

A living fossil from Western Liguria: *Renea* (*Renea*)  
*bourguignatiana* NEVILL 1880  
(Prosobranchia: Aciculidae).<sup>1)</sup>

By

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With 1 textfigure and 1 plate.

**Abstract:** *Renea* (*Renea*) *bourguignatiana*, described as Pleistocene fossil by NEVILL (1880), has been found living in Italy, in the Gorges de St. Louis near Menton, a refuge site where several relic species are confined. *R. (R.) bourguignatiana*, which is the type species of *Renea* NEVILL 1880, is described in its anatomical and morphological details. The subdivision of *Renea* in *R. (Renea)* and *R. (Pleuracme)* is critically examined and appears by now not to be sufficiently supported.

Introduction.

Fossil shells of terrestrial molluscs are not frequently found, and the Pleistocene beds of Menton (French Maritime Alps), discovered and studied by G. NEVILL nearly a century ago, are in Liguria the richest in species. NEVILL (1880) found more than 60 species of fossil land shells, 14 of which were described as new. NEVILL himself (1880) found a few of these species still living and showing often a very restricted relic distribution, such as *Acicula* (*Platyla*) *foliniana* (NEVILL 1880), recorded only from the Gorges de St. Louis, near Menton.

Later on, POLLONERA described *Argna ligustica* (POLLONERA 1886) which is probably, according to GERMAIN (1930), a living form of *A. bourguignatiana* (NEVILL 1880); *Pagodulina austeniana* (NEVILL 1880) was found living and recorded from France (Hérault) and from several localities of the Alps (FORCART 1950; GITTENBERGER 1978, KERNEY, CAMERON & JUNGBLUTH 1983, BOATO, BODON & GIUSTI 1985, HOLYOACK & SEDDON 1985). Recently, these three species have been also found in the Vallone del Passo, beyond the Gorges de St. Louis, near Menton (province of Imperia, Liguria, Italy).

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In the same locality, beyond the entrance of the Gorges, at about 150 m a. s. l., a little basin surrounded by mesophilous woodland with *Ostrya carpinifolia*, *Quercus pubescens* and *Q. ilex*, collects the waters flowing down Cima Longoira. In this site, a rich population of living *Renea* has been found by us in the damp ground litter (4/2/1984, 16/3/1985). Judging from the shell features, which agree very well with the original description and figures, this population undoubtedly belongs to *Renea* (*R.*) *bourguignatiana*, described as Pleistocene fossil by NEVILL (1880).

*R. (R.) bourguignatiana*, which was chosen by NEVILL (1880) as the type species of the genus *Renea* NEVILL 1880, is here described in its morphological and anatomical details (the genus *Renea* was yet unknown from the anatomical point of view).

### *Renea (Renea) bourguignatiana* NEVILL 1880.

Pl. 1 figs. A-C.

1880 *Renea bourguignatiana* NEVILL, Proc. zool. Soc. London, 1879: 138-139, pl. 14 figs. 7, 7a, 7b.

1907 *Acme (Renea) bourguignati*, — KOBELT in ROSSMÄSSLER, Icon., (N. F.) 7: 15-16, T. 183 F. 1157.

1920 *Pleuracme (Renea) bourguignatiana*, — HESSE, Arch. Moll., 52: 89.

1931 *Pleuracme (Renea) bourguignati*, — GERMAIN, Faune de France, 22: 593, figs. 620-622.

1985 *Renea* (s. str.) *bourguignati*, — BOATO, BODON & GIUSTI, Lav. Soc. It. Biogeogr., (N. S.) 9: 347, tab. 1.

Original description: "Testa imperforata, elongata, omnino cylindrica, sat solidula, nitens, cornea, eleganter ac confertim costata; spira regulariter producta, apice laevigato, perobtusio; anfractus  $7\frac{1}{2}$ , convexusculi, sutura profunda separati, supremi  $2\frac{1}{2}$  laevigati, aut sculptura obsoleta, alteri fere aequales, perlente ac regulariter crescentes, anfract. ult. inferne distincte angulatus, superne prope suturam in scissuram terminans, laeviter sulcatulus, costis persinuatis, ad basim evanidis; apertura parva, verticalis, subquadrangularis, ad basim angustata, superne sinu profundo munita; perist. intus album, valde incrassatum, marginibus callo distincto junctis, externo quasi perconvexo ac medio introrsum prominente; columella superne sinuata, suberecta, inferne acute angulata" (NEVILL 1880). Type: Indian Museum, Calcutta.

### Morphological features.

Shell features: According to NEVILL (1880) the main feature characterizing this species is the slender, subcylindric shape of the shell, with  $6\frac{1}{2}$ - $7\frac{1}{2}$  almost flattened whorls and shallow sutures. The ribs on shell surface are very closely pressed and subequal (24-30 ribs on 1 mm). The colour is reddish-brown. Height 3.2-3.8 mm; breadth 1.1-1.2 mm.

The shell of *R. (R.) bourguignatiana* is similar to those of *R. (R.) bayoni* (POLLONERA) and *R. (R.) moutoni* (DUPUY), differing by both these species in the shape of the "pleuromoid sinus" which extends along the suture of the last whorl, departing from the outer lip. This notch is much deeper in *R. (R.) moutoni*, while it is shallow or nearly lacking in *R. (R.) bayoni*. Sexual dimorphism seems not to occur in *R. (R.) bourguignatiana*: no differences in shape of the shell are visible, and in the few specimens examined the shell of males only at times appears to be somewhat smaller and shorter.

Anatomical features: The body is nearly uncoloured; little dark chromatophores are present on the walls of the visceral hump and of the mantle. The visceral hump

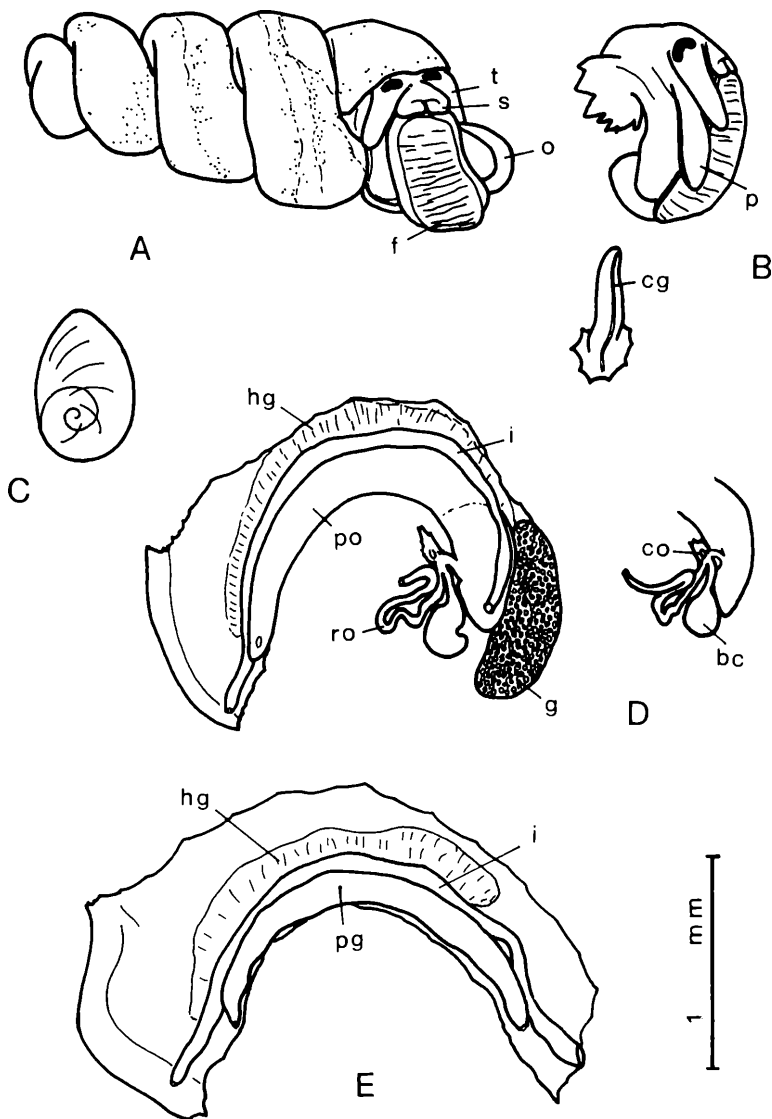


Fig. 1. *Renea bourguignatiana* NEVILL, anatomical characters. A: The body of a female specimen; B: the anterior portion of a male specimen and its penis; C: operculum; D: distal genital tract of two females and pallial structure of a male.

bc = Bursa copulatrix, cg = ciliated groove, co = copulatory opening, f = foot, g = gland anterior to kidney, hg = hypobranchial gland, i = intestine, o = operculum, p = penis, pg = prostate gland, po = pallial oviduct, ro = renal oviduct, s = snout, t = tentacle.

of *R. (R.) bourguignatiana* is elongated and composed of about five whorls. The upper ones, as usual, contain the gonad and digestive gland. The edge of the mantle, slightly sinuous, lacks of differentiated structures; tentacles are short and sub-triangular in shape. Ocular spots lie near the basis of tentacles, and the mouth opens at the end of a short snout. The well developed foot bears transversal ridges on its ventral surface. The operculum is very thin, horny, oligogyrous. The digestive system shows a short intestine, without loops, which extends along the mantle cavity to reach almost the mantle edge.

The male genital system comprises the testis, vas deferens, prostate gland and penis. The elongated prostata is closed, and it is followed by a ciliated groove which extends along the side of the head and the whole length of the ventral side of the penis. The penis lies near the right tentacle and has a subcylindrical shape. It lacks any additional structure.

The female genital system comprises ovary, renal oviduct, pallial oviduct, and a structure which may correspond to a bursa copulatrix (CREEK 1954; F. GIUSTI, pers. comm. suggests that this structure may function as a receptaculum seminis). The bursa is sack shaped and located at the end of a short, narrow duct. Such a duct joins the renal oviduct, which has the function of fertilization chamber (CREEK 1954), to form a short common duct which opens into the mantle cavity by means of a copulatory opening. The pallial oviduct too arises from the common duct and lies on the right side of the mantle cavity. It can be subdivided into two parts: the albumen gland and the capsule gland, which opens in the mantle cavity near its end.

The body plan of *R. (R.) bourguignatiana* is analogous to that of other proso-branch molluscs and it is structured similarly to other members of family Aciculidae. The male and female genital systems are rather identical to those of the few other species anatomically known, belonging to the related genus *Acicula*, namely: *A. (A.) fusca* (MONTAGU), studied by CREEK (1954) and *A. (Platyla) polita* (HARTMANN), studied by JACKIEWICZ (1967). The third genus of Aciculidae, *Menkia*, described by BOETERS, GITTENBERGER & SUBAI (1985), is known only from the shell.

### Taxonomical and biogeographical observations.

The genus *Renea* was described by NEVILL (1880) for *R. bourguignatiana* and *R. moutoni* (DUPUY 1849), the former being established as *typus generis* by the author himself. In 1894 KOBELT described the genus *Pleuracme*: type species, *P. spectabilis* (ROSSMÄSSLER). Later on, POLLONERA (1905) proposed the new genus *Caziotia* for the species *C. singularis* POLLONERA 1905, the latter being distinguished from the related species (*Renea* + *Pleuracme*, all considered by POLLONERA as belonging to the genus "*Acme*", group "*costulatae*"), by the presence of a so-called "respiratory pore" on the suture of the last whorl, near the peristome.

In a revision, HESSE (1920) subdivided the genus *Pleuracme* in three subgenera, namely:

- *Pleuracme* s. str., characterized by a greater shell (3-6.5 mm), without pleurotomoid sinus (notch), and with external callous rib behind the peristome.
- *Renea*, with slightly smaller shell (3-4 mm), showing a more or less pronounced notch near the suture of the last whorl, and without callous rib.
- *Caziotia*, like *Renea*, but with a "respiratory pore" behind the peristome.

HESSE (1920) considers as belonging to subgenus *Pleuracme* s. str.: *P. (P.) bayoni* (POLLONERA), *P. (P.) elegantissima* (PINI), *P. (P.) gentilei* (POLLONERA), *P. (P.) kobelti* (WAGNER), *P. (P.) letourneuxi* (BOURGUIGNAT), *P. (P.) pironae* (POLLONERA), *P. (P.) spectabilis* (ROSSMÄSSLER), *P. (P.) veneta* (PIRONA), as well as some fossil species. In *Renea* he includes *P. (R.) moutoni* (DUPUY) and *P. (R.) bourguignatiana* (NEVILL), oddly establishing the former, instead of the latter, as type species. Only one species, finally, was assigned to subgenus *Caziotia*: *P. (C.) singularis* (POLLONERA).

This subdivision was maintained by GERMAIN (1931) and ALZONA (1971), while GITTENBERGER & RIPKEN (1975) restored as generic name *Renea* NEVILL 1880 (a name older than *Pleuracme* KOBELT 1894), leaving unchanged the subgeneric division as established by HESSE (1920). This division may be probably explained by the choice of *R. moutoni*, which has very deep notch, as type species of *Renea* (HESSE, 1920).

On the other hand, comparing the true type species *R. (R.) bourguignatiana* and *R. (Pleuracme) spectabilis*, the main feature distinguishing the two subgenera *Renea* and *Pleuracme* appears only to be, beneath the shell sizes, the presence-absence of the external callous rib. In fact, the notch near the suture is present in both species and subject to slight variation within a population. In other species, as *R. (P.) bayoni* and *R. (P.) veneta*, the peristome nearly lacks of any sinuosity in its superior margin.

As far as the feature of the callous rib is concerned, however, it may be noted that such a rib is evident only in the type species of *Pleuracme*, *R. (P.) spectabilis*, where it appears like a smooth thickening, without any sculpture. In other species it is less developed (*R. (P.) veneta*) or completely lacking (*R. (P.) bayoni*). In these species the shell sculpture joins the edge of the peristome. Thus, a subgeneric division between *Renea* and *Pleuracme*, to be based only upon such a variable character, does not appear to be supported enough.

On the contrary, the third subgenus established by HESSE (1920), *Caziotia* POLLONERA 1905, may be by now enough characterized. It should be noted that the type species *Renea (Caziotia) singularis* is closely similar to *R. (R.) moutoni* as far as size, shape of the shell and mouth, ridges on the shell surface are concerned; the only distinguishing feature remains the structure of the "respiratory" aperture. In fact, the pleurotomoid sinus in *R. (R.) moutoni* is open, giving rise to a deep notch, while in *R. (C.) singularis* it is closed in the middle, by the fusion of the edge of the notch to the last whorl of the shell, and gives rise to the "respiratory pore". It would be of interest to study the anatomical and functional significance of these "respiratory" structures in the two species (see also GITTENBERGER & RIPKEN 1975), and to clarify possible affinities between them.

Although it is generally difficult to find living populations of the Aciculidae, the presence of *R. (R.) bourguignatiana* in other neighbouring localities of Southern France and Western Liguria may be rather excluded, since in several samplings of freshwater flood debris in these areas neither fresh nor subfossil shells of this species were ever found. Thus, *R. (R.) bourguignatiana* is probably to be considered a palaeoendemic, relic species. Several of these species have been preserved from extinction in refuge sites of the Southern Maritime Alps, by the less extreme climatic conditions which characterized this area, as the near Ligurian Alps, in the glacial period (see BOATO, BODON & GIUSTI, 1985).

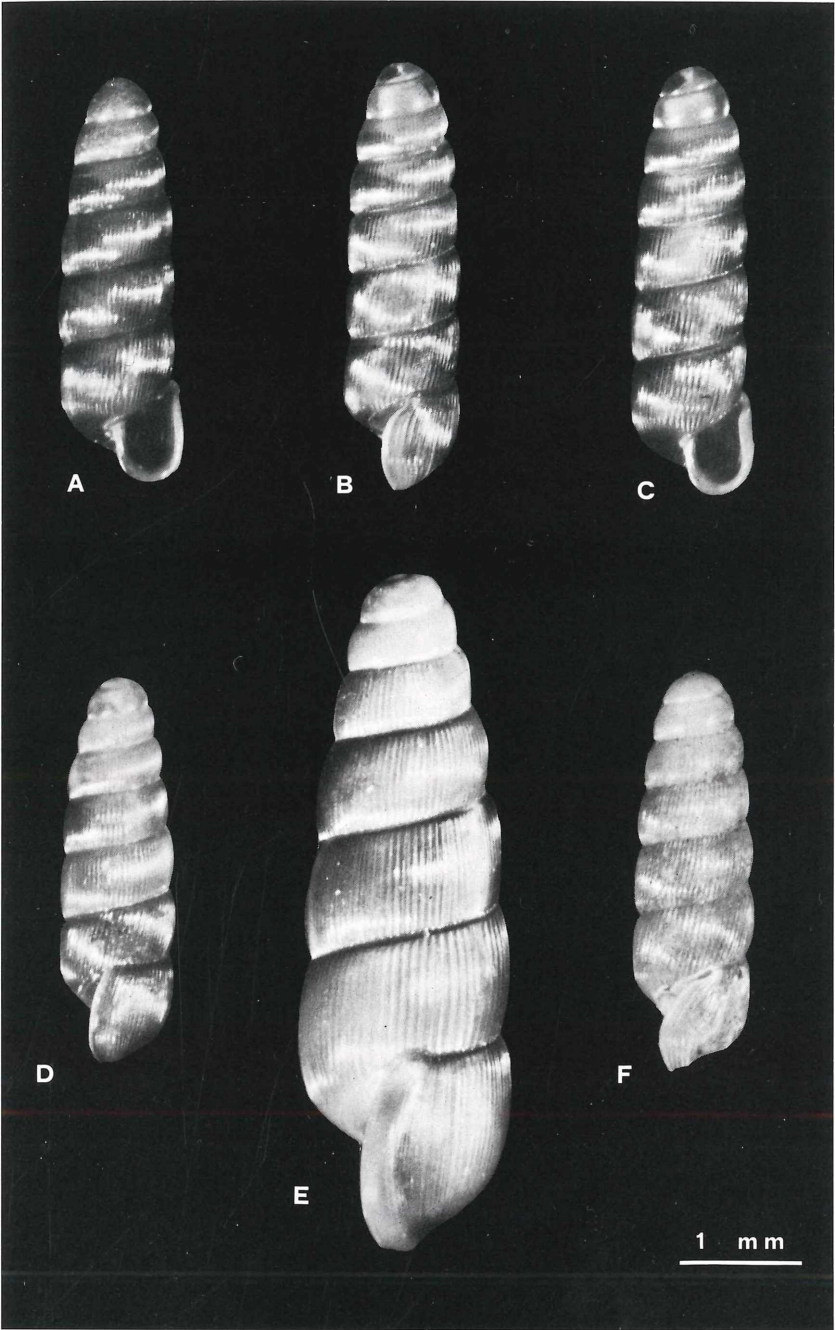
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## Explanation to plate 1.

- Figs. A-C. *Renea* (*Renea*) *bourguignatiana*.  
Vallone del Passo, Gorges de St. Louis (IM, Italy).
- Fig. D. *Renea* (*Renea*) *bayoni*.  
Rio Cornei (SV, Italy).
- Fig. E. *Renea* (*Renea*) *spectabilis*.  
Vedronza (UD, Italy).
- Fig. F. *Renea* (*Renea*) *moutoni*.  
Flood debris of Loup (Alpes Maritimes, France).  
Figured shells in collection BODON, Genova.



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