

# REDISCOVERY AND REDESCRIPTION OF AN ALMOST UNKNOWN *HEMICYCLA* SPECIES (GASTROPODA, PULMONATA, HELICIDAE): *H. EURYTHYRA* O. BOETTGER 1908 FROM TENERIFE, CANARY ISLANDS

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**Abstract** *Hemicycla eurythyra* O. Boettger 1908, endemic to Tenerife, was rediscovered near its type locality. It is redescribed and compared with two conchologically similar taxa: *H. pouchet* (A. Férussac 1821) and *H. pouchadan* Ibáñez & Alonso 2007. *H. eurythyra* is grouped in the subgenus *Hemicycla* s. str. by the presence of a diverticulum in the bursa copulatrix complex.

**Key words** *Gastropoda*, *Hemicycla eurythyra*, Tenerife, Canary Islands.

## INTRODUCTION

Boettger (1908) made a brief conchological description of a Quaternary fossil taxon from the Tejina Ravine, Tenerife Island, Canary Archipelago (Fig. 1), with the name *Hemicycla pouchet* var. *eurythyra*, as follows:

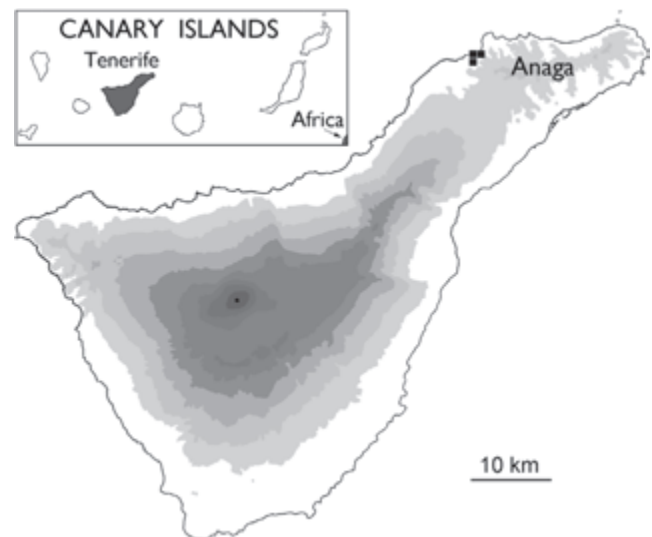
“Differt a typo t. minus solida, magis depressa, apert. majore, transverse subovali, perist. minus incrassato, minus revolute reflexo, intus sublabiato, margine columellari minus distincte tuberculifero. – Alt. 14–15, diam. max. 25–26 mm; alt. apert. 13–13½, lat. apert. 16 mm.”

No subsequent data has been published on this taxon and it is regarded as “incertae sedis” (Bank, Groh & Ripken, 2002: 206; Alonso & Ibáñez, 2007: 4). In this paper it is redescribed as a species distinct from *Hemicycla pouchet* (A. Férussac 1821) and compared with *H. pouchet* and with the conchologically similar *H. (Hemicycla) pouchadan* Ibáñez & Alonso 2007.

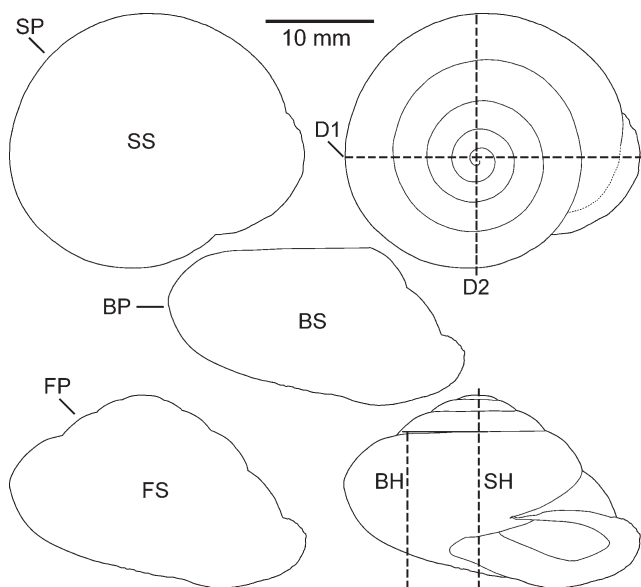
## METHODS

The studied material has been deposited in AIT and the private collections of M. Artiles and

J. Martín. It consists of ten living specimens from Bajamar (leg. M. Artiles, May 2008) and several fresh and Quaternary fossil shells from the area shown in Fig. 1, collected between 1985 and 2007. The fossil shells come from a Pleistocene aeolian deposit older than 130 kyr BP (Castillo *et al.*, 2006). The photographic methodology used is described in detail by Ibáñez *et al.* (2006). The standardized shell measurements are shown in



**Figure 1** Geographical distribution of *Hemicycla eurythyra* O. Boettger 1908. Symbols represent 1×1 km UTM squares.



**Figure 2** Shell of *Hemicycla eurythyra* showing the placement of measurements obtained for Table 1: BH, body whorl height; BP, body whorl frontal perimeter; BS, body whorl frontal surface (plane view); D1, maximum shell diameter; D2, shell diameter perpendicular to D1; FP, shell frontal perimeter; FS, shell frontal surface (plane view); SH, shell height; SP, shell perimeter (dorsal plane view); SS, shell surface (dorsal plane view).

**Table 1** *Hemicycla eurythyra*, shell dimensions of the living population measured (in mm or mm<sup>2</sup>, 10 specimens measured). Abbreviations: SD, standard deviation; Min, minimum; Max, maximum; other abbreviations as in Fig. 2.

Character	Mean	SD	Min	Max
D1	25.27	0.90	24.16	27.03
D2	21.46	1.04	19.72	23.33
SS	405.73	35.82	350.93	476.74
SP	73.67	3.14	69.01	80.05
SH	16.44	0.71	15.25	17.77
FS	279.74	23.52	243.81	318.58
FP	65.72	2.90	61.60	71.49
BH	13.45	0.65	12.45	14.44
BS	255.95	21.52	223.19	289.73
BP	64.06	2.66	60.29	69.19

Fig. 2. The measurements (Table 1) were obtained following the methodology of Alonso, Nogales & Ibáñez (2006) and Alonso *et al.* (2006) with analySIS® software produced by Soft Imaging System GmbH. Calculation of the number of shell whorls follows Kerney & Cameron (1979: 13). “Proximal” and “distal” refer to the position in

relation to the ovotestis. The terminology of parts of the distal male genital system is the same as described in Alonso & Ibáñez (2007). Photographs (Dr. Eike Neubert, SMF) of a specimen regarded by the SMF as a probable syntype of *Hemicycla eurythyra* (SMF 7301, H=14.8 mm, D=23.3 mm, filename: “hele0, Teneriffa: Barranco ???, ex M. Schultze 1908” [original label O. Boettger was missing]) are shown for comparison, with the permission of SMF (Fig. 3A).

#### ABBREVIATIONS

- AIT Alonso & Ibáñez collection, Department of Animal Biology, University of La Laguna, Tenerife, Canary Islands, Spain.  
 MNHN Muséum National d’Histoire Naturelle, Paris, France.  
 SMF Natur-Museum Senckenberg, Frankfurt/Main, Germany.

#### SYSTEMATICS

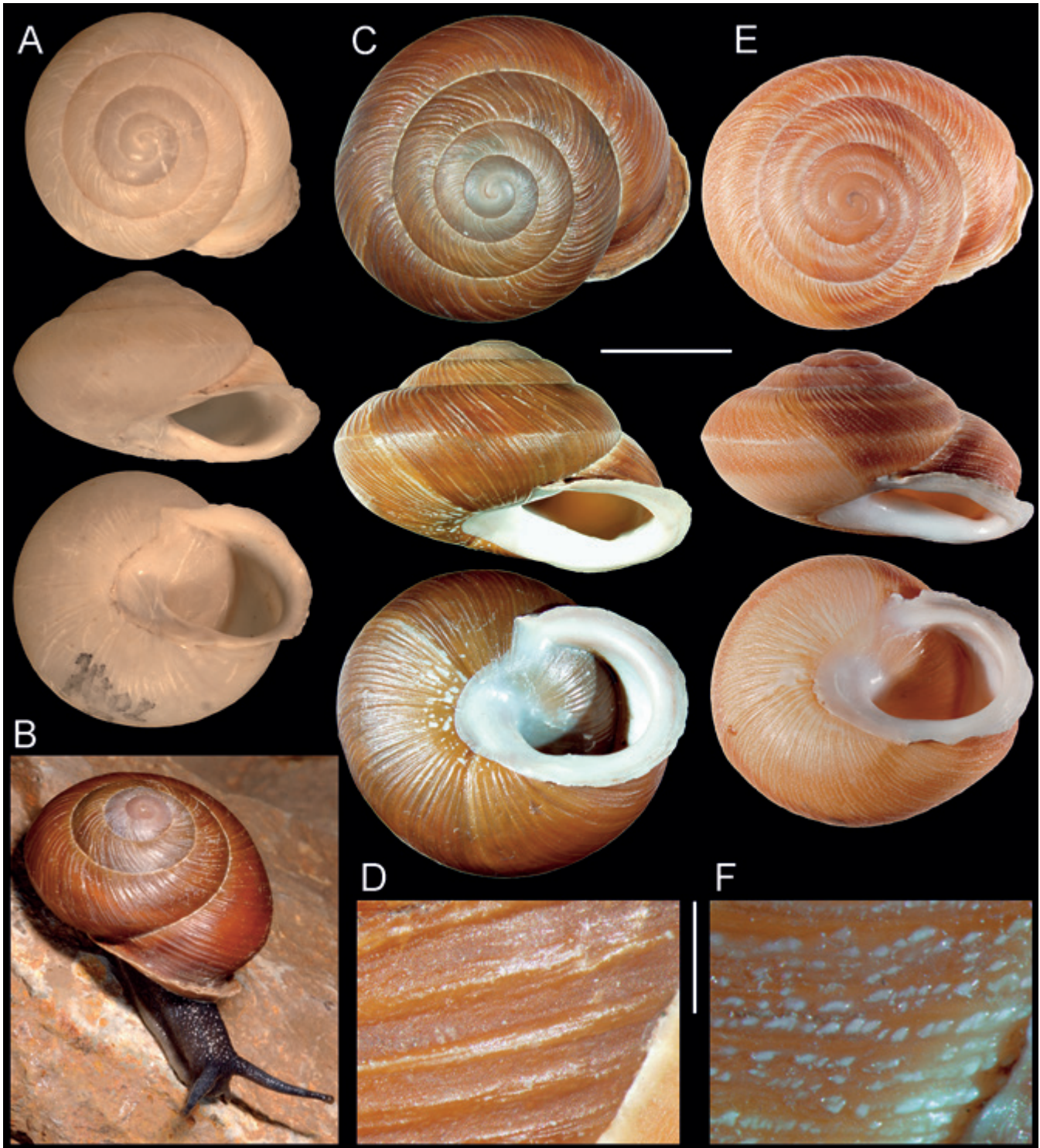
Genus *Hemicycla* Swainson, 1840

Type species (by monotypy): *Helix plicaria* Lamarck, 1816

*Hemicycla (Hemicycla) eurythyra* O. Boettger 1908

**Description** Body dark blue-greyish coloured, sole greyish (Fig. 3B). The shell (Figs 3A, C, D; Table 1) is imperforate, conic-globose, with a soft shine, 4 ½ convex whorls and well-marked sutures. Shell colour, uniform dark reddish-brown. Body whorl angulated (in some specimens until the peristome) and slightly gibbose in the descending zone towards the aperture. Aperture rounded. The white peristome is reflected to cover the umbilicus and is upwardly recurved in the palatal zone. The margins barely converge at the insertion and are united by a white parietal lip.

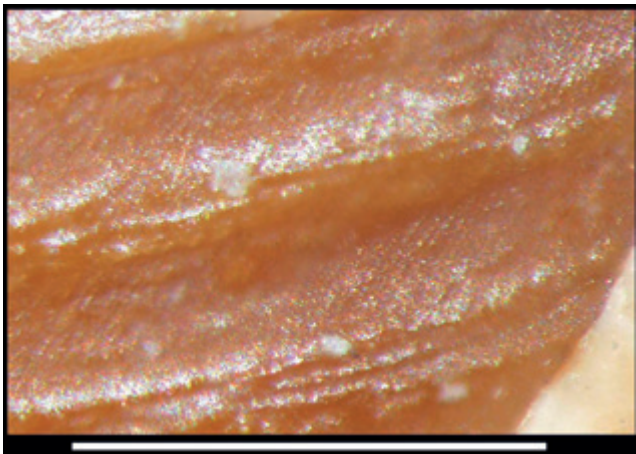
Shell ornamentation (Figs 3C, D) is formed by numerous smooth, radial ribs, regularly arranged, in a similar disposition above and below the periphery. The shell surface between the radial ribbing has minute striations, produced by very numerous, fine and dense, spiral grooves (Fig. 4).



**Figure 3** A, C–F. Shells and shell ornamentation of the penultimate whorl and body whorl, near the aperture of the same specimen (dorsal view): A, probable syntype of *Hemicycla eurythra* (SMF 7301; E. Neubert’s photographs); B, a living *H. eurythra* specimen from Bajamar, Tenerife; C, D, *H. eurythra* shell, from Bajamar; E, F, lectotype (MNHN) of *Hemicycla pouchet* (A. Férussac 1821). Scale bars: A, C, E, 10 mm; D, F, 1 mm.

Genital system (Fig. 5: 2 specimens dissected): Atrium very short. Bursa copulatrix complex with a thick, well developed diverticulum, slightly shorter than the bursa copulatrix duct which,

in turn, is shorter than the common stalk and slightly swollen distally, shortly before entering the proximal vagina. Bursa copulatrix small and globular, with its neck inserted into the diaphragm.



**Figure 4** Enlarged detail of the *Hemicycla eurythyra* shell ornamentation shown in Fig. 3D, with the minute transverse striations of the shell surface between the radial ribs. Scale bar: 1 mm.



**Figure 5** Genital system of *Hemicycla eurythyra* from Bajamar, Tenerife: ag, albumen gland; bc, bursa copulatrix; d, diverticulum; e, epiphallus; f, flagellum; mg, mucous glands; p, penis; r, retractor muscle.

Albumen gland particularly long. Dart sac accompanied by a pair of branched tubular mucous glands. The penial complex displays a flagellum

longer than the sum of penis plus epiphallus. Retractor muscle with an epiphallar insertion.

*Distribution and habitat* (Fig. 1) This species is endemic to Tenerife. It occurs only at an altitude of 20–460 m in a small area in the eastern part of the island (between Tejina Ravine and Bajamar), at the northwest of the dorsal chain of Anaga mountains, in open areas with lowland vegetation.

*Remarks* *H. eurythyra* is conchologically comparable with *H. (Adiverticula) pouchet* (A. Férussac 1821) and *H. (Hemicycla) pouchadan* Ibáñez & Alonso 2007, which also live in the eastern part of Tenerife, but at the south of the Anaga mountains. The syntypes of the last two species were incorrectly considered by Férussac as syntypes only of *H. pouchet*. This taxonomic and nomenclatorial problem was recently clarified by Bank *et al.* (2002) and Ibáñez & Alonso (2007).

*Hemicycla pouchet* (Figs 3E, F) is conchologically more similar to *H. eurythyra*. However, both species belong to different subgenera for their respective presence/absence of a diverticulum in the bursa copulatrix complex. They also differ in shell ornamentation. Thus, *H. pouchet* has a granulated shell, with the granulations arranged on weakly accentuated radial striae which do not reach to form costulae and tend to disappear below the periphery, near the columellar zone.

*Hemicycla pouchadan* shares with *H. eurythyra* the presence of the diverticulum in the bursa copulatrix complex but the shell of *H. pouchadan* (Ibáñez & Alonso, 2007: Figs 3C, D) is smaller and has radial ribs, each with a strong transverse striation produced by very numerous, fine and densely set spiral grooves which do not appear on the shell surface between the radial ribs.

The fossil material of Boettger has similar dimensions to that of the living population measured here (Table 1). Only two of our specimens slightly exceed the size of Boettger's material. The dimensions of the probable syntype of *H. eurythyra* (SMF 7301) are slightly smaller than found in Boettger's material and in material examined here (Table 1).

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REFERENCES

- ALONSO MR, GOODACRE SL, EMERSON BC, IBÁÑEZ M, HUTTERER R & GROH K 2006 Canarian land snail diversity: conflict between anatomical and molecular data on the phylogenetic placement of five new species of *Napaeus* (Gastropoda, Pulmonata, Enidae). *Biological Journal of the Linnean Society* **89**: 169–187.
- ALONSO MR & IBÁÑEZ M 2007 Anatomy and function of the penial twin papillae system of the Helicinae (Gastropoda: Helicoidea: Helicidae) and description of two new, small *Hemicycla* species from the laurel forest of the Canary Islands. *Zootaxa* **1482**: 1–23.
- ALONSO MR, NOGALES M & IBÁÑEZ M 2006 The use of the computer-assisted measurements utility. *Journal of Conchology* **39**: 41–48.
- BANK RA, GROH K & RIPKEN TEJ 2002 Catalogue and bibliography of the non-marine Mollusca of Macaronesia. In: M Falkner, K Groh & MCD Speight [eds], *Collectanea Malacologica – Festschrift für Gerhard Falkner*. ConchBooks, Hackenheim. pp. 89–235, pl. 14–26.
- BOETTGER O 1908 Liste der Mollusken aus einem Sande im Barranco von Tegina auf Tenerife (Canaren). *Zeitschrift der Deutschen geologischen Gesellschaft, Monatsberichte* **60**: 246–249.
- CASTILLO C, YANES Y, ALONSO MR & IBÁÑEZ M 2006 *Napaeus lajaensis* sp. nov. (Gastropoda: Pulmonata: Enidae) from a Quaternary Aeolian Deposit of Northeast Tenerife, Canary Islands. *Zootaxa* **1307**: 41–54.
- IBÁÑEZ M & ALONSO MR 2007 A tale of two snails: “Le Pouchet”, from Adanson (Mollusca, Gastropoda, Helicoidea, Helicidae). *Zoosystema* **29**: 575–582.
- IBÁÑEZ M, SIVERIO F, ALONSO MR & PONTE-LIRA CE 2006 Two *Canariella* species (Gastropoda: Helicoidea: Hygromiidae) endemic to the Northwest Tenerife (Canary Islands). *Zootaxa* **1258**: 33–45.
- KERNEY MP & CAMERON RAD 1979 *A field guide to the land snails of Britain and North-West Europe*. Collins, London.

