

# On *Cerņuella virgata* (Da Costa, 1778) and two Iberian *Xerosecta* species (Mollusca: Gastropoda Pulmonata: Hygromiidae)

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Key words: Hygromiidae; *Cerņuella*; *Xerosecta*; taxonomy; Spain; Portugal.

On the basis of a conchological study, taking anatomical data from the literature into account, four hygromiid species, sensu Ortiz de Zárate y López, are reduced to three, viz. *Cerņuella virgata* (Da Costa), *Xerosecta promissa* (Westerlund) and *X. reboudiana* (Bourguignat). Diagnostic shell characters are discussed and illustrated, and synonymy lists are given.

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## Introduction

In one of his innovative papers on the anatomy and systematics of Spanish pulmonate gastropods, Ortiz de Zárate y López (1950) dealt with three species of "*Helicella* (*Xeromagna*)" that are more or less similar conchologically to *Cerņuella virgata* (Da Costa, 1778). For these species he used the epithets *subrostrata*, *submeridionalis* and *reboudiana*. In the present paper only two species are accepted here: *subrostrata* = *promissa* and *submeridionalis* & *reboudiana* = *reboudiana*. This view is based on conchological studies, which did not provide a basis to distinguish more taxa, and an interpretation of the anatomical data published by Ortiz de Zárate y López (1950), which do not demonstrate convincingly that more than two species are involved.

Next to the two "*Helicella* (*Xeromagna*)" species, for which the generic name *Xerosecta* Monterosata, 1892, should be used (Hausdorf, 1988: 19), Iberian forms of *Cerņuella virgata* were studied as well. This resulted in three synonymy lists, encompassing several nominal taxa that have hardly ever been reported upon after their introduction by Bourguignat, in Servain (1880), Servain (1880), Locard (1899) or Westerlund (1893). The interpretations of these nominal taxa are based on the original descriptions and either syntypes or topotypes from the Bourguignat collection (shells). These topotypes might in fact be syntypes as well, donated by Servain to Bourguignat (see Gittenberger, 1993). In several cases lectotypes are designated to stabilize the synonymy.

The following nominal taxa (epithets) are dealt with:

<i>alluvionum</i> .....	296	<i>edetanorum</i> .....	296	<i>mendranoi</i> .....	296
<i>ambliā</i> .....	296	<i>euglyphā</i> .....	298	<i>meridionalis</i> .....	297, 300
<i>bipartita</i> .....	298	<i>finitimus</i> .....	296	<i>minor</i> .....	296
<i>blasi</i> .....	296	<i>grannonensis</i> .....	296	<i>neglecta</i> .....	297
<i>canovasiana</i> .....	296	<i>jonica</i> .....	297	<i>omnivaga</i> .....	298
<i>castroiana</i> .....	296	<i>luteola</i> .....	296	<i>promissa</i> .....	298
<i>comendadori</i> .....	300	<i>lutulenta</i> .....	296	<i>reboudiana</i> .....	300

<i>romulina</i> .....	300	<i>submeridionalis</i> .....	297, 300	<i>uberta</i> .....	296
<i>salebrosa</i> .....	298	<i>subrostrata</i> .....	298	<i>vettonica</i> .....	300
<i>solanoi</i> .....	296	<i>superflexa</i> .....	298	<i>virgata</i> .....	296
<i>specialis</i> .....	300	<i>tarifensis</i> .....	300	<i>xalonica</i> .....	296
<i>subluteata</i> .....	296	<i>terrosa</i> .....	296		

For collections the following abbreviations are used: MHNG, colln. J. R. Bourguignat, in Muséum d'Histoire Naturelle (Geneva); MNHN, colln. A. Locard, in Muséum National d'Histoire Naturelle (Paris); NMG, colln. C. A. Westerlund, in Naturhistoriska Museet (Göteborg); RMNH, Nationaal Natuurhistorisch Museum (Leiden).

### Systematic part

#### *Cernuella virgata* (Da Costa, 1778) (figs. 1-6)

- Cochlea virgata* Da Costa, 1778: 79 ("Heddington heath, in Oxfordshire", "Hampshire", "Cornwall", "Newmarket heath, in Cambridgeshire", U.K.).
- Helix luteola* var. *minor* Servain, 1880: 74 ("alluvions de l'Ebre à Saragosse" [= flood rubbish of the Ebro at Zaragoza], Zaragoza, Spain); topotype, MHNG (10.0 × 7.6 mm).
- Helix castroiana* Servain, 1880: 74 ("Cintra" [= Sintra], Estremadura, Portugal); topotype, MHNG (13.3 × 8.6 mm) (fig. 6).
- Helix solanoi* Servain, 1880: 96 ("Alluvions de l'Arta à Pampelune" [= flood rubbish of the Arta at Pamplona], Navarra, Spain; topotype, MHNG (10.9 × 8.0 mm).
- Helix edetanorum* Servain, 1880: 97 ("Alluvions de Guadalaviar près de Valence" [= flood rubbish of the Guadalaviar near Valencia] (because the river Guadalaviar is situated in Teruel, not close to the city Valencia, the locality remains unclear)); topotype (with label: "Valence"), MHNG (9.2 × 7.0 mm).
- Helix xalonica* Servain, 1880: 102 ("Saragosse" [= Zaragoza], Zaragoza, Spain; topotype, MHNG (11.3 × 7.8 mm) (fig. 1).
- Helix alluvionum* Servain, 1880: 103 ("détritus de l'Ebre .. du Guadalquivir, près de Séville" [rubbish from the Ebro .. the Guadalquivir, near Sevilla], Sevilla, Spain); no syntypes in MHNG, only a specimen from "Pampelune" [= Pamplona], Navarra, Spain.
- Helix grannonensis* Bourguignat, in Servain, 1880: 104 ("Granville", Manche, France); 10 syntypes, MHNG.
- Helix canovasiana* Servain, 1880: 104 ("Saragosse" [= Zaragoza], Zaragoza, Spain); topotype, MHNG (15.2 × 10.2 mm).
- Helix mendranoi* Servain, 1880: 105 ("Saragosse" [= Zaragoza], Zaragoza, Spain); topotype, MHNG (11.6 × 8.8 mm).
- Helix blasi* Servain, 1880: 106 ("Badajoz", Badajoz, Spain); topotype, MHNG (8.7 × 6.0 mm).
- Helix subluteata* Servain, 1880: 109 ("Valence" [= Valencia], Valencia, Spain); topotype, MHNG (15.4 × 10.8 mm).
- Helix (Xerophila) ambli*a Westerlund, 1893: 32 ("Sevilla", Sevilla, Spain); lectotype (design. nov.), NHMG W1220 (8.9 × 6.4 mm [Westerlund gave different dimensions, namely 12 × 7 mm, but species name, type locality and collectors are correctly indicated on the label]).
- Helix terrosa* Locard, 1899: 103 ("Faro", Algarve, Portugal); lectotype (design. nov.), MNHN (9.0 × 6.4 mm) (fig. 5).
- Helix uberta* Locard, 1899: 125 ("Estoy" [= Estói], Algarve, Portugal); lectotype (design. nov.), MNHN (10.3 × 7.2 mm) (fig. 3).
- Helix finitimus*, Locard, 1899: 127 ("Faro", Algarve, Portugal; lectotype (design. nov.), MNHN (8.4 × 6.0 mm) (fig. 2).
- Helix lutulenta* Locard, 1899: 131 ("Faro", Algarve, Portugal; lectotype (design. nov.), MNHN (11.8 × 9.2 mm) (fig. 4).

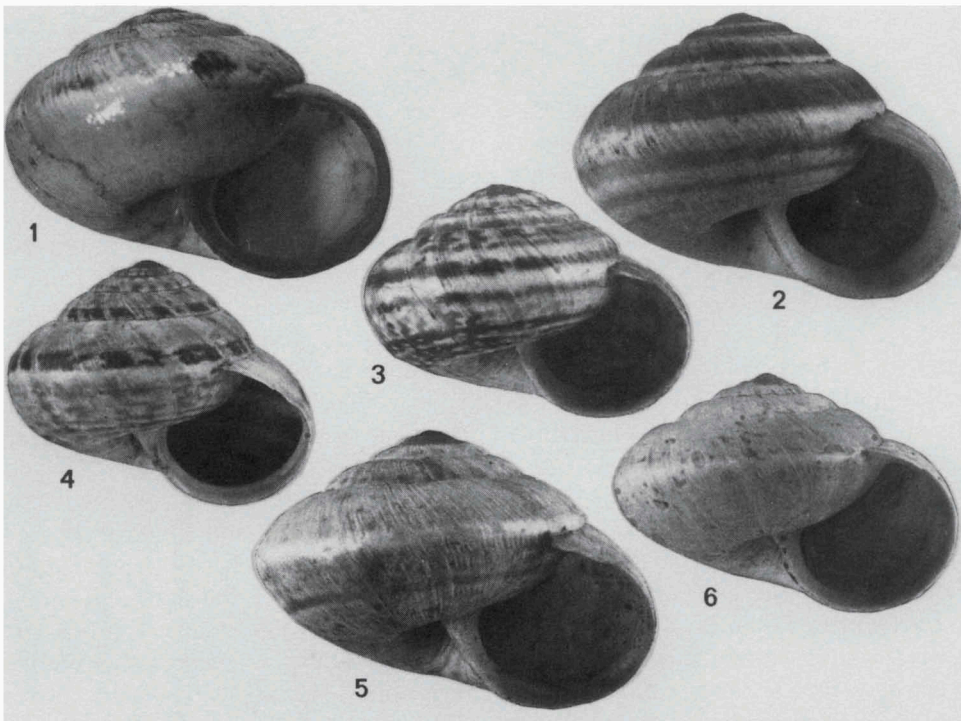
*Helicella (Xeromagna) submeridionalis*; Alonso, 1975: 19, pl. 4 fig. 2 (genitalia), map 2. Not *Helix submeridionalis* Bourguignat, 1863 [= nomen novum for *Helix meridionalis* Mousson, 1854 [= *Cerनुella jonica* (Mousson, 1854)], not Wood, 1828].

*Helicella (Xerocincta) neglecta*; Alonso, 1975: 18, pl. 3 fig. 1 (genitalia), map 2. Not *Helix neglecta* Draparnaud, 1805 [= *Cerनुella n.*]).

Shell.— The polymorphic shell is more or less globular, with a broadly conical spire, and whorls with irregular, fine to moderately prominent growth lines. The body whorl is evenly rounded or, less frequently, angulate (especially in comparatively small specimens, which may be relatively thick-walled). The umbilicus is rounded to slightly oval, its width is  $\frac{1}{6}$ – $\frac{1}{9}$  of the shell-width. The aperture is circular, rarely more oval (in very large specimens), and has a moderately thick internal rib. The shell is extremely variable in colour pattern. Usually there is a pattern of more or less interrupted brown or yellowish brown bands, varying considerably in width. Completely white shells are rare.

Height, 6–19 mm; width, 8–25 mm (Kerney & Cameron, 1979: 177).

Differentiation.— *Cerनुella virgata* may be confused with *Xerosecta promissa*, *X. reboudiana*, or even *X. cespitum arigonis* (A. Schmidt, 1853). However, its circular aperture, rounded umbilicus, rather fine sculpturing and comparatively high, conical



Figs. 1–6. *Cerनुella virgata* (Da Costa). 1, topotype of *Helix xalonica* Servain, Zaragoza, Spain (MHNG), actual width 11.3 mm; 2, lectotype of *Helix finitimus* Locard, Faro, Algarve, Portugal (MNHN), actual width 8.4 mm; 3, lectotype of *Helix uberta* Locard, Estói, Algarve, Portugal (MNHN), actual width 10.3 mm; 4, lectotype of *Helix lutulenta* Locard, Faro, Algarve, Portugal (MNHN), actual width 11.8 mm; 5, lectotype of *Helix terrosa* Locard, Faro, Algarve, Portugal (MNHN), actual width 9.0 mm; 6, topotype of *Helix castroiana* Servain, Sintra, Estremadura, Portugal (MHNG), actual width 13.3 mm.

spire with slightly convex whorls, generally enable its identification.

Genitalia.— Usually the epiphallus is about twice as long as the flagellum; the large dart-sac inserts at the genital atrium. For a more detailed description and illustrations of a series of genitalia of specimens of *C. virgata* from various localities, see Clerx & Gittenberger (1977: 41, figs. 69-94).

### *Xerosecta promissa* (Westerlund, 1893)

(figs. 7-17)

*Helix (Xerophila) promissa* Westerlund, 1893: 29 ("bei Sevilla", Sevilla, Spain); lectotype (design. nov.), NMG 894 (15.0 × 8.9 mm) (figs. 7-9).

*Helix omnivaga* Locard, 1899: 100 ("Lisbonne", Portugal); lectotype (design. nov.), MNHN (13.8 × 8.5 mm) (fig. 17).

*Helix salebrosa* Locard, 1899: 101 ("Lisbonne", Portugal); lectotype (design. nov.), MNHN (14.4 × 9.2 mm) (fig. 16).

*Helix superflexa* Locard, 1899: 102 ("Faro", Algarve, Portugal); lectotype (design. nov.), MNHN (12.6 × 7.5 mm) (fig. 14).

*Helix bipartita* Locard, 1899: 122 ("Lisbonne", Portugal); lectotype (design. nov.), MNHN (13.5 × 8.6 mm) (figs. 12, 13).

*Helix euglypha* Locard, 1899: 123 ("Lisbonne", Portugal); lectotype (design. nov.), MNHN (15.7 × 8.4 mm) (fig. 15).

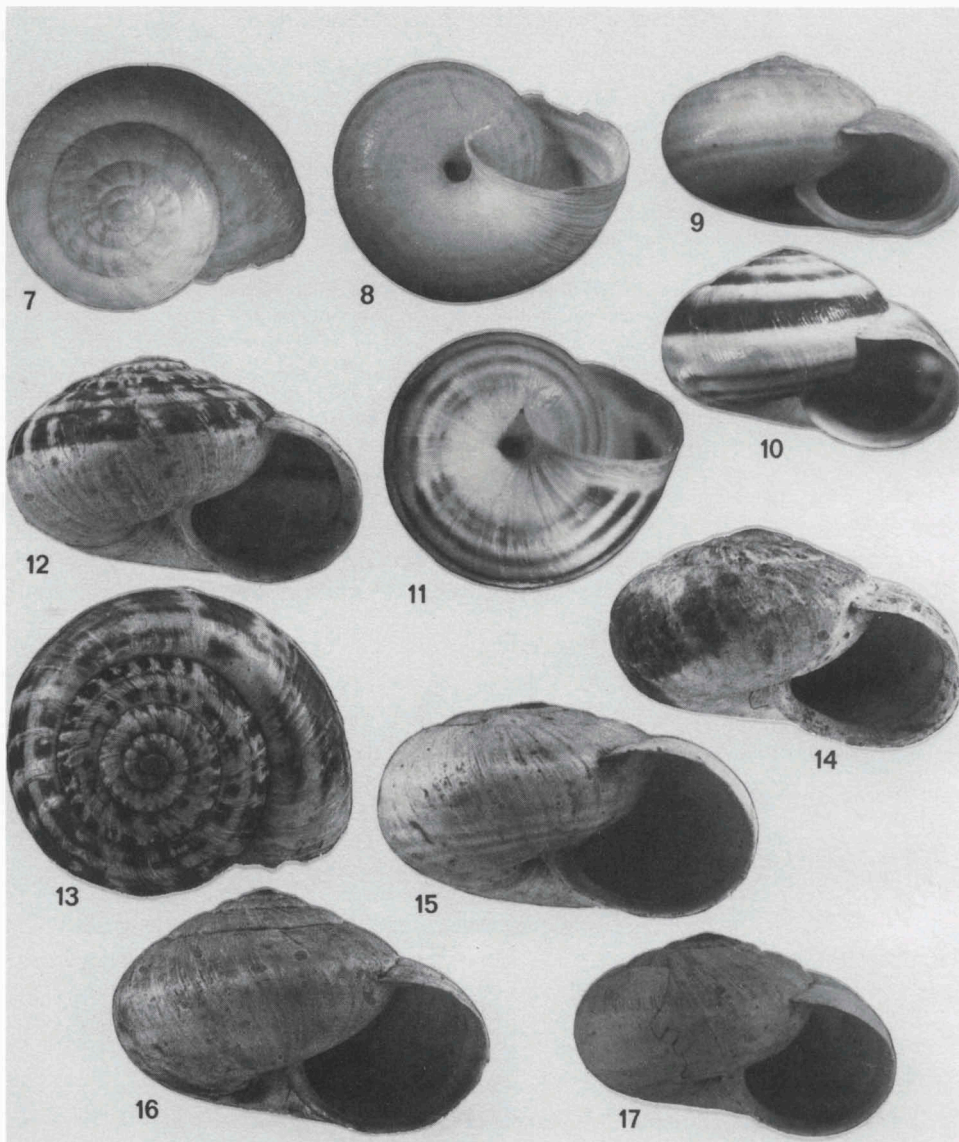
*Helicella (Xeromagna) subrostrata*; Ortiz de Zárate y López, 1950: 74, fig. 19 (genitalia), pl. 2 figs. 27, 28. Alonso, 1975: 20, 27, map 2. Not *Helix subrostrata* Férussac, 1821 [= *Helicella* s.].

Shell.— Shell usually more or less depressed, with a domed spire; initial teleoconch whorls flattened and sculptured with irregular fine to moderately coarse growth lines. The body whorl is evenly rounded at the periphery, sometimes somewhat angulate at its beginning; near the aperture it may be somewhat flaring. Individual shells may be more conical and specimens with (partly) more prominent and regular radial ridges occur as well. In small adult shells the umbilicus is usually strikingly oval, i.e. abruptly enlarged by the last part of the body whorl. In large specimens the umbilical shape is more variable and may be more rounded as well. The umbilical width is c.  $\frac{1}{7}$  of the shell-width. The aperture is elliptical, with a weak to moderately strong internal rib. The shell is very variable in colour-pattern, with homogeneous or more or less interrupted brown bands of various width; light bandless specimens are also known.

Height, 7.5-12.2 mm; width, 12.2-18.2 mm.

Differentiation.— *Xerosecta promissa* is not always easily identifiable conchologically. Confusion with *Cerņuella virgata* is most likely to occur, as has been pointed out by Ortiz de Zárate y López (1950: 74). In *X. promissa*, however, the shell is generally more depressed than in *C. virgata*, whereas the latter has a more circular aperture and a more rounded umbilicus. Specimens of *C. promissa* with coarse and rather regular transverse riblets may be difficult to distinguish from *X. reboudiana*. The latter species usually has more compact, dome-shaped shells, in which the body whorl contributes comparatively less to the total width of the shell, whereas its sculpture is coarser.

Genitalia.— See with *X. reboudiana*.



Figs. 7-17. *Xerosecta promissa* (Westerlund). 7-9, lectotype of *Helix (Xerophila) promissa* Westerlund, Sevilla, Spain (NMG 894), actual width 15.0 mm; 10, 11, Marbella, Málaga, Spain (RMNH), actual width 13.9 mm; 12, 13, lectotype of *Helix bipartita* Locard, Lisboa, Portugal (MNHN), actual width 13.5 mm; 14, lectotype of *Helix superflexa* Locard, Faro, Algarve, Portugal (MNHN), actual width 12.6 mm; 15, lectotype of *Helix euglyphia* Locard, Lisboa, Portugal (MNHN), actual width 15.7 mm; 16, lectotype of *Helix salebrosa* Locard, Lisboa, Portugal (MNHN), actual width 14.4 mm; 17, lectotype of *Helix omnivaga* Locard, Lisboa, Portugal (MNHN), actual width 13.8 mm.

***Xerosecta reboudiana* (Bourguignat, 1863)**  
(figs. 18-26)

*Helix reboudiana* Bourguignat, 1863: 212, pl. 21 figs. 19-30 ("Oran", Algeria); lectotype (design. nov.), MHNG (12.6 × 8.2 mm) (fig. 18).

*Helix comendadori* Servain, 1880: 101 ("Badajoz", Badajoz, Spain); topotype, MHNG (11.4 × 7.2 mm).

*Helix romulina* Servain, 1880: 72 ("Alluvions du Guadalquivir, à Séville" [flood rubbish of the Guadalquivir at Sevilla], Sevilla, Spain); topotype, MHNG (9.6 × 5.7 mm) (fig. 26).

*Helix specialis* Bourguignat, in Servain, 1880: 95 ("Badajoz", Spain); lectotype (design. nov.), MHNG (9.8 × 6.9 mm).

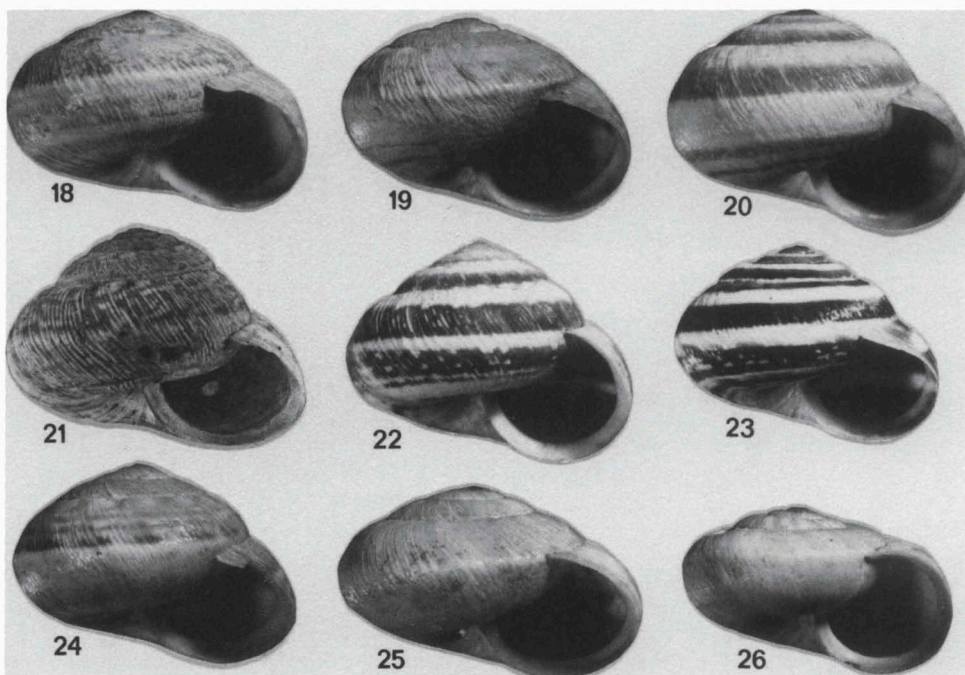
*Helix tarifensis* Bourguignat, in Servain, 1880: 94 ("Tarifa .. dans les anfractuosités des rochers le long du Rio Saldo" [Tarifa, in the crevices of the rocks along the river Saldo], Cádiz, Spain); lectotype (design. nov.), MHNG (11.0 × 6.6 mm) (figs. 24, 25).

*Helix vettonica* Servain, 1880: 106 ("Badajoz", Spain); topotype, MHNG (12.9 × 9.6 mm) (fig. 21).

*Helicella (Xeromagna) submeridionalis*; Ortiz de Zárate y López, 1950: 76, fig. 20 (genitalia). Not *Helix submeridionalis* Bourguignat, 1863: 214 (= nomen novum for *Helix meridionalis* Mousson, 1854, not Wood, 1828).

*Helicella (Xeromagna) reboudiana*; Ortiz de Zárate y López, 1950: 79, fig. 21 (genitalia). Alonso, 1975: 19, 27, pl. 4 fig. 1 (genitalia), map 2.

Description.— Shell globular, more or less depressed, with a domed spire; initial teleoconch whorls flattened and sculptured with irregular coarse radial lines, usually



Figs. 18-26. *Xerosecta reboudiana* (Bourguignat). 18, lectotype of *Helix reboudiana* Bourguignat, Oran, Algeria (MHNG), actual width 12.6 mm; 19, 20, Cerro de San Antón, 4 km NE of Málaga, Málaga, Spain (RMNH), actual widths, 12.5 mm and 13.0 mm; 21, topotype of *Helix vettonica* Servain, Badajoz, Spain (MHNG), actual width 12.9 mm; 22, Sierra Elvira, 12 km NW of Granada, Granada, Spain (RMNH), actual width 11.0 mm; 23, Maro, 3.5 km E of Nerja (RMNH), actual width 9.0 mm; 24, paralectotype of *Helix tarifensis* Bourguignat, Tarifa, Cádiz, Spain (MHNG), actual width 9.9 mm; 25, lectotype of *Helix tarifensis* Bourguignat (MHNG), actual width 11.0 mm; 26, topotype of *Helix romulina* Servain, Sevilla, Spain (MHNG), actual width 9.6 mm.

with many, irregularly distributed hair-scar-like indentations. Near the aperture, the body whorl is evenly rounded; at the beginning it may be somewhat angular at the periphery. The final quarter of the body whorl is not broadened disproportionately. The umbilicus is roundish to oval; its width is about  $\frac{1}{7}$  of the shell-width. The aperture is somewhat broader than high, broadly interrupted at the parietal side, and provided with a moderately prominent internal rib. The shell is very variable in colour-pattern, with homogeneous or more or less interrupted brown bands of various width; light bandless specimens are also known.

Height, 5.7-10.1 mm; width, 8.9-14.2 mm.

Differentiation.— See with *X. promissa*.

Genitalia.— According to Ortiz de Zárate y López (1950: 76), "*Helicella (Xeromagna) submeridionalis*" and "*Helicella (Xeromagna) reboudiana*" are very similar ("muy parecidas entre sí"), and both characterized in the structure of the genitalia by a flagellum that is shorter than the combined penis and epiphallus, in combination with 6-14 terminal digits of the glandulae mucosae. Additionally, the former taxon is said to differ from the latter one by a flagellum that is shorter than the epiphallus, which in turn is twice as long as the penis, and a long pedunculus of the bolsa copulatrix. For the latter taxon the flagellum is described as relatively longer, the epiphallus as relatively shorter and the pedunculus also as shorter. Preliminary data do not support this view of two species being distinguishable. Therefore, and because conchologically no distinction can be made, only a single species is accepted here. According to Ortiz de Zárate y López (1950: 66), "*Helicella (Xeromagna) subrostrata*" (= *Xerosecta promissa*) differs from this species, thus from *X. reboudiana*, by a flagellum that is longer than penis and epiphallus together, in combination with the presence of 15-20 terminal digits. It would be relevant to investigate the variation in these characters in series of specimens from various populations.

The two *Xerosecta* species can be distinguished from *Cerनुella virgata* most easily by the relatively smaller dart-sacs, inserting on the vagina (not the genital atrium).

Note.— The lectotype from Algeria cannot be distinguished from certain specimens from Spain. Therefore, the interpretation of Ortiz de Zárate y López (1950) is followed here. Anatomical data concerning material from Algeria are not available.

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