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SOME NEW SPECIES OF THE GENUS *HELICELLA* (PULMONATA, HELICIDAE) FROM THE PROVINCE LEÓN, SPAIN

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With 18 text-figures and 2 plates

Many samples of Helicellinae have been collected by the second author in León, a province in the North of Spain. While trying to identify the species represented in this material, not only the most recent summarizing publications on Spanish Helicellinae by Ortiz de Zárate (1943, 1946, 1950, 1962, 1964) were consulted, but the older literature was studied as well, especially the books of Locard (1899) and Servain (1880). These, however, constitute a most serious barrier towards a better knowledge of the Iberian terrestrial molluscan fauna, as of the great number of alleged new species described in them, only unclear shell descriptions are provided, not accompanied by a single figure.

Several of our species from León are considered to be new. These are provisionally described in the present paper. A detailed analysis of the whole Helicidae fauna of León and of the importance of the various species as parasite hosts, will be given in a separate paper by the second author. The first author intends to publish the results of the literature study which was necessary for the present paper, together with the results of the examination of the type material of several of the doubtful species; lectotypes will then be selected to stabilize nomenclature.

Helicellinae having genitalia with two large dart sacs, with darts, are considered by most authors to belong to *Helicella* Férussac, 1821. Ortiz de

Zárate (1950, 1952) and Zilch (1960: 668-669) subdivided the genus into three subgenera on characters of the shell and the genitalia: *Helicella* s.s., *Xerotricha* Monterosato, 1892, and *Jabalconia* Ortiz de Zárate, 1952 (= *Pseudoxerotricha* Ortiz de Zárate, 1950, not C. Boettger, 1911). Ortiz de Zárate (1950: 52) distinguished, on shell and radula characters, two "secciones conculológicas" in *Xerotricha*: *Xerotricha* s.s. and *Castellana*, taken for subgenera of a separate genus *Xerotricha* by Gasull (1975). However, *Castellana* Ortiz de Zárate, 1950, was published after 1930 without the fixation of a type-species, which means that this name does not satisfy the provision of ICZN Art. 13 (b) and, therefore, is not available. Whereas the number of known *Helicella* species is growing, the boundaries between the above mentioned subdivisions of the genus become more and more indistinct. Therefore, pending further research, the following new species are described without subgeneric assignment.

Fig. 1 illustrates the terminology used in the descriptions of the reproductive organs.

For the collections where the material is housed, the following abbreviations are used: LPL = Laboratorio de Parasitología, Facultad de Veterinaria y Biología de León (M. Y. Manga); RMNH = Rijksmuseum van Natuurlijke Historie, Leiden, the Netherlands.

***Helicella bierzona* spec. nov.** (figs. 1, 2; pl. 1 figs. 7-10)

Shell. — The strongly carinate shell is depressed and has $4\frac{1}{2}$ - $4\frac{3}{4}$ whorls. There are prominent riblets above the carina; the basal part of the shell has the radial sculpture slightly more obsolete. A microsculpture of very fine spiral striae is most clearly discernible between the riblets on the shell-base. The first postembryonal whorls show many hair scars and a few very short hairs. Juvenile shells, which might be more hairy, could not be studied. Just above the carina and along the suture, a fragmented horny brown band is seen; additional spiral bands, variable in width, can be present on the basal part of the shell. The umbilicus width is $\frac{1}{6}$ or somewhat more than that of the shell. The umbilicus is rounded or slightly oval. The aperture is oval, with a weak to moderately strong apertural barrier, equally thick all along the peristome.

Height, 3.9-4.6 mm; breadth, 7.8-9.4 mm.

H. bierzona comes nearest to (1) *Helix setubalensis* L. Pfeiffer, 1850¹⁾,

¹⁾ *Helix setubalensis* L. Pfeiffer is the type-species of *Xeroplexa* Monterosato, 1892. It is still unknown what type of genitalia this species has. If it is the *Helicella* type, like *H. bierzona*, this would have consequences for nomenclature. At present the name *Xeroplexa* is used for species with two rudimentary dart sacs without darts.

from Setubal, Portugal, and (2) *Helicella (Xeroplexa) setubalensis*, sensu Ortiz de Zárate López & Ortiz de Zárate Rocandio, 1949, from Navarra. Both differ most conspicuously by having the carina strongly knobbed; the first also has a more convex upper part of the body whorl near the aperture, the second is more heavily sculptured on the whole shell.

Genitalia. — The flagellum measures about $1/4$ of the penis, which length is slightly less than that of the epiphallus. The proximal part of the penis is somewhat shorter than the distal part. The dart-sacs are as long as the penis. The tips of the darts (in situ) are clearly separated. There are 6 extremities of the glandulae mucosae. In both specimens the bursa of the receptaculum seminis is deformed by fragments of a spermatophore. The bursa is of about the same length as the pedunculus (variable, see figs. 1, 2).

This conchologically well-defined species can not be separated easily from all other *Helicella* species where the structure of the genitalia is concerned, especially not from *H. zaratei* and *H. corderoi*, both species with a relatively short flagellum. *H. jamuzensis* is also very similar, differing slightly by the comparatively long dart sacs. It should be emphasized here that only two specimens could be studied in detail, both with a deformed bursa of the receptaculum seminis.

Radula. — The radula formula $C + (22-26)$ was found.

Distribution. — The species is known from only a single locality, the dam (embalse) of the Peñarrubia mtn., 12 km NNE of Vega de Valcarce, region Bierzo, western part of León.

Material. — Holotype, RMNH 55138 (shell), genit. slide 882a, rad. slide 882c, locus typicus (see distribution). Paratypes, from the locus typicus only: RMNH 55151/2 juvenile shells, RMNH 55139/1 shell, genit. slide 882b, rad. slide 882d; LPL/3 shells, 3 rad. slides.

Derivatio nominis. — Named after the region Bierzo in the western part of León.

***Helicella corderoi* spec. nov.** (figs. 3, 4, 6; pl. 2 figs. 5-7)

Shell. — The shell is somewhat depressed and has $4-4\frac{3}{4}$ whorls. The body whorl is slightly angulate at the beginning and rounded near the aperture. Above the periphery there are irregular transverse riblets, which vary in length. The riblets are more or less obsolete in the basal part of the shell, where a distinct microsculpture of very fine spiral striae is discernible. Persistent hairs are present on all postembryonal whorls, leaving conspicuous hair scars when removed; on the body whorl the hairs are about 0.15 mm long. Above the periphery, irregular whitish spots as well as whitish riblets are mostly seen on a pale horny brown background. The basal part of the shell shows a few pale horny brown, more or less homogeneous colour bands, varying considerably in width; in a few specimens a similar band is present

just above the periphery. The umbilicus width is about $1/5$ that of the shell. The umbilicus is slightly oval, being somewhat unproportionally enlarged by the last quarter of the body whorl. The aperture is oval, with a very prominent white crescent-shaped apertural barrier, showing through whitish to the exterior of the shell.

Height, 2.4-3.3 mm; breadth, 4.4-5.6 mm.

The shells of the other known *Helicella*-species with conspicuous hairs, *H. conspurcata* (Draparnaud, 1801), *H. gonzalezi* (Azpeitia, 1924), and *H. mariae* (Gasull, 1974), are most clearly different by the absence of a marked apertural barrier. *Cernuella* (*Microxeromagna*) *vestita* (Rambur) (pl. 1 figs. 13, 14) differs additionally by having much shorter hairs.

Genitalia. — The flagellum measures $1/4$ of the length of the penis or somewhat more. The penis is $1/2$ - $6/7$ as long as the epiphallus. The proximal and the distal part of the penis are about equally long. The dart-sacs are intermediate in length between penis and epiphallus. The tips of the darts (in situ) are clearly separated. There are 7 to 9 extremities of the glandulae mucosae. The bursa of the receptaculum seminis is slightly longer than the pedunculus; it is slender, with a swollen basal part.

This conchologically well-defined species can not be easily separated from *H. zaratei* as far as the structure of the genitalia is concerned. Both species have a comparatively short flagellum and a slender bursa of the receptaculum seminis with a broadened basal part (see also the description of *H. zaratei*). In *H. jamuzensis* (figs. 8-10) and *H. cf. madritensis* Rambur, 1868¹⁾ (figs. 11-13) the bursa is more oval; the last mentioned species differs additionally by a swollen basal part of the dart sacs.

Radula. — The radula formula C + (19-21) was found.

Distribution. — The species is only known from a few localities in the central northern part of León, between Piedrafita de Babia (12 km E of Villablino) in the West and Rodillazo (11.5 km NW of La Vecilla de Curueño) in the East.

Material. — Holotype, RMNH 55140 (shell), genit. slide 886a, Piedrafita, 17 km N of Matallana de Torio. Paratypes: Locus typicus, LPL/33 shells, RMNH 55141/2 shells, 55150/6 shells, genit. slides 886c-f, rad. slides 886g-j; Rodillazo, 11.5 km NW of La Vecilla de Curueño, LPL/1 shell; Tabanedo, 6 km N of Matallana de Torio, LPL/1 shell; Piedrafita de Babia, 12 km E of Villablino, LPL/1 shell.

Derivatio nominis. — The species is named in honour of Prof. Dr. N. Cordero, of the

¹⁾ The first author has studied two syntypes (shells) of *Helix madritensis* Rambur, 1868. In León a species with a closely similar shell is found. Nevertheless, in view of frequent convergence in shell structure among Helicellinae, identification of the León species remains uncertain as long as the genitalia of *H. madritensis* from the type-locality remain unknown.

Universidad de Oviedo, Facultad de Veterinaria de León, Cátedra de Parasitología y Enfermedades parasitarias, who greatly stimulated the research of the Helicidae in León.

***Helicella* spec.** (fig. 5, 5'; pl. 2 fig. 12)

A single animal from Busdongo, 21 km NNW of La Robla, near the region in which *H. coderoi* is found, differs from that species in the following shell characters: (1) a comparatively weak apertural barrier, equally thick all along the peristome, (2) a more globular outline, and (3) longer hairs, which measure 0.2 mm on the body whorl. The epiphallus is much longer than in *H. coderoi*, it is twice as long as the penis. The other known hairy *Helicella* species are even more different.

As long as only a single specimen is known, we prefer to wait with the introduction of a new name, until more material is available and a better description will be possible.

***Helicella jamuzensis* spec. nov.** (figs. 8-10; pl. 2 figs. 1, 2, 8, 9)

Shell. — The shell is relatively thin, globular or somewhat depressed and has $4\frac{1}{4}$ - $4\frac{3}{4}$ whorls. The large body whorl is rounded or slightly angulate at the beginning. Above the periphery there are rather regular transverse riblets, which become more or less obsolete in the basal part of the shell. The shell is covered by a conspicuous periostracum and shows a very distinct microsculpture of fine spiral striae. Small hair scars are discernible on the first postembryonal whorls, where very short (0.02 mm) hairs may be present. A narrow fragmented brown band is mostly seen just above the periphery. Some of the riblets are partially or wholly whitish, as are some small irregular spots. The background colour is pale horny brown. In the variable colour-pattern indistinct fragmented bands may be recognized. The umbilicus width is less than $\frac{1}{6}$ that of the shell. The aperture is slightly oval or rounded. The apertural barrier may be prominent, but can be lacking nearly completely also (in adult specimens); it is regularly bent and equally thick all along the peristome or somewhat more pronounced near the columella (when it is weakly developed).

Height, 4.0-5.5 mm; breadth, 6.6-8.0 mm.

H. jamuzensis differs from *H. ordunensis* (Kobelt, 1882) (pl. 2 figs. 3, 4, 10, 11) (= *Helicella* (*Helicella*) *alavana*, sensu Ortiz de Zárate, 1950, not Fagot, 1883) and *H. cf. madritensis* Rambur, 1868 (pl. 1 figs. 5, 6, 12, 15) by the very narrow umbilicus and the prominent spiral striae. *H. ordunensis* is also more obsoletely sculptured (most conspicuous above the periphery) and mostly shows unfragmented colour-bands. *H. cf. madritensis* is more sharply sculptured on the basal part of the shell. *Candidula rocandioi* (Ortiz de Zárate,



Figs. 1, 2. *Helicella bierzona* spec. nov., locus typicus; 1, holotype, RMNH slide 882a — B = bursa of the receptaculum seminis, D = dart, DS = dart sac, E = epiphallus, F = flagellum, G = glandula mucosa, O = oviductus, PD = penis distalis, PP = penis proximalis, R = pedunculus of the receptaculum seminis; VD = vas deferens —; 2, paratype, RMNH slide 882b. Figs. 3, 4, 6. *Helicella corderoi* spec. nov., locus typicus; 3, holotype, RMNH slide 886a; 4, 6, paratypes, RMNH slide 886f-e. Fig. 5, 5'. *Helicella* spec., Busdongo, RMNH slide 891a.

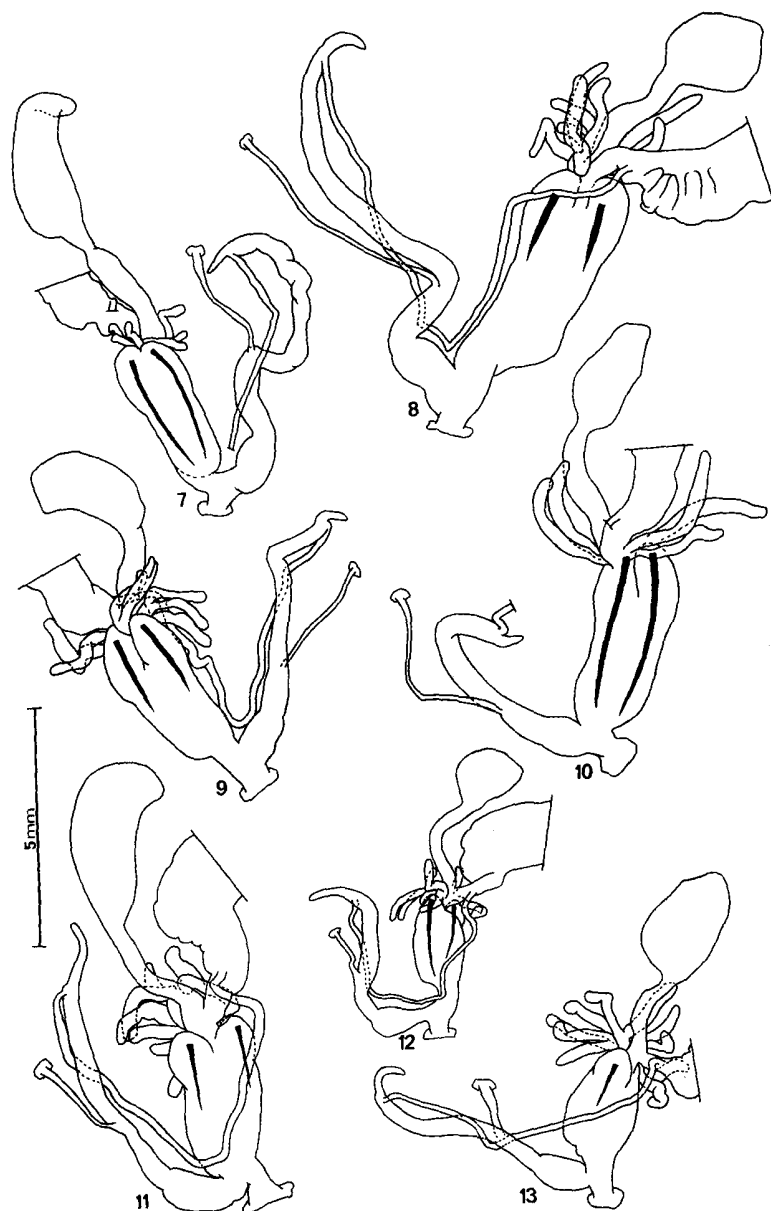


Fig. 7. *Helicella zaratei* spec. nov., holotype, RMNH slide 885a. Figs. 8-10. *Helicella jamuzensis* spec. nov., paratypes; 8, Villanueva de Jamuz, RMNH slide 881; 9, 10, Alija del Infantado, RMNH slides 879a-b. Figs. 11-13. *Helicella* cf. *madritensis* (Ram-bur); 11, Villarroaño, RMNH slide 888; 12, Pajeres de los Oteros, RMNH slide 887; 13, Villamuño, RMNH slide 889a.

1950) (pl. 1 fig. 11), also represented in León, can be easily separated by the depressed shell, with a wider umbilicus, a more obsolete sculpture, and homogeneous colour-bands.

Genitalia. — The flagellum measures about $1/4$ of the length of the penis, the latter being $2/3$ to $1/2$ as long as the epiphallus. The proximal part of the penis is as long as the distal part. The slender dart sacs are $1\frac{1}{2}$ to twice as long as the penis. The tips of the darts (in situ) are well-separated¹⁾. There are 6 to 8 extremities of the glandulae mucosae. The bursa of the receptaculum seminis is oval and has about the same length as the pedunculus.

H. jamuzensis has comparatively long dart sacs and an oval bursa of the receptaculum seminis. Apart from that, the species is very similar to the other small *Helicella* species in which the flagellum is relatively short and the pedunculus is approximately equal to the bursa in length, viz., *H. corderoi*, *H. bierzona* and *H. zaratei*. *H. cf. madritensis* can be easily separated by the swollen basal part of the dart sacs and a longer flagellum (slightly more than $1/3$ of the penis in length). In *H. ordunensis* the flagellum is even longer than in *H. cf. madritensis* and, additionally, the pedunculus differs by being approximately twice as long as the bursa of the receptaculum seminis (fig. 14; Ortiz de Zárate, 1950: 43, fig. 7).

Radula. — The radula formula $C + (25-26)$ was found for two specimens from Alija del Infantado.

Distribution. — The species is only known from a few localities in the central southern part of León on the western border of the Jamuz river, to the south of La Bañeza.

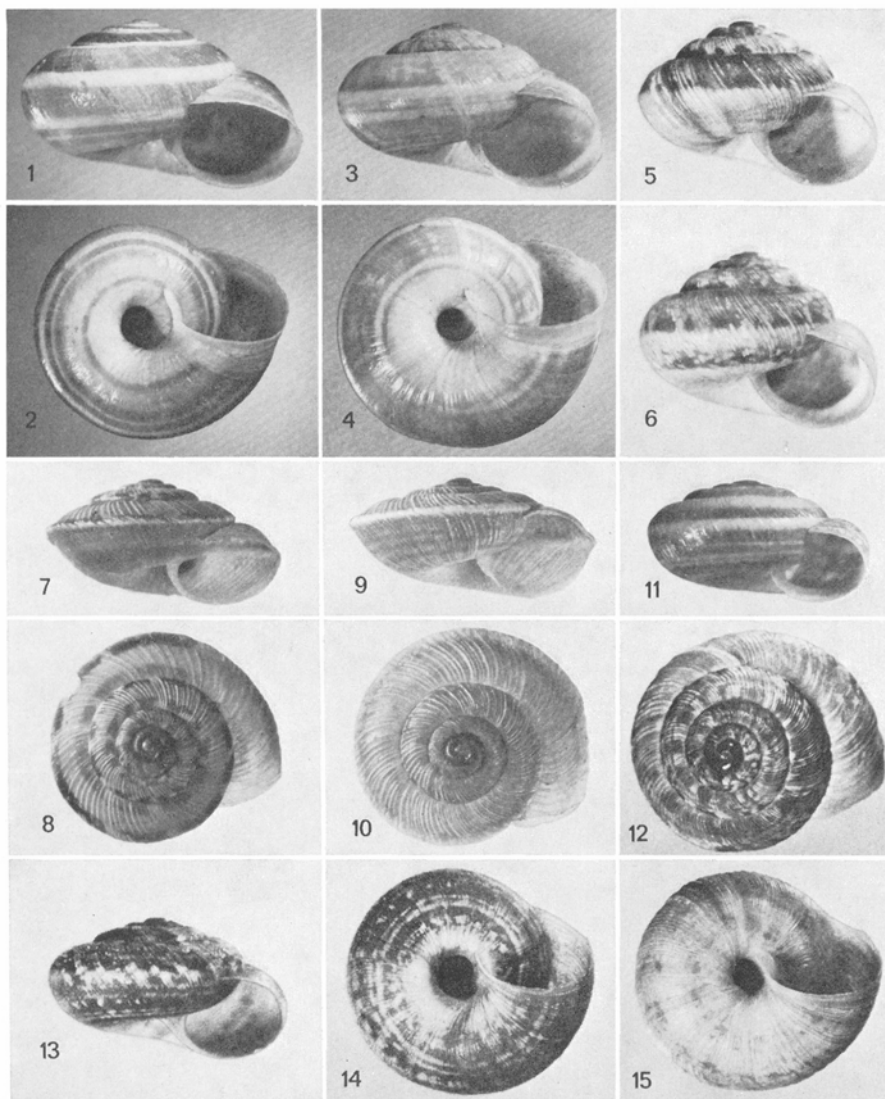
Material. — Holotype, RMNH 55142 (shell), genit. slide 878, Santa Elena de Jamuz. Paratypes: Alija del Infantado, 18 km SSE of La Bañeza, LPL/16 animals, RMNH 55143/4 shells, genit. slides 879a-b, rad. slide 880a, RMNH 9042/5 animals; Villanueva de Jamuz, 8 km SSE of La Bañeza, RMNH 55144/1 shell, genit. slide 881.

Derivatio nominis. — Named after Jamuz, to indicate the region where the type-specimens of this species were found.

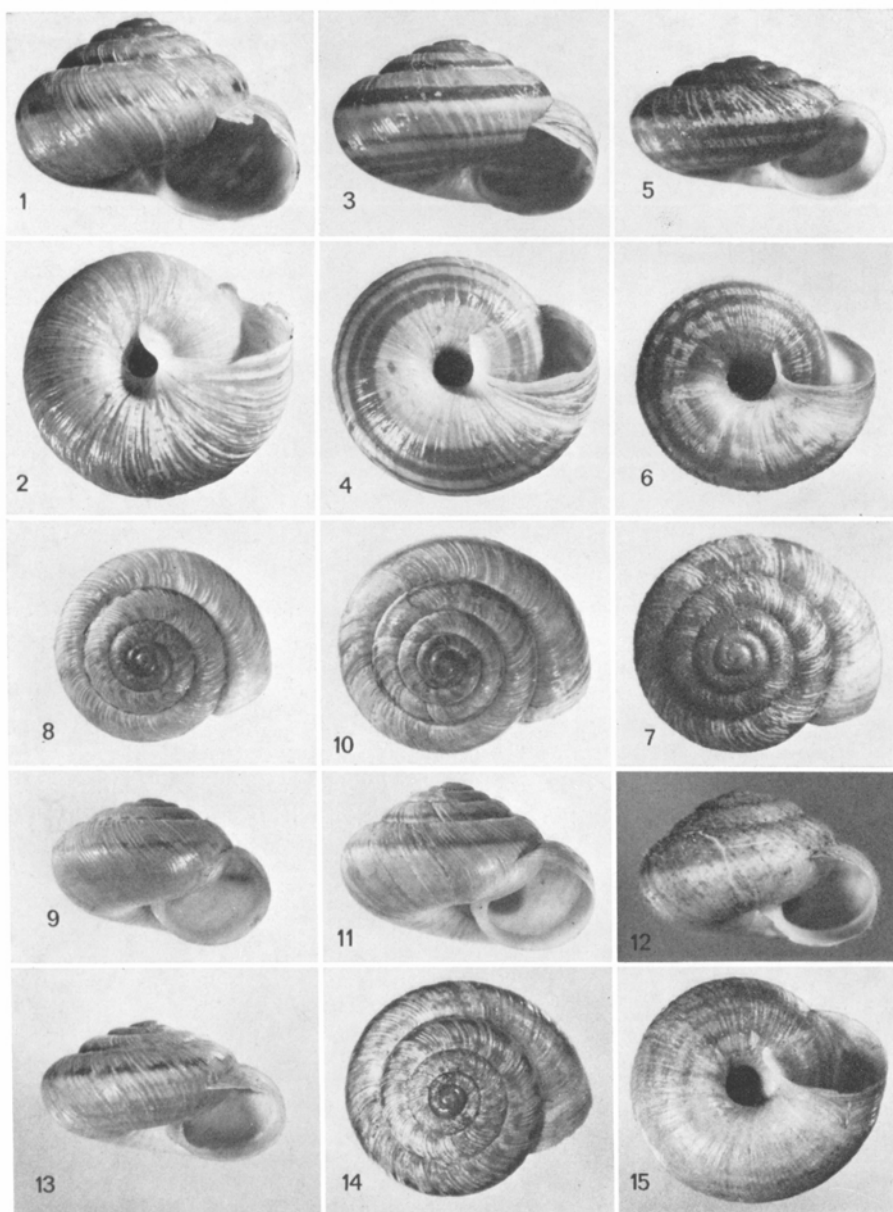
***Helicella valdeona* spec. nov.** (figs. 15, 16; pl. 1 figs. 3, 4)

Shell. — The finely striate shell is more or less depressed and has $5-5\frac{1}{2}$ whorls. Several partly fragmented pale horny brown bands, varying considerably in width, are discernible on a yellowish white background. The umbilicus width is about $1/6$ that of the shell. The umbilicus is rounded, being not unproportionally enlarged by the last part of the body whorl. The

¹⁾ Ortiz de Zárate (1950: 51) overemphasises the importance of the form and position in situ of the darts. As it is difficult to see whether the darts of a specimen are full-grown (e.g. fig. 10?) or immature (e.g. figs. 8, 9), this character should be used with great care.



Figs. 1, 2. *Helicella itala nubigena* (De Saulcy), Cistierna, 21 km SW of Riano, br. 14.7 mm. Figs. 3, 4. *Helicella valdeona* spec. nov., holotype, RMNH 55145, br. 14.3 mm. Figs. 5, 6, 12, 15. *Helicella* cf. *madritensis* (Rambur); 5, 15, Grajal de la Ribera, 25 km SE of La Bañeza, br. 6.5 mm; 6, 12, San Román de los Oteros, 27 km SE of León, br. 7.3 mm. Figs. 7-10. *Helicella bierzona* spec. nov., locus typicus; 7, 8, holotype, RMNH 55138, br. 7.7 mm; 9, 10, paratype, RMNH 55139, br. 8.0 mm. Fig. 11. *Candidula rocandioi* (Ortiz de Zárate), Olleros de Sabero, 17 km E of La Vecilla, br. 6.2 mm. Figs. 13, 14. *Cernuella* (*Microxeromagna*) *vestita* (Rambur), Villaquejida, 18 km S of Valencia de Don Juan, br. 5.9 mm.



Figs. 1, 2, 8, 9. *Helicella jamuzensis* spec. nov.; 1, 2, holotype, RMNH 55142, br. 7.2 mm; 8, 9, paratype, Alíja del Infantado, 18 km SSE of La Bañeza, RMNH 55143, br. 7.1 mm. Figs. 3, 4, 10, 11. *Helicella ordunensis* (Kobelt); 3, 4, La Magdalena, 26 km NW of León, br. 7.3 mm; 10, 11, Santa Lucia, 3 km NE of La Pola de Gordón, br. 8.2 mm. Figs. 5-7. *Helicella corderoi* spec. nov., holotype, RMNH 55140, br. 5.7 mm. Fig. 12. *Helicella* spec., Busdongo, 21 km NNW of La Robla, RMNH 55152, br. 6.4 mm. Figs. 13-15. *Helicella zaratei* spec. nov., holotype, RMNH 55147, br. 6.8 mm.

aperture is also rounded, with a comparatively long parietal border, and a weak apertural barrier.

Height, 8.5-9.2 mm; breadth 14.3-15.2 mm.

The shell most closely resembles *Helicella itala nubigena* (De Saulcy, 1852) (pl. 1 figs. 1, 2). *H. valdeona* only has a slightly narrower umbilicus and a somewhat different apertural shape, the parietal border of the aperture being relatively long.

Genitalia. — The flagellum measures about $7/10$ of the length of the penis. The penis is $1/2$ to $2/3$ as long as the epiphallus. The proximal part of the penis is slightly shorter than the distal part. The slender dart-sacs are comparatively long, about $3/4$ of the length of penis and epiphallus together. The tips of the darts (in situ) are crossed. There are about 10 extremities of the glandulae mucosae. The receptaculum seminis has a very long pedunculus, equalling in length the male part of the genitalia (except the vas deferens), with a relatively small triangular bursa.

H. valdeona differs most clearly from the conchologically similar *H. itala nubigena* by the long genital flagellum; less conspicuous are the longer pedunculus, with a comparatively small bursa and the large dart-sacs. A similar long flagellum is found in *Helicella pampelonensis* (A. Schmidt, 1855) (cf. Ortiz de Zárate, 1950: 40, fig. 6), a species differing by a much shorter pedunculus, bearing an elongated bursa, and, most clearly, by the very wide umbilicus of the shell.

Radula. — The radula formula of the holotype is $C + 29$.

Distribution. — The species is only known from a single locality in the extreme NE of the province León: Santa Marina de Valdeon, 21 km NNE of Riano.

Material. — Holotype, RMNH 55145 (shell), genit. slide 883, radula & mandibula slide 884, Santa Marina de Valdeon, 21 km NNE of Riano. Paratypes: Locus typicus, LPL/1 animal; RMNH 55146/1 subadult shell.

Derivatio nominis. — Named after the type-locality.

***Helicella zaratei* spec. nov.** (figs. 7, 18; pl. 2 figs. 13-15)

Shell. — The shell is more or less depressed and has $4\frac{1}{2}$ - $4\frac{3}{4}$ whorls. The body whorl is slightly angulate at the beginning, becoming more rounded near the aperture. There are irregular transverse riblets above the periphery, which become more or less obsolete in the basal part of the shell, where a distinct microsculpture of fine spiral striae is seen most clearly. Non-persistent hairs, 0.05 mm long, leaving inconspicuous hair scars, may be present on the first post-embryonal whorls, they are not seen on the other whorls. Some more or less distinct fragmented pale horny brown bands on a yellowish white background are discernible. Just above the periphery a more

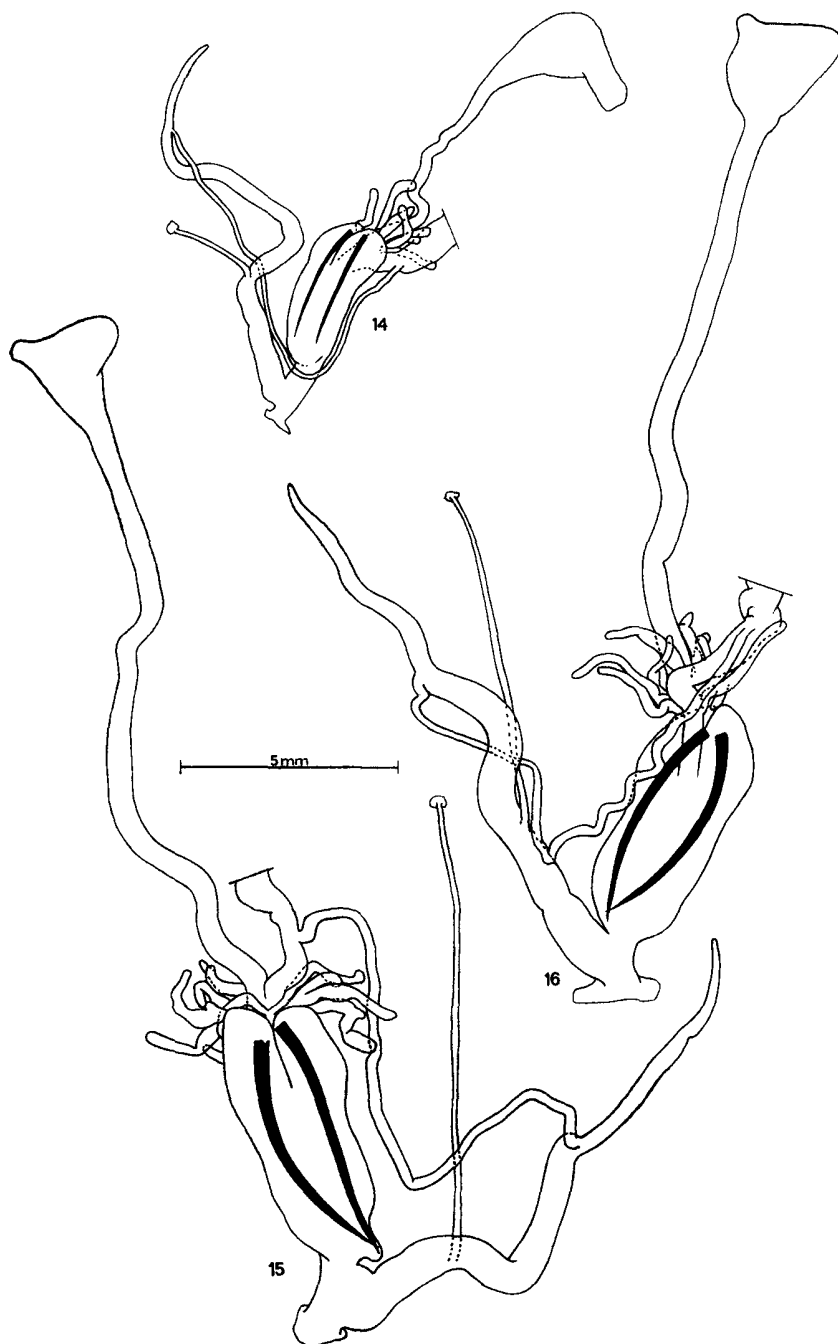


Fig. 14. *Helicella ordumensis* (Kobelt), Villanueva de la Tercia, 12 km N of La Pola de Gordon.

Figs. 15, 16. *Helicella valdeona* spec. nov., locus typicus; 15, holotype, RMNH slide 883; 16, paratype, LPL slide.



Fig. 17. *Helicella itala nubigena* (De Saulcy), Villimer, RMNH slide 890a. Fig. 18. *Helicella zaratei* spec. nov., paratype from the locus typicus, with a broken spermatophore and two long undamaged darts in the bursa of the receptaculum seminis, RMNH slide 885b.

conspicuous fragmented brown band is developed. The umbilicus width is about $1/5$ that of the shell. The umbilicus is rounded, being not unproportionally enlarged by the last part of the body whorl. The aperture is oval, with a weak to moderately prominent apertural barrier, which is regularly bent and equally thick all along the peristome.

Height, 3.6-4.2 mm; breadth 6.3-7.3 mm.

The shell most closely resembles *H. jamuzensis* spec. nov., having a similar microsculpture. It differs, however, by the lower spire and a markedly wider umbilicus. *H. corderoi* spec. nov., which lives in the same region, differs most clearly by the presence of hairs over the entire shell, or, when the hairs are lacking, by the conspicuous hair scars and the more prominent crescent-shaped apertural barrier.

Genitalia. — The flagellum measures $1/5$ - $1/6$ of the length of the penis; the penis is about as long as the epiphallus. The distal part of the penis is $1\frac{1}{2}$ to twice as long as the proximal part. The slender dart-sacs are as long as the penis. The tips of the darts (in situ) are separated but only narrowly so. There are 6-9 extremities of the glandulae mucosae. The slender bursa of the receptaculum seminis has a broadened basal part and equals the pedunculus in length.

On the basis of the genitalia *H. zaratei* can not be clearly differentiated from *H. bierzona* and *H. corderoi*, species that have a comparatively short flagellum and in which the bursa of the receptaculum seminis is slender (maybe not in *H. bierzona*) and equals the pedunculus in length. As compared with these species, *H. zaratei* has the shortest flagellum and a shorter proximal part of the penis.

Radula. — The radula formula C + (19-21) was found for two paratypes from Los Barrios de Luna.

Distribution. — The species is only known from three localities in the central northern part of León, between Los Bayos (12.5 km ESE from Villablino) in the West and Los Barrios de Luna in the East.

Material. — Holotype, RMNH 55147 (shell), genit. slide 885a, Los Barrios de Luna. Paratypes: Locus typicus, RMNH 55148/1 subadult shell, RMNH 55229/4 shells, genit. slides 885b-e, rad. slides 885f-g, LPL/2 shells and 9 animals; El Castillo, 2 km E of Vegaríenza, LPL/1 shell; Los Bayos, 12.5 km ESE from Villablino, RMNH 55149/3 juvenile shells.

Derivatio nominis. — The species is named in honour of Adolfo Ortiz de Zárate y López (1886-1964), the first Spanish malacologist who consistently used anatomical as well as conchological characters in his descriptions (see also Anonymous, 1966). Ortiz de Zárate (1950: 51-52) already pointed out the possibility that undescribed *Helicella* species occur in Spain.

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