REDESCRIPTION OF *PLANORBIS AGRAULUS* BOURGUIGNAT, 1864 (GASTROPODA: PLANORBIDAE).

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Abstract *Syntypes of* Planorbis agraulus *Bourguignat, 1864 are compared with a recently collected* Planorbis *sp. which could be indentified as* P. agraulus, *too. So we can provide the anatomy of the species under discussion for the first time. Comparisons with data in the literature showed us that* P. agraulus *is possibly not in Italy and thus is not conspecific with* Planorbis moquini *Requien, 1848. So the question arose which* Planorbis *spp. live in Italy.*

Key words Planorbis agraulus, Planorbis moquini, *redescription, anatomy, syntypes*

INTRODUCTION

Planorbis agraulus Bourguignat, 1864 is only a poorly known species. Regarding Westerlund (1885: 78) *P. agraulus* occurs in Algeria, Sicily, and Sardinia. Germain (1908: 255) mentioned this species but synonymised it with *Planorbis numidicus* Bourguignat, 1864. More recent authors like van Damme (1984: 36) believes that "Conchologically *P. agraulus* Bgt., *P. numidicus* Bgt. and *P. brondeli* Raymond, recorded by Bourguignat (1864), are very similar and probably identical", while Brown (1994) did not mention this species and Kristensen (1985) neither.

P. agraulus seems to be a widespread species in the Mediterranean. Giusti (1968: 243) mentioned this species from many sampling sites in Montecristo, Algeria, Sicily, Sardagena, and Argentario and used the name *Gyraulus agraulus* for this species. Meier-Brook (1983: p. 36) pointed out that, regarding the anatomy depicted by Giusti (1968: 243), this species should be a member of the genus *Planorbis*. Later on, Giusti *et al.* (1995: 184) mentioned this species as a synonym of *Planorbis moquini* Requien, 1848 from the Maltese Islands. Thus it was believed that *Planorbis moquini* and *Planorbis agraulus* are conspecific and widely distributed in the Mediterranean region.

MATERIAL AND METHODS

The snails were collected with a sieve from the springs of the study area, ca. 25 km southeast of Guelma (Northeastern Algeria) (Fig. 1). The samples were put into 75% ethanol. The dissections and measurements of the genital organs and the shells were carried out using a stereo microscope (ZEISS); the photographs were made with a digital camera system (Leica R8).

To clear the taxonomic status of the *Planorbis agraulus* species described by Bourguignat we borrowed the syntypes from the Muséum d'Histoire Naturelle, Genève. Voucher specimens of recently collected material of *Planorbis agraulus* is stored in the Zoological Museum Hamburg (ZMH 51206).

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STUDY AREA

A characteristic feature of the majority of ponds in North Africa is their transient nature due to seasonal drought. North-Eastern Algeria and surrounding areas have a typical Mediterranean climate and a practically unexplored wetland complex.

RESULTS

In his paper of 1968 (243, Fig. 2) Giusti depicted the anatomy of *Planorbis agraulus* but not the shells. In 1995 Giusti *et al.* (185, Figs 125-127) depicted the anatomy but the prostate was missing in this figure though the prostate diverticula are a very important feature by which Planorbidae can be distinguished (Meier-Brook, 1976, 1983). The shell is not depicted by Giusti (1968) but by Giusti *et al.* (1995: 183, Figs 123-124) which looks distinct from *P. agraulus* from Algeria. Girod *et al.* (1980: 52, Fig. 29) depicted a drawing of the shell

Fig. 1 The habitats of the sampling sites. **1** Aïn Damous **2** Aïn Feïd-El-Bagrat (photos: S. Bouzid).

as well as the anatomy which is distinct from the drawing of Giusti (1968) as well as Giusti *et al.* (1995) because the phallotheca is shorter. Thus the identity of *Planorbis agraulus* is uncertain.

We compared syntypes of *P. agraulus* from Bourguignat's collection with a *Planorbis* sp. from two sampling sites of Algeria with the result that both are conspecific with *P. agraulus*. Thus we could study the anatomy of *Planorbis agraulus* for the first time and redescribe this species.

Among the lots of *Planorbis agraulus* of Bourguignat's collection one misidentified sample exists of which the species collected in Sicily is distinct from *G. agraulus*, but the shells are a little similar to *Gyraulus laevis* (Alder, 1838). The *Planorbis* spp. from Algeria and the Mediterranean region have often been confused with *G. laevis* but dissections revealed that the species from Mediterranean islands belong to the genus *Planorbis* (Meier-Brook 1983: 38).

Genus ***Planorbis*** O.F. Müller, 1773

Type species *Planorbis planorbis* (Linnaeus, 1758)

Planorbis agraulus Bourguignat, 1864

Type locality "Environs de Mostaghanem, dans les eaux tranquilles et un peu marécageuses."

Description The shell is dark horn-coloured, and the 3.5 – 4 whorls are regularly rounded with a deep suture. The first whorls are deep and the underside is wide umbilicated. With the rounded and swollen whorls the under side it resembles *Valvata cristata* O.F. Müller, 1774. The aperture is slightly ovate in the juveniles and becomes more ovate in adult shells (Figs 3.1, 3.2). The last whorl is a little descended. The diameter of the shell is 3.5 – 4 mm, and the height of the last whorl is 0.8-1.0 mm.

Animal The animal is dark grey, the mantle pigmentation is diffuse without any patterns.

Anatomy The prostate gland bears 18-24 diverticula, the penis sheath is up to twice longer than the praeputium, the proprostate duct is long, the bursa is sphaerical to elongate club shape with a relative long bursa duct.

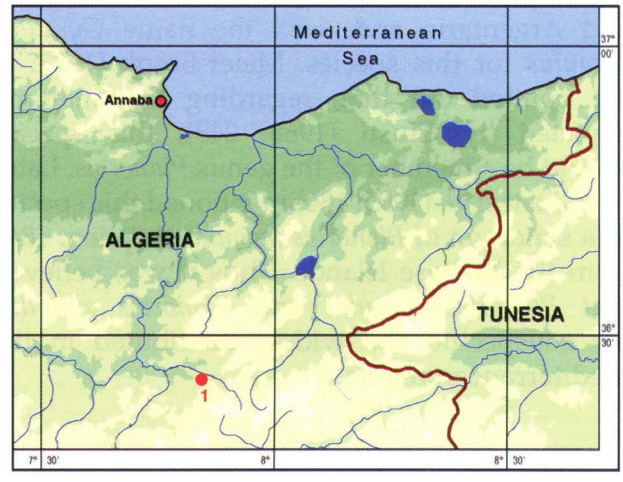

Fig. 2 The sampling sites of *Planorbis agraulus*. **1:** Aïn Damous (N 36° 25.350' E 007° 51.367', 523.34 m asl.) and Aïn Feïd-El-Bagrat (N 36° 25.555' E 007° 51.386', 323.70 m asl.).

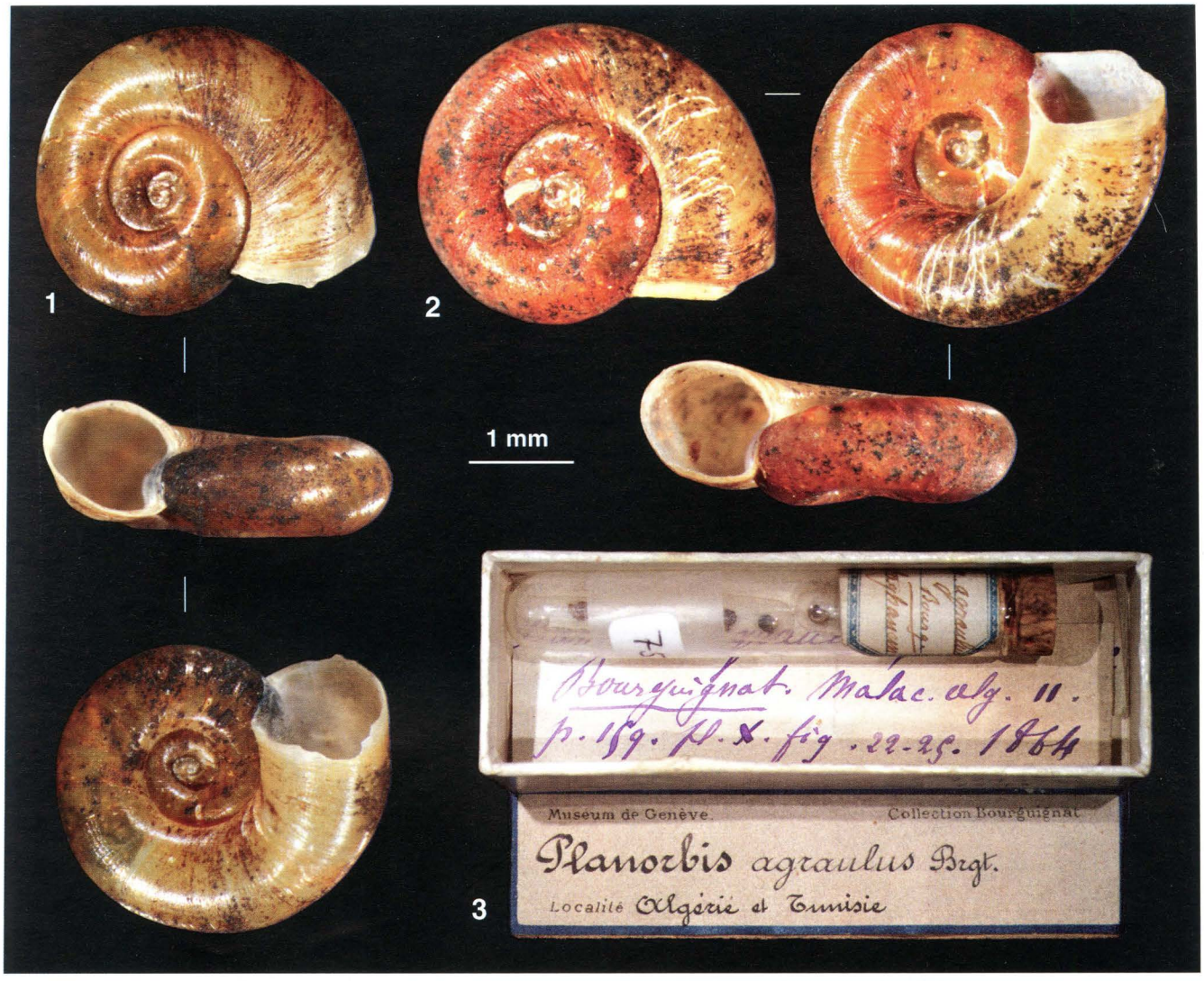

Fig. 3 Shells of *Planorbis agraulus* Bourguignat, 1864. **1-2** Syntypes, **3** Original lot of Bourguignat's collection (1:1).

DISCUSSION

Comparing the anatomy of *Planorbis agraulus* and the drawing of *Gyraulus agraulus* in Giusti (1968: 243, Fig. 2) it shows that both species are distinct. There are differences in the prostate diverticula (18-24 in *P. agraulus* vs. 10 in *G. agraulus* sensu Giusti) and the phallotheca of *G. agraulus* sensu Giusti is as long as the preputium, in *P. agraulus* it is twice longer. The drawing of *Planorbis agraulus* sensu Giusti *et al.* (1995: 185, Fig. 126) shows no prostate so the number of diverticula cannot be compared but the photographed shells of *Planorbis agraulus* sensu Giusti *et al.* (1995: 183) are obviously distinct from *P. agraulus* Bourguignat. Thus we can say that the *P. agraulus* from Montecristo and Maltese Islands are distinct from *Planorbis agraulus*.

Which small Planorbidae live in Italy is unknown. In Bourguignat's collection we found a misidentified *P. agraulus* collected in Madonie (Sicily). Maybe such a species has been confused with *G. laevis* (see Fig. 6) but the aperture of *G. laevis* is more circular than the aperture of *Planorbis* sp. from Sicily (Fig. 6).

In recent literature (Girod *et al.* 1980, Giusti *et al.* 1995, Cossigniani & Cossigniani 1995) only *Planorbis moquini* (Requien, 1848) of the small *Planorbis* spp. is mentioned from Italy. Regarding Giusti *et al.* (1995: 184) *Planorbis agraulus* is a junior synonym of *Planorbis moquini*. Considering the anatomy of *P. agraulus* (Fig. 5) we can state that *P. agraulus* is not a synonym of *P. moquini*, if the *Planorbis* sp. in Italy is conspecific with *P. moquini* in fact.

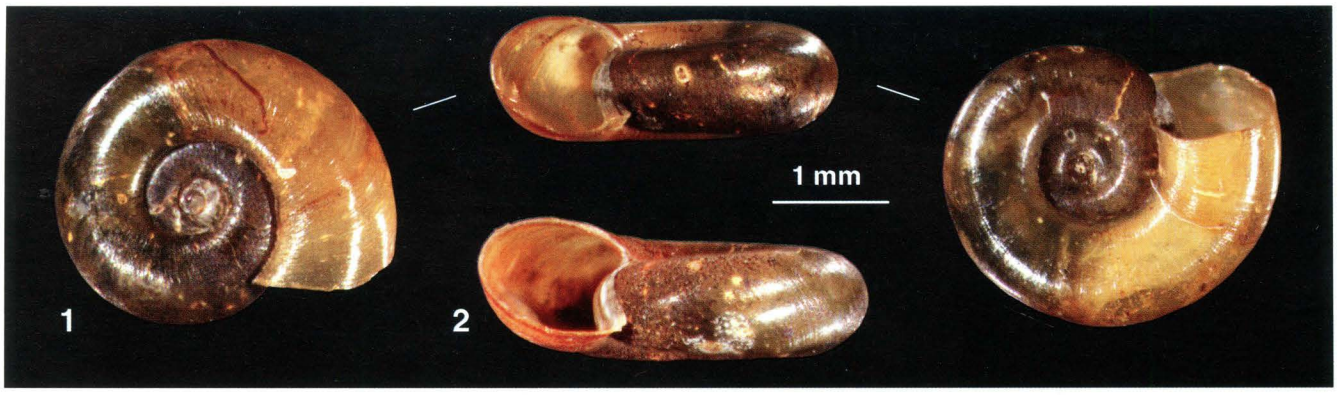

Fig. 4 The shell of *Planorbis agraulus*. **1-2** *P. agraulus* from Aïn Feïd-El-Bagrat, Algeria (leg. S. Bouzid, 24.08.2006).

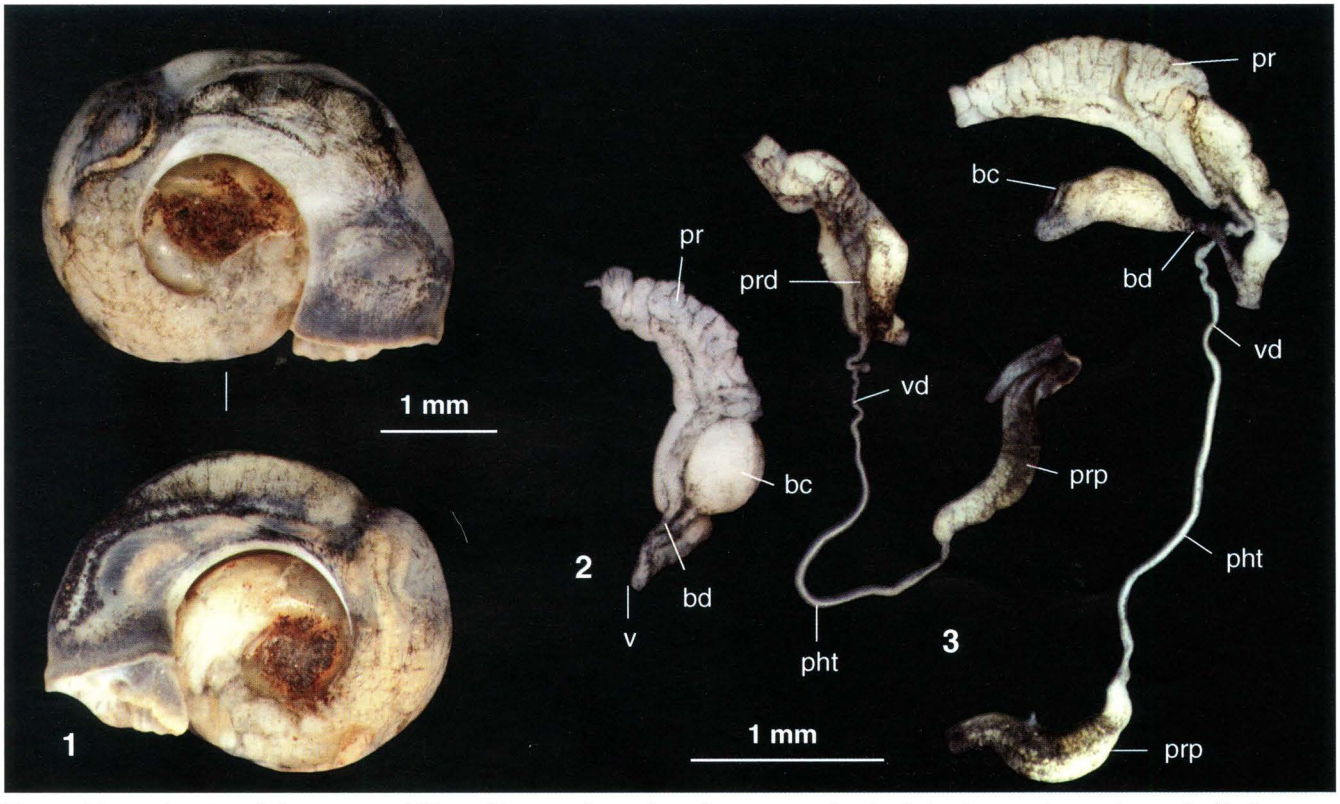

Fig. 5 The animal and Anatomy of *Planorbis agraulus*. – bc = bursa copulatrix, bd = bursa duct, pht = phallotheca, pr = prostata, prd = prostata duct, prp = praeputium, st = stylet, vd = vas deferens, v = vagina.

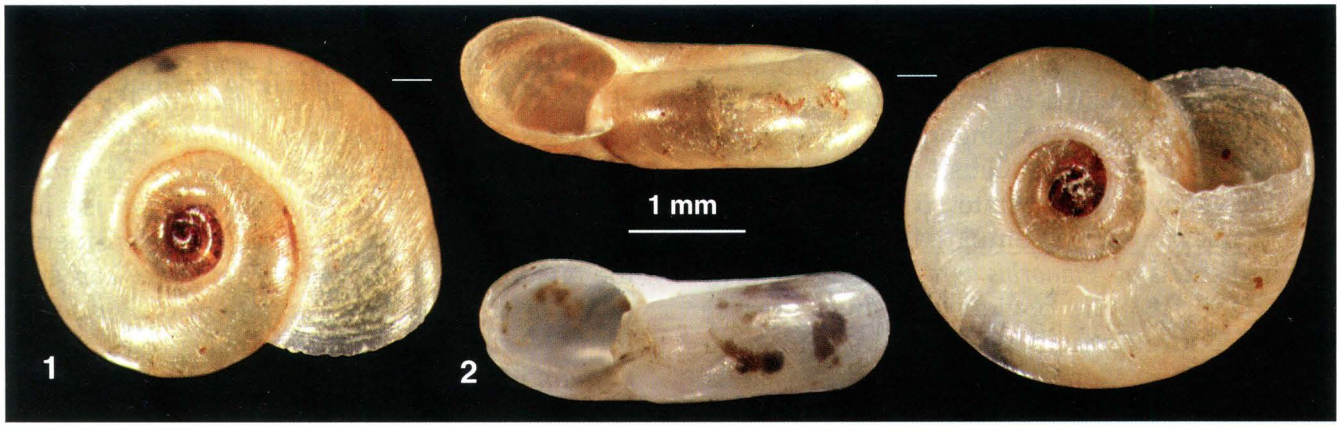

Fig. 6 *Gyraulus laevis* and *Planorbis* sp. from Sicily. **1** *Planorbis* sp., **2** *Gyraulus laevis*. (Hamburg, Germany)

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