

First record of occurrence of *Epiphragmophora estella* (d'Orbigny, 1837) (Mollusca, Gastropoda, Stylommatophora) in Argentina

María Gabriela Cuezzo

Instituto de Biodiversidad Neotropical (CONICET-UNT), Facultad de Ciencias Naturales, Universidad Nacional de Tucumán, Miguel Lillo 205, 4000 Tucumán, Argentina.
E-mail: mcuezzo@unt.edu.ar

Abstract: This is the first record of *Epiphragmophora estella* in Argentina, a species traditionally of Bolivian distribution. Specimens were found during several field trips conducted in the northern patch of the Southern Andean Yungas forest of Salta province. Morphometrics and qualitative shell characters are described in order to validate the taxonomic identification. Current species distribution is also reported.

Key words: Helicoidea, Epiphragmophoridae, South America, Yungas, Bolivia

The genus *Epiphragmophora* Doering, 1874 is endemic to South America and is distributed mainly in Peru, Bolivia, Paraguay, Argentina and southern Brazil but with one species known from Colombia by a single record. Argentinean species of this genus have been reviewed (Fernandez and Rumi 1984; Cuezzo 2006) and 24 valid species were redescribed. Cuezzo (2006) also reported five species from southern Bolivia. However, the remaining species of the genus in other South American countries are in need of taxonomic revision because they are known only by their shell morphology or by their original description, mostly from the last century.

In Argentina, *Epiphragmophora* inhabit different ecoregions but the genus is richest in the Southern Andean Yungas and in the Chaco Serrano. Some also occur in Monte and pre-Puna environments.

Most of *Epiphragmophora* species in Argentina are narrow endemics, with the exception of *Epiphragmophora trenquellensis* (Grateloup, 1851), *E. trigrammephora* (d'Orbigny, 1835), *E. rhathymos* (Holmberg, 1912) and *E. hironymi* Doering, 1874 which are wide spread, even over different ecoregions.

Epiphragmophora estella was described by d'Orbigny in 1837 and the syntypes were collected in the Bolivian departments of La Paz, Chuquisaca and Cochabamba. It was redescribed by Cuezzo (2006) who also documented the taxonomic history of the species. Its anatomy is unknown.

The cloud rainforest (Yungas) is one of the most diverse ecosystems in Argentina and plays a fundamental role in water regulation. It extends from 300 to 3000 m above sea level and from the geographical limit with Bolivia in the north

towards Catamarca province in the south. The Yungas are fragmented into variously sized patches. This region features distinct altitudinal strata composed of different plant associations that are characteristic and easily recognized; that is, the pedemontane forest (300–700 m), two types of montane forest (700–1900 m) and cloud grasslands (2000–3000 m) (Brown and Grau 1995).

The southern portion of the northern patch of Yungas rainforest in Argentina, located between Salta and Jujuy provinces, is home to a particular land gastropod community having species related to those in Bolivia. Some of these species are endemic to Argentina, such as *Nenia argentina* Hylton Scott, 1954 and *Pilsbrylia paradoxa* Hylton Scott, 1952. Field work in Yungas of Salta during the summers of 2010–2013 yielded shells of *E. estella* that were found in rock crevices or under fallen logs in montane forest between 1200 and 1500 m of altitude.

Shell standard linear morphometric including total height (H), major diameter (DM), minor diameter (Dm), apertural diameter (Dap) and apertural height (Hap) were taken with the aid of calipers under a stereomicroscope. The malacological collections Instituto-Fundación Miguel Lillo (IFML) Tucumán, Instituto de Biodiversidad Neotropical (IBN) Tucumán; Museo de La Plata (MLP) La Plata, Buenos Aires; Museo de Historia Natural (MACN-In), Buenos Aires, allowed for the comparison of several shells of *E. estella* from Bolivia and for the gathering of information on distribution of this species. The acronym CWW corresponds to material from the W. Weyrauch collection at the IFML. Photographs of syntypes of *E. estella* deposited at the Natural History Museum, London, England (BMNH) and at Museum of Natural History, Paris, France (MNHN) were also consulted.

Epiphragmophora estella (Figure 1) is characterized by having a small to medium-sized shell of pale yellow to caramel coloration with a thin brown band evident on the periphery of the body whorl. The shell is globose but fragile with a pronounced, conic spire. The protoconch is smooth and shell first two whorls have narrow axial growth lines that progressively became slightly pronounced ribs towards the body whorl, and that are cut by narrow spiral lines. The body whorl sculpture is markedly malleated as well as the ventral side of the shell. The

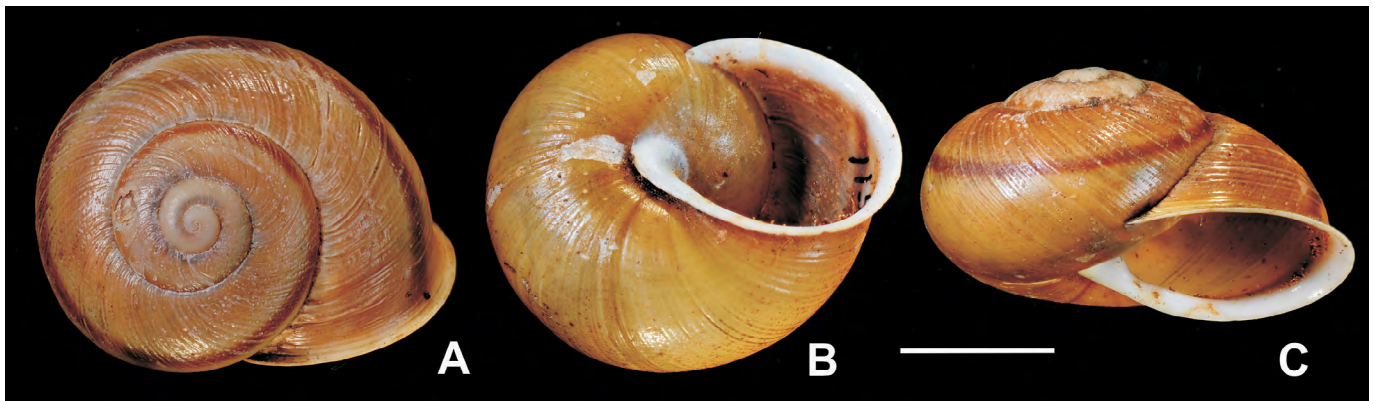


Figure 1. Shell of *Epiphragmophora estella*. A. Dorsal view. B. Ventral view. C. Lateral view. Scale bar = 5 cm.

umbilicus is perspective but narrow and almost completely overlapped by the peristomal lip. The shell aperture is sub-circular to ovate and the peristome is thin, white and slightly reflexed.

Shell measurements (min-max (mean) ($n = 10$): DM = 23.3–26.8 mm (24.59); Dm = 20.2–25.5 mm (21.75); H = 14.4–16.6 mm (15.43); Hap = 11.5–13.3 mm (12.15); Dap = 15–17 (15.47). Voucher specimens have been deposited in the Instituto-Fundación Miguel Lillo (IFML 15846) and Instituto de Biodiversidad Neotropical (IBN 899, IBN 900).

Epiphragmophora estella is clearly different from *E. jujuyensis* and can be distinguished from it by its smaller shell size, paler coloration, and lack of a lower lip peristomal thickening. *Epiphragmophora estella* can be differentiated from *E. argentina* also by its smaller shell, more fragile and thinner shell wall, its narrower peripheral brown band, and perforate umbilicus.

Epiphragmophora estella is distributed in Bolivia in the departments of La Paz, Chuquisaca and Cochabamba and in Argentina in Salta province (Figure 2). According to ecoregion

classification by Olson *et al.* (2001), *E. estella* occurs in Bolivia in the Montane Dry Forest, Central Andean Puna and Bolivian Yungas ecoregions between 800 and 4000 m above sea level (Table 1). The species' distributional area in Argentina is shared with *E. trigrammephora* and *E. jujuyensis*, and both species are found in the same area but at lower altitudes. On the contrary, *E. argentina* has a more southern distribution and is found in Yungas and Chaco ecoregions.

ACKNOWLEDGMENTS

I would like to thank Daniela Dominguez who participated in a field work helping in the collection of specimens during a trip in summer 2014. Thanks are extended to A. McLellan (BMNH) and V. Heros (MNHN) for sending photographs of the syntypes of *E. estella* from their respective museums.

LITERATURE CITED

Brown A. and H. Grau. 1995. Investigación, conservación y desarrollo en selvas subtropicales de montaña. Publicado por el Laboratorio

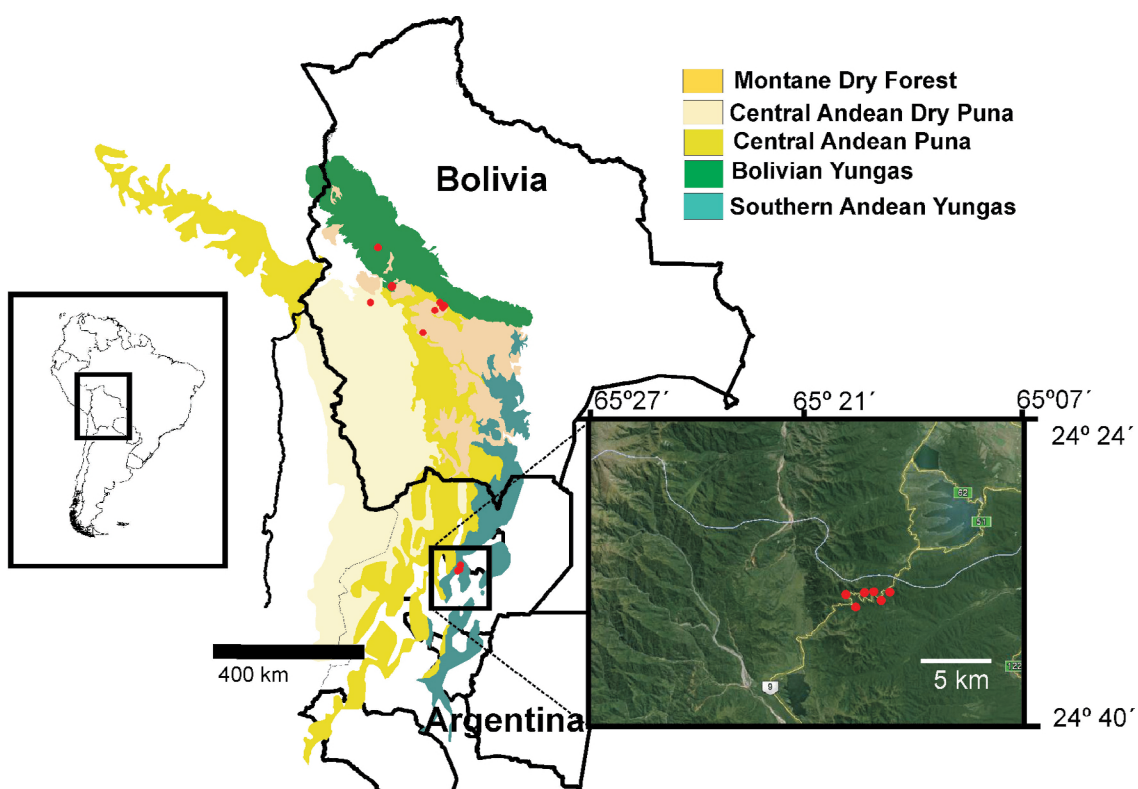


Figure 2. Map showing the known distribution of *Epiphragmophora estella* in Bolivia and new records in Salta, Argentina.

Table 1. Known record of occurrence of *Epiphragmophora estella* in Bolivia together with new records in Argentina. Ecoregions are according to Olson *et al.* (2001). Lots with an asterisk (*) are syntypes.

Country	Department, Locality	Latitude (S)	Longitude (W)	Height (above sea level)	Ecoregion
*Bolivia (BNHN 1854.12.4.62)-MNHN s/n	Santa Cruz Valle Grande, Tasajos	?	?	?	?
*Bolivia (BMNH 1854.12.4.61)	Chuquisaca	?	?	?	?
Bolivia (IFML 1511)	Cochabamba, Punata, Cerro Tuti	-17.469661	-65.852728	3492 m	Bolivian Montane Dry Forest
Bolivia (CWW 2553)	Cochabamba, Colomi	-17.326025	-65.867823	3200 m	Central Andean Puna
Bolivia (MLP)	Cochabamba, Aguirre	-17.406772	-65.744287	3408 m	Bolivian Montane Dry Forest
Bolivia (CWW2554)	Cochabamba, Tarata	-17.622007	-66.031558	2800 m	Central Andean Puna
*Bolivia (BMNH 1854.12.4.63)	La Paz, SicaSica	-17.329256	-67.735280	3950 m	Central Andean Dry Puna
Bolivia	La Paz, Inquisivi	-16.907478	-67.139397	2794 m	Bolivian Yungas
Bolivia	La Paz, Caranavi	-15.835652	-67.548974	800 m	Bolivian Yungas
Argentina (IFML 14884)	Salta, Camino de Corniza	-24.509833	-65.335233	1500 m	Southern Andean Yungas
Argentina (IFML 15846)	Salta, Camino de Corniza	-24.509383	-65.340133	?	Southern Andean Yungas
Argentina (IBN 846)	Salta, Camino de Corniza	-24.534722	-65.585833	1515 m	Southern Andean Yungas
Argentina (IBN 847)	Salta, Camino de Corniza	-24.656388	-65.446666	1489 m	Southern Andean Yungas
Argentina (IBN 267)	Salta, Camino de Corniza	-24.445277	-65.299722	1230 m	Southern Andean Yungas
Argentina (IBN 902)	Salta, Camino de Corniza	-24.507492	-65.327484	?	Southern Andean Yungas

de Investigaciones Ecológicas de las Yungas, de la Facultad de Ciencias Naturales e Instituto Miguel Lillo de la U.N.T. 270 pp.

Cuezzo M.G. 2006. Systematic revision and cladistic analysis of *Epiphragmophora* Doering from Argentina and southern Bolivia (Gastropoda: Stylommatophora: Xanthonychidae). *Malacologia* 49(1): 121–188 (doi: [10.4002/1543-8120-49.1.121](https://doi.org/10.4002/1543-8120-49.1.121)).

d'Orbigny A. 1834–1847. *Voyage dans l'Amérique Meridionale*, 5(3): Mollusques. Paris: C.P. Bertrand 758 pp.

Fernández D. and A. Rumi. 1984. Revisión del género *Epiphragmophora* de la malacofauna terrestre Argentina. *Acta Zoológica Lilloana* 37(2): 231–272.

Olson D.M.E. Dinerstein, E.D. Wikramanayake, N.D. Burgess, G.V.N. Powell, E.C. Underwood, J.A. D'amico, I. Itoua, H.E. Strand, J.C. Morrison, J.C. Loucks, T.F. Allnutt, T.H. Ricketts, Y. Kura, J.F. Lamoreux, W.W. Wettengel, P. Hedao, and K.R. Kassem. 2001. Terrestrial ecoregions of the world: A new map of life on earth. *BioScience* 51(11): 933–938 (doi: [10.1641/0006-3568\(2001\)051\[0933:TEOTWA\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2001)051[0933:TEOTWA]2.0.CO;2)).

Received: September 2014

Accepted: November 2014

Editorial responsibility: Robert G. Forsyth