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Biogeographical homogeneity in the eastern Mediterranean Sea - I: the opisthobranchs (Mollusca: Gastropoda) from Lebanon

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Supplementary Data
[“Biogeographical homogeneity in the eastern Mediterranean Sea -
I: the opisthobranchs (Mollusca: Gastropoda) from Lebanon” by F. Crocetta, H. Zibrowius, G. Bitar,
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Appendix 1. Sampling localities shown in Figure 1, with coordinates

N.	Sites	Coordinates	
		Latitude	Longitude
1	Ramkine Island	34° 29' 47"N	035° 45' 38"E
2	Tripoli	34° 27' 28"N	035° 49' 34"E
3	Anfeh	34° 21' 43"N	035° 43' 36"E
4	El Heri	34° 18' 37"N	035° 41' 51"E
5	Ras El Chakaa	34° 18' 47"N	035° 40' 59"E
6	Chak El Hatab	34° 17' 36"N	035° 40' 17"E
7	Selaata	34° 17' 03"N	035° 39' 31"E
8	Batroun	34° 15' 13"N	035° 39' 19"E
9	Kfar Abida	34° 14' 02"N	035° 39' 15"E
10	Jbail	34° 07' 18"N	035° 38' 28"E
11	Tabarja	34° 01' 55"N	035° 37' 26"E
12	Beirut	33° 54' 55"N	035° 31' 57"E
13	Raoucheh	33° 53' 18"N	035° 28' 01"E
14	Khaldeh	33° 46' 44"N	035° 28' 10"E
15	Saadiyat	33° 41' 49"N	035° 25' 54"E
16	Saida	33° 34' 00"N	035° 22' 10"E
17	El Zahrani	33° 29' 46"N	035° 20' 01"E
18	Khaizaran	33° 26' 47"N	035° 16' 31"E
19	El Kassmieh	33° 20' 22"N	035° 14' 19"E
20	Tyr	33° 15' 56"N	035° 11' 24"E
21	El Bayada	33° 09' 96"N	035° 10' 85"E
22	Nakoura	33° 06' 57"N	035° 07' 11"E

Appendix 2. Marine opisthobranchs from Lebanon according to literature (for some species multiple records may be based on the same samples) and field samples, with remarks on alien and cryptogenic species. Within the literature records, the use (or not) of parentheses for taxon authorships has been reported as originally employed in the cited reference and the original style (caps v. small, italics v. roman) has been corrected, whilst the original spelling has been maintained and is followed by [sic!] if wrong. Within material examined, site number (see Figure 1 and Table 1) is reported before site name. Abbreviations: A, alien species; C, cryptogenic species; spm, live collected specimen/s; sh, empty shell/s; det, determinavit; LACM, Natural History Museum of Los Angeles County; MNCN, Museo Nacional de Ciencias Naturales of Madrid; BBCE, Dipartimento di Biologia e Biotecnologie “Charles Darwin” - University of Rome “La Sapienza”.

Family ACTEONIDAE d’Orbigny, 1843
Acteon tornatilis (Linnaeus, 1758)

Literature records:

Actaeon tornatilis L. - Gruvel & Moazzo, 1929: 424; Moazzo, 1931: 447; Bitar, 1996: 118; *Actaeon tornatilis* Linné var. *minor* Monts 1878 [sic!] - Pallary, 1938: 15; *Acteon tornatilis* (Linné, 1758) - Bitar & Kouli-Bitar, 1998: 40.

Family RETUSIDAE Thiele, 1925
A - *Pyrunculus fourierii* (Audouin, 1826)

Literature records:

Retusa fourieri [sic!] (Audouin, 1826) - Bogi & Khairallah, 1987: 56, 60 (fig. 5); *Pyrunculus fourierii* (Audouin, 1827) [sic!] - Bogi & Galil, 2003: 13 (fig. 5); *Pyrunculus fourierii* - Bitar, 2013: 8.

Material examined:

(10) Jbail: 17/10/1999 - Tablieh, cave sediment, 16 m: 1 sh, FC det (BBCE).

Remarks:

Widespread throughout the Indo-West Pacific, Red Sea and the Suez Canal (Hoenselaar & Dekker, 1998); a Lessepsian species well acclimatised in the Levant Sea, with records from Israel, Lebanon, Turkey and Cyprus, where shells and living specimens have usually been dredged from sandy and muddy bottoms up to 70 m deep (Bogi & Khairallah, 1987; van Aartsen *et al.*, 1989; Tringali & Villa, 1990; Engl, 1995; Buzzurro & Greppi, 1996; Buzzurro & Greppi, 1997; Tringali & Oliverio, 2001; Yokeş, 2009; Bakir *et al.*, 2012; Yokeş *et al.*, 2012).

Retusa mammillata (Philippi, 1836)

Literature records:

Retusa mamillata [sic!] Philippi - Gruvel & Moazzo,

1929: 423; Moazzo, 1931: 446; Bitar, 1996: 118; *Tornatina mamillata* [sic!] Philippi - Pallary, 1938: 15; Bitar, 1996: 117; *Retusa mammillata* (Philippi, 1836) - Bitar & Kouli-Bitar, 1998: 40.

Retusa truncatula (Bruguière, 1792)

Literature records:

Tornatina truncatula Bruguière - Pallary, 1938: 15; Bitar, 1996: 117; *Tornatina truncatula* Bruguière var. *minor* - Pallary, 1938: 15; *Retusa truncatula* Bruguière - Bitar, 1996: 118; *Retusa truncatula* (Bruguière, 1792) - Bitar & Kouli-Bitar, 1998: 40.

Remarks:

Tornatina truncatula var. *minor* Pallary, 1938 is a *nomen nudum* (ICZN, 1999: Art. 12).

Family RHIZORIDAE Dell, 1952

Volvulella acuminata (Bruguière, 1792)

Literature records:

Volvula acuminata Bruguière - Pallary, 1938: 15; Bitar, 1996: 117; *Volvulella acuminata* (Bruguière, 1792) - Bitar & Kouli-Bitar, 1998: 40.

Family RINGICULIDAE Philippi, 1853

Ringicula auriculata (Ménard de la Groye, 1811)

Literature records:

Ringicula auriculata Ménard de la Groye - Pallary, 1938: 15; Bitar, 1996: 118; *Ringicula auriculata* (Ménard de la Groye, 1811) - Bitar & Kouli-Bitar, 1998: 40.

Ringicula conformis Monterosato, 1877

Literature records:

Ringicula auriculata Ménard de la Groye var. *conformis* de Monts. [sic!], 1877 - Pallary, 1938: 15.

Material examined:

(1) Ramkine Island: 31/05/2000 - coarse sand, 13 m: 2 sh, FC det (BBCD); 01/06/2000 - sand, 13-14 m: 1 sh, FC det (BBCD); (5) Ras El Chakaa: 04/06/2000 - cave sediment, 3-4.5 m: 43 sh, FC det (BBCD); (7) Selaata: 23/10/1999 - cave/tunnel, sediment, 7-8 m: 1 sh, FC det (BBCD); 24/09/2002 - cave sediment, 22 m: 2 sh, FC det (BBCD); (10) Jbail: 17/10/1999 - Tablieh, cave sediment, 16 m: 2 sh, FC det (BBCD); (11) Tabarja: 11/07/2003 - coarse sand, 15 m: 1 sh, FC det (BBCD); (16) Saida: 05/06/2000 - off Nahr El Ouali, sand, 31 m: 10 sh, FC det (BBCD).

Family BULLIDAE Gray, 1827

Bulla striata Bruguière, 1792

Literature records:

Bulla striata Brug. - Puton, 1856: 223; *Bulla striata* Bruguière - Pallary, 1912: 171; Pallary, 1919: 167; Gruvel & Moazzo, 1929: 423; Moazzo, 1931: 446; Pallary, 1938: 15; Bitar, 1996: 118; *Bulla striata* Bruguière var. *minor* - Pallary, 1938: 15; *Bullaria striata* (Bruguière) - Spada, 1971: 90; *Bullaria striata* Brug. - Fadlallah, 1975:

68; *Retusa mariateresae* (Parenzan) - Fadlallah, 1975: 69; *Retusa mariateresae* Parenzan - Bitar, 1996: 118; *Retusa mariateresae* Parenzan, 1970 - Bitar & Kouli-Bitar, 1998: 40; *Bulla striata* Bruguière 1792 - Bitar & Kouli-Bitar, 1998: 40, 43; Malaquias & Reid, 2008: 464.

Material examined:

(1) Ramkine Island: 01/06/2000 - sand, 13-14 m: 1 sh, FC det (BBCD); (3) Anfeh: 26/10/1999 - sand, 20 m: 3 sh, FC det (BBCD); (4) El Heri (marina Beaulieu): 03/06/2000 - from sand in *Cymodocea* meadow, 4 m: 1 spm, FC det (BBCD); (17) El Zahrani: 06/06/2000 - Harf El Hawieh El Jouani, 14 m: 1 sh, FC det (BBCD).

Remarks:

Bulla striata var. *minor* Pallary, 1938 is a *nomen nudum* (ICZN, 1999: Art. 12).

Family HAMINOEIDAE Pilsbry, 1895

Haminoea hydatis (Linnaeus, 1758)

Literature records:

Haminea hydatis Linné - Gruvel & Moazzo, 1929: 423; Moazzo, 1931: 446; Pallary, 1938: 15; *Haminea hydatis* L. - Bitar, 1996: 118; *Haminoea hydatis* (Linné, 1758) - Bitar & Kouli-Bitar, 1998: 40.

Haminoea sp.

Material examined:

(1) Ramkine Island: 31/05/2000 - coarse sand, 13 m: 1 sh, FC det (BBCD); (4) El Heri (marina Beaulieu): 03/06/2000 - from muddy sediment just below small cliff, 3 m: 6 sh, FC det (BBCD); (7) Selaata: 29/07/1999: harbour, on floating rope: 2 spm (MNCN).

Family CYLICHNIDAE H. Adams & A. Adams, 1854

A - Acteocina mucronata (Philippi, 1849)

Literature records:

Acteocina mucronata (Philippi, 1849) - Bogi & Giannini, 1990: 48-51 (fig. 4); *Acteocina mucronata* - Bitar, 2013: 8.

Material examined:

(7) Selaata: 18/10/1999 - cave sediment, 9 m: 1 sh, FC det (BBCD).

Remarks:

Originating from the Red Sea, it is a Lessepsian species well established in the Levant Sea, with records from Israel, Lebanon, Turkey and Cyprus, where shells have been recorded at shallow depths (Bogi & Giannini, 1990; van Aartsen *et al.*, 1990; Cecalupo & Quadri, 1994; Engl, 1995; Buzzurro & Greppi, 1996; Storsberg, 1997; Bakir *et al.*, 2012).

Cylichna cylindracea (Pennant, 1777)

Literature records:

Cylichna cylindracea Pennant - Gruvel & Moazzo, 1929: 424; Moazzo, 1931: 447; Pallary, 1938: 15; Bitar, 1996: 117; *Cylichna cylindracea* (Pennant, 1777) - Bitar & Kouli-Bitar, 1998: 40.

A - *Cylichnina girardi* (Audouin, 1826)

Literature records:

Cylichnina girardi (Audouin, 1827) [sic!] - Bogi & Khairallah, 1987: 57, 60 (fig. 4); *Cylichnina girardi* - Bitar, 2013: 8.

Remarks:

Widespread throughout the Indo-Pacific and found in the Suez Canal also; a Lessepsian species well established in the eastern Mediterranean Sea, with records from Egypt, Israel, Lebanon, Turkey, Cyprus and Greece, where it has been found in shallow sandy bottoms mainly, in *Posidonia oceanica* meadows and in lagoons (Minis, 1976; Bogi & Khairallah, 1987; Tringali & Villa, 1990; Engl, 1995; Buzzurro & Greppi, 1996; Cecalupo & Quadri, 1996; Cosenza & Fasulo, 1997; Hoenselaar & Dekker, 1998; Bakir *et al.*, 2012; Yokeş *et al.*, 2012).

Family PLAKOBRANCHIDAE Gray, 1840

A - *Elysia grandifolia* Kelaart, 1857

Literature records:

Elysia grandifolia Kelaart, 1858 [sic!] - Yokeş & Rudman, 2004: 3; *Elysia grandifolia* - Bitar, 2013: 8.

Material examined:

(2) Tripoli: 19/09/2002 - harbour, 2 m: 1 spm (MNCN - 15.05/46604); 20/09/2002 - harbour entrance, breakwater jetty, outer side, 5 m: 1 spm, JT det (MNCN - 15.05/46606); (3) Anfeh: 22/08/2012 - among Corallinales, 2 m: 1 spm, GB det (photo G. Bitar); (8) Batroun: 23/09/2002 - 2-3 m: 1 spm, JT det (MNCN - 15.05/47202); (8) Batroun: 26/09/2010 - rocky bottom with *Corallina*, 0-3 m: 3 spm, GB det (photo G. Bitar); (9) Kfar Abida: 26/08/2012 - rocky bottom with *Corallina* and *Bryopsis*, 0-3 m: around 50 spm, GB det (photo G. Bitar); 29/08/2012 - rocky bottom with *Corallina* and *Bryopsis* (in bloom), 0-3 m: very abundant, more than 150 spm, GB det (photo G. Bitar); 01/09/2012 - rocky bottom with *Corallina* and *Bryopsis* (in bloom), 0-3 m: very abundant, more than 150 spm, GB det (photo G. Bitar); 22/09/2012 - rocky bottom with *Corallina* and *Bryopsis* (in strong regression), 0-3 m: around 50 spm, GB det (photo G. Bitar); 29/09/2012 - rocky bottom with *Corallina* and very rare *Bryopsis*, 0-3 m: 7 spm, GB det (photo G. Bitar); 07/10/12 - rocky bottom with *Corallina* and absence of *Bryopsis*, 0-3 m: 1 dead spm, GB det (photo G. Bitar); (12) Beirut: 15/09/2002 - harbour jetty, inner side, 5 m: 2 spm, JT det (MNCN - 15.05/46609); 25/09/2002 - airport, on boulders, 17 m: 1 spm, JT det (MNCN - 15.05/46608); (13) Raoucheh: 17/09/2002, boulders and rock, 7-9 m: 12 spm, JT det (MNCN - 15.05/46607); (22) Nakoura: 22/09/2002 - jetty, 3 m: 3 spm, JT det (MNCN - 15.05/46605).

Remarks:

Presumably distributed in the Indian Ocean; distribution is not known with certainty due to confusion with

Elysia ornata (Swainson, 1840), a circumtropical species recorded in the tropical Indo-Pacific and Atlantic Oceans (Jensen, 2001). The two species have almost identical colouration, but *E. grandifolia* reaches larger sizes (up to more than 10 cm); the parapodia are larger and thinner, and the black and orange bands at the edge of the parapodia are not separated by white. The Mediterranean specimens fall within the intraspecific variability of the latter. It has been recorded from Israel, Lebanon and Turkey (Yokeş & Rudman, 2004; Pasternak & Galil, 2012; Yokeş *et al.*, 2012), but since no records are known from the Red Sea, its status as a Lessepsian invader is still doubtful. It feeds on Bryopsidaceae mainly, as summarized in Pasternak & Galil (2012) and confirmed by our observations in Kfar Abida.

Family UMBRACULIDAE Dall, 1889

***Umbraculum umbraculum* (Lightfoot, 1786)**

Literature records:

Umbrella mediterranea Lamarck - Pallary, 1919: 167; Pallary, 1938: 15; *Umbrella mediterranea* Lamarck - Bitar, 1996: 116; *Umbraculum umbraculum* (Röding, 1798) [sic!] - Bitar & Kouli-Bitar, 1998: 40.

Material examined:

(3) Anfeh: 25/04/2010 - among *Corallinales*, 2 m: 1 spm, GB det (photo G. Bitar); among sponges, 2 m: 1 spm, GB det (photo G. Bitar); (13) Raoucheh: 17/09/2002 - boulders and rock, on a grey sponge, 7-9 m: 1 spm, JT det (MNCN - 15.05/46603); 19/02/2006 - cave, among sponges and ascidians, 2 m: 1 spm, GB det (photo G. Bitar).

Family PLEUROBRANCHIDAE Gray, 1827

***Berthella aurantiaca* (Risso, 1818)**

Material examined:

(1) Ramkine Island: 14/07/2003 - under stones, 3-4 m: 2 spm, JT det (MNCN - 15.05/47205); (9) Kfar Abida: 30/05/2000 - tunnel, small cave, 7-8 m: 1 spm, JT det (MNCN - 15.05/47203).

Remarks:

This species can be superficially confused with *Berthellina edwardsi* (Vayssi re, 1896). We have checked the material examined for its relative shell size, larger than in *B. edwardsii*.

***Berthella ocellata* (delle Chiaje, 1830)**

Material examined:

(8) Batroun: 23/09/2002 - under stones, 2-3 m: 1 spm, JT det (MNCN - 15.05/47204).

A - *Pleurobranchus forskalii* (R ppell & Leuckart, 1831)

Literature records:

Pleurobranchus forskalii - Bitar, 2013: 8.

Material examined:

(6) Chak El Hatab: 05/07/2003 - 3 m, cave: 1 spm (MNCN).

Remarks:

Originally described from the Red Sea and widespread in the tropical Indo-Pacific (Rudman, 1993), in the Mediterranean Sea it has been only found in Israel, where 2 specimens were dredged in sandy mud at 48 m depth (Barash & Danin, 1977). It is nocturnal and feeds on compound ascidians (Marshall & Willan, 1999), and therefore the diurnal record in a cave, hereby reported from Lebanon, is not surprising. Although a long lasting existence in the Mediterranean (neglected due to its rarity) cannot be ruled out, the only three specimens of this large-sized and easy-to-identify species found in the Levant Sea suggest that it has not established viable populations in the Mediterranean. The most likely hypothesis is that the scattered records are a consequence of isolated events of introduction, probably via progressive penetration through the Suez Canal.

Family APLYSIIDAE Lamarck, 1809

A - *Aplysia dactylomela* Rang, 1828

Literature records:

Aplysia dactylomela - Bitar, 2013: 8.

Material examined:

(1) Ramkine Island: 25/07/2011 - on rocks: 1 spm, GB det (photo G. Bitar); (15) Saadiyat : 12/07/2009, in a small sciafilous cave with Corallinales, *Peyssonnelia* and *Crambe crambe*: 1 spm, GB det (photo G. Bitar); (18) Khaizaran: 03/04/2010 - amidst *Dendropoma* sp., surface: 1 spm, GB det (photo G. Bitar); (20) Tyr : 11/09/2010 - rocky bottom with *Jania*, 1 m : 5 spm, GB det (photo G. Bitar).

Remarks:

A species living in tropical and warm temperate waters, showing disjunctive distribution in the Atlantic Ocean and in the Indo-Pacific, Red Sea included, mainly observed in shallow waters on rocky bottoms with a wide algal coverage (see Pasternak & Galil, 2010; Crocetta & Galil, 2012). After the first records in 2002, it is now established and widespread along the eastern Mediterranean (Pasternak & Galil, 2010; Crocetta & Galil, 2012; Yokeş *et al.*, 2012), with scattered records from the central Mediterranean (Schembri, 2008; Crocetta *et al.*, 2009; Crocetta & Galil, 2012) and the eastern Adriatic Sea (Turk & Furlan, 2011; Kljajić & Mačić in Thessalou-Legaki *et al.*, 2012). Based on faunal data, and due to the absence of records from the western Mediterranean, the Mediterranean population(s?) has been recently suspected to originate from the Indo-Pacific/Red Sea one (Crocetta & Galil, 2012), pending, however, further study (including genetic data) to confirm this.

Aplysia depilans Gmelin, 1791

Literature records:

Aplysia depilans Linné [sic!] - Pallary, 1938: 15; *Aplysia depilans* L. [sic!] - Bitar, 1996: 116; *Aplysia depilans* Gmelin, 1791 - Bitar & Kouli-Bitar, 1998: 40.

Material examined:

(12) Beirut: 04/05/2008 - AUB (American University of Beirut), amidst mainly photophilous algae (*Acanthophora*, *Colpomenia*, *Corallina*, *Hypnea*, *Jania*, *Padina* and *Ulva*), 1m: 2 spm, GB det (photo G. Bitar).

Aplysia fasciata Poiret, 1789

Material examined:

(4) El Heri (marina Beaulieu): 03/06/2000 - 1 m: 1 spm, JT det (MNCN - 15.05/47198); (8) Batroun: 25/07/2011 - rocky bottom with *Corallina* - 1 m: 1 spm, GB det (photo G. Bitar); (12) Beirut: 04/05/2008 - AUB (American University of Beirut), amidst mainly photophilous algae (genus *Acanthophora*, *Colpomenia*, *Corallina*, *Hypnea*, *Jania*, *Padina* and *Ulva*), 1 m: 17 spm, GB det (photo G. Bitar); 03/06/2010 - IC (International College), amidst *Corallina*, *Jania* and *Ulva*, 1 m: 1 spm, GB det (photo G. Bitar); (13) Raoucheh: 13/06/2008 - rocky bottom with *Corallina*, 3 m: 1 spm, GB det (photo G. Bitar); (14) Khaldeh: Villamar, 07/06/2000 - 1 m: 1 spm, JT det (MNCN - 15.05/47197); (15) Saadiyat: 04/07/2010 - on boulders covered by *Ganonema*, 2 m : 1 spm, GB det (photo G. Bitar); (20) Tyr: 06/07/2011 - rocky bottom amidst *Corallina* and *Jania*, 2 m: 1 spm, GB det (photo G. Bitar).

A - *Bursatella leachii* Blainville, 1817

Literature records:

Bursatella leachi [sic!] de Blainville, 1817 - Zenetos *et al.*, 2004: 181; *Bursatella leachi* [sic!] - Bitar, 2013: 8.

Material examined:

(7) Selaata: 18/10/1999 - 12 m: 2 spm, GB det (photo J.G. Harmelin); 10/10/2000 - 10 m: 2 spm, JT det (MNCN - 15.05/40235); (12) Beirut: 02/06/2000 - harbour, 10 m: 1 spm, JT det (MNCN - 15.05/47122).

Remarks:

A circumtropical species, widespread also in the temperate waters of the Indo-Pacific and Atlantic Oceans, and recorded for decades in the entire Mediterranean Sea (see Eales & Engel, 1935; O'Donoghue & White, 1940; Swennen, 1961; Bebbington, 1970; Eales, 1970; Zenetos *et al.*, 2004; Oliver & Terrasa, 2004; Crocetta *et al.*, 2009; Ibáñez-Yuste *et al.*, 2012). In the Mediterranean it is usually found in soft bottoms covered by the green seaweed *Caulerpa prolifera* or the marine angiosperms *Cymodocea nodosa* and *Zostera noltii* (Zenetos *et al.*, 2004). Population size of this species may fluctuate drastically, with thousands of individuals present in a small area of a lagoon, in very dense aggregations, entirely absent a few weeks later. It is widely accepted as a Lessepsian species due to early records from the Levantine shores, although records from the Spanish Mediterranean Sea (Oliver & Terrasa, 2004; Ibáñez-Yuste *et al.*, 2012), as well as the fact that the most dense populations occur in the central Mediterranean Sea (Crocetta *et al.*, 2009;

Doneddu, 2011), would suggest that its Mediterranean dispersal pathway should be re-assessed by genetic data, as it may include some Atlantic sources.

A - *Syphonota geographica* (A. Adams & Reeve, 1850)

Literature records:

Syphonota geographica (Adams & Reeve, 1850) - Crocetta & Galil, 2012: 45; *Syphonota geographica* - Bitar, 2013: 8.

Material examined:

(7) Selaata: 06/07/2003: under boulders, 10 m: 1 spm (MNCN).

Remarks:

A circumtropical species mainly distributed in the Indo-West Pacific and recorded in the Mediterranean Sea from Lebanon, Greece, Turkey and Italy (Yokeş & Rudman, 2004; Mollo *et al.*, 2008; Crocetta *et al.*, 2009; Crocetta & Galil, 2012; Yokeş *et al.*, 2012). Despite some external similarities, it can be easily distinguished from *Aplysia* species by the position of the rhinophores, closer and placed back and between the parapodial lobes. Its feeding behaviour, on the Erythrean alien sea grass *Halophila stipulacea*, as well as its high dispersal abilities, with adults being able to swim by flapping the parapodia, strongly suggest that its Mediterranean secondary spreading is due to natural alien spreading mainly (Mollo *et al.*, 2008; Crocetta & Galil, 2012).

Family CHROMODORIDIDAE Bergh, 1891

Felimare picta (Schultz in Philippi, 1836)

Material examined:

(1) Ramkine Island: 31/05/2000 - 3-5 m: 2 spm, JT det (MNCN - 15.05/47107 - 15.05/47119); 19/10/2008, low depth: 1 spm, GB det (photo G. Bitar); (3) Anfeh: 27/09/09 - among *Corallina*, low depth: 1 spm, GB det (photo G. Bitar); 26/10/1999 - 15 m: 2 spm, JT det (MNCN - 15.05/40236); (12) Beirut: 25/09/2002 - airport, on boulders, 17 m: 1 spm, JT det (MNCN - 15.05/47211); (16) Saida: 05/06/2000 - Harf El Rijmeh, rocky bottom, 10 m: 1 spm, JT det (MNCN - 15.05/47112); (17) El Zahrani: 06/06/2000 - Harf El Hawieh El Jouani: 1 spm (MNCN); (19) El Kassmieh: 25/10/1999 - 42 m: 1 spm, GB det (photo G. Bitar).

Felimida britoi (Ortea & Perez, 1983)

Material examined:

(12) Beirut: 16/09/2002 - harbour, quay 60, 5 m: 1 spm, JT det (MNCN - 15.05/47201).

Felimida luteorosea (Rapp, 1827)

Material examined:

(1) Ramkine Island: 14/07/2003: 1 spm (MNCN).

Felimida purpurea (Risso in Guérin, 1831)

Material examined:

(7) Selaata: 02/05/2001: 1 spm (MNCN).

A - *Goniobranchus annulatus* (Eliot, 1904)

Literature records:

Chromodoris annulata - Bitar, 2013: 8.

Material examined:

(1) Ramkine Island: 28/08/2010 - sciaphilous rocky bottom with *Corallina* and *Peyssonnelia*, 1 m: 1 spm, GB det (photo G. Bitar); (4) El Heri (marina Beaulieu): 03/06/2000 - 2-3 m: 2 spm (MNCN); (5) Ras El Chakaa: 04/06/2000 - cave, 6 m: 1 spm (MNCN); (8) Batroun: 09/07/2011 - rocky bottom with *Corallina* and *Bryopsis*, 3 m: 2 spm, GB det (photo G. Bitar); 25/07/2011 - rocky bottom amidst *Corallina* et *Galaxaura rugosa* (J. Ellis & Solander) J.V. Lamouroux, 2 m: 1 spm, GB det (photo G. Bitar); (13) Raoucheh: 30/09/2010 - cave entrance amidst *Corallina* et *Pterocladia*, 3 m: 1 spm, GB det (photo G. Bitar); (15) Saadiyat: 02/07/2009 - rocky bottom with *Corallinales*, *Peyssonnelia*, *Margaretta cereoides* (Ellis & Solander, 1786) and *Crambe crambe* (Schmidt, 1862), 2 m: 2 spm, GB det (photo G. Bitar); 13/09/2011 - rocky bottom amidst calcareous algae and bryozoans, 1 m: 1 spm, GB det (photo G. Bitar); 26/07/2012 - rocky bottom with *Laurencia* and *Macrorhynchia philippina* Kirchenpauer, 1872, 3 m: 1 spm, GB det (photo G. Bitar); (20) Tyr: 23/05/2011 - amidst *Corallina*, 2 m: 1 spm, GB det (photo G. Bitar); (21) El Bayada: 14/10/2009 - rocky bottom with *Corallina*, *Crambe crambe* and *Chondrosia*, 2 m: 2 spm, GB det (photo G. Bitar); 26/07/2011 - rocky bottom amidst *Corallina*, 2 m: 1 spm, GB det (photo G. Bitar).

Remarks:

Widespread in the Indian Ocean, Red Sea included (see Daskos & Zenetos, 2007; Pasternak *et al.*, 2011; Yonow, 2012), it was first reported in 2004 from the Mediterranean Sea, where records from the Saronikos Gulf (Greece) suggested an arrival by shipping (Daskos & Zenetos, 2007). It is now widespread all along the Eastern Mediterranean shores, from Israel to Greece, where specimens have been found at shallow depths on rocky bottoms mainly (Gökoglu & Özgür, 2008; Yokeş *et al.*, 2009; Özcan *et al.*, 2010; Tsiakkios & Zenetos, 2011; Pasternak *et al.*, 2011; Yokeş *et al.*, 2012; Bitar, 2013). The specimens examined backdate its first record in the Mediterranean Sea to year 2000, with 3 specimens found at 2 different sampling sites in Lebanon, and therefore suggest Lessepsian spreading.

A - *Hypselodoris infucata* (Rüppell & Leuckart, 1831)

Literature records:

Hypselodoris infucata (Rüppell & Leuckart, 1830) [sic!] - Valdés & Templado, 2002: 25, 26 (fig. 2C), 27 (fig. 3); *Hypselodoris infucata* - Bitar, 2013: 8.

Material examined:

(1) Ramkine Island: 31/05/2000: 4 spm, JT det (LACM - 152755); 14/07/2003 - 3-4 m: 1 spm, JT det (MNCN); (3) Anfeh: 16/09/2012 - amidst algae, low depth: 1 spm, GB det (photo G. Bitar); (4) El Heri (marina Beaulieu): 03/06/2000 - 2-3 m: 3 spm, JT det (LACM - 152758); (7) Selaata: 02/05/2001: 1 spm, JT det (LACM - 152757); (8) Batroun: 23/09/2002 - amidst algae, low depth: 1 spm, GB det (photo G. Bitar); (10) Jbail: 17/10/1999 - harbour entrance, 2-3 m: 1 spm, JT det (MNCN - 15.05/40234); (11) Tabarja: 09/07/2009 - amidst algae, 1 m: 1 spm, GB det (photo G. Bitar); (12) Beirut: 02/06/2000 - harbour, 3-8 m: 63 spm, JT det (LACM - 152756 and MNCN - 15.05/45958); 16/09/2002 - harbour, breakwater, 5 m: 1 spm, JT det (MNCN - 15.05/46601); 09/07/2003 - harbour, outer side of the main jetty, western part, 12 m: 1 spm, JT det (MNCN - 15.05/47200); (13) Raoucheh: 17/09/2002 - boulders and rock, 7 m: 1 spm, JT det (MNCN - 15.05/46602); 13/06/2008 - amidst algae, low depth: 1 spm, GB det (photo G. Bitar); (22) Nakoura: 07/11/2010 - 1 m: 1 spm, GB det (photo G. Bitar).

Remarks:

Originally described from the Red Sea, it is very common in the Indo-Pacific, where it has been reported under different names (Johnson & Valdés, 2001). Due to the considerable taxonomic confusion of the Indo-Pacific *Hypselerodoris infucata* species-complex (see Johnson & Valdés, 2001), specimens from Lebanon have been anatomically examined by Valdés & Templado (2002). This Lessepsian species, spreading all along the Levantine shores with records from Israel, Cyprus, Lebanon and Turkey (Mienis & Gat, 1981; Çevik & Öztürk, 2001; Tsiakkios & Zenetos, 2011; Yokeş *et al.*, 2012), is now one of the most common Mediterranean opisthobranchs of the eastern Mediterranean, living on rocky bottoms in shallow waters and being able to thrive in harbour conditions (e.g. Beirut harbour). In Hawaii (Bertsch & Johnson, 1981) it feeds on *Dysidea fragilis* mainly (Montagu, 1818). This demosponge is also present in the Mediterranean, and this may be another reason for its widespread Mediterranean dispersal. However, Mienis & Gat (1981) noted that in Israel up to 15 specimens were seen in a single colony of the autochthonous sponge *Clathrina coriacea* (Montagu, 1818).

Family DISCODORIDIDAE Bergh, 1891

C - *Tayuva lilacina* (Gould, 1852)

Literature records:

Discodoris lilacina (Gould, 1852) - Valdés & Templado, 2002: 26 (fig 2: D, E), 28 (fig. 4), 29; *Tayuva lilacina* (Gould, 1852) - Dayrat, 2010: 119-127; *Discodoris lilacina* - Bitar, 2013: 8.

Material examined:

(4) El Heri (marina Beaulieu): 03/06/2000 - 2-3 m: 1 spm, JT det (LACM - 152717).

Remarks:

Dayrat (2010, 2011) used the name *Tayuva lilacina* referring to a circumtropical complex of cryptic species (including the taxa *lilacina* Gould, 1852, from the Indo-Pacific region; *crucis* Bergh, 1880, from the Caribbean sea; *maculosa* Bergh, 1884, from the Mediterranean and eastern Atlantic; and *ketos* Marcus and Marcus, 1967, from the Panamic Eastern Pacific) until a phylogeographic study of this group based on molecular markers clarifies their taxonomic status. Hence, the specimens recorded as alien from Israel, Lebanon and Tunisia (as *Discodoris concinna* and *D. lilacina*: Barash & Danin, 1977; Valdés & Templado, 2002; Ben Souissi *et al.*, 2005; Galil, 2007; Bitar, 2013) may belong to the Mediterranean taxon *T. maculosa*, but could also correspond to the true *T. lilacina* from the Indo-Pacific region through Lessepsian migration. In agreement with Zenetos *et al.* (2010) and Antit *et al.* (2011), we consider *Tayuva lilacina* a cryptogenic species and it is provisionally excluded from the list of Mediterranean alien species pending genetic studies to elucidate this issue. Valdés (2002) treated *Tayuva* as a junior synonym of *Discodoris* whilst Dayrat (2010) ranked them as distinct genera. The World Register of Marine Species database (WoRMS: Appeltans *et al.*, 2013) follows the criteria of the last author considering *Tayuva* as a valid genus.

Family PHYLLIDIIDAE Rafinesque, 1814

Phyllidia flava Aradas, 1847

Material examined:

(16) Saida: 05/06/2000 - off Nahr El Ouali: 1 spm, JT det (LACM-152718)

Family DENDRODORIDIDAE O'Donoghue, 1924

Dendrodoris grandiflora (Rapp, 1827)

Material examined:

(5) Ras El Chakaa: 21/09/2002 - under stone, 12 m: 1 spm, JT det (MNCN - 15.05/47206).

Dendrodoris limbata (Cuvier, 1804)

Material examined:

(8) Batroun: 23/09/2002 - under stones, 2-3 m: 4 spm (MNCN - 15.05/47207); 26/09/2002 - under stones, 2 m: 2 spm, JT det (MNCN - 15.05/47208).

Family POLYCERIDAE Alder & Hancock, 1845

A - *Plocamopherus ocellatus* (Rüppell & Leuckart, 1831)

Literature records:

Plocamopherus ocellatus (Rüppell & Leuckart, 1830) [sic!] - Valdés & Templado, 2002: 24, 25 (fig. 1), 26 (fig 2: A, B); *Plocamopherus ocellatus* - Bitar, 2013: 8.

Material examined:

(6) Chak El Hatab: 04/06/2000 - 5 m: 1 spm, JT det (LACM 152716); (12) Beirut harbour: 07/07/2003, outer breakwater jetty, 15 m: 1 spm (MNCN); (13) Raoucheh:

17/09/2002 - boulders and rock, 7 m: 2 spm, JT det (MNCN 15.05/46581).

Remarks:

Originally described from the Red Sea and the Suez Canal, this Lessepsian species has been found in Israel, Lebanon and Turkey (Barash & Danin, 1982; Valdés & Templado, 2002; Zenetos *et al.*, 2004; Yokeş *et al.*, 2012). Although the number of specimens found in the Mediterranean Sea is still low, repeated findings may indicate that some established populations exist in the eastern Mediterranean. Nothing is currently known on the biology of this species. As other congeneric species, it probably feeds on branching bryozoans and can swim by lateral flexion of the body (Vallès & Gosliner, 2006).

Family AEOLIDIIDAE Gray, 1827

Aeolidiella alderi (Cocks, 1852)

Material examined:

(1) Ramkine Island: 01/06/2000 - 1 m: 1 spm, JT det (MNCN - 15.05/47210).

Family FLABELLINIDAE Bergh, 1889

A - Flabellina rubrolineata (O'Donoghue, 1929)

Literature records:

Flabellina rubrolineata - Bitar, 2013: 8.

Material examined:

(5) Ras El Chakaa: 13/07/2003 - on *Eudendrium*, 5 m: 1 spm, JT det (MNCN - 15.05/47199).

Remarks:

Originally described from Suez, Egypt, it is very common and widely distributed in the tropical Indo-Pacific (Gosliner & Willan, 1991). This Lessepsian species presumably spread via progressive penetration through the Suez Canal, having been recorded from Israel, Lebanon, Cyprus, Turkey and Greece (Gat, 1993; Yokeş & Rudman, 2004; Zenetos *et al.*, 2004; Tsiakkios & Zenetos, 2011; Poursanidis in Eleftheriou *et al.*, 2011; Yokeş *et al.*, 2012; Bitar, 2013). It mainly feeds on hydroids of the genus *Eudendrium* (Willan & Coleman, 1984; Gosliner *et al.*, 1996), also confirmed by our record.

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