known as *Pleurodema thaul* (Lesson, 1826), as shown in the synonymy (see below). In fact, when Lesson (1831: 64) described *Bufo thaul*, he cited as antecedents Daudin (*sine die*, i.e., either 1802 or 1803), who included “le thaul” among frogs, and Merrem (*s.d.*, i.e., 1820), who did so among toads. These two authors, in turn, credited the species to Schneider (1799), and it is therefore clear that Lesson did not describe any new species of Chilean frog or toad.

Anyway, Lesson (1831: 6) commented on Molina’s *Rana arunco*, and on another, unnamed frog, noting that this second species inhabits the clear waters of “Río del Penco”, has half the size of the green frog and is beautifully colored: on a uniform shade of slate light blue covering the body and legs, there are scattered round or oval patches of blue-black; additionally, round spots of the same color, edged in white, are placed on each side of the neck and on the sides of the back, whereas the ventral parts are white.

Despite the doubts and denial listed on page 6, in the redescription on pages 64–65, Lesson (1831) used the name *Bufo thaul* explicitly credited to Molina, with two misunderstandings. One is its contradictory attribution to Merrem (i.e., Merrem 1820), and the other is the indication that it was depicted on Figure 6 of plate 7. As already mentioned, the name *Bufo thaul* is due to Schneider (1799). The figure 6 on Lesson *et al.* (1829) corresponds to *Bufo arunco*, with *Bufo thaul* shown in Figure 5: Schinz (1833) was the first author to detect the transposition between figures. The specimen figured as *Bufo thaul* in Lesson’s work could not be traced in the Paris Museum (Dr. A. Ohler, pers. comm.).

What follows in this history is known and therefore we avoid dwelling on the subject. The species referred by Lesson received various generic attributions and its nomen has several synonyms (see synonymy, below). Until now it has been mostly known under the combination *Pleurodema thaul* (Lesson, 1826).

To close this nomenclatural puzzle, it is necessary to consider, as noted above, that there exists no *Bufo thaul* Lesson, 1826 but *Bufo thaul* Schneider, 1799, and that the nomen *Rana lutea* Molina, 1782 was never cited after 1831, while *Bufo thaul* Schneider (1799) was frequently used, and since the work of Donoso-Barros (1969) referred to the genus *Pleurodema* Tschudi, 1838. In the synonymy that follows (see below), we list more than 25 works published by at least 10 authors in the immediately preceding 50 years, to demonstrate that *Bufo thaul* Schneider, 1799 fits the requirements of art. 23.9 on “Reversal of precedence” (Anonymous 1999). Thus, *Rana lutea* Molina, 1782 is a *nomen oblitum* whereas *Bufo thaul* Schneider, 1799 is a *nomen protectum*, and the species in question must be named *Pleurodema thaul* (Schneider, 1799).

Pleurodema thaul is a highly polymorphic species (Ceí & Capurro 1957; Ceí 1958). Three morphotypes were described by Duellman & Veloso (1977), but these groups were supported neither by allozymes (Victoriano *et al.* 1995) nor by morphometry (Rosset *et al.* 2001). Phylogeographic analysis (Correa *et al.* 2008) recovered four main clades, whereas Faivovich *et al.* (2012), in their phylogenetic analysis, demonstrated that Chilean populations include trans-Andean populations from Argentina closely related to some Chilean samples. Consequently, up to the clarification of the internal structure of the taxon currently known as *Pleurodema thaul*, we refrain from designating a neotype. This lack of name-bearing type overrides the restriction of the type locality to “Chile, Penco, Concepción” as proposed by Ceí (1962), and maintains the ambiguous one from Schneider (1799), who noted that *Bufo thaul* inhabits in “*aquas Chilensis*” (“Chilean waters”).

A revised synonymy of *Pleurodema thaul* (Schneider, 1799)

Boulenger (1882: 302) included “? *Rana thaul*, Molina, Hist. Nat. Chili, p. 194” (sic) and “*Bufo thaul* Garn. & Less. Voy. Coq. ii. pl. 7. f. 6” in the synonymy of *Bufo spinulosus*, based on the transposition between figures of plate 7 of Lesson *et al.* (1829), as already noted by Ceí (1961). Although Molina never described *Rana thaul*, and the authorship of *Bufo thaul* must be credited to Schneider (1799), not to Garnot and Lesson, the nomen must be removed from the synonymy of the Andean Toad, *Rhinella spinulosa* (Wiegmann, 1834). The symbol [?] in the following synonymy denotes our uncertainty as to whether these references belong to *P. thaul*. Clarified these points, the synonymy and chresonymy (see Smith & Smith 1973; Dubois 2000) of *Pleurodema thaul* (Schneider, 1799) includes:

- Rana lutea* Molina, 1782. *Nomen oblitum*.—Gmelin 1788; Suckow 1798; Shaw 1802; Lesson 1828, 1831.
- Bufo thaul* Schneider, 1799. *Nomen protectum*.—Merrem 1820; Lesson 1831; Schinz 1833; Girard 1858.
- Rana thaul* – Daudin 1802, 1803.
- Cystignathus Bibroni* [nec *Pleurodema bibroni* Tschudi, 1838] Duméril & Bibron, 1841.—Guichenot 1848; Lichtenstein *et al.* 1856.
- Pleurodema elegans* Bell, 1843.—Girard 1858; Günther 1859.
- Cystignathus elegans*—Guichenot 1848.
- Pleurodema bibroni*—Girard [?] 1853, 1858; Günther, 1859; Steindachner 1867; Jiménez de la Espada 1875; Philippi 1902; Quijada 1916; Nieden 1923; Parker 1927; Hellmich 1932; Freiberg 1942; Schmidt 1954; Capurro 1950, 1953, 1955, 1957, 1958, 1960; Adam 1954; Ceí 1956, 1958a, b, 1962; Ceí & Capurro 1957; Ceí & Espina Aguilera 1957; Capurro & Patrone 1959; Capurro & Silva 1959.
- Bufo spinulosus*—Steindachner, 1867 (part).
- [?] *Bufo luteus*—Weyenberg 1876a, b, c, d; Berg 1896.
- Paludicola frenata* Cope, 1890. —Nieden 1923.
- Pleurodema andina* Philippi, 1902.
- Pleurodema andicola* Philippi, 1902.
- Pleurodema aspera* Philippi, 1902.
- Pleurodema belli* Philippi, 1902.
- Pleurodema bibroni* var. *grandis* Philippi, 1902.
- Pleurodema bibroni* var. *gracilis* Philippi, 1902.
- Pleurodema carbonaria* Philippi, 1902.
- Pleurodema coquimbensis* Philippi, 1902.
- Pleurodema fusca* Philippi, 1902.
- Pleurodema glandulosa* Philippi, 1902.
- Pleurodema longipes* Philippi, 1902.
- Pleurodema plebeya* Philippi, 1902.—Schmidt 1954; Capurro 1958.
- Pleurodema phryniscoides* Philippi 1902.
- Pleurodema pseudophryne* Philippi, 1902.
- Pleurodema verrucosa* Philippi, 1902.
- Physalaemus coquimbensis* Philippi, 1902.—Parker 1927.
- Pleurodema thaul*—Donoso-Barros 1969 [first combination of the epithet *thaul* with *Pleurodema*]; Barrio & Rinaldi de Chieri 1970; Veloso *et al.* 1973a, b, 1974; Barrio 1977; Duellman & Veloso 1977; Díaz & Veloso 1979; Ceí 1980, 1987; Acevedo *et al.* 1981; Aguayo *et al.* 1981; González *et al.* 1982, 1989; Norris & Concha 1982; Penna & Veloso 1982, 1990; Neumann *et al.* 1986, 1990; Díaz *et al.* 1987; Veloso & Iturra 1987; Herrmann 1988; Norris *et al.* 1988, 1992, 1994; Veloso & Navarro 1988; Wassersug & Heyer 1988; Ortiz 1989; Ortiz & Lescure 1989; Sobrevia *et al.* 1989; Toledo & Jared 1989; Montoya & Quevedo 1990; Ortiz & Hermosilla 1991; Lavilla 1992; Quevedo *et al.* 1992; Schmid *et al.* 1993; Victoriano *et al.* 1995; Benavides & Ortiz 1996; Norris & Quevedo 1996; Toledo *et al.* 1996; Penna *et al.* 1997, 2008; Penna & Solís 1998; Úbeda 2001; Lavilla *et al.* 2000; Díaz-Páez & Ortiz 2001, 2003; Lavilla & Ceí 2001; Rosset *et al.* 2001; Jara 2005; Maio *et al.* 2005; Correa *et al.* 2007, 2008, 2010; Suwalsky *et al.* 2000, 2002, 2007; Rabanal & Nuñez 2008; Ferraro & Casagrande 2009; Kolenc *et al.* 2009, 2011; Iturra-Cid *et al.* 2010; Jara & Perotti 2010; Perotti & del Carmen Diéguez 2010; Bourke *et al.* 2011; Perotti *et al.* 2011; Vera Candioti *et al.* 2011; Barrasso *et al.* 2012; Faivovich *et al.* 2012; Ferraro *et al.* in press.

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van den wydberoemden Linnaeus, in orde geschikt, door den Heer Martinus Houttuyn, Med. Doctor, Lid van verscheide Maatschappijen der Weetenschappen. Benevens een Appendix van een kostbaare Party Goud-en Zilver-Ertsen en andere Mineralen en zeldzaame Naturalien. Welk alles verkogt zal worden, op Woensdag den 14 Maart 1787, en volgende Dagen, ten Huize van A. Dankmeyer en Zoon, in't Oude Zyds Heeren Logement te Amsterdam. Door de Makelaars J. Posthumus, Nic. Blinkvliet, Pieter Posthumus, Will. Jan Lobe, Pieter Bel En Joh. Zac. Rycke. By wien de Catalogus voor 8 St. is te bekomen. Alles zal op Maandag en Dingsdag bezien kunnen worden, i–viii + 178 pp.

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