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ON SOME ALIEN TERRESTRIAL AND FRESHWATER GASTROPODS (MOLLUSCA) FROM MALTA

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ABSTRACT

Nine species of gastropod molluscs: *Otala lactea* (O. F. Müller, 1774); *Cernuella virgata* (da Costa, 1778); *Cochlicella barbara* (Linnaeus, 1758); *Oxychilus helveticus* (Blum, 1881); *Succinea putris* (Linnaeus, 1758); *Oxyloma elegans* (Risso, 1826); *Helisoma duryi* Wetherby, 1879; *Planorbarius corneus* (Linnaeus, 1758); and the limacid slug *Lehmannia valentiana* (A. Férussac, 1822) are recorded for the first time as alien species from local plant nurseries. For each species a short description and notes on distribution and ecology are given.

INTRODUCTION

The land and fresh water Mollusca of the Maltese Islands have been recently well treated by Giusti *et al.* (1995). However, during the last twelve years many non-indigenous plants, shrubs and trees, both decorative species and fruit trees, have been imported from Europe either to embellish local gardens or roadsides or for agricultural purposes. It occurred to the authors that there is the possibility that alien species of molluscs might have been introduced accidentally with these imported plants. This is not a completely new phenomenon. For example, *Pomatias elegans* and *Discus rotundatus* occur at San Anton Gardens were they were probably alien introductions due to human activities (Thake, 1973).

During recent research to assess the status of some of the endemic molluscs of the Maltese Islands, with special emphasis on the Limacidae, areas where imported plants are stocked were searched for any alien species. This resulted in the discovery of several alien species of terrestrial and freshwater snails, a few of them alive. Most of these species were found in private nurseries belonging to different local plant and flower importers.

MATERIALS AND METHODS

Several visits to plant nurseries were carried out by the authors during winter and spring of 2002/3. Searches were made on the trunks of imported trees, at the bases of flower pots, on the foliage of plants and in leaf litter found amongst the pots. Live specimens and empty shells were collected and later cleaned for examination and identification. On subsequent examination it was noticed that amongst the collected material, which also included local species, there were a few shells and live specimens which seemed new to the Maltese malacofauna.

The species *Otala lactea* was previously recorded from Malta from shells discarded by ships' crews over 120 years ago (Feilden 1879). Two species, *Helisoma duryi* Wetherby, 1879 and *Oxyloma elegans* (Risso, 1826) were already previously cited by Giusti *et al.* (1995). The former as Recent at Wied il-Luq at Buskett, although not recorded for a long time now, and the latter from fossil material collected from Wied tal-Bahrija. A third species, *Cernuella virgata* (da Costa, 1778) is known from the Maltese Islands from a few shells present in two foreign collections (Mienis, 1989; Beckmann, 1992) but has not been recorded for almost a hundred years. Three specimens of *Lehmannia valentiana* (Férussac, 1822) were recorded from a hotel at Msida in April 1986 (Beckmann, 2003). Most probably these originated from some imported plants used to embellish the hotel gardens. All the other alien species are recorded from the Islands for the first time. All collected material is deposited in the authors' collections.

Abbreviations used: CM. - Constantine Mifsud (Rabat, Malta); PS. - Paul Sammut (Rabat Malta); CC. - Charles Cachia (Qormi, Malta); CS. - Charles Sammut (Rabat, Malta); coll. - collection.

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SPECIES LIST

Family Helicidae

Subfamily Helicinae

***Otala lactea* (O. F. Müller, 1774)**

Otala lactea (live)

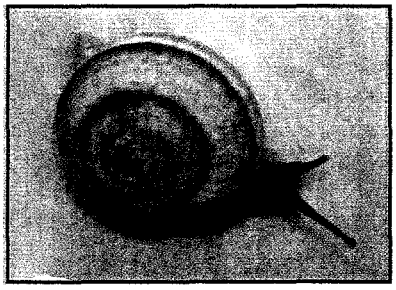
Material studied: 7 live specimens and 5 shells (coll. CM); 1 live specimen (coll. CC); 10 shells (coll. PS); 4 shells (coll. CS). All material collected from "Flower Power" plant nurseries, Mosta.

Shell helicoidal rather depressed and thin walled, with 4-5 whorls. There is no sculpture, but the whorls are ornamented with spiral, wide, brown bands which are usually interrupted with white coloured growth lines. Outer lip thin, and stiffened by the reflected edge. There is no umbilicus and the columellar callus and the shell interior are coloured dark brown or black. The animal has a dark grey or black head and body with the underside of the foot yellow.
Size of shell: height = 20mm., width =35mm.

The several empty shells and live specimens were found amongst the flowerpots and attached to the walls of greenhouses belonging to the 'Flower Power' plant nursery, near Mosta. Giusti *et al.* (1995) include *Otala lactea* with the doubtful species for the Maltese Islands adding, that Feilden's record could represent a misidentified *Eobania vermiculata* (O. F. Müller, 1774). The species could be confused with the local *Cantareus aspersus* (Müller, 1774) because of the coloration of the shell and with *Eobania vermiculata* (O. F. Müller, 1774) because of the flared outer lip. It may have been introduced with plants imported from Spain. *Otala lactea* has a distribution ranging from Southern Portugal, Southern Spain, the Balearic Islands and Morocco in North Africa. Elsewhere, including in northern Europe, this is a common greenhouse pest which has also reached the American continent.

Subfamily Hygromiinae

***Cernuella virgata* (da Costa, 1778)**



Cernuella virgata (live)

Material studied: 1 live specimen (coll. CM); 1 shell (coll. PS).

Shell globular with a high spire and from 5-6 convex whorls. Sutures moderately deep, growth lines opisthocline. Umbilicus narrow, sometimes partly covered by the columellar callus. Aperture round, stiffened by an internal rib or ridge. The shell colour is very variable but is usually white or cream with dark brown spiral bands.
Size of shell: height = 10mm., width = 25mm.

One aestivating specimen and a freshly dead shell were found by one of us (PS) attached to the trunk of an olive tree originating from Portugal and donated to the National Natural History Museum at Mdina. The species was also recorded previously from these Islands by Mienis (1988) from three specimens belonging to the former Wintle collection housed at the mollusc collection of the Zoological Museum at the Hebrew University of Jerusalem and originally collected from Valletta by Despott. In the O. von Moellendorff collection housed at the Senckenberg Museum in Frankfurt there are five shells of this species collected from Malta "in the last [19th.] century" (Beckmann, 1992). It is also known from fossil material from Gozo (Giusti *et al.*1995). The species has a Mediterranean and Western European distribution but has also been recorded from the British Isles, Belgium and the Netherlands.

Subfamily Ciliellinae

***Cochlicella barbara* (Linnaeus, 1758)**

Cochlicella barbara (live)

Material studied: 2 live specimens and 1 shell (coll. CM); 1 shell (coll. CC); 1 shell (coll. CS). All material collected from Zammit Nurseries, Qormi.

Shell an elongated cone of 7-8 slightly convex and thick whorls. It has a white basic colour and is ornamented with brown spiral bands or patches. Fresh shells have a thin yellow periostracum. The protoconch is brownish. The growth lines are opisthocline and rough, sometimes resembling axial ribs. The sutures are shallow. The umbilicus is

partly hidden by the columellar callus. The aperture is elliptical and the outer lip is thin and lacks a varix. The animal is greyish-blue in colour. Size of shell: height = 10mm., width = 5mm.

The two live specimens and the two empty shells were found among the leaf litter near flower pots at Zammit Nurseries, Qormi. This is a Mediterranean species usually found near the sea shore, especially on dunes. Here it may have been introduced with plants imported from France, where it seems to be very common. Besides the Mediterranean, the species has been found in Northern France, England (Torquay) and Belgium.

Family Zonitidae

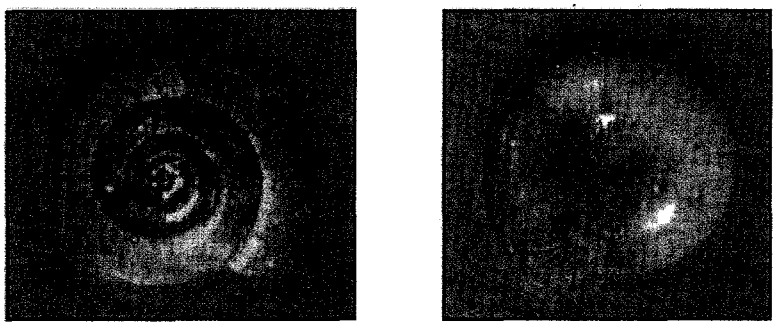
Subfamily Oxychilinae

***Oxychilus helveticus* (Blum, 1881)**

Material studied: 1 live specimen (coll. CM). From 'Flower Power' plant nurseries, Mosta.

Shell small, discoidal, with about 5 slightly convex whorls, enlarging regularly. The whorls are very slightly keeled, glossy brownish-yellow in colour and transparent with some slight white touches near the umbilicus. The umbilicus is very narrow. The animal is bluish-grey in colour with black mantle edges. Size of shell: height = 1.8mm., width = 5mm.

This small (5mm), live specimen was found between the leaves of the orchid *Cymbidium* sp. imported from plant nurseries in Holland. In the literature, (Kerney & Cameron 1987) it is stated that the species reaches a size of 8-10mm and that it emits a strong garlic smell if disturbed. This is a NW. European species, ranging from Southern Britain, Ireland, France and Belgium.



Oxychilus helveticus (left: dorsal and right: ventral view)

Family Succineidae

***Succinea putris* (Linnaeus, 1758)**

Material studied: 10 live specimens and 10 shells (coll. CM); 5 shells (coll. PS); 12 live specimens and 5 shells (coll. CC); 6 shells (coll. CS). All material collected from Zammit Nurseries, Qormi.

Succinea putris (live)

Shell fragile, transparent, with three rapidly enlarging and slightly rounded whorls. The last whorl forming about two thirds of the shell height. Suture shallow and there is no umbilicus. Aperture wide with rounded outer lip. The whorls are greenish brown with a black apex when fresh. The body of the animal, which can also be observed through the transparent shell, is dark grey.
Size of shell: height =12mm., width = 6.5mm

The numerous live specimens and empty shells were found in leaf litter amongst flower pots at Zammit Nurseries. The specimens we found were small, up to 12mm, but the species, according to Kerney and Cameron (1987) is said to occasionally reach 24mm. It has a European and Siberian distribution and inhabits wet situations such as marshes and margins of rivers. Our specimens may have been attached to water plants imported from Europe.

Oxyloma elegans **(Risso, 1826)**

Oxyloma elegans

Material studied: 2 shells (coll. CM). From Zammit Nurseries, Qormi.

Shell fragile, transparent, with three rapidly enlarging whorls. The whorls are only lightly rounded or nearly flat. Aperture elliptical, rather narrow and with a sharp outer lip. There is no umbilicus and fresh shells are transparent. Old shells are opaque yellowish-brown with a dark apex. The animal (not observed) has a greyish head with longitudinal white stripes, while the base of the foot is white (Fechter *et al.*, 1990). Size of shell: height = 16mm., width = 7mm.

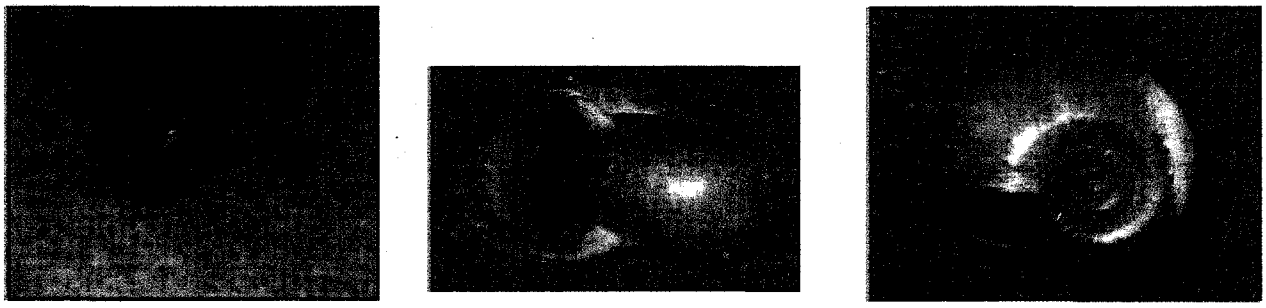
The two fresh empty shells were found in leaf litter amongst flower pots at Zammit Nurseries. The species has the same ecology as *Succinea putris* and has a European and Asian distribution. This species has only been previously recorded for these Islands from fossil material collected from Wied tal-Bahrija (Giusti *et al.* 1995).

Family Planorbidae

Helisoma duryi **Wetherby, 1879**

Material studied: 15 live specimens (coll. CM); 10 live specimens (coll. PM); 3 live specimens (coll. CC). All material collected from Zammit Nurseries, Qormi.

Shell sinistral and planorbid, the whorls being coiled in the same plane. There are from 4-5 rounded and rapidly expanding whorls, usually carinated at the top. Aperture semicircular with a sharp outer lip, the top of which extends above the other whorls. Columella slightly convex with a wide callus. Growth lines opisthocline and evident. Umbilicus wide and deep. Sutures also very deep, especially on the base. Shell external colour is light brown while the inside is white, especially in old shells. The animal has an orange coloration. Size of shell: height = 10mm., width = 25mm.



Heliosoma duryi (left: live, centre: apertural view and right: dorsal view)

A population of this species, which lives and feeds on freshwater plants, was recorded by Giusti *et al.* (1995) from Wied il-Luq at Buskett. Although this species is extinct in the wild from the Maltese Islands, large populations have thrived in ponds at San Anton gardens and the Argotti gardens for at least the past 30 years. We include it here because we found many specimens of various growth stages in garden pools, and because of its growing frequency in local private aquariums, garden pools and reservoirs, which are embellished with imported water plants. The species, whose origin is the southern part of the USA, has spread to all parts of the globe and is presently listed as cosmopolitan.

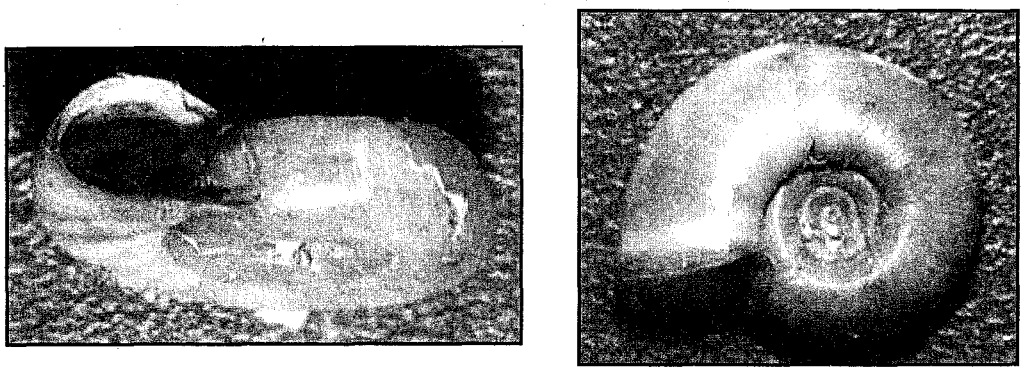
Planorbarius corneus **(Linnaeus, 1758)**

Material studied: 15 live specimens and 5 shells (coll. CM); 8 live specimens (coll. PS); 25 live specimens (coll. CC). All material collected from Zammit Nurseries, Qormi.

Shell sinistral and planorbid, the whorls being coiled in the same plane. There are from 4-5 rounded and regularly expanding whorls which are sometimes carinated slightly at the top. Aperture semicircular, elongated laterally and with a sharp outer lip. The top of the aperture is nearly in line with the other whorls, while its base extends well below the other whorls. Umbilicus narrow and deep. Sutures deep. The shell colour is greyish when fresh but soon fades to opaque white. The animal has a bluish-grey coloration.
Size of shell: height = 7mm., width = 20mm.,

This species is very similar to the preceding species and also lives and feeds on freshwater plants. However, besides the differences in the morphology of the soft parts, the shell is evidently much flatter and has a different coloration. It seems

to be also frequently introduced with imported aquarium plants. Many specimens of various growth stages were found on water plants in an outdoor pond at Zammit Nurseries and also in private aquaria. The species has a European and western Asian distribution.



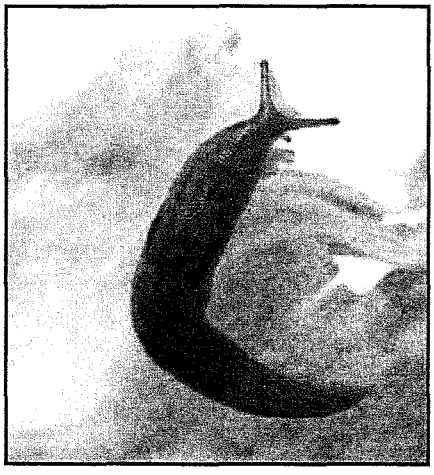
Panorbarius corneus (left: apertural view and right: dorsal view)

Family Limacidae

***Lehmannia valentiana* (A. Férussac, 1822)**

Material studied: 2 live juvenile specimens (coll. CM). Collected from Zammit Nurseries, Qormi.

Small slug, greyish with translucent yellow patches. It also has two lateral darker bands on each side of the mid-line, behind the mantle and with a pair of bands on the mantle forming a lyre pattern. There are also a few interrupted bands on the back end of the body at the tail. The animal is rather soft and gelatinous. The keel is short, slightly paler than body. The genitalia in these juvenile specimens were not studied. Unfortunately the two specimens succumbed to the intense summer heat before reaching maturity. Size of animal: length = 30mm.



Lehmannia valentiana

The two juveniles were found under flowerpots at Zammit Nurseries. This Iberian species is a well-known greenhouse and garden pest all over Europe. It is known to have spread as far as New Zealand, Mexico and British Columbia.

DISCUSSION

These sporadic records of alien species seem to be confined solely to private gardens and agricultural business concerns and therefore, at least for the time being, do not seem to pose a threat to the indigenous fauna or to local agriculture, even if some of these alien species are notorious pests. Searches for these same alien species in areas outside the indicated places of discovery have so far proved fruitless. Moreover, no newly hatched juvenile specimens of the terrestrial alien species cited here were found inside the nurseries.

In our opinion however, the presence of an alien species of slug, well known for its devastating damage to agricultural products, is of some concern. While snails are generally easily noticed and measures to eradicate them can be taken, slugs on the other hand are usually nocturnal in their habits and their presence can only be assessed with difficulty. Luckily most of the larger European slugs cannot survive the local summer climatic conditions and are probably unobtrusively eliminated. Finally, we would like to point out that this list of alien species is not exhaustive. Empty shells of at least four other species of hygromiids were also found, but these are still under study.

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