



## On the occurrence of *Atys macandrewii* E. A. Smith, 1872 (Gastropoda: Haminoeidae) in the Mediterranean

### Sobre la presencia de *Atys macandrewii* E. A. Smith, 1872 (Gastropoda: Haminoeidae) en el Mediterráneo

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#### SUMMARY

The presence of the cephalaspidean species *Atys macandrewii* E.A.Smith, 1872 is reported from the Mediterranean for the first time. The species is compared with the other *Atys* species occurring in the area.

#### RESUMEN

Se cita el cefalaspídeo *Atys macandrewii* E.A.Smith, 1872 por primera vez para el mar Mediterráneo y se compara con otras especies del género que habitan en el área.

KEY WORDS: Cephalaspidea, taxonomy, geographical distribution, *Atys macandrewii*.

PALABRAS CLAVE: Cephalaspidea, taxonomía, distribución geográfica, *Atys macandrewii*.

#### INTRODUCTION

The cephalaspidean Family Haminoeidae is represented in the Mediterranean by three genera: *Haminoea* Turton and Kingston, 1830, *Atys* Montfort, 1810, and *Weinkauffia* Monterosato, 1884 ex Adams A. ms., with a total of some 13-15 species. Of these the genus *Atys* has been traditionally considered as being represented by the species *A. blainvilliana* (Récluz, 1843), *A. brocchii* (Michelotti, 1847) and *A. jeffreysi* (Weinkauff, 1868). The last mentioned taxon is certainly the commonest and best known of these three, occurring in various Mediterranean stations, usually in infra to circalittoral waters. The other two taxa are not well known. Indeed there are even doubts as to their specific

validity and, in the case of *Atys brocchii*, of its occurrence as a Recent species. *Atys angustatus* E. A. Smith, 1872, an invader from the Red Sea has also been reported from the Eastern Mediterranean (VAN AARTSEN AND GOUD, 2006). Another allied species is *Weinkauffia turgidula* (Forbes, 1844). This too is a well known and common cephalaspidean, often occurring with *Atys jeffreysi*.

#### MATERIAL AND METHODS

Whilst examining shell samples in our collections collected from various stations around the Maltese Islands and from other Mediterranean localities, we recently came

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across a species of *Atys* which could not be identified with any of the known Mediterranean species. Further research in the literature led us to identify this as *Atys macandrewii* E. A. Smith, 1872.

Fresh dead shells of various sizes were found on both the eastern and western seaboard of Malta, on the beach, in littoral shallows and in off-shore lower infralittoral depths (to c. 60m) on different dates during 2005-06. However it would seem that this species was overlooked for the Mediterranean malacofauna. Examining samples of *Atys jeffreysi* collected locally in 1990, we came across a few other specimens of *Atys macandrewii* mixed up with them, one of which with dried soft parts. Finally in November 2006, a few live specimens were found from off Gnejna Bay (60 metres) from a muddy-sand bottom with dead leaves of *Posidonia*.

#### Material studied

MALTA: Salina Bay, in biocladistic sand from 4m, 1 shell, xii-1990 coll. C. Mifsud; off Fomm ir-Rih Bay, in sand and weeds from 60m, 5 shells (one with dried soft parts), viii-1990 coll. C. Mifsud; Bahar ic-Caghaq Bay, beached, 1 shell, iv-2005 coll. C. Cachia; off Rdum id-Delli: 12 shells in biocladistic sand and weeds from 60m, x-2006 coll. C. Cachia; off Gnejna Bay, 60m, in muddy sand and dead leaves of *Posidonia oceanica* (Linnaeus) Delile, 14 live specimens and 30 shells, xi-2006 coll. C. Mifsud.

CANARY ISLANDS: Lanzarote, Puerto del Carmen, 8 shells (leg. W. Engl), coll. C. Mifsud.

ITALY: Sicily, Messina, Villagio Pace, 6 shells, Coll. C. Bogi.

ISRAEL: Tel Aviv, 1 shell, coll. C. Bogi.

The size of the shells ranges from 2 mm to 6.7 mm (largest specimen) in height.

#### DISCUSSION

SMITH (1872: 346) described his new species on the basis of empty shells from the Canary Islands, collected in Lanzarote, Canary Islands, by Macandrew, to whom the species is dedicated (origi-

nal spelling as *M'Andrewii*). Smith's original description is as follows;

*"A. testa elongato-ovata, superius truncata, pellucida, fasciis angustis numerosis lacteis et medio una latiore cincta, transversim superne basique distanter striata, interstitium laeve, vertex excavatus, margine aliquanto acuto circumdatus; apertura angusta, super verticem parum producta, basi sensim paululum dilatata et effusa, labrum tenue verticis medio junctum et ibi sinuatum; columella brevis, incrassata, haud torta; umbilici regio leviter perforata. Long. 5 mill. diam. 2 mm."*

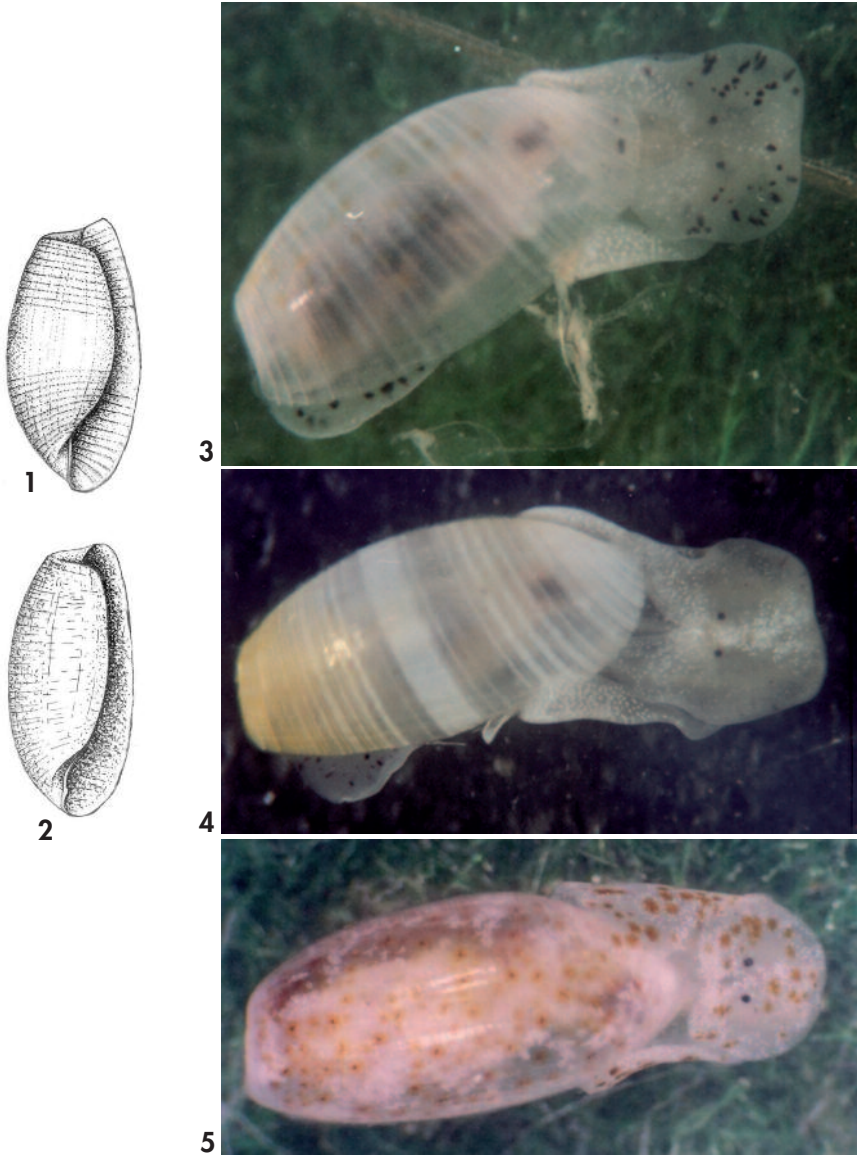
To facilitate identification, we here redescribe the species based on the specimens which we have found:

Shell thin, rather fragile, oval and elongate in overall aspect, very glossy white and a little transparent, with milky white bands. Sculpture of 8-12 rather regularly spaced, spiral striae, adapically, and another 11-12 abapically, the middle section being plain (we found this feature rather variable in our material) with very fine and dense growth lines. Aperture narrow and elongated, becoming wider abapically. Columella vertical, a little thickened, without a fold or twist and with an elongated, rather chink-like umbilicus behind it. Apex perforated. Outer lip plain inside, thin, a little higher than the spire, and joining the centre of the vertex. Maximum shell size encountered: 6.7mm.

COLLIN, DIAZ, NORENBURG, ROCHA, SÁNCHEZ, SCHULZE, SCHWARTZ AND VALDÉS (2005) described the animal of Caribbean specimens of *Atys macandrewii* as follows;

*"Body elongate with a short cephalic shield posteriorly divided and two short parapodia covering anterior end of shell. Colour variable, whitish with black pigment of cephalic shield and parapodia, viscera brownish. Up to 8mm long"*.

A more detailed discussion of the animal with photos of the radula, jaw and gizzard plates is given by MARTÍNEZ AND ORTEA (1998). The ground colour as described by these authors is transparent white with scattered opaque whitish spots. In the live specimens in our study, the animal is



Figures 1. Shell of *Atys macandrewii*, specimen from Rdum id-Delli, 60 metres, size 5.1 mm, viii-2006. Figure 2. Shell of *Atys jeffreysi*, specimen from Salina Bay, 3 metres, size 7.1 mm, vii-1974. Drawings by C. Cachia. Figures 3, 4. *Atys macandrewii*, Malta, off Gnejna Bay, 40 m, xi-2006. 3: animal with black freckles on oral shield and mantle, shell size 4.5 mm; 4: animal without black freckles on oral shield, shell size 5 mm. Figure 5. *Atys jeffreysi*, Malta, off Fomm ir-Rih Bay, 30/40m, size 6 mm, viii-1996. Figures by C. Cachia, photos by C. Mifsud.

Figura 1. Concha de *Atys macandrewii*, ejemplar de Rdum id-Delli, 60 metros, 5,1 mm, viii-2006. Figura 2. Concha de *Atys jeffreysi*, ejemplar de Salina Bay, 3 metros, 7,1 mm, vii-1974. Dibujos de C. Cachia. Figuras 3, 4. *Atys macandrewii*, Malta, frente a bahía de Gnejna, 40 m, xi-2006. 3: animal moteado de negro en el escudo oral y en el manto, tamaño de la concha 4,5 mm; 4: animal sin el moteado de negro en el escudo oral, tamaño de la concha 5 mm. Figura 5. *Atys jeffreysi*, Malta, frente a bahía de Fomm ir-Rih, 30/40 m, tamaño 6 mm, viii-1996. Figuras de C. Cachia, fotos de C. Mifsud.

also transparent white, with dense pigments of opaque white spots and scattered black freckles all over the body. A few specimens lacked the black freckles on the head shield, but these were present on the posterior mantle flap (also called a false tail).

The associated living molluscan fauna found with our specimens included:

*Chamelea gallina* (Linnaeus, 1758)  
*Spisula subtruncata* (Da Costa, 1778)  
*Nuculana pella* (Linnaeus, 1767)  
*Pandora pinna* (Montagu, 1803)  
*Abra prismatica* (Montagu, 1808)  
*Tellina donacina* Linnaeus, 1758  
*Cryptonatica filosa* (Philippi, 1845)  
*Euspira macilenta* (Philippi, 1844)  
*Nassarius mutabilis* (Linnaeus, 1758)  
*Bittium latreillii* (Payraudeau, 1826)

*Atys macandrewii* is an amphiatlantic species, having been recorded from the Louisiana coast (USA), Costa Rica, the West Indies, Brazil, the Canary Is., Madeira and the Cape Verde Is. (MARTÍNEZ AND ORTEA, 1998) and the Azores (NORDSIECK, 1972; MIKKELSEN, 1995). The species is not cited in the Mediterranean species lists of PIANI (1980) CATTANEO-VIETTI AND THOMPSON (1989) and SABELLI, GIANNUZZI-SAVELLI AND BEDULLI (1990), neither is it mentioned by PEÑAS, ROLÁN, LUQUE, TEMPLADO, MORENO, RUBIO, SALAS, SIERRA Y GOFAS (2006) for Alborán Island. To our knowledge, it appears that this finding is the first one for the Mediterranean Sea.

In its general appearance, the shell of *Atys macandrewii* (Fig. 1) resembles that of *Atys jeffreysi* (Fig. 2), but principally differs from that species in the following:

1. its few spaced spiral striae on either end of the shell with a smooth median section;
2. its straight vertical columella without a fold;
3. its milky white bands. The latter character is not always apparent especially in dead collected specimens.
4. the colour patterns of the animals (Figs. 3-5).

We do not know *Atys brocchii* nor *Atys blainvilliana*. According to PRUVOT-FOL

(1954: 77) the former has a "cylindrical oblong shell with a fold on the columella and a sculpture of fine spiral striae" whereas the latter taxon likewise has "a cylindrical oblong shell which is slightly convex in its middle section. It is milky white, shiny, and very smooth. The outer lip extends quite higher than the apex. At the shell's extremities there are striations, the marginal ones being more incised." From these descriptions both species are clearly differentiated from *Atys macandrewii*. *Weinkauffia turgidula* has a sculpture which is rather similar to that of *Atys macandrewii*. However that species has an oval-oblong shell (not regularly oval-cylindrical as in *macandrewii*) and a clear tooth or fold on the columella. Its animal (PRUVOT-FOL, 1954; MIFSUD, 2000) is yellowish and maculated red-brown, again different from that of *Atys macandrewii*.

Separating specimens from our material from that of *Atys angustatus* E.A. Smith, 1872, an Indo-Pacific species recently recorded as a migrant in the Eastern Mediterranean by VAN AARTSEN AND GOUD (2006), is rather problematic. These authors have not considered *Atys macandrewii*. Their identification was based on the study of the type material of *Atys angustatus* housed in the Natural History Museum (London) and of fresh shells from Haifa Bay, Israel. *Atys angustatus* was described by Smith exactly following *Atys macandrewii* on the same page of his 1872 work. Though we did not see any type material of *angustatus*, we were able to examine a single shell from the Mediterranean coast of Israel (of the presumed *Atys angustatus*) and we believe that this belongs to the same species as our material. Moreover, we compared a few shells of *A. macandrewii* from the type locality, Lanzarote, and could not detect any differences with our material or with that collected at Messina.

## CONCLUSIONS

Judging from the images of the lectotype of *Atys angustatus* and the specimen identified as such from Haifa, Israel (in VAN AARTSEN AND GOUD, 2006) we could

notice some differences between the lectotype and that of the Haifa shell.

Although both shells lack the spiral milky white bands (probably due to their age);

1. the shell aperture of the lectotype seems to be slightly broader.

2. the base of the outer lip is more rounded and ends abruptly, while in that of the Haifa specimen it is extended and reflected outward (as in all of our study material)

3. the columella is taller, with a slightly more conspicuous umbilical chink.

Knowing that the separation of species from this genus from shells alone is very problematic, we have also based our identification on the animal's colour patterns which correspond in all respects to those of MARTÍNEZ AND ORTEA (1998), COLLIN *ET AL.*, (2005) and ROLÁN (2005). Unfortunately, the animal of *angustatus* is as yet unknown.

Noticing the dates of collection of some samples in our collections, it is evident that the species has been present, but unnoticed in Maltese waters for quite some time. Also, judging from the number of specimens found so far, we can perhaps say that the present species is rather frequent in Maltese waters. COLLIN *ET AL.*, (2005) cite the species as uncommon, though abundant at Bocas del Toro (Panama). MALAQUIAS, MARTÍNEZ AND ABREU (2002) examined two live specimens from 18-22 m and 19 empty shells from Madeira and the Selvagens Islands.

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MARTÍNEZ AND ORTEA (1998) found 9 empty shells and 4 specimens from the Canary Is. and another 18 specimens from the Cape Verde Archipelago. Rolán (2005) reports it as common in muddy bottoms from 8-30m depth at the Cape Verde Islands. Depth and size data in all these findings agree well with those for our specimens. Finally, from the material we examined, it would appear that this species offers a little variability, this being mainly restricted to the presence or absence of the black freckles on the body of the animal, the width and disposition of the milky white bands, the number of spirals on the shell and, finally, to a slight height to diameter ratio (H/D) difference between specimens.

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