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On the presence of *Notodiaphana atlantica* Ortea, Moro et Espinosa, 2013 in the Mediterranen Sea, with notes on *Retusa multiquadrata* Oberling, 1970 and *Cylichna mongii* (Audouin, 1826) (Cephalaspidea Cylichnidae)

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ABSTRACT *Notodiaphana atlantica* Ortea, Moro et Espinosa, 2013 (Cephalaspidea Cylichnidae) is reported from various localities of Western and Central Mediterranean. Records of *Retusa multiquadrata* Oberling, 1970 are listed and discussed, most of them are considered to be based on *N. atlantica*. Possible synonymy between *N. atlantica* and *R. multiquadrata* is discussed, but former name is preferred. Based on the study of material from Suez channel, *Bulla mongii* Audouin, 1826 seems to be based on a very young specimen of the common species *Liloa curta* (A. Adams in Sowerby, 1850), but as Audouin's name is older, then *Bulla curta* shall be considered synonym of *Bulla mongii*. *Liloa mongii* (Audouin, 1826) new combination is than proposed.

KEY WORDS *Bulla mongii*; *Notodiaphana atlantica*; *Retusa multiquadrata*; Mediterranean; Lessepsian.

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INTRODUCTION

The recently described species *Notodiaphana atlantica* Ortea, Moro et Espinosa, 2013 (Cephalaspidea Cylichnidae) is here reported for the first time in the Mediterranean Sea. In the Mediterranean Sea have also been reported *Cylichna mongii* (Audouin, 1826) and *Retusa multiquadrata* Oberling, 1970, two poorly known species, which need to be clarified to avoid misuse of the name. Mediterranean records of these three species, obviously only those accompanied by a photo, are discussed.

Notodiaphana atlantica Ortea, Moro et Espinosa, 2013

2013. *Notodiaphana atlantica* - Ortea et al.: 17, fig. 4, pl. 1.
1972. *Cylichnina multiquadrata* - Nordsieck: 35, pl. O XVI, fig. 18
1995. *Retusa multiquadrata* - Mikkelsen: 205, fig. 2E
2001. *Cylichnina multiquadrata* - Cachia et al.: 125, pl. XX, fig. 7
2008. *Cylichnina multiquadrata* - Cecalupo et al.: 128, pl. 75 figs. 5-7 (not fig. 4)

Examined material. Jerba (Tunisia), -2/3 m, 6 sh. (Figs. 5, 12–16); Pace, 5 km north of Messina, Sicily, -6 m, 1 sh., 2014, legit A. Villari (Fig. 6); Augusta, north of Syracuse, Sicily, beached in the harbour area, 1 sh., 1990, legit A. Villari; Linosa

island, Sicily Channel, -10 m, 1 sh., 2013, legit P. Micali; Cabo Negro, Tetouan, Morocco, -30m, 1sh.

REMARKS. *N. atlantica* is described based on specimens from a wide area ranging from Bahamas islands to Cuba and Canary islands, type locality is not designated.

Authors widely discuss the Mediterranean records, bearing also a photo, of *C. mongii* and *R. multiquadrata*, to ascertain whether this species is present in the Mediterranean. In particular Authors refer to the photos of three specimens in a work published on web (http://www.naturamediterraneo.com/forum/topic.asp?TOPIC_ID=100306) by the Gruppo Malacologico Livornese and later on published in the "Notiziario S.I.M." (Gruppo Malacologico Livornese, 2004), ignoring that the three photos have been taken from Cecalupo & Quadri (1996). Authors note that one of the three specimens (they do not indicate which one, but possibly that at photo 1b) resembles *N. atlantica* for the profile and the presence of spiral and axial threads. Authors are misled by the indication that the figured specimen is 2.2 mm high and 1.5 mm wide and conclude that it is not *N. atlantica* for the size and the H/W of 1.46 against 2 in *N. atlantica*. Really Cecalupo & Quadri (1996) determine the three specimens as *C.* cfr. *mongii* and indicate that the specimen at fig. 1 is 2.2 mm high, while the other two, whose height is not indicated, but may be calculated from the enlargement (x 25) indicated in the legend of the table, should be 1.7 mm (fig. 1b) and 1.24 mm (fig. 1c) high. Ortea et al. (2013) conclude that *N. atlantica* is not present in the Mediterranean.

Nordsieck (1972) describes and draws a specimen from Le Franqui, type locality of the species. The Author states "*nach Foto von Oberling*", therefore description and drawing are taken from a photo of *C. multiquadrata* that Oberling sent to Nordsieck, and this is proved by the dimension of the drawn specimen, that is very close to that indicated by Oberling.

Ortea et al. (2013) do not mention the work of Cecalupo et al. (2008) on the malacofauna of Gabés gulf, where are figured two specimens from various localities of Kerkennah island, as *C. multiquadrata*, having height ranging from 3.2 to 3.4 mm, therefore well mature. Photo of a living specimen clearly shows that soft parts are white, with a large darker zone hardly visible inside the shell. This colour corresponds with *N. atlantica*, for which a large dark spot, corresponding to digestive gland is indicated.

The specimen in Cecalupo et al. (2008) is clearly different by *N. atlantica*, and it is currently under study.

Cachia et al. (2001) describe and figure *C. multiquadrata*, stating that few empty shells have been found at Salina Bay, Malta. From the description and drawing of a specimen 3.9 mm high, there is no doubt that it is *N. atlantica*.

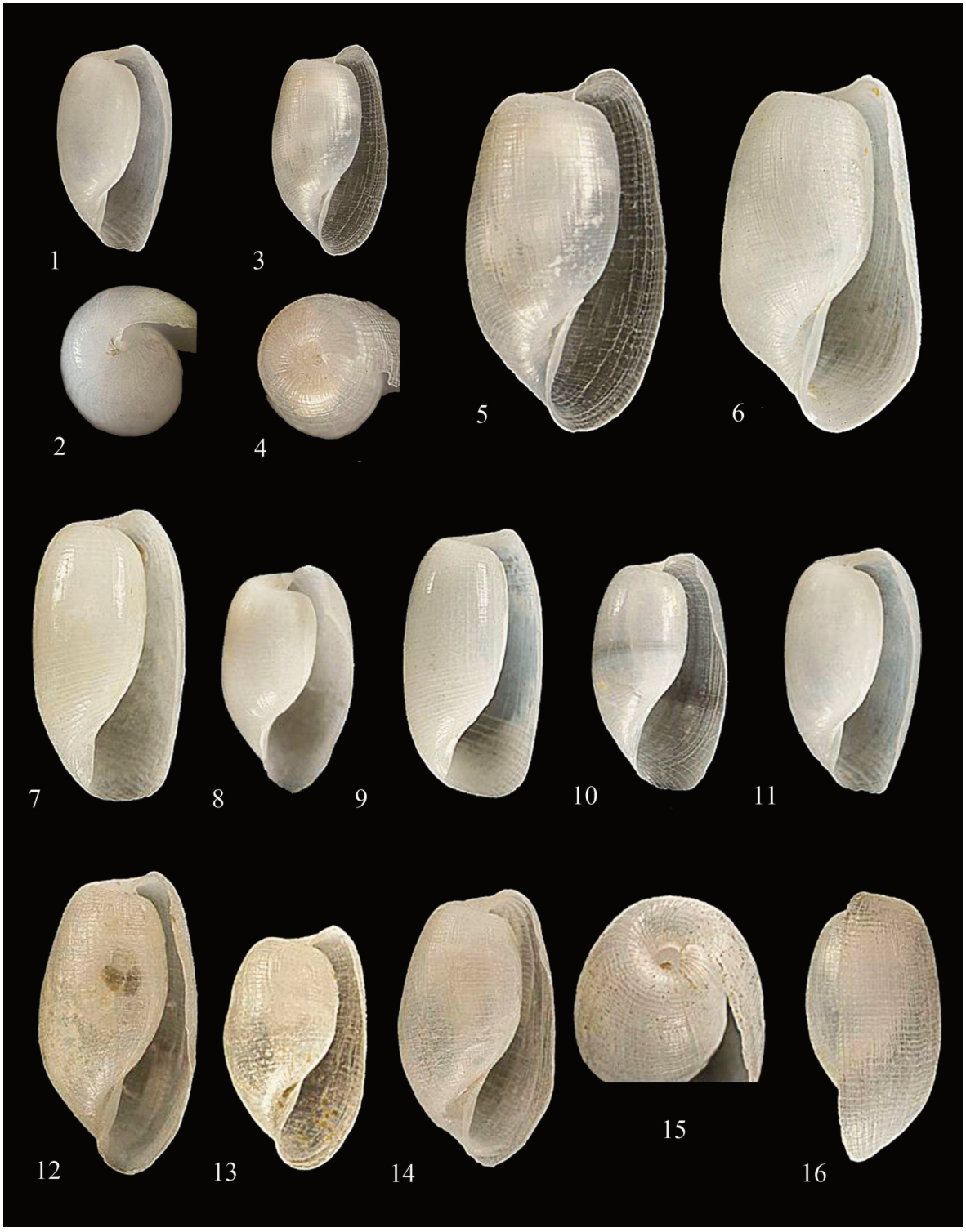
Vazzana (2010) lists *C.* cfr. *mongii* at Scilla (Strait of Messina), without figuring it. Based on reported findings of *N. atlantica* in this area and the photos on web, where this species is also on sale, there is no doubts that the records in the Strait of Messina shall be referred to *N. atlantica*.

Therefore based on studied material and confirmed records, *N. atlantica* is widespread in the western and central Mediterranean sea, up to south France, Sicilian coasts, Malta and south Tunisia.

N. atlantica may be easily separated from *Liloa mongii* for the much finer cancellate sculpture with more than double number of spiral grooves. The sculture of *L. mongii* is not cancellate, consisting of spiral grooves and growth folders. In specimens about 2.2 mm high *N. atlantica* has a nearly straight, instead of regularly convex lateral shell profile. Seen from the aperture the profile shows a wider and more squared last whorl and columellar lip extended over the umbilical rim. Columellar profile is inclined but almost straight in the joint to the whorl, while in *L. curta* the columella is short and there is an angle, not covered by columellar lip. The abapical margin is more acute and by transparency it is visible the external cancellate sculpture, while in *L. curta* the margin is squared, quite straight and only some spiral grooves may be seen from inside (compare Figs. 1, 2 and Figs. 3, 4)

R. multiquadrata was described a first time (Oberling, 1970) with the following description: "*De rares spécimens sur la plage de la Franqui* [north of Perpignan, south France]. *Forme en cylindre trapu, un peu comme* R. mammillata*. Phil., mais avec sommer perforé. Sculpture réticulée de sillon spiraux et transverses, comme pour* R. crebisculpta *Mtr., mais réseau plus dense que dans cette espèce. La columelle est fortement développée*".

In one later work (Oberling, 1971) the species is again described with more details "*Un petit (1 ¾ x 1 mm.)* Retusa*, presque cylindrique quoique avec*



Figures 1, 2. *Liloa mongii*, Great Bitter Lake (Suez channel), height 2 mm. Fig. 1: front view. Fig. 2: apical view. Figures 3–5. *Notodiaphana atlantica*, Jerba (Tunisia), height = 2.3 mm. Fig. 3: front view for comparison with Fig. 1. Fig. 4: apical view. Fig. 5: front view. Figure 6. *N. atlantica*, Pace (Messina), height = 2.3 mm. Figures 7–11. *Liloa mongii*, Great Bitter Lake (Suez channel). Fig. 7: height 4.6 mm. Fig. 8: height 1.4 mm. Fig. 9: height 3.7 mm. Fig. 10: height 2 mm. Fig. 11: height 2.3 mm (same specimen of Fig. 1). Figures 12–16. *N. atlantica*, Jerba (Tunisia). Fig. 12: height = 4.5 mm. Fig. 13: height = 1.7 mm. Figs. 14-16: height = 3.3 mm. Fig. 14: front view. Fig. 15: apical view. Fig. 16: lateral view.

tours quelque peu convexes; spire enfoncée, protoconque visible au fond du trou ainsi créé, tours autour de celui-ci-embrassants. Columelle trés allongée (longueur prés de ¾ de celle de la région pariétale); surface de la coquille treillissée de stries spirales et verticales bien marquées. – Cette espéce ressemble vaguement au R. crebisculpta *Mtrs.: celui-ci est relativement deux fois plus long, sa columelle beaucoup plus courte, sa protoconque est cryptique, etc*...". The description fits with *N. atlantica*, but without the study of type material, even after Nordsieck's illustration of the species, the name should be considered nomen dubium.

The name *Cylichnina multiquadrata* is used by Mikkelsen (1995) for specimens from Azores, by Buzzurro & Greppi (1997) in a list of shells from Tasuçu (south Turkey), without any comment or figure and, later on, by Cecalupo et al. (2008) who figure three specimens as *C. multiquadrata*, basing the determination upon Oberling's description. As proved below, the specimens at figures 5-7 shall actually be referred to *N. atlantica*, while specimen at fig. 4, which is a little different, could be another species.

It is astonishing that a species poorly described and not figured, has met such a success. The type material (not the holotype, which was not fixed) seems to be lost (Oliverio in litteram, 08 Sept. 2014).

From what above seems that *C. multiquadrata* and *N. atlantica* are synonyms, anyway as the specimen figured by Nordsieck is not indicated as belonging to type series, then *C. multiquadrata* is here considered nomen dubium and *N. atlantica* is the name to be used until Oberling's type material will be traced and studied.

Liloa mongii (Audouin, 1826) new combination

1826. *Bulla mongii* - Audouin: 39 (ref. to Savigny's figure, 1817: pl. 5, fig. 7).
1869. *Cylichna mongii* - Issel: 170 n° 424; 347 (ref. to Savigny's figure at pl. 5, fig. 7).
1926. *Cylichna mongii* - Pallary P.: 76, pl. 5, fig. 7.
1939. *Cylichna mongei* (sic) - Moazzo: 135.
1982. *Bulla mongii* - Bouchet & Danrigal: 14, fig. 58.
1996. *Cylichnina* cfr. *mongii* - Cecalupo & Quadri: 110, tav. III, fig. 1, 1a, 1b.
2008. *Liloa curta* - Rusmore-Villaume: 150, fig.
2014. *Liloa curta* - Too et al.: 383, fig. 1J (living), 3D, 17A-I

For further figures of *L. curta* see Too et al. (2014).

EXAMINED MATERIAL. Great Bitter lake, Suez Channel, Egypt, legit G.P. Franzoni, 10 sh.

REMARKS. *Cylichna mongii* (Audouin, 1826) is a species of controversal determination, with many records in literature (see below). At present not all Authors agree on the origin or determination of this species. Gofas & Zenetos (2003) list among the species excluded from CIESM the *C.* cf. *mongii*, with a "(*m*)" to indicate that "*citation is considered to proceed from a misidentification of a native species*".

The difficulty in the determination of this species is because Audouin (1826) assigned the name of *Bulla mongii* to the species figured by Savigny (1817) at pl. 5, fig. 7, therefore the species was never described and Savigny's drawing is very small.

Issel (1869) indicates that the species is known to him only from fossil specimens collected on beaches above sea level ("*spiagge emerse del Golfo Arabico*"), but as the species was figured by Savigny, it is then included among the recent species. Issel (1869) gives the first description, obviously based on his interpretation of the species: "*Conchiglia assai piccola, sottile, ovato-cilindrica, più ristretta alla parte inferiore che alla superiore, bianca, liscia, non striata né solcata, poco nitida; apice incavato, non perforato. Apertura stretta, più allargata in basso che in alto; margine destro regolarmente arcuato, semplice, superante l'apice alla parte superiore; parte visibile della columella assai breve e non troncata. Dimensioni: Altezza millim. 2; diametro 1* [shell very small, thin, ovate-cylindrical, more restricted in the lower than in the upper part, white, smooth, not striated or sulcate, not glossy; spire sunken, not perforated. Aperture narrow, larger in the lower than in the upper part; right margin regularly arched, acute, protruding the apex; visible portion of the columella very short, not truncate. Dimensions: height 2 mm, width 1 mm]".

Pallary (1926) does not add any comment. Lamy (1938) reports this species for Ismailia (Suez

Channel), without comments. Moazzo (1939) reports it for the bay of Suez and lake Timsah. Bouchet & Danrigal (1982) illustrate the single specimen, only 1.6 mm high, present in Savigny collection, to be then considered the holotype. From the photo it is possible to see the spiral lines present all over the shell and the straight and folded outwardly columellar lip.

From the comparison of type specimen and Issel's description, it is clear that Issel's interpretation of this species is wrong, because he describes the surface as smooth, not striated or sulcate.

Ortea et al. (2013) show the type specimen, after metal coating, in little different position from photo in Bouchet & Danrigal (1982), with a more realistic view of the columellar profile and aperture.

Cecalupo & Quadri (1996) figure as *C.* cf. *mongii* three specimens from Kyrenia (North Cyprus), stating that this is the first Mediterranean record.

The CIESM (http://www.ciesm.otg/atlas/appendix 3bis.html, last update: December 2003) includes *C.* cf. *mongii* (Audouin, 1826) in the "List of excluded species", with the following comment: "*The taxon reported under this name, from Cyprus by Cecalupo and Quadri (1996), may be an undescribed Mediterranean species. According to Van Aartsen (pers. comm.) this species is also known from the Island of Djerba, Tunisia, and Akkum, Turkey, and without doubt lives in the Mediterranean*".

Cossignani & Ardovini (2011) figure the *C.* cf. *mongii* using the photos from Cecalupo et al. (2008), from Kerkennah (Tunisia), instead of those from Cecalupo & Quadri (1996), showing the specimens from Cyprus, to which is referred the comment in CIESM (see above). In addition it is erroneously indicated Malaga as origin of the material.

The reduced size of the holotype (H= 1.6 mm) let one suppose that it could be the immature stage of a species living in the area. Studying the specimens of *Liloa curta* (A. Adams in Sowerby, 1850) collected in the Great Bitter Lake, it became clear that *Bulla mongii* is based on an immature specimen of the species known as *L. curta*. Figures 7–11 show a growth series from a specimen corresponding to type of *Bulla mongii*, to a specimen corresponding to *Liloa curta*. The shell profile varies with the growth, as the sculpture, which is more evident in small specimens. As the Audouin's name is much older than Adams 's name, then the new combination *Liloa mongii* (Audouin, 1826) is here proposed. This species shall be considered a true Lessepsian migrant, as it is present in the Suez Channel since long time and has entered the Mediterranean.

L. curta, as such, has not been reported in the Mediterranean sea, but record of *C. mongii* from Cyprus by Cecalupo & Quadri (1996) shall be considered the first in Mediterranean. Comparison between *L. mongii* from Suez Channel and specimens from Cyprus has been carried out with positive result.

L. mongii is a well known species with very wide distribution covering Red Sea, Malaysia the Philippines, China, Japan, Papua New Guinea, Guam, New Caledonia and Hawaii (fide Too et al., 2014). The description from Too et al. (2014) is the following: "*Maximum height 18 mm; whitish; thin and fragile, translucent, cylindrically oval, sides slightly convex only, anterior end slightly rounded, posterior end truncated; spire sunken, aperture broad, outer lip thin, base semi-circular; spiral grooves covering entire shell, distance between spiral grooves almost equal, faint irregular axial lines present*".

Moazzo (1939) reports this species as *C. semisulcata* Dunker, 1882 indicating it frequent in Lake Timsah, less frequent in the Great Bitter Lake and rare in Suez bay. Rusmore-Villaume (2008) in her work on the Egyptian Red Sea, indicates *L. curta* as "*infrequent in all areas. Locally common in shell grit*", reaching a height of 12.5 mm. Studied specimens from Great Bitter Lake reach about 5 mm. *Atys porcellana* Gould, 1859, *C. semisulcata* and *B. curta* A. Adams in Sowerby, 1850 are then synonyms of *B. mongii* Audouin, 1826.

L. mongii may be easily separated from *Atys cylindricus* (Hebling, 1779) for the depressed spire, with a smaller protrusion between the spire and lip, for the more cylindrical profile and the spiral grooves covering the whole height of the spire.

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REFERENCES

Audoin V., 1826. Explication sommaire des planches de Mollusques de l'Égypte et de la Syrie publiées par J.C. Savigny. Description de l'Égypte ou recuil des observant et des recherches qui ont été faites en Egypte pendant l'expédition de l'armée française publié par les ordres de sa majesté l'empereur Napoléon le grand. Histoire Naturelle. Imprimerie impériale, Paris. Animaux invertébrés, 1(4): 7–56.

Bouchet P. & Danrigal F., 1982. Napoleon's Egyptian Campaign (1798-1801) and the Savigny collection of shells. The Nautilus, 96: 9–24.

Buzzurro G. & Greppi E., 1997. The Lessepsian mollusca of Tasuçu (South East Turkey). La Conchiglia, Annuario 1996, Supplemento al n° 279: 3–22.

Cachia C., Mifsud C. & Sammut P.M., 2001. The marine Mollusca of the Maltese Islands. Part Three. Backhuys Publishers, Leiden, 182 pp.

Cecalupo A., Buzzurro G. & Mariani M., 2008. Contributo alla conoscenza della malacofauna del Golfo di Gabès (Tunisia). Quaderni della Civica Stazione Idrobiologica di Milano, 31: 1-175.

Cecalupo A. & Quadri P., 1996. Contributo alla conoscenza malacologia per il nord dell'isola di Cipro (Terza e ultima parte). Bollettino Malacologico, 31: 95–118.

Cossignani T. & Ardovini R., 2011. Malacologia Mediterranea. L'Informatore Piceno, Ancona, 536 pp.

Gofas S. & Zenetos A., 2003. Exotic molluscs in the Mediterranean basin: current status and perspectives. Oceanography and Marine Biology: an Annual Review, 41: 237–277.

Gruppo Malacologico Livornese, 2004. Documenti del Gruppo Malacologico Livornese. Notiziario S.I.M., 22: 60–76.

Issel A., 1869. Malacologia del Mar Rosso, ricerche zoologiche e paleontologiche. Biblioteca Malacologica, Pisa, 387 pp.

Lamy E., 1938. Mission Robert Ph. Dollfuss en Égypte: 7. Mollusca testacea. Mémoires de l'Institut d'Égypte, 37: 1–90.

Mikkelsen P.M., 1995. Cephalaspid opisthobranchs of the Azores. In: Martins A.M.F. (Ed.), The marine fauna and flora of the Azores. Proceedings of the Second International Workshop of Malacology and Marine Biology, Vila Franca do Campo, São Miguel, Azores. Açoreana, Supplement 4: 193–215.

Moazzo P.G., 1939; Mollusques testacés marins du Canal du Suez. Mémoires de l'Institut d'Égypte, 38: 1–283.

Nordsieck F., 1972. Die Europäischen Meeresschnecken. Gustav Fischer Verlag. Stuttgart, 327 pp.

Oberling J.J., 1970. Quelques especes nouvelles de Gasteropodes du bassin Mediterraneen. Kleine Mitteilungen Naturhistorisches Museum Bern, 1: 1–7.

Oberling J.J., 1971. Quelques taxa nouveaux or mal compris de microgasteropodes Mediterraneen. Kleine Mitteilungen Naturhistorisches Museum Bern, 2: 1–8.

Ortea J., Moro L. & Espinosa J., 2013. Nueva especie de *Notodiaphana* Thiele, 1931 del Océano Atlántico y nueva ubicación genérica para *Atys alayoi* Espinosa & Ortea, 2004 (Gastropoda: Opisthobranchia: Cephalaspidea). Revista de la Academia Canaria de Ciencias, 25: 15–24.

Pallary P., 1926. Explication des planches de J.C. Savigny. Mémoires de l'Institut d'Égypte, 11: 1–138.

Rusmore-Villaume M.L., 2008. Seashells of the Egyptian Red Sea: the Illustrated Handbook. The America University in Cairo Press, 307 pp.

Too C.C., Carlson C., Hoff P.J. & Malaquias M.A.E., 2014. Diversity and systematics of Haminoeidae gastropods (Heterobranchia: Cephalaspidea) in the tropical West Pacific Ocean: new data on the genera *Aliculastrum*, *Atys*, *Diniatys* and *Liloa*. Zootaxa, 3794 (3): 355–392.

Vazzana A., 2010. La malacofauna del Circalitorale di Scilla (Stretto di Messina). Bollettino Malacologico, 46: 65–74.