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A revised inventory of Annelida in the Lebanese coastal waters with ten new aliens for the Mediterranean Sea

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Mediterranean Marine Science, 25 (3) 2024

Supplementary Material 1

Non-indigenous annelid species sampled in Lebanon, with material examined, updated descriptions of the Mediterranean specimens, molecular data and taxonomic remarks.

Amphinomidae Lamarck, 1818
Eurythoe complanata (Pallas, 1766) *sensu lato*

Material examined. Sample TR5/NT17 (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, on Artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 4 specimens. Sample TR64/NT270 (33.27453°N, 35.19079° E), 21 November 2022, 0-3 m depth, on hard substrate with coralline and photophilous algae: 1 specimen.

Molecular data. Two COI sequences (accession numbers: PP808830; PP808831) were obtained from two individuals. The two individuals were genetically identical and gave a 100% match with *Eurythoe complanata* from China on GenBank (accession number: OQ749906) and with *Eurythoe* sp. from the Pacific coast of Mexico on BOLD (accession numbers: YCHAE218-08.COI-5P; YCHAE217-08.COI-5P; YCHAE219-08.COI-5P). Identity above 98% was also retrieved with several sequences assigned to *Eurythoe* sp. or *E. complanata* from Panama, Australia, the Caribbean Region, as well as from tropical aquaria, that might be considered as conspecific. This lineage corresponds to the Pacific lineage tentatively identified by Barroso *et al.* (2010) as *Eurythoe armata* (Kinberg, 1867).

Remarks. *E. complanata* was identified as a species complex by Barroso *et al.* (2010), who found three divergent lineages with partially disjoint distributions. This study primarily focused on tropical Atlantic lineages of *E. complanata* but also identified a Pacific lineage, reported for Taboga Island, Panama, which genetically corresponds to the one identified in the present study. Barroso *et al.* (2010) tentatively referred this lineage to *E. armata*, though this evaluation is largely based on the type locality. The original description of *Blenda armata* Kinberg, 1867 is in fact almost a *nomen nudum* (Kinberg, 1867) and should be backed by a more complete morphological description, possibly based on type material. Arias *et al.* (2013a) revised the Mediterranean records of *E. complanata*, highlighting the presence of two different species (*E. complanata* and *Eurythoe laevisetis* Fauvel, 1914). According to Arias *et al.* (2013a), the occurrence of *E. complanata* in the Mediterranean Sea is confirmed for Israel and the Sea of Alboran, while records for Cyprus (Ben-Eliahu, 1972), Türkiye (Ergen & Çinar, 1997), Italy (Castelli *et al.*, 2008; Langeneck *et al.*, 2020a), and Greece (Chatzigeorgiou *et al.*, 2016) might refer to either *E. complanata* or *E. laevisetis*. Additionally, Kinberg (1857) described for "the coasts of Syria" a seemingly pre-Lessepsian species of *Eurythoe*, *Eurythoe syriaca*, which was reported from Lebanon as well (Bitar & Kouli-Bitar, 1998). The identity of *E. syriaca* is currently uncertain but since *E. complanata* was historically found in association with fouling assemblages on ships, it might represent one of the first introductions in the Mediterranean Sea.

The present report extends the distribution of *E. complanata sensu lato* to Lebanon and includes the first molecular data for Mediterranean individuals of this species complex. The lineage found in the Mediterranean Sea appears to have a wide distribution, though it might be non-indigenous in much of its current range. Most sequences belonging to this lineage come from the Pacific Ocean, suggesting an Indo-Pacific affinity. These data imply that Mediterranean specimens identified as *E. complanata* do not correspond to the species *sensu stricto* (with west-Atlantic affinity) but rather to an Indo-Pacific lineage potentially corresponding to *E. armata*. The introduction pathways followed by this species in the Mediterranean Sea are still unclear, mainly due to the lack of data for the Indian Ocean. The occurrence of this lineage in a relatively remote part of the Indo-Pacific region and its presence in tropical aquaria (Weigert *et al.*, 2016) could suggest an aquarium-mediated introduction, though ballast water introductions also a likely explanation. However, the molecular identity of *E. complanata* from the Red Sea and the western Indian Ocean is currently unknown, and for this reason, a spread through the Suez Canal cannot be excluded at present.

Linopherus canariensis Langerhans, 1881

Material examined. Sample TR19/NT82, (33.33295° N, 35.18680° E), 18 November 2022, 38 m depth, hard substrate with encrusting and photophilous algae: 2 specimens.

Molecular data. Two COI sequences were obtained from the two individuals found (accession numbers: PP808832; PP808833). The two sequences had a 96.5% identity; a comparison with the sequences deposited in GenBank gave a 82% highest identity with *Eurythoe complanata*, while on BOLD the comparison gave a 95-98% identity with a private sequence assigned to "Polychaeta", without further data. Sequences assigned to *L. canariensis* were missing from both databases.

Remarks. This species was historically reported from Lebanon as *Pseudeurythoe acarunculata* Monro, 1937 (Laubier, 1966); the identity of the Mediterranean species was clarified by Çinar (2009). *L. canariensis* is widespread in the Eastern Mediterranean Sea (Laubier, 1966; Ben-Eliahu, 1976; Ergen & Çinar, 1997; Çinar, 2005; 2009) and occurs along the Italian coastline (Cosentino & Giacobbe, 2011; Langeneck *et al.*, 2020a). The present data confirm its occurrence in Lebanon.

The molecular data here presented are the first available for this species, which unfortunately does not allow any comparison with topotypic material. However, the genetic distance between the two specimens assayed (around 3.5%) is relatively high and might suggest a strong genetic structure within the species and the possibility of multiple introductions from different parts of its native range into the Mediterranean Sea.

Eunicidae Berthold, 1827
Leodice antennata (Savigny, 1818) (Fig. S1)

Material examined. Sample LB43, (33.27538° N, 35.19548° E), 04 June 2022, 0-5 m depth, on Artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 6 specimens. TR15/NT98, (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, Artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 18 specimens. TR41/NT246, (33.28366° N, 35.19549° E), 18 November 2022, 0-6 m depth, on hard substrate with coralline algae and photophilous algae: 35 specimens. TR59/NT276, (33.26500° N, 35.19059° E), 20 November 2022, 0-4 m depth, on artificial hard substrate with photophilous algae: 11 specimens. TR69/NT270D, (33.27453°N, 35.19079° E), 21 November 2022 0-3 m depth, on hard substrate with coralline algae and photophilous algae: 11 specimens. TR87/NT210, (33.33295° N, 35.18800°E), 22 November 2022, 35 m depth, hard substrate with coralligenous formation and freshwater output: 1 specimen.

Description. Complete adults with 82-106 chaetigers, 18-62 mm total length, 2.8-6.1 mm L10, 1.5-3 mm maximum width (Fig. S1A). Prostomium slightly bilobed, with two large dark brown eyes and five antennae (Fig. S1B, C). Antennae moniliform, with numerous, roundish articles, central antenna with shorter ceratophore with respect to paired ones (Fig. S1B, C). Central antenna with 13-20 articles, median antenna with 10-15 articles, lateral antenna with 7-12 articles. Peristomium bi-annulated, anterior ring 3 times the posterior one (Fig. S1B). Tentacular cirri smooth, spindle-shaped, inserted around half the posterior peristomial ring, twice the length of the posterior peristomial ring. Dorsal cirri cirriform, initially thick, becoming thinner and shorter around the 6th chaetiger. Ventral cirri shorter than dorsal ones, cirriform, with enlarged basis (Fig. S1K-L). Branchiae starting at the 6th (rarely 7th) chaetiger, initially with 1-2 filaments, quickly increasing to 5-6 filaments at the 7th-9th chaetiger. Number of branchial filaments rapidly decreasing to 3 (25th chaetiger), then to 1 (35th chaetiger), increasing again to 3 around the 60th chaetiger. Branchiae to the end of the body. Two long anal cirri, with 5-6 elongated, not very distinct articles.

Maxillae dark. M1 forceps-like (1+1), M2: 6-8+4-5, M3: 8-9 asymmetrical (right jaw missing), M4: 7-8+6-7, M5: 1+1 (Fig. S1C).

Parapodia uniramous with two yellow neuroaciculae throughout the body (Fig. S1K-L). First chaetiger with aciculae relatively thin, mucronate (Fig. S1I), 3 limbate chaetae, 7 compound chaetae. 10th chaetiger with 8 limbate chaete and 12 compound chaetae. 70-80th chaetiger with 4 limbate chaetae, 5 compound chaetae, 2 strongly tridentate acicular chaetae (Fig. S1J) and 2-3 pectinate chaetae (Fig. S1H). In the posterior part of the body the aciculae slightly surpass the edge of the parapodium. Compound chaetae with strongly bidentate blade and a hyaline hood slightly surpassing the primary tooth; secondary tooth as large as primary tooth, the two teeth forming a wide angle (Fig. S1D, E).

Complete juveniles with 30-54 chaetigers, 5.6-7.8 mm total length, 1.54-2.13 mm L10, 0.4-0.6 mm maximum width. Antennae proportionally more or less as long as in the adult, but with fewer, more elongated articles. Central antenna with 7-12 articles, median antenna with 3-7 articles, lateral antenna with 1-4 articles. Branchiae from the 6th to the 9th-15th chaetiger depending on the size, all unbranched. Parapodia with one acicula, up to 3 limbate chaetae and 6 compound chaetae. Compound chaetae often with an additional small tooth on the dorsal edge of the primary tooth (Fig. S1F, G). Up to 2 acicular chaetae from the 9th chaetiger.

Live colour bright orange, with prostomium pale (Fig. S1A, B). Antennae whitish with dark orange rings. A white ring on the first chaetiger, one whitish, sub-rectangular spot on the back of each chaetiger.

Molecular data. A COI sequence obtained from one specimen from sample TR68 (accession number: PP808816) gave a >99% identity with unidentified polychaetes/Eunicidae from the Red Sea (Pearman *et al.*, 2018; Kandler *et al.*,

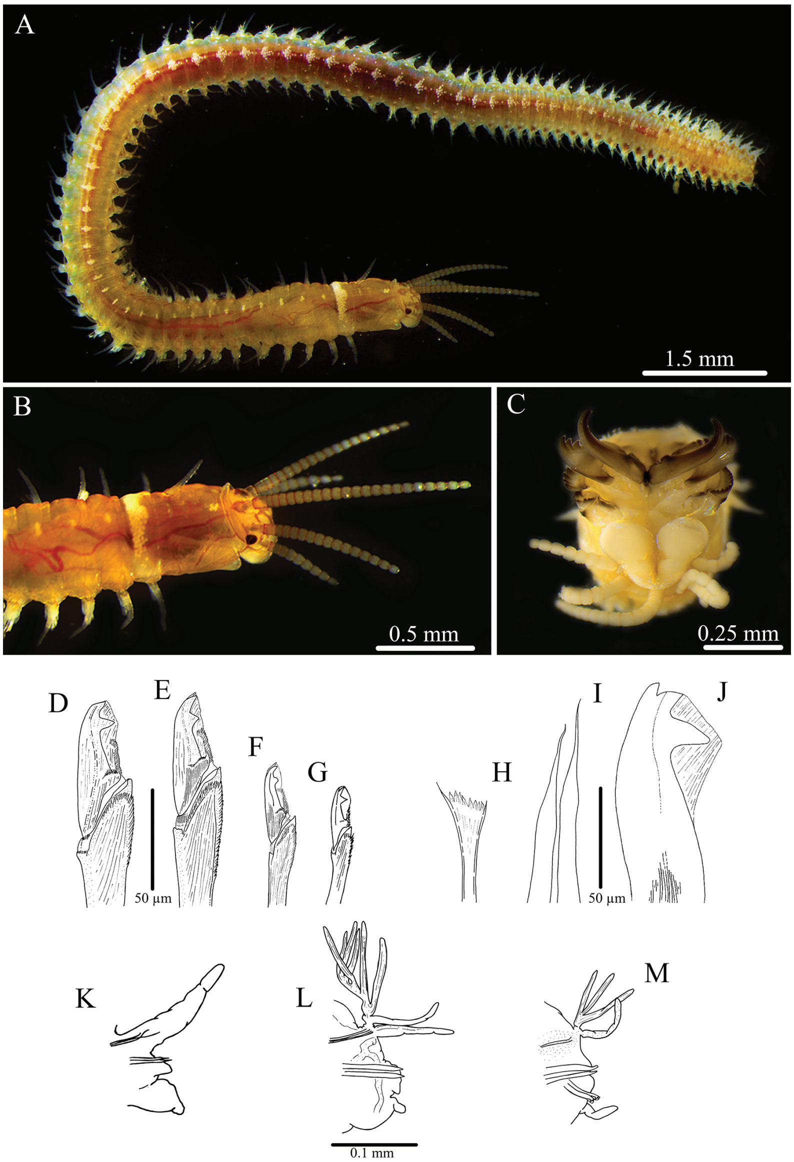

Fig. S1: *Leodice antennata* (Savigny, 1818). A. Almost complete live specimen; B. Close up to prostomium and peristomium; C. Maxillary apparatus everted, frontal view; D-J. Chaetae, line drawings (D, E. Adult compound chaetae; F. Juvenile bidentate compound chaetae; G. Juvenile tridentate compound chaetae; H. Pectinate chaeta; I. Aciculae; J. Acicular chaeta); K-M. Parapodia, line drawings (K. Parapodium of the 1st chaetiger; L. Mid-body parapodium; M. Posterior parapodium).

2019 - accession numbers KY263118; KY263184; MH338664).

Remarks. The examined individuals correspond well to the redescriptions of *L. antennata* by Fauchald (1992) and Kurt Şahin & Çinar (2009). Lavrador *et al.* (2023) list *L. antennata* among the species for which barcoding data are currently unavailable on BOLD; however, this statement is not correct, as barcodes do indeed exist, except they are deposited under the invalid synonym *Eunice antennata*. The percentage identity of the deposited COI sequences, corresponding to specimens sampled in the Hawaii islands, is relatively low, around 80%. Conversely, specimens from Lebanon show a >99% identity with unidentified Eunicidae from the Red Sea, indicating they are conspecific. Sequence data confirm the Red Sea origin of the Mediterranean individuals, but when compared to the available sequences of *L. antennata*, these individuals clearly belong to a different species. Considering that the type locality of *L. antennata* is in the Red Sea, it is likely that the species identified in this study is *L. antennata sensu stricto*, while sequences from the Hawaii Islands might represent a pseudocryptic, possibly undescribed species of the same genus. This species is already known from Lebanon (Badreddine & Çinar *in* Fortič *et al.*, 2023).

Palola valida (Gravier, 1899) (Fig. S2)

Material examined. Sample TR1/NT1 (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, Artificial wall covered by coralline algae and photophilous algae/ vermetid reef; under rocks: 2 specimens.

Description. Adult specimen incomplete, 227 chaetigers, 91.7 mm total length, 5.3 mm L10, 3.2 mm maximum width without parapodia. Juvenile specimen incomplete, 53 chaetigers, 6.75 mm total length, 1.99 mm L10, 0.64

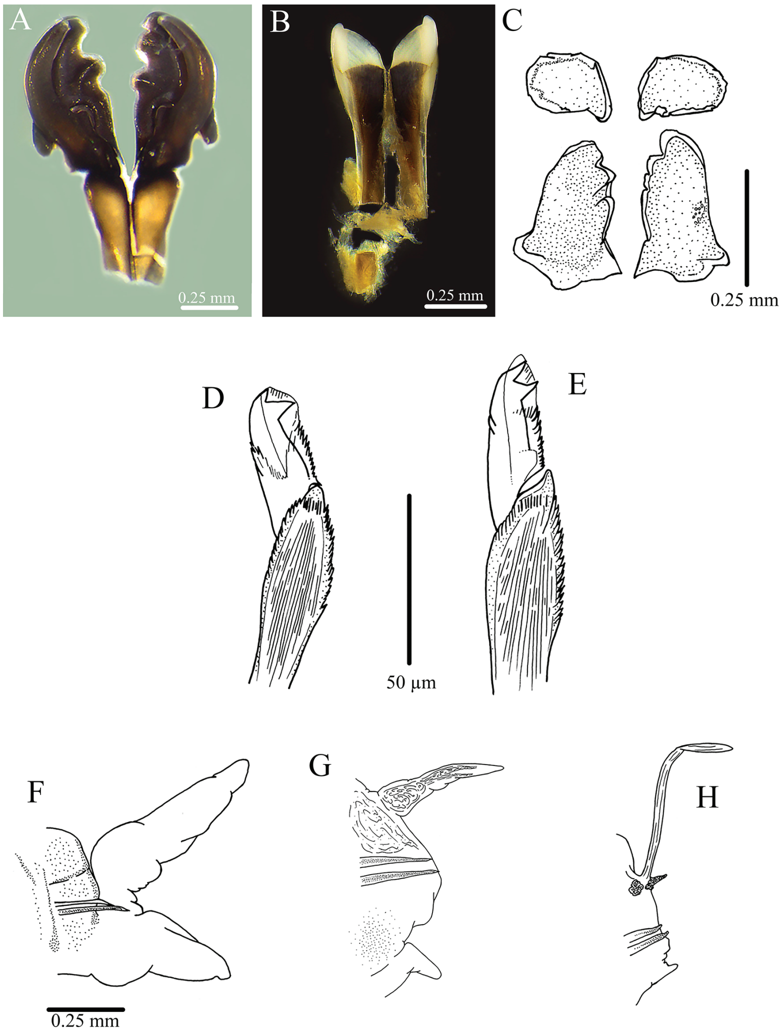

Fig. S2: *Palola valida* (Gravier, 1899). A. Maxillae 1 and 2; B. Mandible; C. Maxillae 3 and 4, line drawings; D, E. Compound chaetae, line drawings; F-H. Parapodia, line drawings (F. Parapodium of the 1st chaetiger; G. Mid-body parapodium; H. Posterior parapodium).

mm maximum width. Body anteriorly cylindrical, posteriorly slightly flattened. Prostomium slightly bilobed, with a couple of small, black eyes. Five tapering antennae, wrinkled in the preserved individual but without annulations. Peristomium formed by two achaetous rings, anterior ring 1 ½ times the posterior ring, tentacular cirri smooth, inserted around half of the posterior ring, anteriorly reaching half of the anterior ring. First chaetiger with reduced parapodia, with both dorsal and ventral cirri slender, tapering. Subsequent dorsal cirri slender, ventral cirri gradually shortening, with basis becoming thicker and swollen around the 6th-7th chaetiger. Branchiae filiform, unbranched, starting at the 79th chaetiger (Fig. S2H), gradually increasing in length, slightly longer than the dorsal cirri at the 83rd chaetiger, much longer than the dorsal cirri at the 88th chaetiger. Branchiae starting at the 51st chaetiger in juveniles.

Parapodia uniramous (Fig. S2F-H) with 1 or 2 black aciculae, irregularly alternating. 1st chaetiger reduced, with 2 thin aciculae, 2 limbate chaetae and 2 compound chaetae. 10th chaetiger with 2 aciculae, 8 limbate chaetae and 19 compound chaetae. 100th chaetiger with 2 thick aciculae, 5 limbate chaetae and 7 compound chaetae. 200th chaetiger with 1 thin acicula, 3 limbate chaetae and 3 compound chaetae. Limbate chaetae with narrowly hooded, pinnulated limbation. Compound chaetae heterogomph, with short bidentate blade surrounded by a distinctly ribbed transparent hood; blades with secondary tooth much larger than the primary one (Fig. S2D, E). Pectinate and acicular chaetae absent.

Maxillae dark. M1 forceps-like (1+1), M2: 2 + 3, slightly shorter than M1; M3: 3+4; M4: 1+1; M5: 1+1 (Fig. S2A, C). Carriers as long as M2 (Fig. S2A). Mandible (labium) dark with whitish distal part, elongated, symmetrical, incompletely fused, anteriorly widened with slightly serrated anterior edge (Fig. S2B).

Preserved colour: light brown with a whitish honeycomb-like pattern in the adult specimen, uniformly yellowish tan in the juvenile.

Molecular data. A COI sequence obtained from the largest individual (accession number: PP808817) showed a 93% identity with a sequence of *Palola valida* from Salento (accession number: PP067668 - Langeneck *et al.*, 2024) suggesting that, despite a good morphological correspondence, the two specimens belong to different species. Molecular identity with the native *Palola siciliensis* (accession numbers: GQ497554; PP811701) was much lower (around

80%) (Fig. S3). 16S rDNA amplification (which was obtained for the Salento specimens) proved impossible with all primer combinations.

Remarks. The examined specimens, especially the largest one, correspond well to the redescription by Kurt Şahin & Çinar (2009). This species was firstly reported for the Bay of Iskenderun (Kurt Şahin & Çinar, 2009) and later reported from the Eastern Adriatic Sea (Spagnolo *et al.*, 2019), the Turkish Aegean Sea (Çinar & Dağli, 2021), and Cyprus (Rousou *et al.*, 2023). Records from circalittoral environments of the Italian Ionian Sea (Gravina *et al.*, 2021) are debatable (Langeneck *et al.*, 2024), as these environments are characterized by a limited impact of non-indigenous species (Gravina *et al.*, 2021). The only record of *P. valida* from an Italian port environment, despite a good morphological correspondence, did not match eastern Mediterranean material from a molecular perspective, as the 7% genetic distance detected between the two individuals suggests they are different species. Nonetheless, based on 16S and COI sequences, these individuals are clearly distant from the native *Palola siciliensis* (Grube, 1840) and tend to cluster with Indo-Pacific *Palola* spp. (Fig. S3), confirming the Indo-Pacific affinity of the *P. valida* species group.

The main feature distinguishing *P. valida* from the native *P. siciliensis* is the maxillary apparatus, which is asymmetrical in *P. valida* and symmetrical in *P. siciliensis*. However, individuals belonging to this genus with an asymmetrical maxillary apparatus were found in historical material from the western Mediterranean Sea (A. Giangrande, *pers. obs.*), suggesting either that *P. siciliensis* shows some variability in this trait or that there is more than one native species of the genus *Palola*. A critical revision of this genus in the Mediterranean Sea is therefore needed to ascertain the usefulness of the employed morphological characters and the possible occurrence of pseudocryptic species.

Palola* cf. *siciliensis (Grube, 1840)

Material examined. Sample TR58/NT279, (33.26500° N, 35.19059° E), 20 November 2022, 0-4 m depth, on artificial hard substrate with photophilous algae: 4 specimens.

Description. All specimens incomplete (21-40 chaetigers), for 3.51-6.45 mm total length, 1.88-2.36 mm L10, 0.91-1-17 mm maximum width. The majority of characters match the description of *P. valida*, with the exception of the preserved colour (whitish, without any trace of dark pigmentation or honeycomb-like pattern) and the maxillary formula, which was as follows: M1 forceps-like (1+1), M2: 3+3; M3: 3+3; M4: 1+1; M5: 1+1. Two individuals are mature females with dark green oocytes in the coelome.

Remarks. See *P. valida*.

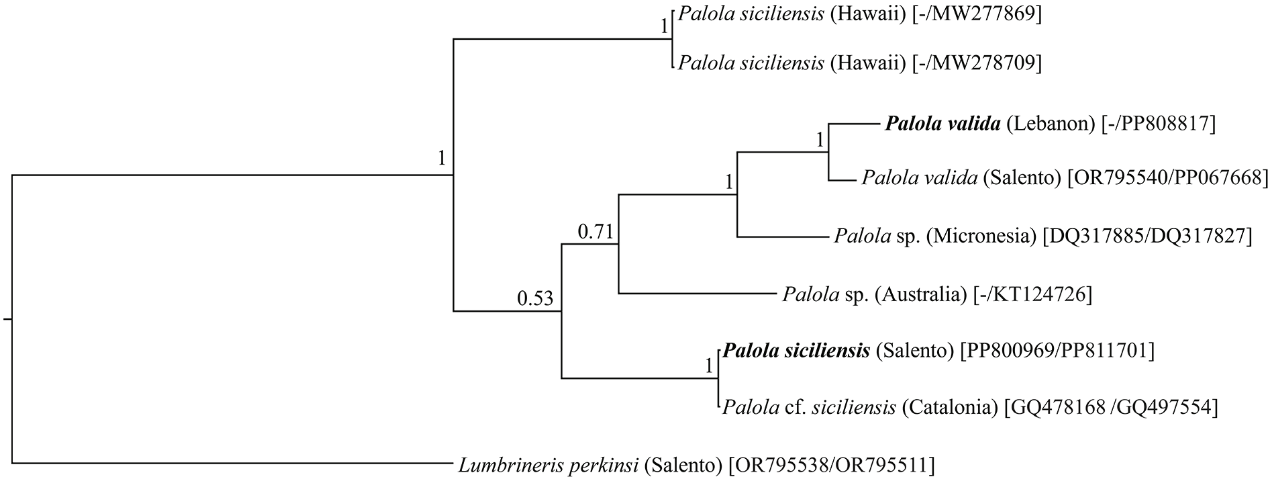

Fig. S3: Bayesian phylogenetic tree of Mediterranean and Indo-Pacific individuals belonging to the genus *Palola* based on concatenated 16S rDNA and COI sequences (accession numbers: [16S/COI]). *Lumbrineris perkinsi* is used as outgroup. Node values represent Bayesian posterior probabilities, specimens in bold were sequenced in the present study.

Lumbrineridae Schmarda, 1861

Lumbrineris annulata Hartmann-Schröder, 1960 (Fig. S4)

Material examined. Sample TR42/NT140, (33.28366° N, 35.19549° E), 18 November 2022, 0-6 m depth, on hard substrate with coralline algae and photophilous algae/ soft bottoms: 1 specimen.

Description. Specimen incomplete (Fig. S4A), 56 chaetigers, 25.69 mm total length, 3.76 mm L10, 1.54 mm maximum width. Prostomium rounded, slightly wider than long. Peristomium biannulated, anterior ring 1½ times longer than the posterior one. Chaetigers gradually becoming more elongated towards the posterior region, midbody chaetigers with a distinct dorsal ridge.

Maxillae dark. M1 forceps-like, 1+1; M2: 4+4; M3 rather elongated: 2+2 (teeth thin and very close, beak-like); M4

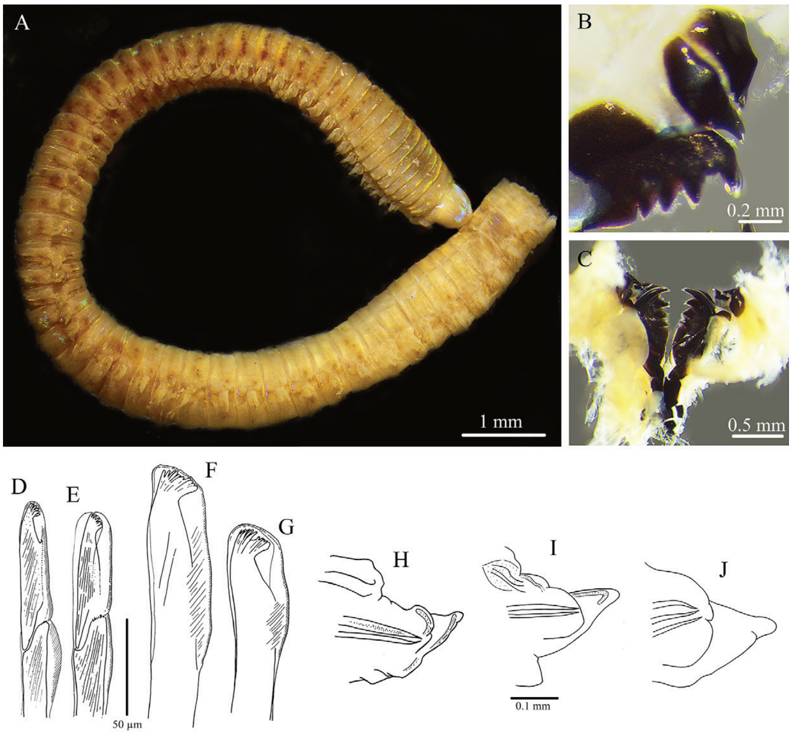

Fig. S4: *Lumbrineris annulata* Hartmann-Schröder, 1960. A. Incomplete specimen; B. Maxillae 2, 3 and 4; C. Maxillary apparatus, dissected; D-G. Chaetae, line drawings (D, E. Compound multidentate hooded hooks; F. Long-hooded simple multidentate hook; G. Short-hooded simple multidentate hook); H-J. Parapodia, line drawings (H. Anterior parapodium; I. Mid-body parapodium; J. Posterior parapodium).1

elongated: 1+1; M5 edentate plate (Fig. S4B, C). Carriers shorter than M1, damaged during the extraction (Fig. S4C). Mandibles fused for the whole length, damaged in the extraction.

Parapodia uniramous (Fig. S4H-J). Prechaetal lobe massive, short, gradually elongated towards the pygidium, distinctly digitiform from the 30th chaetiger. Postchaetal lobe triangular, flattened, increasing in length. Compound multidentate hooded hooks at chaetigers 1-23, ventral limbate chaetae at chaetigers 1-25, dorsal limbate chaetae at chaetigers 1-34. Up to 2 yellow, aristate aciculae per parapodium. 5th chaetiger with 3 dorsal limbate chaetae, 4 compound multidentate hooded hooks and1 ventral llimbate chaeta. 22nd chaetiger with 3 dorsal limbate chaetae, 2 compound multidentate hooded hooks, 1 ventral limbate chaeta. 30th chaetiger with 2 dorsal limbate chaetae and 3 simple multidentate short-hooded hooks. 56th chaetiger with 5 simple multidentate long-hooded hooks. Compound multidentate hooded hooks with medium-size blade (length:width= 3:1), with 8-10 apical teeth gradually decreasing in size distally, but without a distinct main fang (Fig. S4D, E). Simple multidentate hooded hooks of the same thickness, with a truncated, crenulated main fang topped by 5-6 smaller teeth (Fig. S4F, G).

Molecular data. A COI sequence (accession number: PP808819) was obtained for the only specimen found. A comparison with sequences deposited in both GenBank and BOLD retrieved a 81% identity with *Lumbrineris japonica* Marenzeller, 1879.

Remarks. Even though this is the only specimen retrieved, its features are clearly different from those of the other *Lumbrineris* species reported from the Mediterranean Sea. Most Mediterranean species are characterised by a conical prostomium, while a globular prostomium is known only for *Lumbrineris coccinea* (Renier, 1804) and *Lumbrineris perkinsi* Carrera-Parra, 2001, both occurring in the eastern Mediterranean Sea. Among these species, *L. perkinsi* is readily recognisable for its maxillary formula, unique among Mediterranean species, characterised by M3 with 4 teeth and M4 with 2 teeth. *Lumbrineris coccinea* is seemingly closer, as it is characterised by M3 with 2 teeth, as in *L. annulata*; however, the two teeth of the M3 are massive and well separated in *L. coccinea* (thin and very close in *L. annulata*). The blades of compound multidentate hooded hooks are shorter and with up to 5 teeth (longer and with up to 10 teeth in *L. annulata*), and the simple multidentate hooded hooks are characterised by triangular main fang with smooth edge (truncated and crenulated in *L. annulata*). The correspondence with the redescription of *L. annulata* by Carrera-Parra (2006) is almost perfect; the only differences retrieved are represented by the number of chaetigers where compound multidentate hooded hooks, ventral limbate chaetae and dorsal limbate chaetae occur (23, 25, and 34, respectively, in the examined specimen, *versus* 15-18, 20, and 25, respectively). Carrera-Parra (2006) stated that simple multidentate hooded hooks are of clearly different sizes, with pre-acicular ones twice as big as post-acicular ones; however, the examined

individual did not show such a clear difference between pre-acicular and post-acicular hooks. In our opinion, these differences might fall within the intraspecific variability of *L. annulata*.

The occurrence of *L. annulata* in the eastern Mediterranean is rather puzzling, as this species is currently known only for the south-eastern Pacific Ocean, between Peru and Chile (Carrera-Parra, 2006) and seems therefore to have temperate affinity. A possible explanation might imply a passive transport from the Pacific Ocean through ballast waters. However, the polychaete fauna of the Red Sea is only partially known, and the majority of the *Lumbrineris* species reported in historical works are currently regarded as indeterminable or dubious (Wehe & Fiege, 2002; Carrera-Parra, 2006). Among the species reported in the Red Sea, only four species have been described as having a rounded prostomium, namely *Lumbrineris cavifrons* (Grube, 1866), *L. coccinea*, *Lumbrineris inflata* Moore, 1911, and *Lumbrineris sphaerocephala* (Schmarda, 1861). Among them, *L. inflata* is characterised by M3 with 3-4 teeth (see remarks on *L. perkinsi*) and does not correspond to this taxon. The original descriptions of *L. cavifrons* and *L. sphaerocephala* are very scanty, and the type material of these taxa, originally described from South Africa and New Zealand, respectively, has not been redescribed; however, based on original descriptions and redescriptions (Schmarda, 1861; Grube, 1866; Fauvel, 1927; Day, 1967), these species lack compound falcigers and should possibly be assigned to the genus *Scoletoma* Blainville, 1828. Nonetheless, it is not impossible that one of these names has been used for this species in historical works, and that the presence of *L. annulata* in the Mediterranean Sea is due to a range extension through the Suez Canal. Molecular data do not allow to ascertain nor disprove the identity of this individual, as the genetic identity retrieved with deposited sequences is very low, and sequences of topotypic individuals of *L. annulata* are currently unavailable. In principle, therefore, the occurrence of cryptic species within *L. annulata* cannot be disproved; however, from the morphological point of view, the examined specimen corresponds well to this species, and we would consider it as a new non-indigenous species in the Mediterranean Sea.

Lumbrineris perkinsi Carrera-Parra, 2001 (Fig. S5)

Material examined. Sample TR108/NT49**,** (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, on Artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 1 specimen. TR45/NT179, (33.28366° N, 35.19549° E), 18 November 2022, 0-6 m depth, on hard substrate with coralline algae and photophilous algae/soft bottoms: 1 specimen. TR83/NT49, (33.33295° N, 35.18800°E), 22 November 2022, 35 m depth hard substrate with coralligenous formation, and freshwater output: 1 specimen.

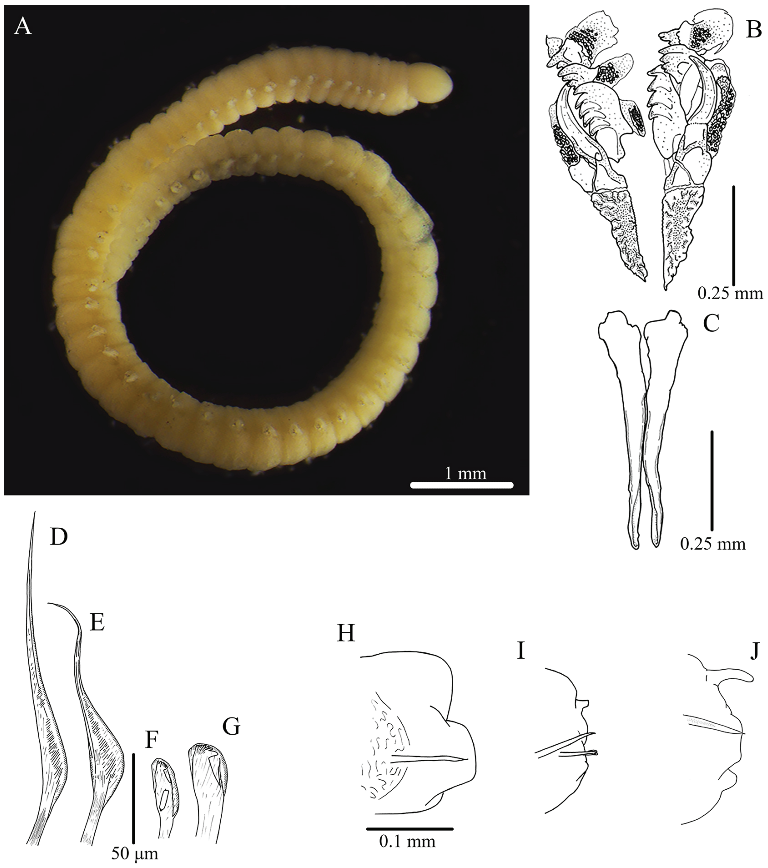

Fig. S5: *Lumbrineris perkinsi* Carrera-Parra, 2001. A. Almost complete specimen; B. Maxillary apparatus, line drawings; C. Mandible, line drawings; D-G. Chaetae, line drawings (D, E. Limbate chaetae; F. Compound multidentate hooded hook; G. Simple multidentate hooded hook); H-J. Parapodia, line drawings (H. Anterior parapodium; I. Mid-body parapodium; J. Posterior parapodium).

Description. Complete specimens (Fig. S5A) with 45-54 chaetigers, 7.75-12.13 mm total length, 2.01-2.75 mm L10, 0.54-0.62 mm maximum width without parapodia. Prostomium rounded, slightly longer than wide, peristomium formed by two achaetous rings, anterior ring twice the posterior ring. Parapodia uniramous, with only one yellow neuroacicula throughout the body (Fig. S5H-J); post-chaetal lobe digitiform, always longer than the pre-chaetal lobe, clearly longer than the parapodial lobe from the 4th chaetiger, increasing in length to the 14th chaetiger, then of constant length to the 30th chaetiger, gradually becoming shorter towards the pygidium. Pre-chaetal lobe papilliform, slightly more elongated in chaetigers 14-25. The first chaetiger in one specimen has only simple multidentate hooded hooks, compound multidentate hooded hooks from chaetiger 1-2 to chaetiger 6, dorsal limbate chaetae from chaetiger 1 to chaetiger 9, ventral limbate chaeta from chaetiger 1 to chaetiger 8. First chaetiger with 3 dorsal limbate chaetae, 1 multidentate hooded hook (either compound or simple) and 1 ventral limbate chaeta. 10th chaetiger with three simple multidentate short-hooded hooks, 50th chaetiger with 2-3 simple multidentate long-hooded hooks. Compound multidentate hooded hooks with five sub-equal marginal teeth (Fig. S5F); simple multidentate hooded hooks with 5-6 teeth over a subtriangular, clearly larger main fang (Fig. S5G), showing a limited variation along the body. Pygidium truncated with four sub-equal anal cirri. Maxillae dark; M1 1+1, M2 4-5+5, M3 3-4+4, M4 2+2, M5 as edentate plate (Fig. S5B).

Molecular data. A COI sequence was obtained from a specimen from Tyre (accession number: PP808820); it had a >99% identity with both sequences of *L. perkinsi* deposited on BOLD (mostly private), and sequences of *L. perkinsi* from the Italian Ionian coast (accession numbers: OR795510-OR795511 – Langeneck *et al.*, 2024).

Remarks. The examined specimens correspond well to the original description and redescriptions of *L. perkinsi* (Carrera-Parra, 2001; 2006; Çinar, 2009), and the identification is confirmed by barcoding data. A slight variation towards the other available descriptions refers to the possible presence of simple multidentate hooded hooks at the first chaetiger (possibly a clue of regeneration) and the observation of asymmetrical M2 and M3 in a single specimen. This species is currently widespread in the Mediterranean Sea, having been reported from Spain (Campoy, 1982 – as *L. inflata*), Italy (Giangrande *et al.*, 1981 – as *L. inflata*; Gherardi *et al.*, 1985 – as *L. inflata*; Langeneck *et al.*, 2020a; 2024), Türkiye (Çinar, 2009), Algeria (Grimes *et al.*, 2018), Israel (Langeneck *et al.*, 2020a), France (Tempesti *et al.*, 2022) and Egypt (Hamdy *et al.*, 2023). The present data extend its distribution to Lebanon. The identity of individuals reported as *L. inflata* from the Red Sea (Wehe & Fiege, 2002) is currently uncertain, but at least the individuals reported by Amoureux *et al.* (1980) are characterised by 4 to 5 teeth in the M3, which is more compatible with *L. perkinsi* than with *L. inflata sensu stricto*.

Dorvillea similis (Crossland, 1924)

Material examined. Sample TR108/NT34, (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, on Artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 8 specimens. TR41/NT128, (33.28366° N, 35.19549° E), 18.xi.2022, 0-6 m depth, on hard substrate with coralline algae and photophilous algae: 4 specimens. TR59/NT284, (33.26500° N, 35.19059° E), 20 November 2022, 0-4 m depth, on artificial hard substrate with photophilous algae: 1 specimen. TR86/NT226, (33.33295° N, 35.18800°E), 22 November 2022, 35 m depth, hard substrate with coralligenous formation and freshwater output: 13 specimens. TR116/NT191, (33.27395° N, 35.19532° E), 26 November 2022, 0-5 m depth, on ropes inside the harbour: 6 specimens.

Additional material. Beirut Harbour with *Pomatoleios* crust, surface, H.Z., 15 September 2002 HZ20020915f, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32928): 5 specimens.

Molecular data. COI sequences obtained from specimens from Tyre (accession numbers: PP808808; PP808809) showed a 95% identity with both sequences of *D. similis* from the Italian Ionian Sea (accession number: OR795506-OR795507 - Langeneck *et al.*, 2024), and sequences of an unidentified polychaete sampled in sponges in the Red Sea (Kandler *et al.*, 2019, accession numbers: KY262757, KY263450).

Remarks. The examined specimens perfectly correspond to both the original description of smaller specimens from the Gulf of Suez (Crossland, 1924) and subsequent redescriptions of Mediterranean material (Çinar, 2009; Dragičević *et al.*, 2019). However, molecular data highlight a 5% genetic divergence between these specimens and sequences from both the Ionian and the Red Sea, suggesting that *D. similis*, as currently defined, includes at least two cryptic lineages. The species is currently known for Türkiye (Çinar, 2009), Greece (Corsini-Foka *et al.*, 2015), Italy (Dragičević *et al.*, 2019; Langeneck *et al.*, 2020a; Tempesti *et al.*, 2022; Langeneck *et al.*, 2024), Cyprus (Rousou *et al.*, 2023) and Egypt (Hamdy *et al.*, 2023). Additionally, the jaw features of a specimen from Algeria briefly described as *D. rubrovittata* by Jumars (1974) do not correspond to this species and might be instead compatible with *D. similis*. *Dorvillea similis* is most likely widespread across the whole eastern Mediterranean Sea.

Oenonidae Kinberg, 1865

Oenone fulgida (Lamarck, 1818) (Fig. S6)

Material examined. Sample LB76, (33.26500° N, 35.19059° E), 05 June 2022, 0-4 m depth, on artificial hard substrate with photophilous algae: 1 specimen. TR60/NT310 (33.26500° N, 35.19059° E), 20 November 2022, 0-4 m

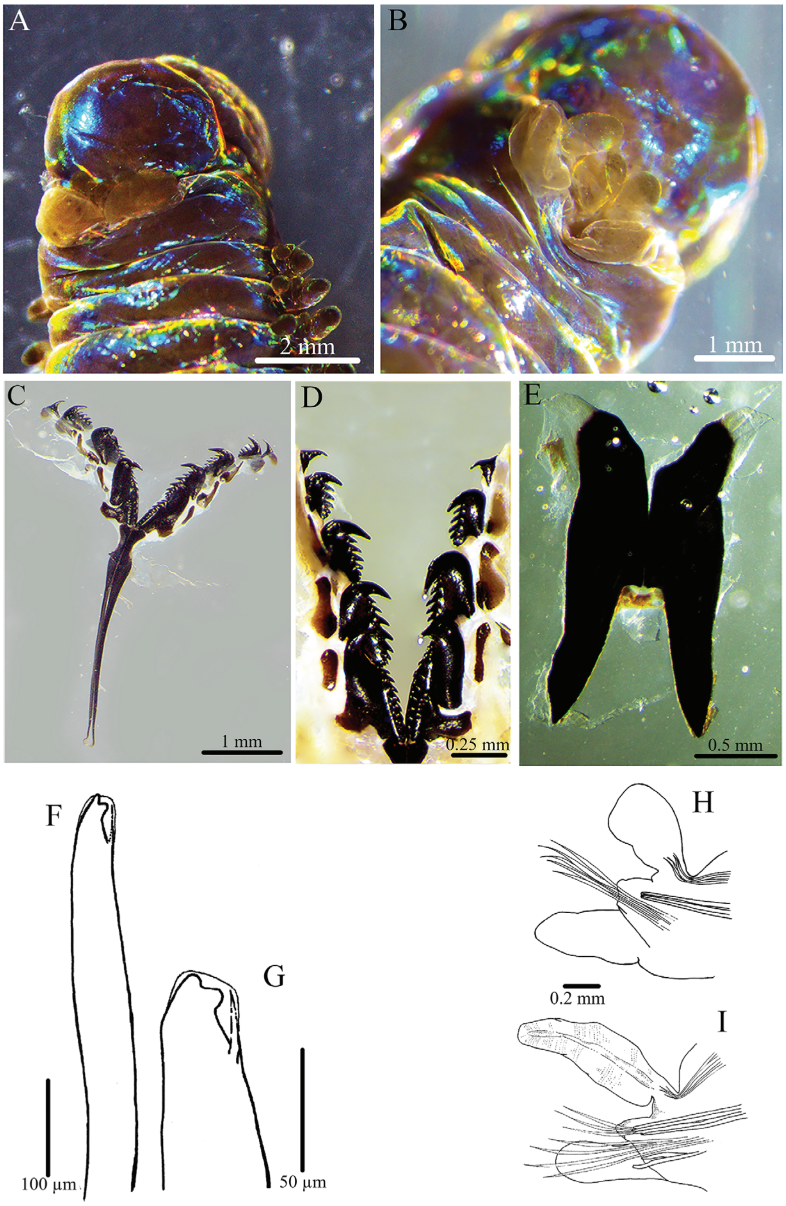

Fig. S6: *Oenone fulgida* (Lamarck, 1818). A. Anterior end (prostomium and peristomium); B. Prostomial antennae after partial dissection; C. Maxillary apparatus; D. Close up of maxillary apparatus; E. Mandible; F, G. Sub-acicular hooks, line drawings; H, I. Parapodia, line drawings (H. Anterior parapodium; I. Mid-body parapodium).

depth, on artificial hard substrate with photophilous algae: 1 specimen.

Additional material. Bay of Jounieh, North, Aquamarina, under stones, 20 m, H.Z., 14 July 2003 HZ20030714, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32931): 1 specimen.

Description. Complete specimen with 246 chaetigers, 183 mm total length, 8 mm L10, 5 mm maximum width. Prostomium rounded, slightly wider than long, with two eyes and three antennae (Fig. S6A, B). Antennae inserted on the posterior edge of prostomium, partially covered by a peristomial fold, cylindrical in shape, with rounded tip (Fig. S6B). Central antenna slightly forward with respect to the lateral ones (Fig. S6B). Peristomium formed by two achaetous rings, anterior peristomial ring dorsally slightly longer than posterior one, ventrally at least twice the posterior one. Parapodia uniramous, with flattened, leaf-shaped dorsal cirrus, increasing in length towards the pygidium, basally supported by 6 thin, tapered notoaciculae (Fig. S6H, I). Neuropodium supported by 4-6 neuroaciculae, anteriorly with 18 limbate chaetae with tapered tip, posteriorly with 8-10 limbate chaetae and a single sub-acicular hook. Sub-acicular hook occurring after the 100th chaetiger, stocky, with bidentate tip surrounded by a hyaline sheath. Parapodia with a ventral pre-chaetal and a ventral post-chaetal lobe. Pre-chaetal lobe initially inconspicuous, then digitiform in the midbody, very short and stocky in the posterior part of the body. Post-chaetal lobe conical, always longer than the pre-chaetal lobe.

Five pairs of asymmetrical maxillae (Fig. S6C). Right M1 with distal tooth bifid (possibly trifid), followed by 9 teeth. Left M1 with a large distal tooth followed by 9 smaller teeth. Right M2 overlapping with right M1, slightly smaller, with 9 sub-equal teeth. Left M2 with a large distal tooth followed by 7 smaller teeth. Left M3 with a large distal tooth followed by 5 smaller, well defined teeth, plus two additional knobs. Right M4 unidentate, with arcuate internal cutting edge. Left M4 with a large distal tooth followed by 4 well-defined teeth and one knob. Left M5 unidentate, with arcuate internal cutting edge (Fig. S6C). Mandible formed by two symmetrical pieces, centrally fused, heavily mineralised, anteriorly with a thinner, slightly translucent part (Fig. S6D).

Molecular data. A COI sequence was obtained from one of the examined specimens (accession number: PP808828) and gave a 84-85% identity with *Oenone fulgida* from the Hawaii Islands (BOLD accession numbers: KANBI135-19, KANBI361-19, KANBI807-19; GenBank accession numbers: MW277780, MW277956, MW278289).

Remarks. The examined specimens correspond well to the available descriptions of *O. fulgida* (Day, 1967; Zanol & Ruta, 2015) and confirm the occurrence of this species in the eastern Mediterranean Sea. Currently, the species is known for Cyprus (Çinar, 2005) and Italy (Langeneck *et al.*, 2020a); however, all specimens examined in the previous studies are distinctly smaller than the ones found in Lebanon and might be considered juveniles. The available molecular data highlight a high genetic divergence between *O. fulgida* from Lebanon and *O. fulgida* from the Hawaii Islands, suggesting that this species might represent a species complex; however, *O. fulgida* has been originally described from the Red Sea, and it is likely that Mediterranean specimens have a Lessepsian origin and correspond to the species *sensu stricto*.

Iphionidae Kinberg, 1856
Iphione muricata (Lamarck, 1818)

Material examined. Sample LB6, (33.28366° N, 35.19549°E), 06 June 2022, 3-6 m depth, under the rocks: 1 specimen. TR32/NT124, (33.28366° N, 35.19549° E), 18 November 2022, 0-6 m depth, under rocks: 2 specimens.

Molecular data. Two COI sequences were obtained (accession numbers: PP808826; PP808827), giving a 99.7% identity with each other. The comparison with both GenBank and BOLD gave inconclusive results, as on GenBank the highest match was 82% with an unidentified Polynoidae, while on BOLD a similar identity was retrieved towards *Lepidonotus* sp..

Remarks. The species has been reported for Israel (Goren *et al.*, 2017) and Tunisia (Boudaya *et al.*, 2019). The record for Tunisia is confirmed by Ayari-Kliti *et al.* (2022) but it is not supported by any description or photograph and refers to soft bottoms where the species was allegedly sampled using a Van Veen grab, while this species is usually associated with hard bottoms, where it can be easily found under stones. The present records represent the first observation for Lebanon and suggest that the species is currently expanding its distribution in the Mediterranean Sea.

Polynoidae Kinberg, 1856
Hololepidella nigropunctata (Horst, 1915) (Fig. S7)

Material examined. Sample TR42/NT144, (33.28366° N, 35.19549° E), 18 November 2022, 0-6 m depth, on hard substrate with coralline algae and photophilous algae: 1 specimen. TR83/NT230, (33.33295° N, 35.18800°E), 22 November 2022, 35 m depth hard substrate with coralligenous formation, and freshwater output: 1 specimen.

Description. All specimens incomplete (Fig. S7A). One specimen with 17 chaetigers, 3.48 mm total length, 1.82 mm L10, 1.09 mm maximum width with parapodia, without chaetae. The other specimen with 19 chaetigers, 2.47 mm total length, 1.01 mm L10, 0.68 mm maximum width with parapodia. Body slightly flattened, elongated. Prostomium trapezium-shaped, with well-defined, conical cephalic peaks, not protruding from the frontal profile (Fig. S7B). Antennae broken, basis of the median antenna slightly backwards with respect to the frontal peaks (Fig. S7B). Palps flattened, 1 ½ times the prostomium length, with briskly tapered, acute tip (Fig. S7B). Two pairs of orange eyes, forming an almost straight transverse line in the widest part of the prostomium. Anterior eyes 1 ½ times the posterior eyes, inserted laterally on the prostomium, posterior eyes dorsal, surrounded by a pale ring (Fig. S7B). Dorsal cirri smooth, very thin and pointed, more than twice the parapodium length. Elytra easily detached, almost rounded, with slightly irregular edge and covered by very small microtubercles ordered into radial, branched veins (Fig. S7D). Parapodia biramous, neuropodium much longer than notopodium, each ramus supported by a single acicula (Fig. S7C). Notopodium with 12-16 thick notochaetae, unidentate or indistinctly bidentate, with 8-11 denticles along the ventral edge (Fig. S7H, I). Neuropodium with 17-20 neurochaetae divided into three types (Fig. S7E-G). Three-five dorsal-most neurochaetae thin, elongated, with clearly bidentate tip and thickly denticulated ventral edge; 10-11 intermediate neurochaetae subdistally thickened, with bidentate tip, secondary tooth much shorter than primary tooth, with 10-15 denticles along the ventral edge; 4 ventral neurochaetae identical to intermediate neurochaetae, but much shorter.

Colour pattern partially preserved in the ethanol-fixed individuals: dark grey pigmentation on the prostomium, with pale rings around the posterior eyes, and on the body, as a median series of sub-triangular dark spots alternating with paired, V-shaped spots of the same colour.

Molecular data. COI and 16S amplification was not obtained for any of the individuals.

Remarks. Even though the examined specimens are rather short anterior fragments, they correspond well to the available descriptions of this species (Horst, 1915; Devaney, 1967; Pettibone, 1969a; Hanley & Burke, 1991; Wehe, 2006). This species has been recorded both as free-living and as a commensal of echinoderms (Wehe, 2006); in the

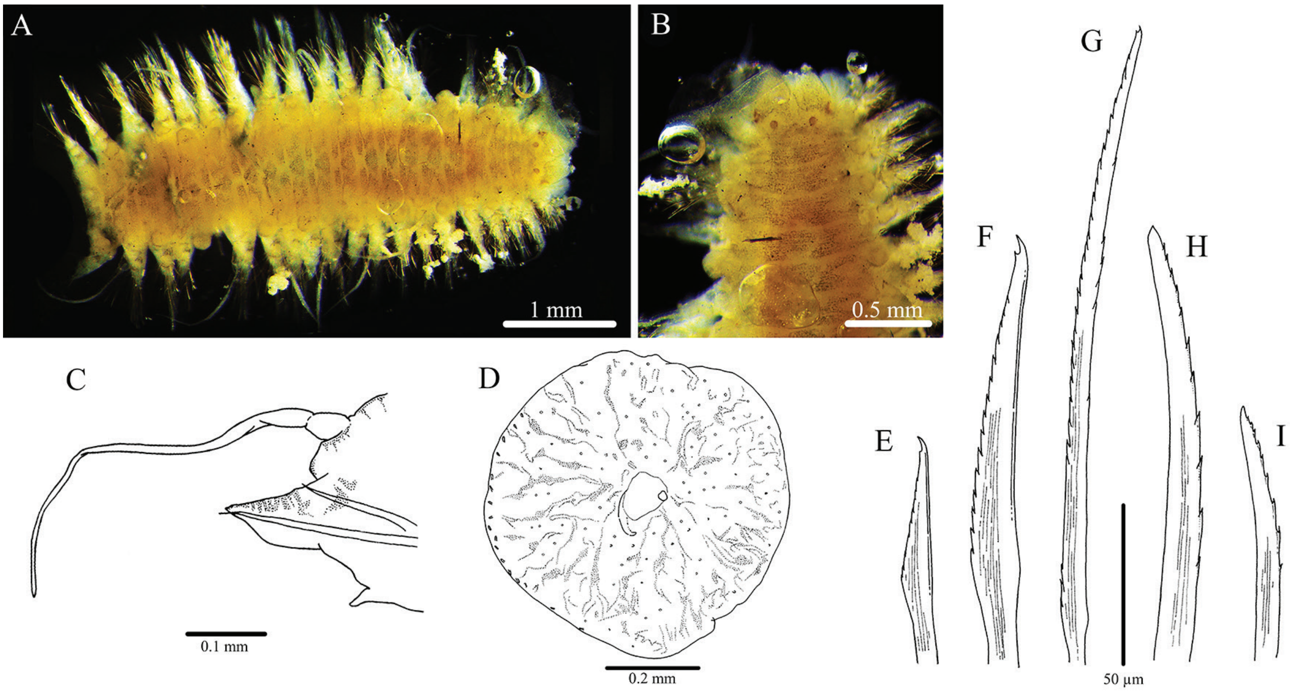

Fig. S7: *Hololepidella nigropunctata* (Horst, 1915). A. Specimen incomplete; B. Close up of prostomium and peristomium; C. Parapodium, line drawing; D. Elytra, line drawing; E-I. Chaetae, line drawings: E-G. Neurochaetae (E. ventral neurochaeta; F. intermediate neurochaeta; G. dorsal neurochaetae); H, I. Notochaetae.

examined samples, echinoderms were not frequent, and the majority of the specimens corresponded to very small Ophiuroidea, suggesting that at least in Lebanon, this species is not associated with echinoderms. *H. nigropunctata* was originally described from Ambon Island, Indonesia (Horst, 1915), and subsequently reported from several areas across the Indo-Pacific region, from the Hawaiian Islands to New Caledonia, South China Sea, and the Red Sea (Devaney, 1967; Hanley & Burke, 1991; Barnich *et al.*, 2004; Wehe, 2006). This is the first record of the species in the Mediterranean Sea. Barnich & Fiege (2003) already considered it as a potential Lessepsian immigrant and, despite the absence of Mediterranean records, included it in the dichotomous key to Mediterranean Polynoinae. However, the key by Barnich & Fiege (2003) separates *H. nigropunctata* from other Polynoinae mainly on the basis of the number of elytra (around 50 in complete individuals) and might be misleading when taking into account incomplete specimens, which might be confused with the numerous species of the genera *Harmothoe* and *Malmgrenia* occurring in the Mediterranean Sea. Incomplete individuals (such as those found in Lebanon) can be distinguished by i) the shape of prostomial peaks (defined, but not protruding from the prostomium edge in *Hololepidella*, well-defined and protruding in *Harmothoe*, not defined in *Malmgrenia*); ii) the presence of two distinct types of neurochaetae; and iii) the contrasted dark colour pattern, which is consistently described by all authors and is often preserved in fixed material. The elytra are rather distinctive compared to those of Mediterranean *Harmothoe* species and might instead recall those of several *Malmgrenia* species; however, elytra easily detach in preserved material (Horst, 1915; Hanley & Burke, 1991) and in several cases they cannot be used as a diagnostic character.

Subadyte albanyensis Hanley & Burke, 1990 (Fig. S8)

Material examined. Sample TR48/NT250, (33.26061° N, 35.18264° E), 20 November 2022, 20 m depth, on hard substrate with photophilous algae: 3 specimens. TR59/NT300, (33.26500° N, 35.19059° E), 20 November 2022, 0-4 m depth, on artificial hard substrate with photophilous algae: 3 specimens.

Comparative material examined. *Subadyte pellucida* (Ehlers, 1864): Taranto, Ionian Sea (40.443694° N; 17.127426° E), 05 April 2022, 4 m depth, on fouling on coconut ropes: 2 specimens; same locality, depth and environment, 28 April 2023: 1 specimen. Castro, Ionian Sea (39.99965° N; 18.4366° E), 29 July 2022, 50 m depth, coralligenous: 5 specimens. Santa Maria di Leuca, Ionian Sea (39.78778° N; 18.33711° E), 20 July 2022, 30 m depth, coralligenous:2 specimens.

Description. All individuals rather small. Complete specimens with 23-24 chaetigers, 3.82-4.27 mm total length, 1.54-1.90 mm L10, 0.41-0.59 mm maximum width with parapodia, but without chaetae (Fig. S8A). Body stocky, flattened, parapodia slightly shorter than body width. Prostomium bilobed, with two pairs of relatively small, dark red eyes arranged along the posterior edge (Fig. S8B). Three antennae, external ones inserted latero-ventrally, central one (often broken) inserted centrally (Fig. S8B). Lateral antennae ½ prostomium length, central antenna twice the prostomium length, subdistally inflated, with tapered tip, covered with filiform papillae. Palps thick, with tapered tip,

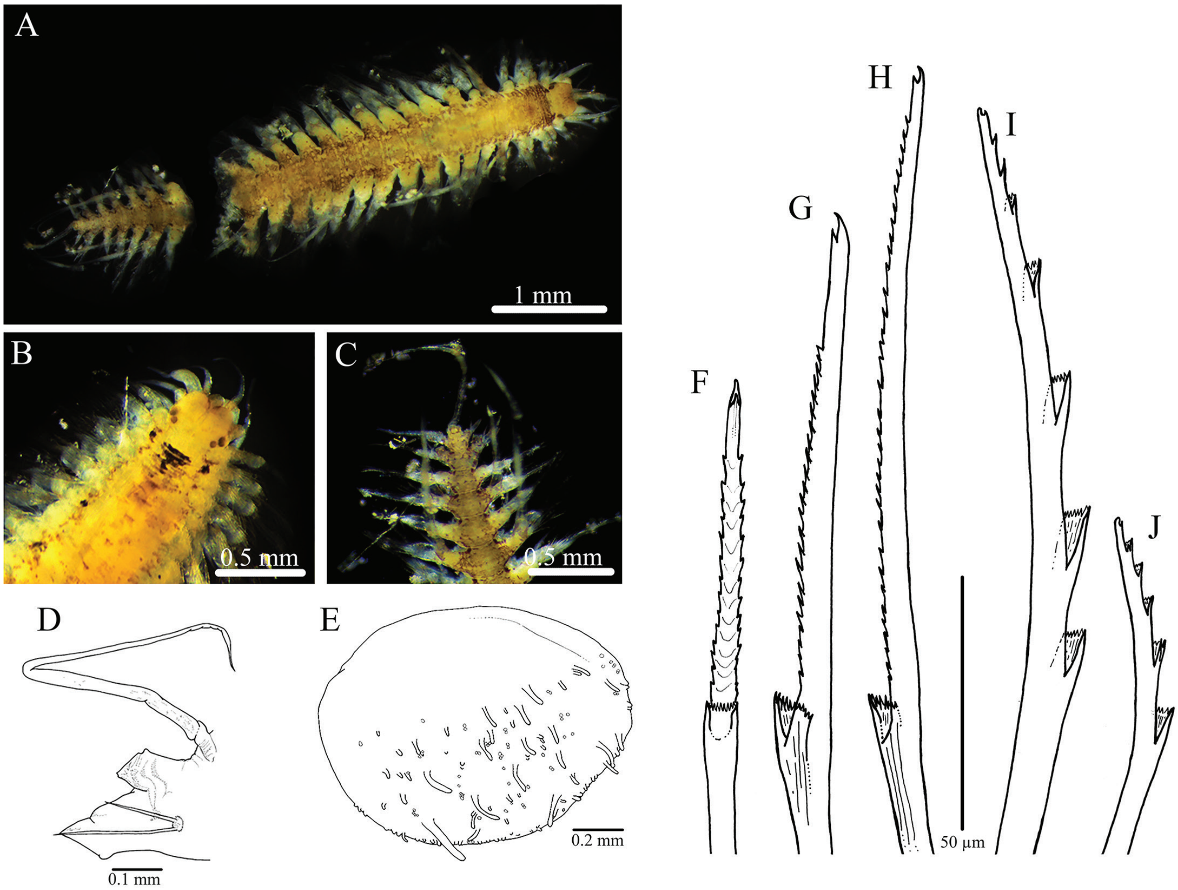

Fig. S8: *Subadyte albanyensis* Hanley & Burke, 1990. A. Full specimen; B. Close up to prostomium and peristomium; C. Pygidium; D. Parapodium, line drawing; E. Elytra, line drawing; F-J. Chaetae, line drawings: F-H. Neuropodial chaetae; I, J. Notopodial chaetae.

as long as prostomium. Two pairs of tentacular cirri, dorsal pair of tentacular cirri 1 ½ times the prostomium length, ventral pair of tentacular cirri as long as prostomium (Fig. S8B). Dorsal cirri at chaetigers 2, 5, 7, 9, 11, 13, 15, 17, 19, 21, and 23, very long (approximately as long as body width with parapodia), mostly without thickened subdistal area, and a long, tapered tip, with a few, scattered filiform papillae. Elytra oval, with smooth edge, covered with conical, elongated macrotubercles, intermixed with smaller, scattered microtubercles (Fig. S8E). Both dorsal cirri and elytra easily broken. Ventral cirri pointed, tapered, shorter than the neuropodial lobe.

Parapodia biramous, each ramus supported by a single, strong acicula with acute tip, surpassing the edge of the parapodial lobe (Fig. S8D). Notopodium with 12-17 notochaetae, slightly curved, with blunt, clearly bidentate tip, and 4-9 (usually 5-8) semilunar pouches (Fig. S8I, J). Neuropodium with 19-36 neurochaetae, much longer than notochaetae, expanding around 2/3 of their length into a single semilunar pouch, followed by a distal part with bidentate tip, with secondary tooth only slightly shorter than the primary one, and 15-30 denticles along the ventral margin (Fig. S8F-H).

Colour usually at least partially preserved in fixed individuals, pale tan with a reticulated brownish pattern (Fig. S8A); a longitudinal, sinuous black band along each side, just above the bases of parapodia, darker and more expanded over cirrophorous parapodia. A couple of specimens with traces of a transverse band over the 1st chaetiger (Fig. S8B). Dorsal cirri with brown basis and a brown ring around half of their length. Live specimens with a distinct purple hue.

Description of Mediterranean *Subadyte pellucida* (Figs S9, S10). Mediterranean individuals from coralligenous environments (30-50 m) are slightly larger than individuals from Lebanon (incomplete individual with 14 chaetigers, 3.43 mm total length, 2.60 mm L10, 1.70 mm maximum width) (Fig. S9A-C). Parapodia are pretty much identical, but ventral cirri are much shorter than the neuropodial lobe. Notopodium with 13 strongly curved notochaetae with pointed tip and a small subdistal notch, bearing 7-10 semilunar pouches (Fig. S9G, H), neuropodium with 21 neurochaetae with bidentate tip, with secondary teeth much shorter than the primary one, and a semilunar pouch around 2/3 of the length followed by 15-30 denticles (Fig. S9D-F). Elytra all detached. Mediterranean individuals from shallow environments much larger (Fig. S10A, C), complete individual with 43 chaetigers, 19.57 mm total length, 4.63 mm L10, 2.41 mm maximum width including parapodia. Parapodia identical to the ones of the coralligenous *S. pellucida*, notopodium with 16 curved notochaetae with slightly notched tip and 10-13 semilunar pouches, the last 2-3 very small (Fig. S10I-K). Neuropodium with 37 chaetae with bidentate tip, secondary tooth much shorter than the primary one, a semilunar pouch around 2/3 of the length followed by 8-15 denticles (Fig. S10F-H). Elytra thin, oval, translucent,

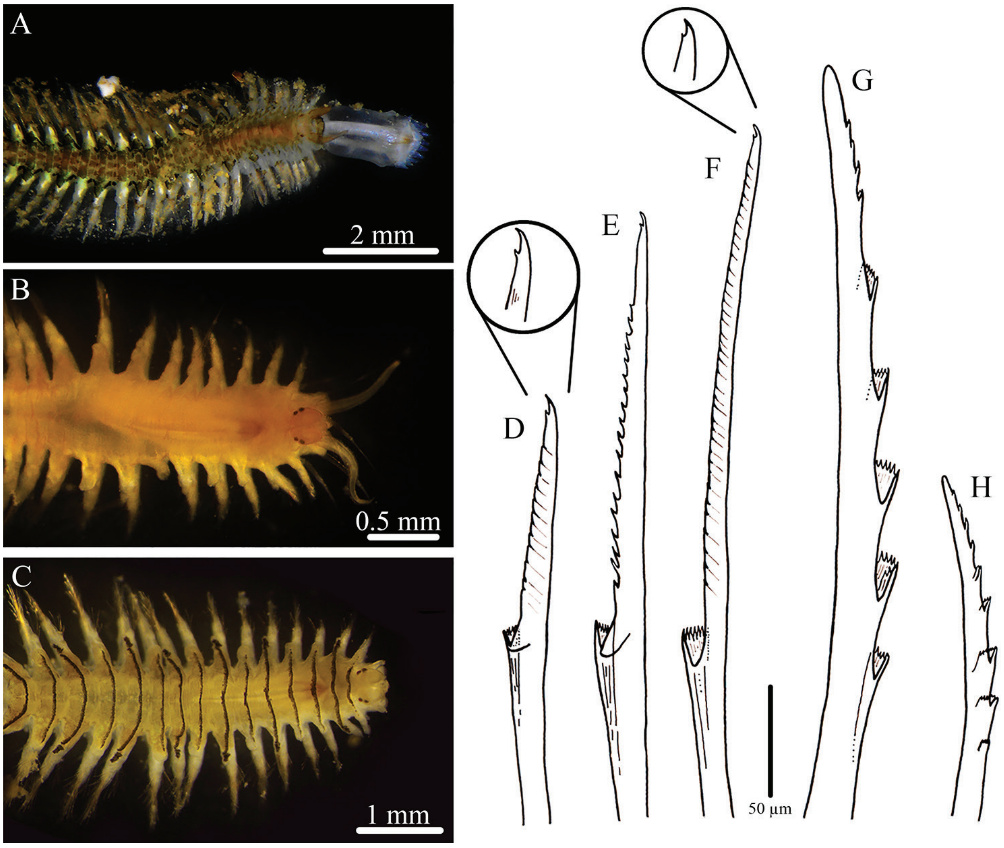

Fig. S9: *Subadyte pellucida* (Ehlers, 1864) from coralligenous assemblages. A-C. Live colour patterns (A. Checkered/striated pattern; B. Absence of coloration pattern; C. Striped pattern); D-H. Chaetae, line drawing; D-F. Neuropodial chaetae; G, H. Unidentate notopodia chaetae.

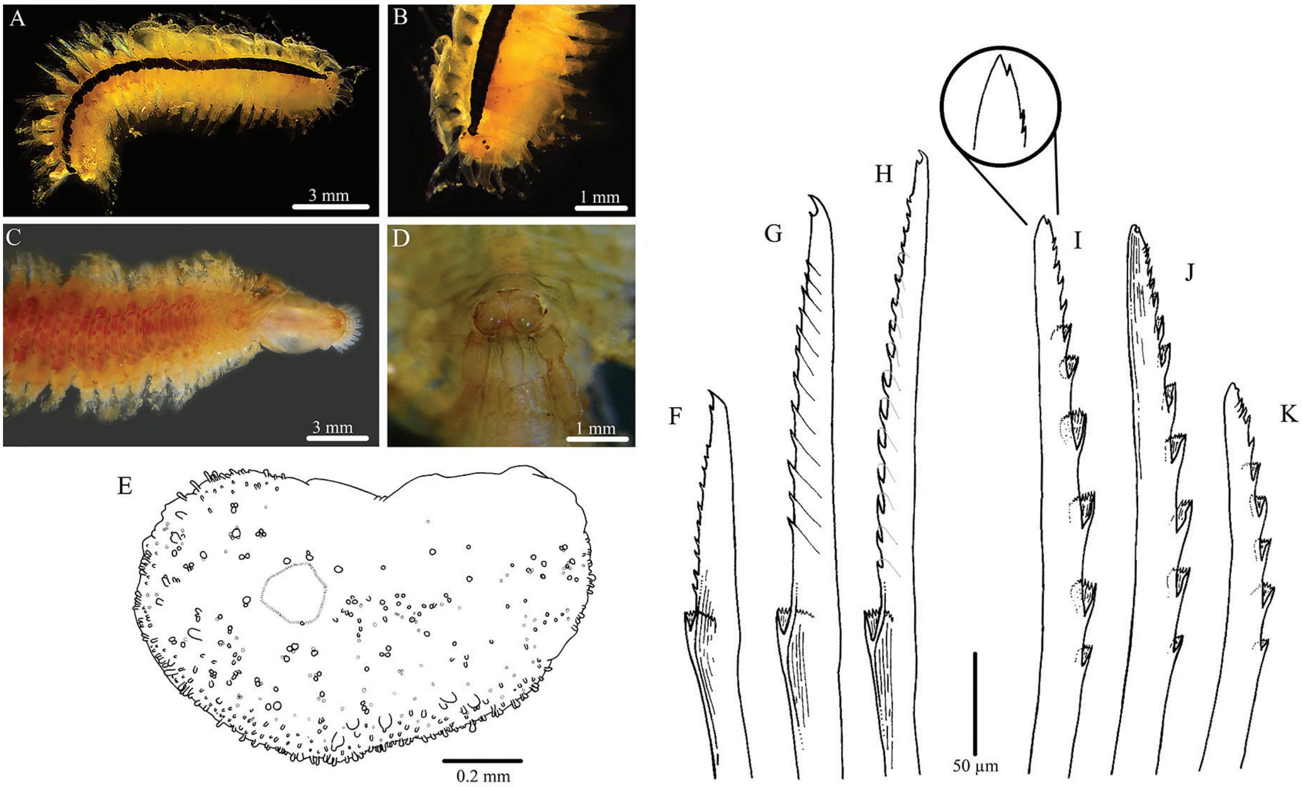

Fig. S10: *Subadyte pellucida* (Ehlers, 1864) from shallow water biocenosis. A-D. Live colorations (A. Longitudinally striped pattern; B. Close-up to prostomium and peristomium; C. Checkered pattern; D. Close-up to prostomium and peristomium); E. Elytra, line drawing; F-K. Chaetae, line drawing; F-H. Neuropodial chaetae; I-K. Bidentate notopodial chaeta.

covered in papilliform microtubercles, stalked around the edge (Fig. S10E). Macrotubercles only around the external part of the elytron, subdistally inflated, with a distal papilla. Live colour very variable; the majority of specimens are greenish-brown, with a checkered pattern, but some specimens are completely pale, sometimes with unpaired dark spots or bands, and other specimens are pale with regular green transverse stripes (Fig. S9A-C; S10A, C).

Molecular data. The COI obtained from two specimens from Lebanon (accession numbers: PP808823; PP808824) gave a 98.5-99.7% identity with an unidentified Polynoidae from the Red Sea (Kandler *et al.*, 2019; GenBank accession numbers KY262672, KY262696, KY262794 and KY263231). Amplification was unsuccessful for *S. pellucida* from coralligenous environments, while two individuals from shallow environments off Taranto (accession numbers: PP808821; PP808822) gave a 99.8% identity with *S. pellucida* from Murcia and an unspecified locality in Italy (Mugnai *et al.*, 2022; GenBank accession number ON716089, ON716098). The identity between the two lineages was rather low (83%). 16S sequences were obtained for three individuals from Lebanon (accession numbers PP800966; PP800967; PP800968) and gave as the highest match a 88% identity with *Paradyte crinoidicola* (Potts, 1910). 16S amplification was successful for all individuals of *S. pellucida* assayed (accession numbers PP800964; PP800965; PP800972; PP800973); the four sequences had identity >99.5% with each other, while the identity with *S. albanyensis* from Lebanon was around 89% (Fig. S11).

Remarks. Despite their rather small size, the individuals from Lebanon correspond very well to the original description (Hanley & Burke, 1990) and to the redescription of this species by Wehe (2006), which is based on specimens from the Red Sea and the Suez Canal, previously identified as *S. pellucida*. Molecular data confirm the distinction from Mediterranean *S. pellucida* and the Lessepsian origin of these small *Subadyte*. However, the morphological differences between *S. albanyensis* and *S. pellucida* are finer than what is stated by Hanley & Burke (1990) and Wehe (2006), and the variability detected in these individuals is slightly higher than that described by these authors, partially overlapping with *S. pellucida*, especially regarding chaetal features. Both references stated that *S. pellucida* has notochaetae with up to 20 semilunar pouches, while *S. albanyensis* has up to 6 semilunar pouches. However, such a high number of semilunar pouches was only reported by Pettibone (1969b) in specimens from South Africa, which most likely belong to a different species; in the original description Ehlers (1864) referred to 9 semilunar pouches, while Barnich & Fiege (2003) did not give a specific number of semilunar pouches, but the drawing provided depicts a notochaeta with 9 semilunar pouches, which is consistent with the original description. The examination of individuals of *S. pellucida* from the Ionian Sea showed that semilunar pouches on notochaetae can vary from 7 to 13. On the other hand, the examined individuals from Lebanon show notochaetae with 4-9 semilunar pouches. Although, on average, *S. albanyensis* from Lebanon has fewer semilunar pouches than *S. pellucida*, there is some overlap, and the identification of the two species cannot focus on this character only. The two species can be distinguished based on i) the shape of the notochaetae (less curved and blunt in *S. albanyensis*, more curved and pointed in *S. pellucida*); ii) the tip of the neurochaetae (with secondary tooth almost as long as the primary tooth in *S. albanyensis*, with secondary tooth much shorter than the primary tooth in *S. pellucida*); iii) the papillae on antennae and dorsal cirri (scattered, not very evident in *S. albanyensis*, more numerous in *S. pellucida*); and iv) the elytra (with conical macrotubercles without a distal papilla in *S. albanyensis*, with oval macrotubercles with a distal papilla in *S. pellucida*). The colour pattern of the examined individuals of *S. albanyensis* is rather distinctive, but it is rather similar to the most widespread colour pattern observed in *S. pellucida*, and on the other hand, this latter species shows a high chromatic variability, suggesting that this character is not very informative.

On the other hand, examination of Mediterranean material revealed that individuals from coralligenous environments and shallow-water environments have fine but stable morphological differences (see Table S1). Specifically, coralligenous individuals have notochaetae with fewer semilunar pouches (7-10) and neurochaetae with a higher number of denticles (up to 30), while shallow individuals have notochaeta with more semilunar pouches (10-13) and

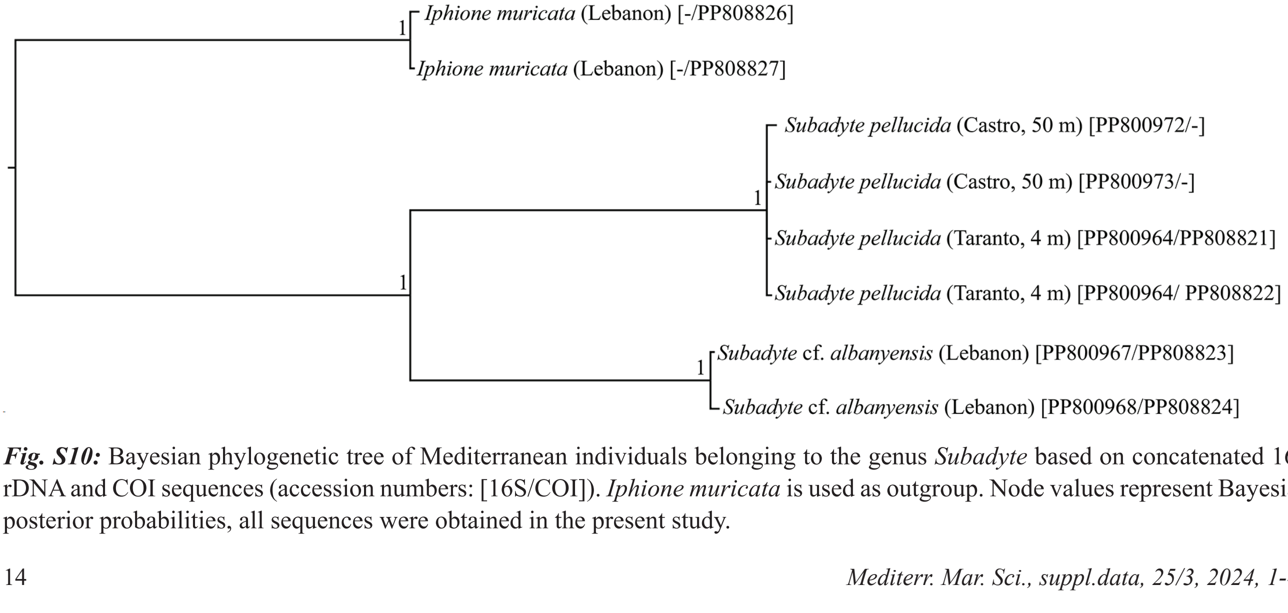

Fig. S10: Bayesian phylogenetic tree of Mediterranean individuals belonging to the genus *Subadyte* based on concatenated 16S rDNA and COI sequences (accession numbers: [16S/COI]). *Iphione muricata* is used as outgroup. Node values represent Bayesian posterior probabilities, all sequences were obtained in the present study.

Table S1. Comparison between different descriptions of *Subadyte albanyensis* and *S. pellucida* from the Mediterranean Sea.

Species	*S. albanyensis*	*S. albanyensis*	*S. albanyensis*	*S. pellucida*	*S. pellucida*
Reference	Hanley & Burke, 1990	Wehe, 2006	Present study	Present study	Present study
Locality	Australia	Red Sea	Lebanon	Ionian Sea (4 m)	Ionian Sea (50 m)
Notochaetae	5-7 semilunar pouches	4-6 semilunar pouches	4-9 semilunar pouches	10-13 semilunar pouches	7-10 semilunar pouches
Neurochaetae	Numerous rows of spines under a bidentate tip.	Numerous rows of spines under a bidentate tip.	15-30 rows of spines, bidentate tip with secondary tooth slightly shorter than primary tooth.	8-15 rows of spines, bidentate tip with secondary tooth much shorter than primary tooth.	15-30 rows of spines, bidentate tip with secondary tooth much shorter than primary tooth.
Elytron	Macrotubercles conical without terminal papilla.	Macrotubercles conical without terminal papilla.	Macrotubercles conical without terminal papilla.	Macrotubercles oval, with a terminal papilla.	

neurochaetae with a lower number of denticles (up to 15). All other characters match very well, and the 16S sequences are very close, suggesting that these characters are subject to a certain degree of intraspecific variability, possibly associated with phenotypic plasticity.

Sigalionidae Kinberg, 1856
Pisione guanche San Martín, López & Núñez, 1999 (Fig. S12)

Material examined. Sample TR79/NT219, (33.33295° N, 35.18800°E), 22 November 2022, 35 m depth, coarse sediment close to freshwater output: 2 specimens.

Description. All specimens incomplete (Fig. S12A), 56-72 chaetigers for 8.74-9.52 mm total length, 1.09-1.54 mm L10, 0.45-0.73 mm maximum width without parapodia. Body elongated, flattened, prostomium and peristomium fused with the metastomium (Fig. S12B, C). Prostomium with a deep central anterior notch, just over the buccal opening, showing the presence of a pair of buccal aciculae (Fig. S12C). Palps long and flattened, with tapering tip, as long as head plus first four chaetigers. Two pairs of antennae; internal antennae ovoid, short, external antennae conical, twice the length of internal ones. Two pairs of coalescent black eyes, inserted dorsally at the level of the 1st chaetiger (Fig. S12B). Dorsal cirri of the 2nd chaetiger long and tapered, dorsal cirri of all other chaetigers oval. Ventral cirri of the 1st chaetiger very long and tapered, ventral cirri of following chaetigers sphaerical, short. Muscular pharynx with four serrated jaws, occupying six chaetigers.

Parapodia biramous, with one notoacicula and one neuroacicula (Fig. S12D). Notopodium without chaetae, with a single, massive acicula, with acute tip, clearly protruding from the parapodium in posterior parapodia. Neuropodium in anterior parapodia with one supra-acicular simple chaeta, with falcate, unidentate tip and finely serrated concave edge (Fig. S12F), and 5 compound sub-acicular heterogomph chaetae, with short unidentate blades (Fig. S12E). Neuropodium in posterior parapodia with one single supra-acicular simple chaeta, with unidentate tip and some long filaments along the concave edge, and 4 compound sub-acicular chaetae.

Live colour unknown, preserved animals colourless.

Molecular data. A single COI sequence (accession number: PP808825) gave a 99.8% identity with *Pisione guanche* from the Canary Islands (accession number: KY657661) (Gonzalez *et al.*, 2017), confirming the morphological identification.

Remarks. This species was originally described for the Canary Islands (San Martín *et al.*, 1999) and is also known also from the Azores (Moreira *et al.*, 2010). Its presence in the Mediterranean Sea was reported by Çinar (2009), who considered it as a non-indigenous species, possibly introduced through ballast waters. However, Moreira *et al.* (2010) suggested that the Mediterranean Sea might actually be part of the native range of *P. guanche*, and that its recent discovery in the basin could be attributed to the relatively recent description of the species, coupled with the widespread use of keys including only *Pisione remota* (Southern, 1914). Until further studies shed more light on this taxon, we suggest considering it cryptogenic in the Mediterranean Sea.

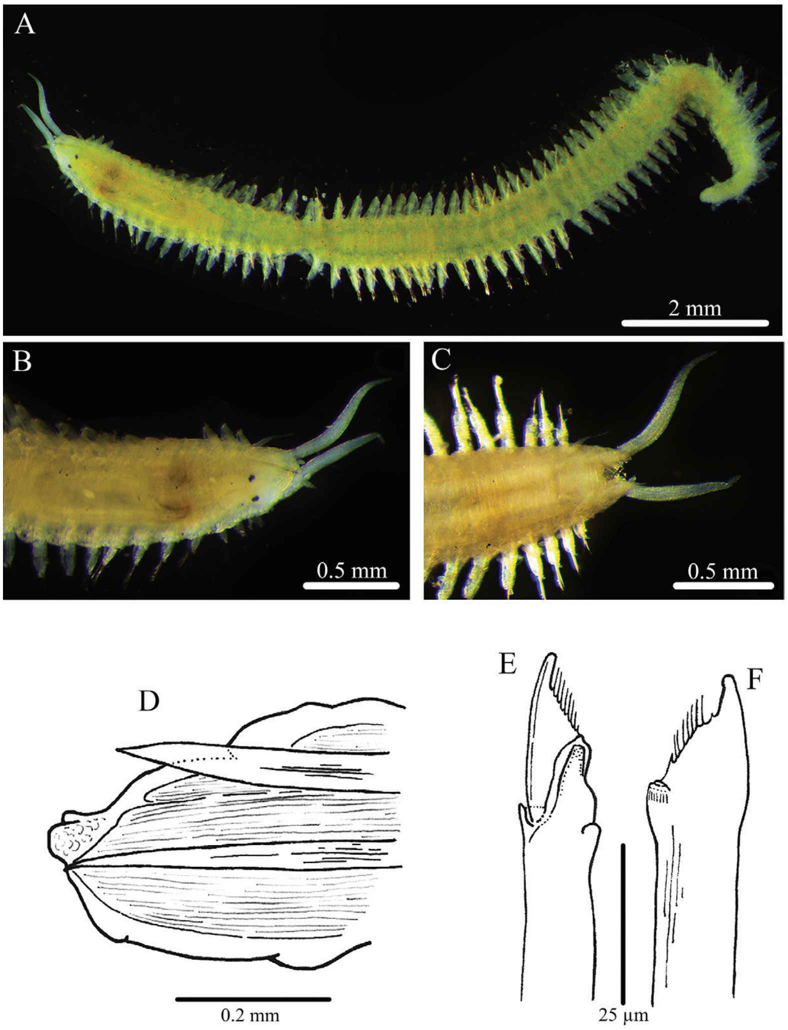

Fig. S12: *Pisione guanche* San Martín, López & Núñez, 1999. A. Full specimen; B. Close-up to prostomium and peristomium, dorsal view; C. Close-up to prostomium and peristomium, ventral view; D. Parapodium, line drawing; E, F. Chaetae, line drawing; E. Compound chaetae; F. Simple chaetae.

Nereididae Blainville, 1818
Ceratonereis tentaculata Kinberg, 1865 (Fig. S13)

Examined material. Sample TR15/NT34 (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, on artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 18 specimens. TR41/131, (33.28366° N, 35.19549° E), 18 November 2022, 0-6 m depth, on hard substrate with coralline algae and photophilous algae: 2 specimens. TR59/NT273, (33.26500° N, 35.19059° E), 20 November 2022, 0-4 m depth, on artificial hard substrate with photophilous algae: 4 specimens. TR48/NT258, (33.26061° N, 35.18264° E), 20 November 2022, 20 m depth, on hard substrate with photophilous algae: 1 specimen. TR71/NT244, (33.33019° N, 35.18475° E), 21 November 2022, 15 m depth, on hard substrate with photophilous algae/ soft bottoms: 2 specimens.TR69/NT270, (33.27453° N, 35.19079° E), 21 November 2022, 0-3 m depth, hard substrate with coralline algae and photophilous algae: 1 specimen. TR80/NT198, (33.33295° N, 35.18800°E), 22 November 2022, 35 m depth hard substrate with coralligenous formation, and freshwater output and sediments: 16 specimens.

Additional material. Beirut Airport pillar jetty 3-10 m H.Z., 50 25 September 2002 HZ20020925ba, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32959): 5 specimens; Beirut Harbor, quai 60, with Pomatoleios-crust, surface, H.Z. 15 July 2002, hz20020715 Senckenberg Naturmuseum Polychaetes Collection (cat. number 32967): 1 specimen.

Description. Complete specimens with 51-63 chaetigers, 12.2-14.2 mm total length, 2.05-4.81 mm L10, 0.54-2.11 mm maximum width without parapodia. Body elongated, rather flattened, indistinctly tapering towards the pygidium (Fig. S13A). Prostomium wider than long, anteriorly bilobed, with four sub-equal black eyes in rectangular arrangement. Two antennae, longer than prostomium, thick and tapering. Two palps, shorter than antennae, articulated, with palpophore long, cylindrical, palpostyle rounded, very short. Peristomium achaetous, much shorter than the prostomium. Tentacular cirri elongated, tapered; anterior dorsal tentacular cirri reaching the 8th-10th chaetigers backwards, posterior dorsal tentacular cirri reaching the 20th chaetiger backwards, ventral tentacular cirri much shorter.

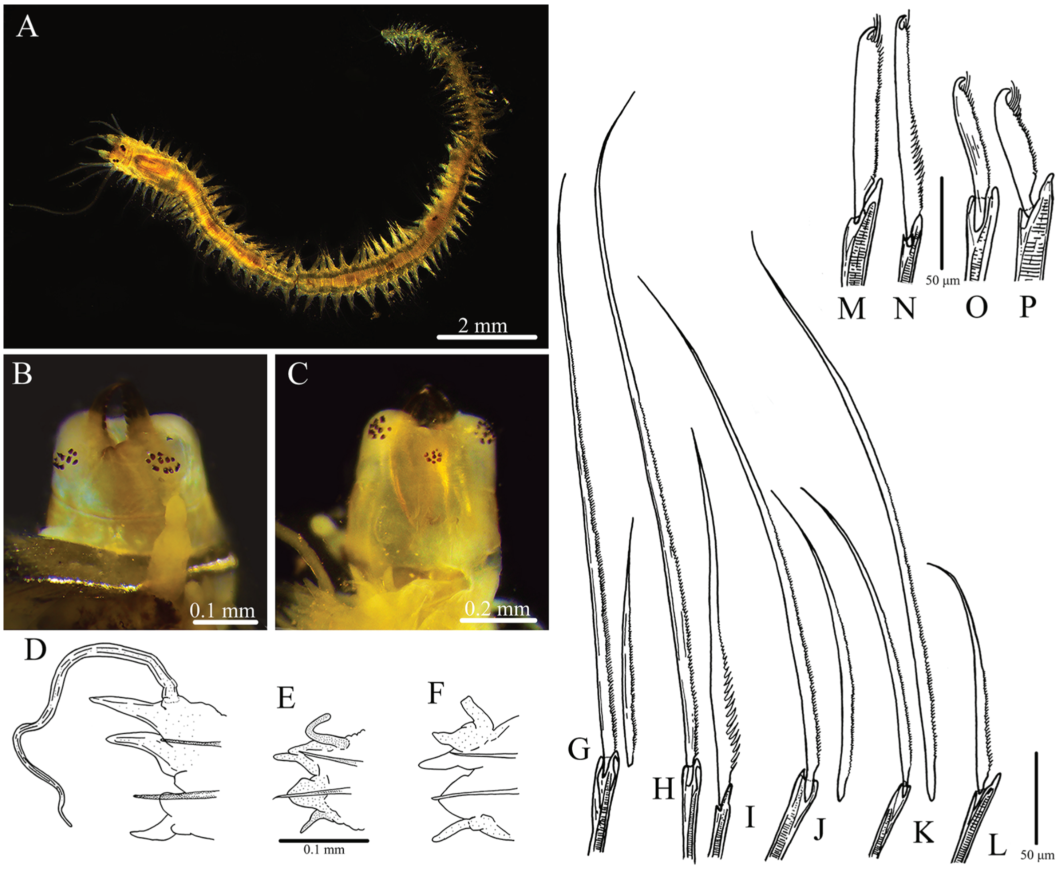

Fig. S13: *Ceratonereis tentaculata* Kinberg, 1865. A. Full specimen; B. Pharynx and paragnaths disposition, dorsal view; C. Pharynx and paragnaths disposition, ventral view; D-F. Parapodia, line drawing (D. Anterior parapodium; E. Mid-body parapodium; F. Posterior parapodia); G-P. Chaetae, line drawing; G. Anterior parapodia homogomph compound spiniger notochaetae; H. Anterior parapodia homogomph compound spiniger neurochaetae I. Anterior parapodia heterogomph compound spiniger neurochaetae; J. Mid-posterior parapodia homogomph compound spiniger notochaetae; K. Mid-posterior parapodia homogomph compound spiniger neurochaetae; L. Mid-posterior parapodia heterogomph compound spiniger neurochaetae; M. Anterior parapodia heterogomph supra-acicular falciger neurochaetae; N. Anterior parapodia heterogomph sub-acicular falciger neurochaetae; O. Mid-posterior parapodia homogomph falciger notochaetae; P. Mid-posterior parapodia heterogomph falciger neurochaetae.

Protrusible pharynx with two muscular rings bearing corneous, dark paragnaths (Fig. S13B, C). One pair of corneous, brown jaws, each with 5-6 teeth. Maxillary ring: area I without paragnaths; area II with 8-10 conical paragnaths in two oblique rows (Fig. S13B); area III with 5-7 flat, rounded paragnaths forming a rosette; area IV with 10-12 conical paragnaths in three irregular oblique rows (Fig. S13C). Oral ring without paragnaths (Fig. S13B, C).

Parapodia biramous, notopodium supported by one light brown acicula, neuropodium supported by one light brown acicula (Fig. S13D-F). Anterior notopodia with very long, tapering dorsal cirri, approximately twice the length of the parapodium, including ligules (Fig. S13D); dorsal ligule conical, pointed, slightly tapered distally, median ligule conical, slightly shorter than dorsal ligule; 5-6 homogomph spinigers. Anterior neuropodia with neuroacicular ligule conical, short, ventral ligule conical, not very long, ventral cirri seemingly absent (Fig. S13D); supra-acicular fascicle with 8 homogomph spinigers and 4 heterogomph falcigers; sub-acicular fascicle with 3 heterogomph spinigers and about 20 heterogomph falcigers. After the 30th chaetiger the neuroacicular ligulae become more elongated and pointed (Fig. S13E, F), and the notopodia bear 2 homogomph falcigers. Homogomph spinigers with very long, unidentate blade, finely serrated for the whole length (Fig. S13G, H, J, K). Heterogomph spinigers with very long, unidentate blade, proximally coarsely serrated (Fig. S13I). Heterogomph falcigers of the supra-acicular fascicle with unidentate blade and finely serrated ventral edge (Fig. S13M). Heterogomph falcigers of the sub-acicular fascicle and homogomph falcigers with unidentate blade, with coarse serration along the ventral edge, longer marginal denticles surpassing the tip of the blade (Fig. S13N).

Live specimens pale pink to yellowish, with indistinct orange transverse lines along the posterior edge of the anterior chaetigers. Some fixed individuals with dark antennae, tentacular cirri and dorsal cirri.

Molecular data. The COI obtained from one specimen from Lebanon (accession number: PP808829) gave a 99% identity with private sequences assigned to Nereididae on BOLD, and a 99% identity with an unidentified Nereididae associated with sponges from the Red Sea on GenBank (accession numbers: KY262608, KY262821, KY263241, KY263478; Kandler *et al.*, 2019). The correspondence with sequences assigned to *C. tentaculata* from the Hawaii Islands (GenBank accession numbers: MW277876, MW277880, MW277910) was very low (74%).

Remarks. This species was originally described from the Hawaii Islands (Kinberg, 1865) and later reported from Australia (Augener, 1913; Monro, 1931; Glasby, 2019). Although the original description by Kinberg (1865) is quite brief, a posthumous publication of Kinberg's notes on this material (Kinberg, 1910) included detailed drawings that support the identification of this species. This species is very similar to *Ceratonereis mirabilis* Kinberg, 1865, which was briefly considered synonymous (Augener, 1913; Fauvel, 1927). However, the two species can be distinguished based on the structure of the notopodial homogomph falcigers (unidentate in *C. tentaculata*, bidentate in *C. mirabilis* - but see Hadiyanto & Glasby, 2023) and the more developed notopodial dorsal ligule (Hadiyanto & Glasby, 2023). The individuals from Lebanon match the available descriptions of *C. tentaculata* for both characters. *Ceratonereis mirabilis* has been widely reported from the Levant Sea (Amoureux, 1976; Çinar, 2005; 2009; Abdelnaby, 2020; Rousou *et al.*, 2023), while *C. tentaculata* has never been documented in this region. Since at least the first records of *C. mirabilis* from the Red Sea merge the two species into a same taxon, it is possible that at least part of the records of *C. mirabilis* in the Mediterranean Sea refer to *C. tentaculata*. Our molecular data show a good correspondence with an unidentified Nereididae from the Red Sea, indirectly confirming the Lessepsian origin of this species. However, the resemblance with deposited sequences from the type locality assigned to *C. tentaculata* is very low, suggesting that *C. tentaculata* as currently defined is a species complex, and that the Lessepsian lineage might represent a different species.

Neanthes cf. ***unifasciata*** (Willey, 1905) (Fig. S14)

Material examined. Sample TR22/NT177, TR19/NT82, (33.29111° N, 35.16858° E), 18 November 2022, 38 m depth, hard substrate with encrusting and photophilous algae around a hydrothermal vent: 1 specimen.

Additional material. Beirut Airport pillar jetty 3-11 m H.Z. 16 July 2003 HZ20030716d, Senckenberg Naturmu-

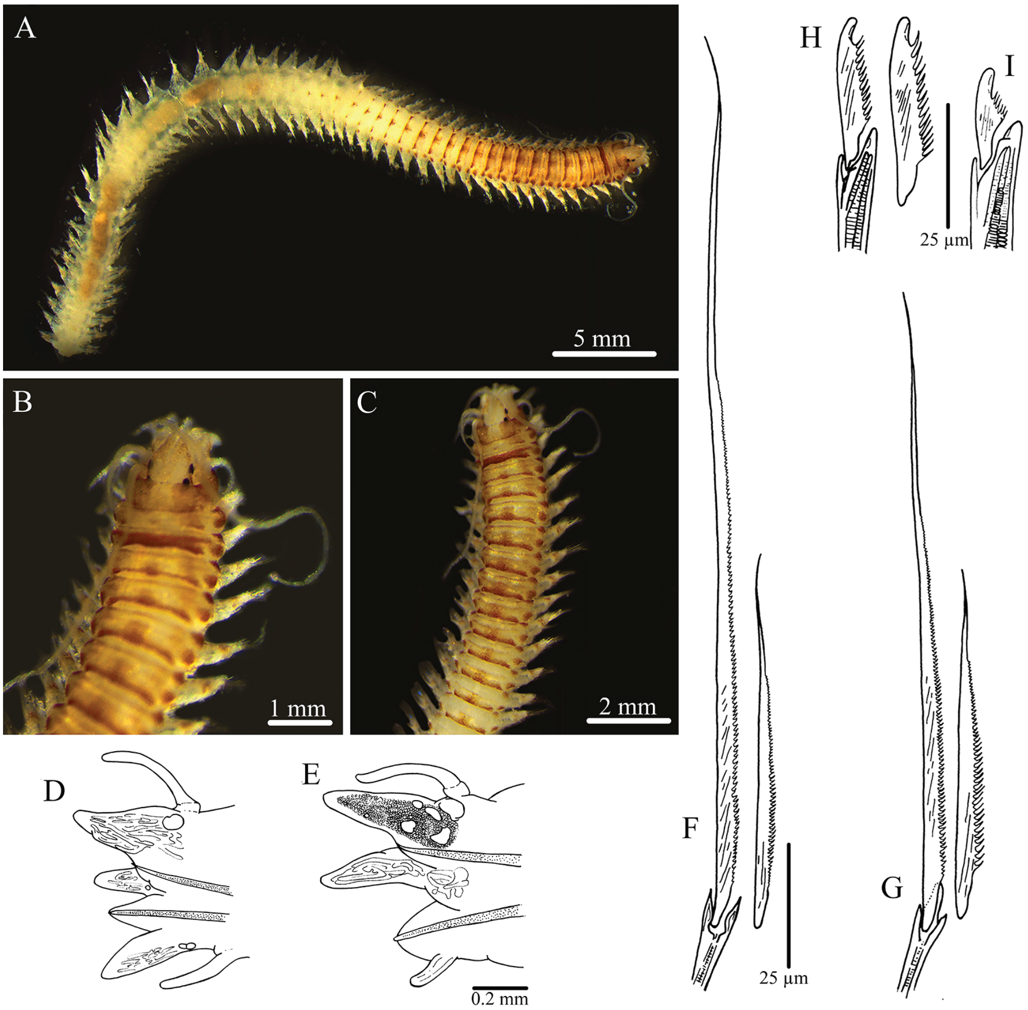

Fig. S14: Neanthes cf. *unifasciata* (Willey, 1905). A. Specimen incomplete; B. Close-up to prostomium and peristomium; C. Close-up anterior portion of the body; D-E. Parapodia, line drawing (D. Anterior parapodium; E. Mid-body parapodium;); F-I. Chaetae, line drawing; F. Anterior parapodia homogomph compound spiniger notochaetae; G. Anterior parapodia hemigomph compound spiniger neurochaetae; H. Anterior parapodia heterogomph falciger neurochaetae; N. Mid-body parapodia heterogomph falciger neurochaetae.

seum Polychaetes Collection (cat. number 32926): 3 specimens; Beirut Airport pillar jetty 3-10 m H.Z., 50 25 September 2002 HZ20020925ba, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32958): 3 specimens.

Description. All specimens incomplete (Fig. S14A), 46-84 chaetigers, 9-35.3 mm total length, 1.41-6.48 mm L10, 0.29-2.43 mm maximum width without parapodia. Prostomium ogival, 1½ times longer than wide, with four sub-equal black eyes. Two conical, slightly tapered antennae, 2/3 the prostomium length, clearly surpassing the tips of palps (Fig. S14B). Two bi-articulated palps, slightly shorter than antennae. Peristomium achaetous, less than half the prostomium length, with four pairs of cirriform, tapered tentacular cirri (Fig. S14B). Anterior dorsal tentacular cirri reaching the 5th chaetiger backwards, posterior dorsal tentacular cirri reaching the 3rd chaetiger backwards. Ventral tentacular cirri reaching the 2nd chaetiger backwards. Pharynx inverted, not examined.

Parapodia biramous (Fig. S14D, E). Anterior parapodia with notopodium supported by a single, black acicula, with short, tapering dorsal cirri, dorsal ligule conical, longer than dorsal cirri, median ligule as long as dorsal ligule but thinner; 5-6 homogomph spinigers. Neuropodium supported by a single, black acicula, neuroacicular ligule conical, short, ventral ligule rather elongated, with rounded tip, ventral cirrus tapering, not very long; supra-acicular fascicle with 2 homogomph spinigers and 2 heterogomph falcigers, sub-acicular fascicle with 5 heterogomph spinigers and 5 heterogomph falcigers. Midbody parapodia with notopodium supported by one black acicula, dorsal cirrus digitiform, very short, dorsal and median ligule conical, of the same length; 3 homogomph spinigers. Neuropodium supported by one black acicula, neuroacicular ligule very short, ventral ligule conical, short, ventral cirrus digitiform, short; supra-acicular fascicle with 4 homogomph spinigers and 1 heterogomph falciger, sub-acicular fascicle with 3 heterogomph (hemigomph) spinigers (Fig. S14G) and 3 heterogomph falcigers. Homogomph falcigers absent to the end of the examined anterior fragment. One notopodial homogomph spiniger with distinctly thicker shaft starting from the 35th chaetiger (Fig. S14F). Heterogomph falcigers with unidentate blades, with distal tooth rounded and strongly serrated ventral edge, showing a slight dorso-ventral gradation (Fig. S14H-I).

Strong and distinctive pigmentation, well preserved in the fixed individual (Fig. S14A-C). Traces of tan pigmentation around the edges of prostomium, peristomium brown with a median, pale band. Peristomial pigmentation noticeable on the first chaetigers as two parallel longitudinal bands, fading around the 9th chaetiger. External margin of each chaetiger (above the parapodium) with two rusty brown spots. 2nd chaetiger almost completely covered by an evident rusty brown transverse band; following chaetigers with a thin brown band along the posterior edge, gradually becoming thinner, with central part becoming more elongated and structuring a distinct triangular median spot around the 15th chaetiger (Fig. S14B, C). Pigmentation pattern gradually fading posteriorly, completely disappearing after the 25th chaetiger. Specimen from Senckenberg naturmuseum with coloration partially faded; traces of pigmentation around the anterior edges of prostomium; dark reddish spots at the base of dorsal cirri each chaetigers from chaetiger 4; a pale reddish dot just dorsal to parapodia continuing dorsally as a pale band from chaetiger 16, becoming darker posteriorly, never forming a complete dorsal band.

Molecular data. A short 16S sequence (~300 bp, accession number: PP852215) was obtained for the only specimen sampled in 2022. This sequence showed the highest identity (85%) with the recently described, abyssal *Neanthes visicete* Georgieva, Wiklund, Ramos, Neal, Glasby & Gunton, 2023 (accession numbers: OQ820957, OQ820958; Georgieva *et al.*, 2023). Conversely, the identity with the 16S sequence of the individual of *Nereis* cf. *agulhana* from Salento sequenced by Langeneck *et al.* (2024; accession number: OR795539) was around 76%, confirming that the two individuals belong to different species.

Remarks. The examined specimens were initially identified as *Neanthes agulhana* (Day, 1963), a species reported across the whole Mediterranean Sea where it was considered as a non-indigenous species. However, previous reports of *N. agulhana* stressed inconsistencies with the original description (López & Richter, 2017; Langeneck *et al.*, 2024) and recently Villalobos-Guerrero *et al.* (2022) redescribed this species on the basis of the type material, demonstrating that homogomph falcigers are present in the posterior notopodia, at least in large specimens, and that this species belongs to the genus *Nereis*. The Mediterranean specimens herein described are devoid of homogomph falcigers and show a better correspondence with *N. unifasciata*, originally described from Sri Lanka (Willey, 1905) but widely reported from the Indo-Pacific region (Day, 1967; Mohammad, 1973; Pamungkas & Glasby, 2015; Hadiyanto & Glasby, 2023), including the Red Sea and the Suez Canal (Fauvel, 1927). In fact, the two species are very similar in size, colour pattern and paragnaths number and disposition (Day, 1967). Generally speaking, *N. unifasciata* seems to have a higher number of paragnaths than *N. agulhana* in all areas of the pharynx, but the main difference highlighted by Day (1967 - 0 paragnaths in area I in *N. agulhana*, 1-6 in line in *N. unifasciata*) is not confirmed by other descriptions, consistently reporting 0-1 paragnaths in area I (Fauvel, 1927; Hadiyanto & Glasby, 2023). The most obvious difference between the two species, aside from the absence of notopodial homogomph falcigers, is represented by the structure of the notopodia, showing the presence of two ligules (dorsal and median) in *N. unifasciata*, two ligules and a well-developed notopodial acicular lobe in *N. agulhana* (Day, 1967); in addition, dorsal cirri are seemingly shorter in comparison to dorsal ligules in *N. unifasciata* than in *N. agulhana*. The specimens herein examined are characterised by the presence of only two ligules in the notopodium, relatively short dorsal cirri and the absence of notopodial homogomph falcigers throughout the body, suggesting that they are closer to *N. unifasciata* than to *N. agulhana*. According to Day (1967) an important difference between *N. agulhana* and *N. unifasciata* is represented by the length of the blades of heterogomph falcigers, which are described and depicted as long and with a poorly developed subdistal tendon in *N.*

agulhana, short and with an evident subdistal tendon in *N. unifasciata*. This is indirectly confirmed by Fauvel (1927), and also Hadiyanto & Glasby (2023) depict compound chaetae with short blade and a strongly developed subdistal tendon. The individuals from Lebanon are characterised by a somewhat intermediate situation, with anterior parapodia with relatively long blades, recalling those observed in *N. agulhana*, and posterior parapodia with short blades, more similar to those of *N. unifasciata*; this disposition is very similar to that of the Mediterranean specimens from Spain described by Viéitez *et al.* (2004) as *N. agulhana*, which are seemingly characterised by the presence of a very short notopodial acicular lobe in anterior chaetigers, albeit much less developed than in *N. agulhana* (Day, 1967; Villalobos-Guerrero *et al.*, 2022). Lastly, while the colour pattern is similar between the two species, it is seemingly more marked in *N. unifasciata*, with more developed brown stripes on the anterior chaetigers (Pamungkas & Glasby, 2015). Nereididae identified as *N. agulhana*/*N. unifasciata* in the Mediterranean Sea might include more than one species, and most likely do not fully correspond to either species; however, the individuals from Lebanon herein described are in our opinion closer to *N. unifasciata* than to *N. agulhana*, not only from the morphological point of view, but also from the biogeographical and ecological point of view; in fact, *N. agulhana* is a species associated with relatively deep soft bottoms in temperate South Africa (Day, 1963; 1967), while *N. unifasciata* is a hard bottom species with a wide tropical and subtropical distribution in the Indian Ocean (Willey, 1905; Fauvel, 1927; Mohammad, 1973; Pamungkas & Glasby, 2015; Hadiyanto & Glasby, 2023).

Nereis persica Fauvel, 1911 (Fig. S15)

Material examined. Sample TR94/NT241, (33.33295° N, 35.18800°E), 22 November 2022, 35 m depth sediments close to the freshwater output: 1 specimen.

Additional material. Beirut Harbor G.B. & H.Z., 16 September 2002, HZ20020916c, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32969): 2 specimens.

Description. Specimen complete (Fig. S15A), 46 chaetigers, 7.05 mm total length, 2.14 mm L10, 0.70 mm maxi-

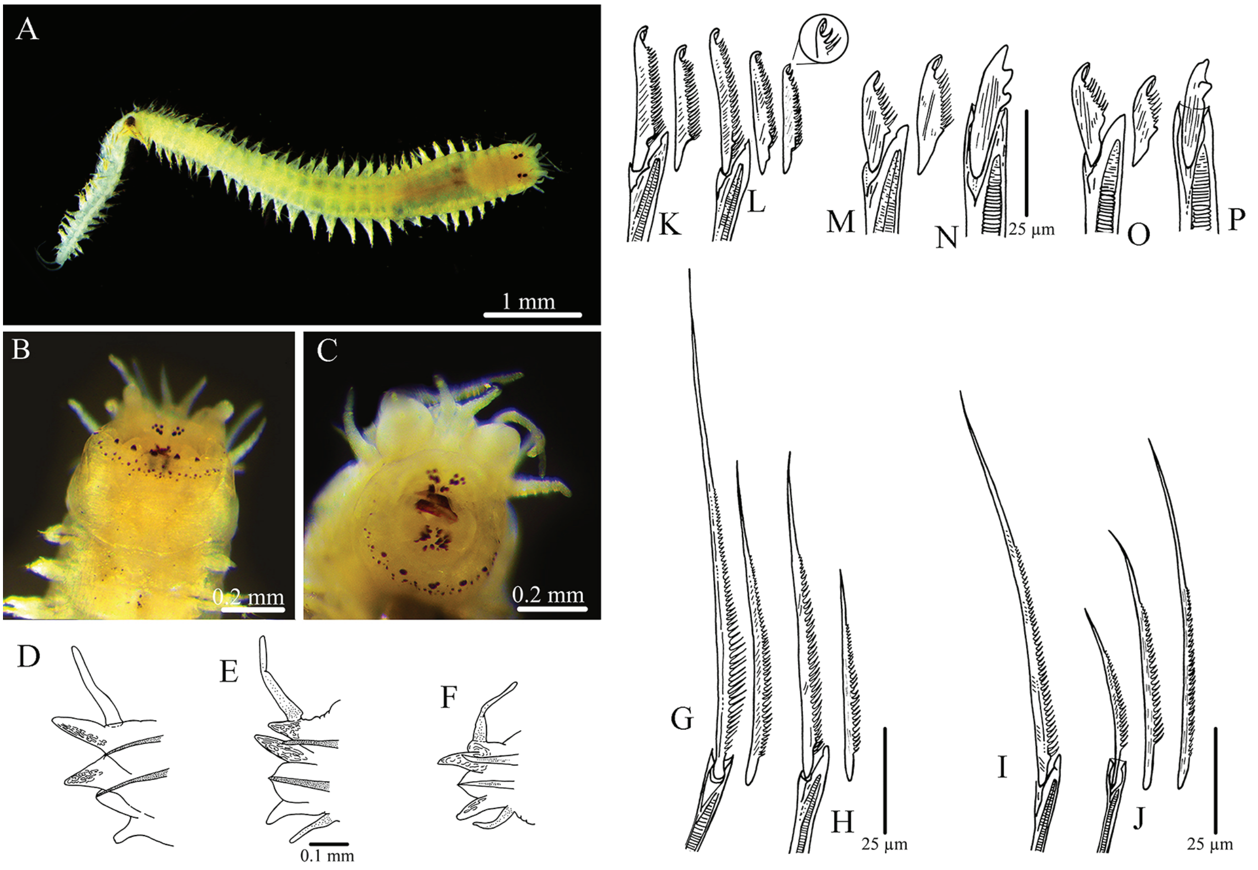

Fig. S15: *Nereis persica* Fauvel, 1911. A. Full specimen; B. Pharynx and paragnaths disposition, ventral view; C. Pharynx and paragnaths disposition, frontal view; D-F. Parapodia, line drawing (D. Anterior parapodium; E. Mid-body parapodium; F. Posterior parapodia); G-P. Chaetae, line drawing; G. Anterior parapodia homogomph compound supra-acicular spiniger neurochaetae; H. Anterior parapodia heterogomph compound sub-acicular spiniger neurochaetae; I. Posterior parapodia heterogomph compound spiniger chaetae; J. Posterior parapodia homogomph compound spiniger chaetae; K. Anterior parapodia heterogomph supra-acicular falciger neurochaetae; L. Anterior parapodia heterogomph sub-acicular falciger neurochaetae; M. Mid-body parapodia heterogomph falciger chaetae; N. Mid-body parapodia homogomph falciger chaetae; O. Posterior parapodia heterogomph falciger chaetae; P. Posterior parapodia homogomph falciger chaetae**.**

mum width without parapodia. Prostomium sub-triangular, as wide as long at the basis; 4 round, sub-equal dark eyes along the external edge of the prostomium. Antennae tapering, acute, 2/3 of prostomium length. Palps with short, sub-conical palpophore, palpostyle oval, 2/3 the palpophore length. Peristomium achaetous, ½ the prostomium length (Fig. S15C). 4 pairs of short tentacular cirri, the longest barely reaching the 2nd chaetiger, ventral tentacular cirri 1/3 the longest dorsal cirri.

Pharynx partially everted, with two muscular rings bearing corneous, black paragnaths (Fig. S15B, C). One pair of corneous, light brown jaws, number of teeth not noticeable. Maxillary ring: area I with 1 small, conical paragnath; area II with 3 large blunt paragnaths (Fig. S15C); area III with 3 paragnaths in a single transverse row (Fig. S15B, C); area IV with about 9 rather large paragnaths in two oblique rows. Oral ring: area V bare; area VI with 4-5 large, round paragnaths in a rosette; areas VII and VIII with a continuous anterior row of 5 large conical, blunt paragnaths, followed by two slightly irregular rows including about 35 smaller conical paragnaths (Fig. S15B, C).

Parapodia biramous (Fig. S15D-F). Anterior parapodia with notopodium supported by a single, black acicula, with long, pointed dorsal cirri, dorsal and median ligule conical, of the same length, median ligule thicker than the dorsal one; 5 homogomph spinigers. Neuropodium supported by a single, black acicula, neuroacicular ligule conical, short, ventral ligule conical, rather elongated, thick, ventral cirrus tapering, as long as ventral ligule; supra-acicular fascicle with 2-3 homogomph spinigers and 2-3 heterogomph falcigers, sub-acicular fascicle with 1 heterogomph spinigers and 6-7 heterogomph falcigers. Midbody parapodia with notopodium supported by one brown acicula, dorsal cirrus elongated, tapering, as long as the parapodium, dorsal and median ligule conical, similar in size, with evident glandular structures; 2 homogomph falcigers. Neuropodium supported by one dark brown acicula, neuroacicular ligule very short, ventral ligule conical, thick, ventral cirrus tapering, half the length of the dorsal cirrus; supra-acicular fascicle with 3 homogomph spinigers and 2 heterogomph falcigers, sub-acicular fascicle with 2 heterogomph spinigers and 2 heterogomph falcigers. Posterior parapodia with notopodium supported by one light brown acicula, dorsal cirrus tapering, with basis shifted towards the distal part of the parapodium; 1 homogomph falciger. Neuropodium supported by one light brown acicula, neuroacicular ligule very short, ventral ligule conical, rather long, ventral cirrus tapering, as long as ventral ligule; supra-acicular fascicle with 2 homogomph spinigers and 1 heterogomph falciger, sub-acicular fascicle with 1 homogomph falciger, 1 heterogomph spiniger and 3 heterogomph falcigers. Homogomph falcigers from the 22nd chaetiger, with short blade, unidentate, with 1-2 large secondary teeth along the ventral edge (Fig. S15N, P). Heterogomph falcigers with relatively long, unidentate blades, with strongly serrated ventral edge (Fig. S15K-M, O).

Pygidium rounded, with dorsal anus, two anal cirri elongated, tapering, as long as the last 4 chaetigers. Preserved specimen whitish, with traces of dark pigmentation on the prostomium edges.

Remarks. The examined specimen closely matches the original description of *N. persica* (Fauvel, 1911). This species was initially recorded in Port Said, Egypt, in 1924, marking one of the earliest Lessepsian polychaetes in the Mediterranean (Fauvel, 1927). Currently, it is known from Egypt (Fauvel, 1927; Ben-Eliahu, 1991), Israel (Ben-Eliahu, 1972), Turkey (Çinar, 2009), and Croatia (Mikac, 2015). However, historical records from the central and western Mediterranean (Amoureux, 1983; Fresi *et al.*, 1984) should be treated with caution, as they might represent misidentifications of the native, often overlooked *Nereis funchalensis* (Langerhans, 1880) (Gravina *et al.*, 2016). This new record extends the known distribution of this species to Lebanon.

Pseudonereis anomala (Gravier, 1899)

Material examined. Sample TR9/NT10, (33.27538° N, 35.19548° E), 17.xi.2022, 0-5 m depth, on Artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 11 specimens. TR41/NT127, (33.28366° N, 35.19549° E), 18.xi.2022, 0-6 m depth, on hard substrate with coralline algae and photophilous algae/ soft bottoms: 16 specimens. TR59/NT277, (33.26500° N, 35.19059° E), 20.xi.2022, 0-4 m depth, on artificial hard substrate with photophilous algae: 8 specimens. TR83/NT227, (33.33295° N, 35.18800°E), 22.xi.2022, 35 m depth hard substrate with coralligenous formation and freshwater output: 10 specimens.

Remarks. Species historically known from Lebanon (Laubier, 1966). In the Mediterranean Sea, it is also known from Egypt (Fauvel, 1937), Israel (Fauvel, 1955), Cyprus (Ben-Eliahu, 1972), Türkiye (Ergen & Çinar, 1997), Greece (Kambouroglou & Nicolaidou, 2006), Italy (D'Alessandro *et al.*, 2016; Langeneck *et al.*, 2024) and Algeria (Kurt *et al.*, 2021).

Syllidae Grube, 1850
Branchiosyllis exilis (Gravier, 1900) (Fig. S16)

Material examined. Sample LB105, (33.28366° N, 35.19549°E), 06 June 2022, 0-6 m depth, on artificial hard substrate with coralline algae and photophilous algae/ soft bottoms: 4 specimens. TR105/NT20, (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, on Artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 6 specimens. TR20/NT115, (33.33295° N, 35.18680° E), 18 November 2022, 38 m depth, Hard substrate with pre- coralligenous formation and hot water output: 1 specimen. TR41/NT138, (33.28366° N, 35.19549° E),

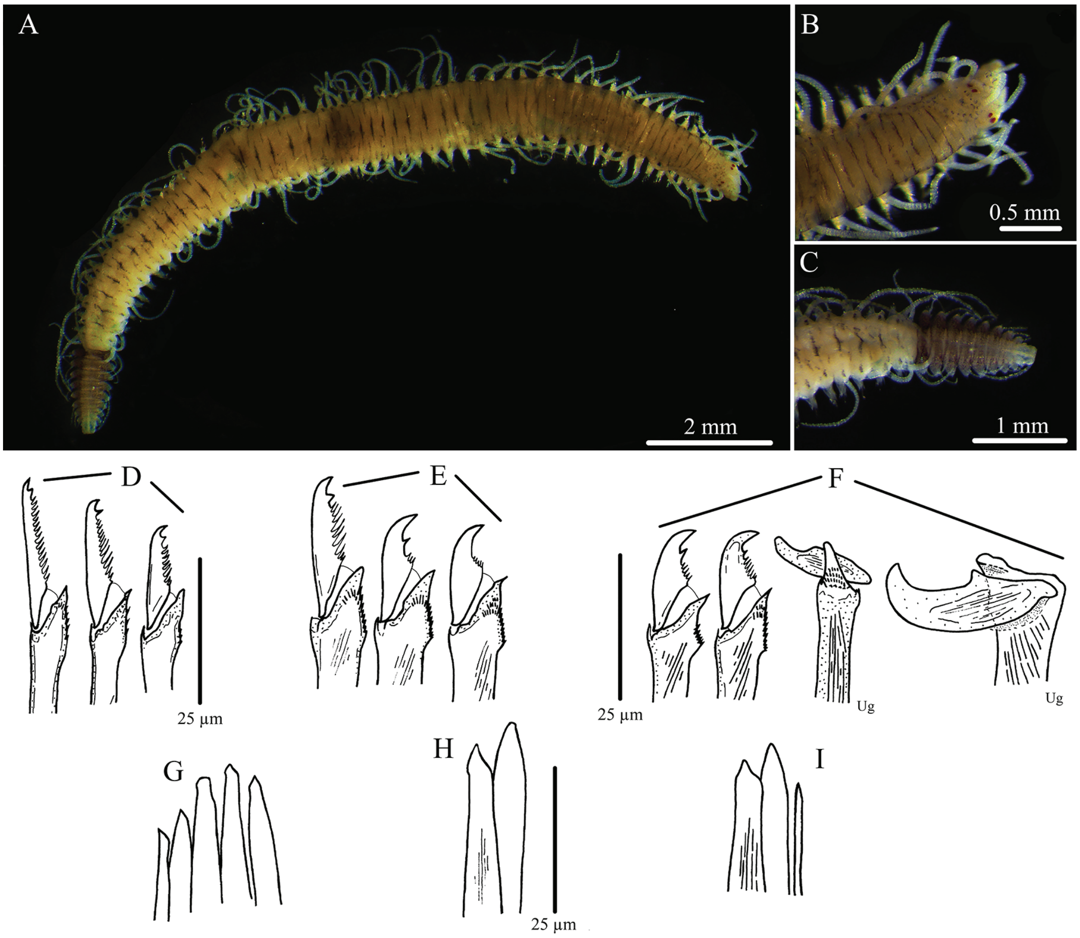

Fig. S16: *Branchiosyllis exilis* (Gravier, 1900). A. Complete specimen; B. Close-up of prostomium and peristomium; C. Close-up of posterior end with developing stolon; D-I. Chaetae, line drawing (D. Compound chaetae of anterior parapodia; E: Compound chaetae of mid-body parapodia; F: Compound chaetae and ungulae (Ug) of posterior parapodia; G. Anterior parapodia aciculae; H. Mid- body parapodia aciculae; I. Posterior parapodia aciculae).

18.xi.2022, 0-6 m depth, on hard substrate with coralline algae and photophilous algae: 18 specimens. TR50/NT164, (33.26061° N, 35.18264° E), 20 November 2022, 20 m depth, on hard substrate with photophilous algae: 1 specimen. TR116/NT193, (33.27395° N, 35.19532° E), 26 November 2022, 0-1 m depth inside the harbour (scratching the rope): 1 specimen.

Additional material. Beirut Airport pillar jetty 3-10 m, H.Z., 50 25 September 2002 HZ20020925ba, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32937): 3 specimens; Tripoli, brise-lame devant le port, côte intérieur, 2-3 m, H.Z., 51 20 September 2002 Sabellidae hz20020920, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32965): 1 specimen; Beirut Airport Breakwater, surface, H.Z. 25 September 2002 hz20020925c, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32970): 1 specimen.

Description. Complete individuals (Fig. S16A) with 28-77 chaetigers, 2.56-9.05 mm total length, 1.02-2.76 mm L10, 0.20-1.03 mm maximum width without parapodia. Prostomium oval, more than 1½ times wider than long (Fig. S16B). Two pairs of small, red eyes, in an almost transverse line, anterior pair slightly larger than posterior pair; one pair of small eyespots at the basis of the lateral antennae. Palps basally fused, as long as the prostomium (Fig. S16B). Antennae, dorsal cirri and tentacular cirri moniliform. Median antenna with 16-18 articles, lateral antennae with 14-16 articles. Dorsal tentacular cirri with 33 articles, ventral tentacular cirri with 16-17 articles. Dorsal cirri with up to 32 articles, without a clear alternating pattern. Ventral cirri as long as the parapodium, not articulated.

All chaetiger uniramous with a small post-acicular, triangular lobe. Anterior parapodia supported by 5 sub-equal aciculae (Fig. S16G), four with acute tip, the fourth with 90° bent tip, with 8-10 compound chaetae (Fig. S16D). Mid-body parapodia supported by 2 pointed aciculae (Fig. S16H), with 5 compound chaetae and 2-3 ungulae (Fig. S16E). Posterior parapodia supported by 3 aciculae (Fig. S16I), two thick and pointed , protruding from the parapodium, and one thin, not protruding, with 5-6 compound chaetae and 4 ungulae (Fig. S16F). Dorsal and ventral simple chaetae absent. Compound chaetae heterogomph, showing a slight dorso-ventral gradation in size of blades; blades bidentate, with secondary tooth smaller than the primary one and a thick serration along the ventral edge (Fig. S16D-F). Ungulae (modified compound chaetae) from the 26th-29th chaetiger, thick, unidentate, without serration (Fig. S16E, Ug); ventral-most blades in posterior chaetigers with secondary tooth much smaller than the primary one, shifted proximally.

Pharynx over 6 chaetigers, rather wide, with a large sub-terminal, triangular tooth, proventriculum slightly longer than the pharynx, over 6 chaetigers, with 35 muscle cell rows. Colour pattern overall well preserved in fixed material; ground colour pale yellowish, with an intersegmental, continuous dark stripe and a second dark transverse stripe around half of each chaetiger, split in two centrally. Intersegmental bands very marked in the anterior part, fading after the proventriculum, with central part disappearing, and only lateral parts remaining (Fig. S16A). Transverse stripe across the chaetiger becoming more evident posteriorly, split into three parts. Stripes noticeable to the end of the body. Small dark spots on the articles of antennae, tentacular cirri and at least anterior dorsal cirri. Unripe stolons in a part of the specimens, developing from the 49th chaetiger (Fig. S16C).

Molecular data. A COI sequence was obtained for an individual (accession number: PP808837). This sequence did not give any similarity with other annelid sequences, while very low similarities (72-74%) were retrieved with arthropoda of different groups.

Remarks. This species has been widely reported from the entire Mediterranean Sea. While some of the first records considered it a non-indigenous species (Monro, 1937; Ben-Eliahu, 1972), presumably due to its type locality in the Red Sea (Gravier, 1900), it was later excluded from the list of non-indigenous species occurring in the Mediterranean Sea (Zenetos *et al.*, 2005). This exclusion was justified by its widespread distribution in the basin and the neighbouring Atlantic Ocean. However, it is likely that the majority of specimens reported in the Mediterranean Sea do not belong to *B. exilis*, but rather to *Branchiosyllis cirropunctata* (Michel, 1909), a species originally described from the Gulf of Naples. *B. cirropunctata* was historically synonymized with *B. exilis* (Licher, 1999; San Martín, 2003) but was reinstated only recently (San Martín *et al.*, 2008). The native species closely resembles *B. exilis* but shows slight differences in the shape of chaetae, the length of dorsal cirri, and the live colour pattern (San Martín *et al.*, 2008). The examined specimens from Lebanon do not correspond to *B. cirropunctata*, and are instead very close to recent redescriptions of *B. exilis* from the Indo-Pacific region (San Martín *et al.*, 2008; Lucas *et al.*, 2017). The only identifiable difference is the colour pattern, which appears more pronounced than that described by Lucas *et al.* (2017) for specimens from Socotra. However, it should be noted that the material from Socotra was described nearly 20 years after its sampling, while the material from Lebanon was relatively recent, which might explain the better preserved colour. We suggest considering *B. exilis* a non-indigenous species in the Mediterranean Sea. Historical material from other Mediterranean areas should be carefully re-examined to determine whether it corresponds to *B. cirropunctata* or to *B. exilis*.

Exogone africana Hartmann-Schröder, 1974

Material examined. Sample TR71/NT140, (33.33019° N, 35.18475° E), 20 November 2022, 15 m depth, on hard substrate with photophilous algae/ soft bottoms: 4 specimens. TR50/NT268, (33.26061° N, 35.18264° E), 20 November 2022, 15-20 m depth, on hard substrate with photophilous algae: 1 specimen.

Exogone breviantennata Hartmann-Schröder, 1959

Material examined. Sample TR108/NT40, (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, on artificial hard bottom with coralline algae and photophilous algae: 1 specimen. TR83/NT237, (33.33295° N, 35.18800°E), 22 November 2022, 35 m depth hard substrate with coralligenous formation, and freshwater output and sediments: 1 specimen.

Syllis* cf. *crassicirrata (Treadwell, 1925) (Fig. S17)

Material examined. Sample TR45/NT172, (33.28366° N, 35.19549° E), 18 November 2022, 0-6 m depth, on hard substrate with coralline algae and photophilous algae/soft bottoms: 57 specimens. TR113/NT189, (33.27395° N, 35.19532° E), 26 November 2022, 0-1 m depth, on ropes inside the harbour: 6 specimens.

Additional material. Beirut Harbor, quai 60, with Pomatoleios-crust, surface, H.Z., 15 July 2002, hz20020715, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32952): 8 specimens.

Description. Complete individuals (Fig. S17A) with 43-74 chaetigers, 3.16-8.97 mm total length, 0.52-1.58 mm L10, 0.42-0.86 mm maximum width without parapodia. Prostomium rectangular, slightly wider than long, anteriorly developing into a sub-triangular cusp. Two pairs of reddish eyes, anterior eye larger, oval, inserted dorso-laterally, posterior eyes rounded, inserted dorsally (Fig. S17B). One pair of small eyespots on the anterior edge of the prostomium, at the basis of lateral antennae. Palps basally fused, approximately 1½ longer than the prostomium. Antennae, dorsal cirri and tentacular cirri moniliform, number of articles often difficult to determine, as the first 3-4 are very short and close. Median antenna inserted backwards with respect to the lateral ones, with 26 articles, lateral antennae with 12-15 articles, approximately 2/3 the length of the median antenna. Dorsal tentacular cirri with 24 articles, ventral tentacular cirri approximately 2/5 of dorsal tentacular cirri, with 15-16 articles. Antennae, tentacular cirri and anterior pairs of dorsal cirri much thicker than the ones of the midbody and posterior part. Longer dorsal cirri at 1st, 3rd, 4th, 6th, 7th, 9th, and then regularly alternating to the end of the body, with 29-34 articles in the anterior part of the body, where they are much thicker than the shorter ones, 24-26 articles in the midbody; shorter dorsal cirri at 2nd, 5th, 8th, 10th, and

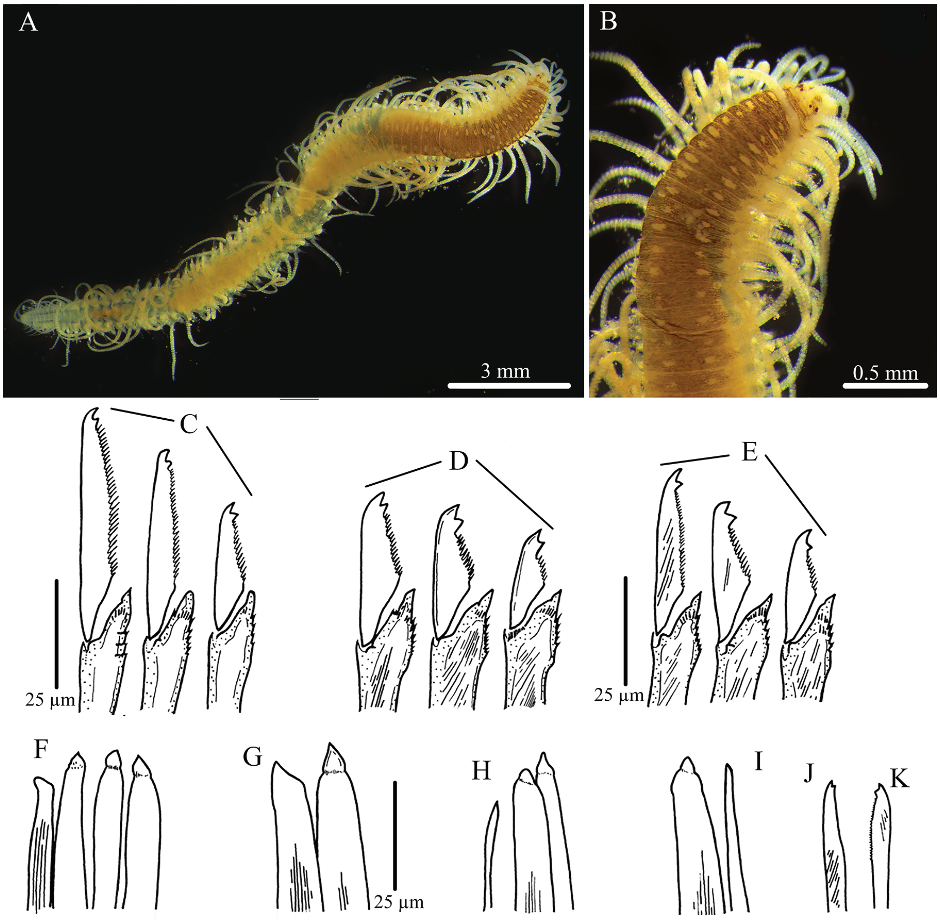

Fig. S17: *Syllis* cf. *crassicirrata* (Treadwell, 1925). A. Complete specimen; B. Close-up to anterior end; C-K. Chaetae, line drawing (C. Anterior parapodia compound chaetae; D. Mid-body parapodia compound chaetae; E. Posterior parapodia compound chaetae; F. Anterior parapodia aciculae; G. Mid- body parapodia aciculae; H, I. Posterior parapodia aciculae; J. Posterior parapodia ventral simple chaetae; K. Posterior parapodia dorsal simple chaetae).

then regularly alternating to the end of the body, with 22-24 articles in the anterior part of the body, 15-17 articles in the midbody. Tip of antennae and dorsal cirri yellowish in the preserved specimens. Ventral cirri slightly longer than the parapodium, not articulated. Pygidium rounded, with one pair of rather thin anal cirri, with 17-19 oval articles.

All chaetigers uniramous. Anterior parapodia supported by 4 aciculae (3 in juveniles) (Fig. S17F), one with truncated, blunt tip and three with pointed tip, with 13-14 compound chaetae with a strong dorso-ventral gradation in size of blades (longest blade in the parapodium approximately twice the shortest one) (Fig. S17C). Midbody parapodia supported by 2 aciculae (Fig. S17G), one of which with acute tip, the other one with slightly bent, blunt tip, with 8 compound chaetae showing a slight dorso-ventral gradation in size of blades (Fig. S17D). Posterior parapodia supported by 2 aciculae (Fig. S17I), one very thick, slightly acuminate, the other one much thinner, with distal area inflated (first posterior abdominal chaetiger with 3 aciculae, two thick and one really thin, Fig. S17H), with 6-8 compound chaetae showing a slight dorso-ventral gradation in size of blades (Fig. S17E). Both dorsal and ventral simple chaetae occurring after the 70th chaetiger, both finely bidentate and with slightly serrated ventral edge (Fig. S17J, K). Compound chaetae heterogomph, with strongly bidentate blade, primary and secondary teeth of similar size, strongly serrated ventral edge (Fig. S17C-E).

Pharynx on 12 chaetigers, not slender, with a massive triangular tooth inserted close to the anterior margin, proventriculum slightly shorter than the pharynx, on 9 chaetigers, with 33 muscle cell rows. Colour pattern overall well preserved, showing some variability, pale yellowish, generally with a reddish-brown tinge on anterior chaetigers, gradually fading towards the posterior part of the body; each chaetiger shows the presence of two paired pale spots (Fig. S17A, B). Some specimens are paler, with a large reddish-brown spot recalling a reversed 8 on the dorsum of each chaetiger, or two wide transverse stripes on each chaetiger, not connected into an 8. Developing stolon from the 63rd chaetiger, seemingly dicerous, with two large eyes and two short antennae without articulations.

Molecular data. The COI obtained for two specimen of *S. crassicirrata* (accession numbers: PP808812; PP808813) gave a 75% identity with *Syllis bella* and *S. crassicirrata* on GenBank, while on BOLD they gave a 97.5% identity with a private sequence assigned to Syllidae, without further taxonomic details. The 16S sequence obtained for a single specimen of *S. crassicirrata* (accession number: PP810984) gave a 99.8% identity with a *Syllis* sp. obtained from the gut content of a gastropod sampled in Arabia (accession number: MW007420; Gorson *et al.*, 2021), confirming the Red Sea origin of the species.

Remarks. The examined specimens show a good correspondence with both *Syllis bella* (Chamberlin, 1919), which was reported from Lebanon by Aguado & San Martín (2007), and *S. crassicirrata*, hitherto unknown in the Mediterranean Sea, but known in the Red Sea (Ba Akdah *et al.*, 2018). Already Licher (1999), while assigning the two species to different informal groups, stressed the close similarity between them. The main difference between *S. bella* and *S. crassicirrata* is represented by the presence of a weak dorso-ventral gradation in the size of blades of compound chaetae in *S. bella*, *vs* a pronounced gradation in *S. crassicirrata*; moreover, the secondary tooth in *S. bella* is clearly less developed than the primary one, while in *S. crassicirrata* the two teeth have similar size. The description by Aguado & San Martín (2007) shows a good correspondence with that by Licher (1999) except in the number of articles of dorsal cirri; the specimens examined in this study are characterised instead by an evident dorso-ventral gradation in the size of blades of compound chaetae (Fig. S17C-E). In the SEM scans provided by Aguado & San Martín (2007), the secondary tooth seems more developed than in typical specimens of *S. bella*, suggesting that the specimens identified as *S. bella* by these authors and the ones identified here as *S.* cf. *crassicirrata* could in fact represent the same species. Nonetheless, in our opinion the specimens show a better correspondence with *S. crassicirrata* than with *S. bella* (Licher, 1999; Álvarez-Campos *et al.*, 2015). This species, originally described from the Hawaii Islands (Treadwell, 1925), was subsequently widely reported across the Indo-Pacific region. Ba Akdah *et al.* (2018) reported it from the Red Sea, where it is a common species on artificial hard substrates. However, these authors highlighted a remarkable pseudocryptic diversity within this taxon, with five different colour patterns and at least two divergent molecular lineages, none of which correspond to *S. crassicirrata* from Australia and New Zealand (Ba Akdah *et al.*, 2018). Ba Akdah *et al.* (2018) suggested that they might represent undescribed species. The sequences obtained in this study do not match those published by Ba Akdah *et al.* (2018), which however cover only a small part of the analysed individuals; however, based on the correspondence with an unidentified *Syllis* sp. from the gut of a gastropod sampled in the Red Sea, genetic data confirm the Lessepsian origin of the species.

***Syllis* cf. *picta* (Kinberg, 1866) (Fig. S18)**

Material examined. Sample TR59/181, (33.26500° N, 35.19059° E), 20 November 2022, 0-4 m depth, on artifi-

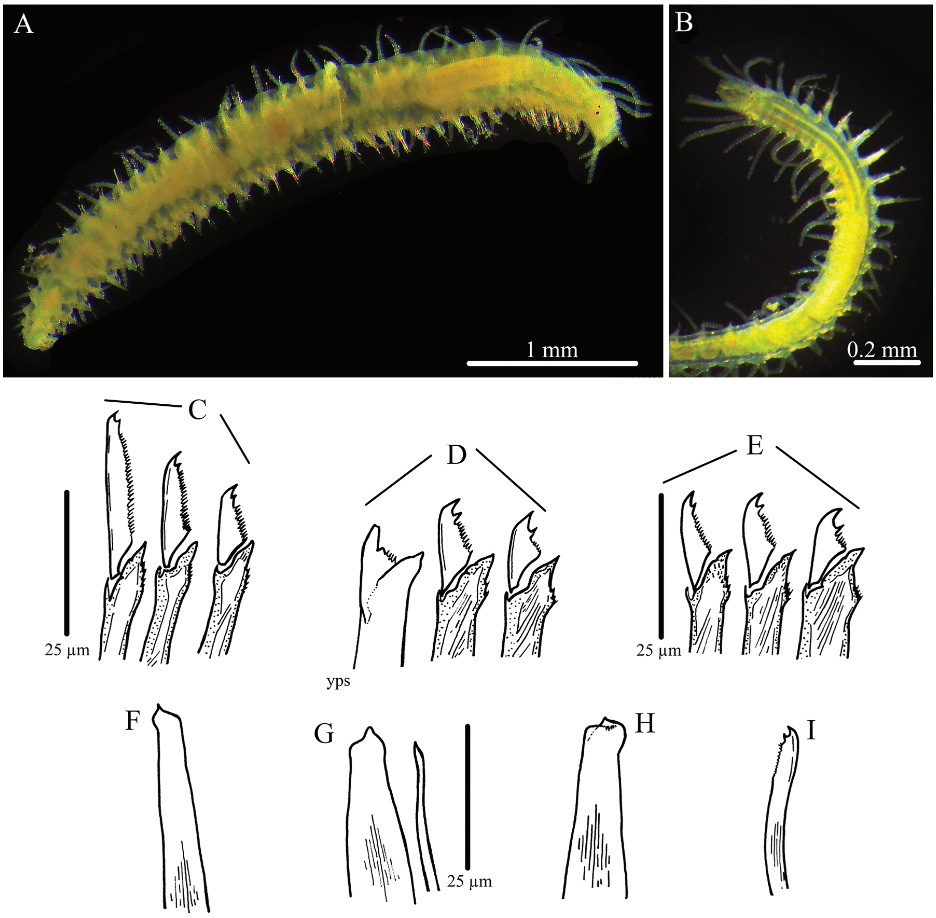

Fig. S18: *Syllis* cf. *picta* (Kinberg, 1866). A. Full specimen, fixed material; B. Close-up to anterior end, alive specimen; C-I. Chaetae, line drawing; C. Anterior parapodia compound chaetae; D. Mid-body parapodia ypsiloid pseudo-compound (yps) and compound chaetae; E. Posterior parapodia compound chaetae; F. anterior parapodia aciculae; G. Mid-body parapodia aciculae; H. Poaterior parapodia aciculae; I. Posterior parapodia ventral simple chaetae.

cial hard substrate with photophilous algae:1 specimen. TR202/NT213, (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, Artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 4 specimens.

Description. Complete individual (Fig. S18A) with 37 chaetigers, 3.33 mm total length, 1.05 mm L10, 0.46 mm maximum width. Prostomium oval, twice wider than long, with 4 round, reddish eyes, anterior pair slightly larger than posterior one, antero-lateral, posterior pair smaller, dorsally inserted. Palps fused basally, twice the prostomium length (Fig. S18B). Antennae, dorsal cirri and tentacular cirri moniliform. Median antenna with 18 articles, lateral antennae with 8-9 articles. Dorsal tentacular cirri with 12 articles, ventral tentacular cirri approximately 2/3 of dorsal tentacular cirri, with 6 articles. Dorsal cirri regularly alternating between longer and shorter. Longer dorsal cirri with 14-17 articles in the anterior part of the body, 8-10 in the midbody; shorter dorsal cirri with 6-8 articles in the anterior part of the body, 4-5 articles in the midbody. All cirri very short in the posterior part of the body.

All chaetigers uniramous. Anterior parapodia supported by one acicula (Fig. S18F), 4-5 compound chaetae with a weak dorso-ventral gradation in size of blades (Fig. S18C). Midbody parapodia supported by 2 acicula (Fig. S18G), one thick with square distal part, and an asymmetrical, bent acute tip and one really thin, with 1 pseudo-compound ypsiloid chaeta (Fig. S18D yps) (shaft and blade fused) and 2 compound chaetae (Fig. S18D). Posterior parapodia supported by one large acicula (Fig. S18H), with square distal part, and an asymmetrical thin, acute tip, with one dorsal simple chaeta, 3-4 compound chaetae and one ventral simple chaeta (Fig. S18E). Dorsal simple chaetae thin, indistinctly bidentate, with serrated ventral margin. Ventral simple chaetae thin, straight and smooth, with briskly crooked tip (Fig. S18I). Compound chaetae heterogomph, with relatively short bidentate blade, primary tooth always larger than the secondary one, strongly serrated ventral edge (Fig. S18C-E). Pseudo-compound ypsiloid chaetae with blade and shaft fused with a distinct suture, blade unidentate, with a weak serration towards the basis (Fig. S18D yps).

Pharynx on 6 chaetigers, slender, with a triangular tooth inserted close to the anterior margin, proventriculum more or less as long as the pharynx, on 4½ chaetigers, with 41 muscle cell rows (Fig. S18B). Live colour yellowish, translucent, with two dark transverse bars on each anterior chaetiger, fading after the proventriculum (Fig. S18B); preserved specimens without any recognisable colour pattern (Fig. S18A).

Molecular data. A COI sequence obtained from one of the specimens (accession number: PP808815) gave a 90% identity with an unidentified polychaete from the Red Sea (accession number: KY262881), and an 86% identity with *Syllis gracilis* Grube, 1840 lineage 3 *sensu* Álvarez-Campos *et al.* (2017a) on GenBank (accession numbers: KX280978-KX280983), while on BOLD the identity was 90% with a private sequence assigned to *S. gracilis*, and 86% with *Syllis ypsiloides* Aguado, San Martín & ten Hove, 2008. Moreover, a 99.7% identity is retrieved with a very short sequence assigned to *S. crassicirrata* from the Red Sea (accession number: MH384813; Ba Akdah *et al.*, 2018). A 16S sequence from the same specimen (accession number: PP800963) gave a 92-93% identity with *S. ypsiloides* (accession numbers: JF903733; KX280939; KX280940; KX280941; KX280942; KX280944) and *Syllis gracilis* lineage 3 (JF903733; KU182891; KX280935).

Remarks. Based on the presence of ypsiloid chaetae resulting from the fusion between the blade and shaft in the midbody, the examined specimens can be assigned to the *Syllis gracilis* species complex. This group encompasses at least 9 unnamed lineages worldwide, along with *S. picta*, *S. ypsiloides* and *Syllis magellanica* Augener, 1918 (Álvarez-Campos *et al.*, 2017a; Langeneck *et al.*, 2020b). While all these species share a very similar habitus, and the live colouration closely resembles that observed in native lineages of the *S. gracilis* complex (Langeneck *et al.*, 2020b), they can be easily separated based on the presence of a suture in ypsiloid chaetae (absent in native lineages) and the co-occurrence of compound and ypsiloid chaetae throughout the whole midbody (only ypsiloid chaetae in the midbody in native lineages) (Álvarez-Campos *et al.*, 2017a). The presence of a suture is common in Indo-Pacific lineages of the *S. gracilis* complex, but the co-occurrence between compound and ypsiloid chaetae is known for *S. picta* and *S. ypsiloides*, which differ in the number of chaetae (up to 3 per parapodium in *S. picta*, 2 in *S. ypsiloides*). Molecular data confirm that these specimens belong to a sub-clade with Indo-Pacific affinity, which includes two unnamed lineages from Australia and the Philippines, as well as *S. ypsiloides*, confirming their non-indigenous origin. Morphological data suggest an affinity with *S. picta*, while molecular data suggest rather a closeness with the clade including *S. ypsiloides*. Interestingly, a specimen from the Red Sea identified as *S. picta* based on morphology turned out to be closer to *S. ypsiloides* (Ba Akdah *et al.*, 2018). Ba Akdah *et al.* (2018) only deposited the 18S of this specimen; however, one COI sequence assigned to *S. crassicirrata* sequenced in the same study (accession number: MH384813) was almost identical to our sequence of *S.* cf. *picta*, while it was very distant from the allegedly conspecific sequence with accession number MH384814. It is possible that this sequence actually belongs to *S. picta*, and its assignment to *S. crassicirrata* is due to mislabelling. In this case, *S. picta* from Jeddah and these specimens would represent the same species, which should be considered as a new Lessepsian invader in the Mediterranean Sea. As the majority of morphological characters match well with the native *S. gracilis* lineages, previous records of this species along the Levantine coast should be critically re-examined, as some of the material might actually belong to this species.

Syllis schulzi (Hartmann-Schröder, 1960)

Material examined. Sample TR9/NT5, (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, on artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 20 specimens. TR59/NT290, (33.26500°

N, 35.19059° E), 20 November 2022, 0-4 m depth, on artificial hard substrate with photophilous algae: 7 specimens.

Remarks. This species, with type locality in the Red Sea, was considered a questionable non-indigenous species by Zenetos *et al.* (2010). In the Mediterranean Sea, *S. schulzi* is currently known from the southern-most part of the Iberian Peninsula (López *et al.*, 1996); the report of the species for the eastern Mediterranean Sea (Zenetos *et al.*, 2010) is due to a compilation error (Faulwetter *et al.*, 2017). Therefore, the current records represent the first ones for the eastern Mediterranean Sea. These specimens correspond well to the redescription based on Red Sea specimens, including the strongly contrasted colour pattern (Ba Akdah *et al.*, 2018). Although the species disappeared from Mediterranean NIS lists, we suggest to keep considering it a non-indigenous species, pending further analyses, possibly based on molecular data.

***Trypanosyllis* cf. *krohnii* Grube, 1863**

Material examined. Sample TR108/NT58, (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, on artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 3 specimens. TR39/NT160, (33.28366° N, 35.19549° E), 18 November 2022, 0-6 m depth, on hard substrate with coralline algae and photophilous algae/ soft bottoms: 6 specimens. TR50/NT267, (33.33019° N, 35.18475° E), 20 November 2022, 15 m depth, on hard substrate with algae and photophilous algae: 1 specimen.

Molecular data. The COI sequence obtained from one individual (accession number: PP808811) gave a >99% identity with *Trypanosyllis* cf. *krohnii* from Australia (GenBank accession number: JF903790) and a 98% identity with *Trypanosyllis* cf. *krohnii* from Brazil (GenBank accession number: KX084985). The 16S sequence from the same individual (accession number: PP800962) gave a 98.4% identity with *Trypanosyllis* cf. *krohnii* from Australia (GenBank accession number: JF903752) (Fig. S21).

Remarks. *Trypanosyllis krohnii*, a species with type locality in the Mediterranean Sea, has recently been re-evaluated as part of a large species complex by Álvarez-Campos *et al.* (2017b). According to their findings, there are at least three Mediterranean lineages forming a clade. However, despite morphological similarities to Mediterranean specimens, the examined specimen from Lebanon does not belong to any of them. Instead, it falls within a clade that includes specimens from Australia and Brazil, suggesting a non-indigenous origin in the Mediterranean Sea. The distribution of this lineage is very wide, encompassing Australia, Brazil and the Eastern Mediterranean Sea, and it is likely that the species is non-indigenous also elsewhere; it is currently unknown whether this lineage also occurs in the Red Sea, but already Fauvel (1927) reported the presence of seemingly indistinguishable *Trypanosyllis zebra* (Claparède, 1864) = *T. krohnii* on both sides of the Suez Canal, highlighting that this was one of the few species common between the Mediterranean and the Red Sea. It is likely that the material from the two basins actually belonged to two different, albeit morphologically very close, species.

Trypanosyllis luzonensis (Pillai, 1965) (Fig. S19)

Material examined. Sample LB52, (33.29111° N, 35.16858° E), 18 June 2022, 38 m depth, hard substrate with pre-coralligenous formation and hot water output: 1 specimen. TR14/NT18, (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, Artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 1 specimen. TR39/NT161, (33.28366° N, 35.19549° E), 18 November 2022, 0-6 m depth, on hard substrate with coralline algae and photophilous algae: 3 specimens.

Additional material. Beirut Harbour with *Pomatoleios* crust, surface, H.Z. 15/9/2002 HZ20020915f, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32955): 3 specimens; Beirut Airport Jetty 12m H.Z. 25/9/2002 HZ20020925bab, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32962): 1 specimen.

Description. Complete individuals (Fig. S19A) with 85-173 chaetigers, 10.51-32.3 mm total length, 0.74-1.46 mm L10, 0.58-1.5 mm maximum width without parapodia. Incomplete individuals larger, 101-159 chaetigers, 18.66-32.51 mm total length, 2.06 mm L10, 1.76-1.83 mm maximum width. Body very long, flattened. Prostomium sub-rectangular, with a median notch along both the anterior and the posterior edge, and with a longitudinal furrow dividing it into two equal ovoidal halves (Fig. S20B). Two pairs of round, dark red eyes, posterior eyes slightly smaller than anterior ones. Palps completely separated basally, shorter than prostomium (Fig. S19B). Antennae, dorsal cirri and tentacular cirri moniliform, number of articles often difficult to determine, as the basal ones are very short and close. Median antenna with 40 articles, lateral antennae with 24-27 articles. Peristomium wider than prostomium, laterally developed into a triangular protrusion; both pairs of tentacular cirri inserted below the triangular protrusion. Dorsal cirri irregularly alternating between longer and shorter ones. Longer dorsal cirri with 48-76 articles, up to 1½ times the width of the corresponding chaetiger, shrter dorsal cirri with 25-33 articles, shorter than the width of the corresponding chaetiger. Longer dorsal cirri to the end of the body, where they reach a length twice the width of the corresponding chaetiger. Pygidium rounded, with one pair of long anal cirri.

All chaetigers uniramous. Anterior parapodia supported by 3 thick, pointed aciculae (Fig. S19F), one of which thicker than the other ones, with 14 compound chaetae with a strong dorso-ventral gradation in size of blades (Fig. S19C). Midbody parapodia (around 100th chaetiger) supported by 2 sub-equal, thick and blunt aciculae (Fig. S19G),

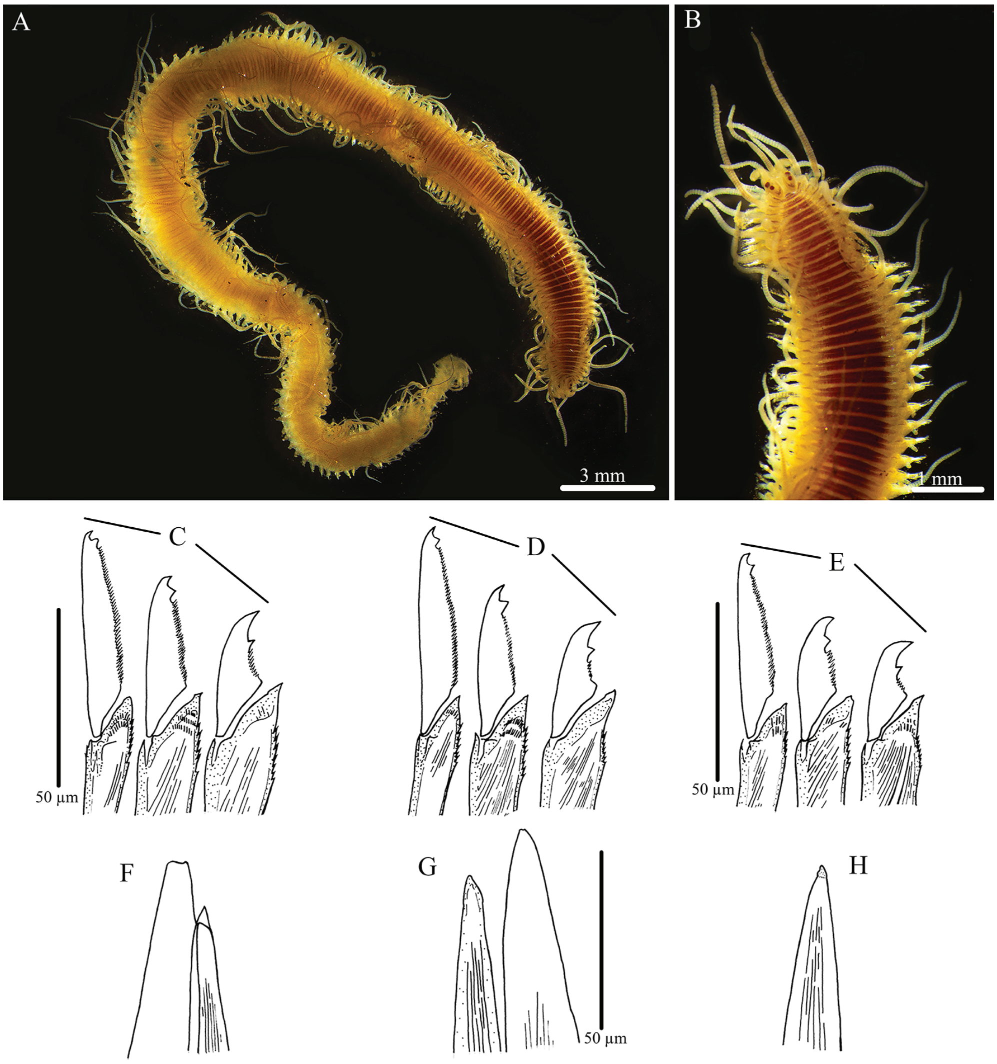

Fig. S19: *Trypanosyllis luzonensis* (Pillai, 1965). A. Full specimen; B. Close-up to anterior end; C-H. Chaetae, line drawing; C. Anterior parapodia compound chaetae; D. Mid-body parapodia compound chaetae; E. Posterior parapodia compound chaetae; F. Anterior parapodia aciculae; G. Mid- body parapodia aciculae; H. Poaterior parapodia aciculae.

with 11-12 compound chaetae showing a strong dorso-ventral gradation in size of blades (Fig. S19D). Posterior parapodia (around 150th chaetiger) supported by 1 pointed acicula (Fig. S19H), with 7-9 compound chaetae showing a strong dorso-ventral gradation in size of blades (Fig. S19E). Dorsal and ventral simple chaetae lacking. Compound chaetae heterogomph, with strongly bidentate blade and a thin serration along the ventral edge; primary and secondary tooth of similar size in upper compound chaetae, secondary tooth much smaller than primary one, shifted towards the middle of the ventral edge in lower compound chaetae (Fig. S19C-E).

Pharynx on 13 chaetigers, proventriculum slightly shorter than the pharynx, on 10 chaetigers, number of muscle cell rows impossible to determine. Colour pattern very well preserved in fixed material. Prostomium pale, with a dark arcuate band after each eye. Peristomium with dark brown anterior half, posteriorly two dark bands separated by a pale band half the thickness of the dark bands (Fig. S19A). Chaetigers with two wide reddish-brown transverse bands, each formed by 5-6 thinner stripes, separated by a thin pale stripe (Fig. S19B). The pale stripe becomes gradually wider towards the prostomium, while the dark tinge gradually fades. Dark bands disappear around the 100th chaetiger. Dorsal cirri and antennae with dark stripes in the articulations, median antenna and first pair of dorsal cirri light brown.

Molecular data. A 16S sequence (accession number: PQ400069) gave a 96% identity with sequences of *T. luzonensis* from the Philippines and clustered with them in a highly supported clade (Fig. S21).

Remarks. The examined specimens closely match the redescription of *T. luzonensis* by Álvarez-Campos *et al.* (2017b), with the exception that all compound chaetae have bidentate blades, whereas Álvarez-Campos *et al.* (2017b) consider the presence of a few chaetae with unidentate blades as a key difference between *T. luzonensis* and the *T. krohnii* species complex. However, these authors also note variability in the shape of chaetae within this species, and the genetic divergence between different *T. luzonensis* lineages appears comparable to that within the *T. krohnii* species complex (Álvarez-Campos *et al.*, 2017b), suggesting that *T. luzonensis* is also a species complex. The 16S lineage detected in Lebanon does not perfectly match any of those identified by Álvarez-Campos *et al.* (2017b), even though it is rather close. Nevertheless, this species is known only from the Indo-Pacific (Philippines, China and Australia) and has never been reported in the Mediterranean Sea, indicating that it likely represents a new non-indigenous species in the basin.

Trypanosyllis cf. ***cristoboi*** Álvarez-Campos, Taboada, San Martín, Leiva & Riesgo, 2018 (Fig. S20)

Material examined. Sample TR48/NT251, (33.33019° N, 35.18475° E), 20 November 2022, 15 m depth, on hard substrate with algae and photophilous algae/ soft bottoms: 2 specimens. TR200/NT201, (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, Artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 1 specimen.

Description. Complete individual (Fig. S20A) with 46 chaetigers, 3.16 mm total length, 0.67 mm L10, 0.51 mm maximum width without parapodia. Incomplete individual larger, 65 chaetigers, 5.42 mm total length, 0.78 mm L10, 0.71 mm maximum width. Body long and flattened (Fig 20A). Prostomium sub-rectangular, with a median notch along both the anterior and the posterior edge, and with a longitudinal furrow dividing it into two equal ovoidal halves (Fig. S20B). Two pairs of round, dark red eyes, posterior eyes slightly smaller than anterior ones. Palps completely separated basally, shorter than prostomium (Fig. S20B). Antennae, dorsal cirri and tentacular cirri moniliform, number of articles often difficult to determine, as the basal ones are very short and close. Median antenna with 30 articles, lateral antennae with 15-16 articles. Two ciliary bands between the central antenna and the lateral ones. Dorsal tentacular cirri with 29-37 articles, ventral tentacular cirri with 8-9 articles. Dorsal cirri showing a slightly irregular alternation between longer and shorter, decreasing in length towards the pygidium. Dorsal cirri of the first chaetiger with 24-25 articles. Longer dorsal cirri longer than the width of the corresponding chaetiger, with 21-22 articles in the anterior part of the body, 14-17 articles in the posterior part of the body, shorter dorsal cirri shorter than the width of the corresponding chaetiger, with 11-12 articles in the anterior part of the body, 8-9 articles in the posterior part of the body. Ventral cirri not articulated, as long as the parapodium.

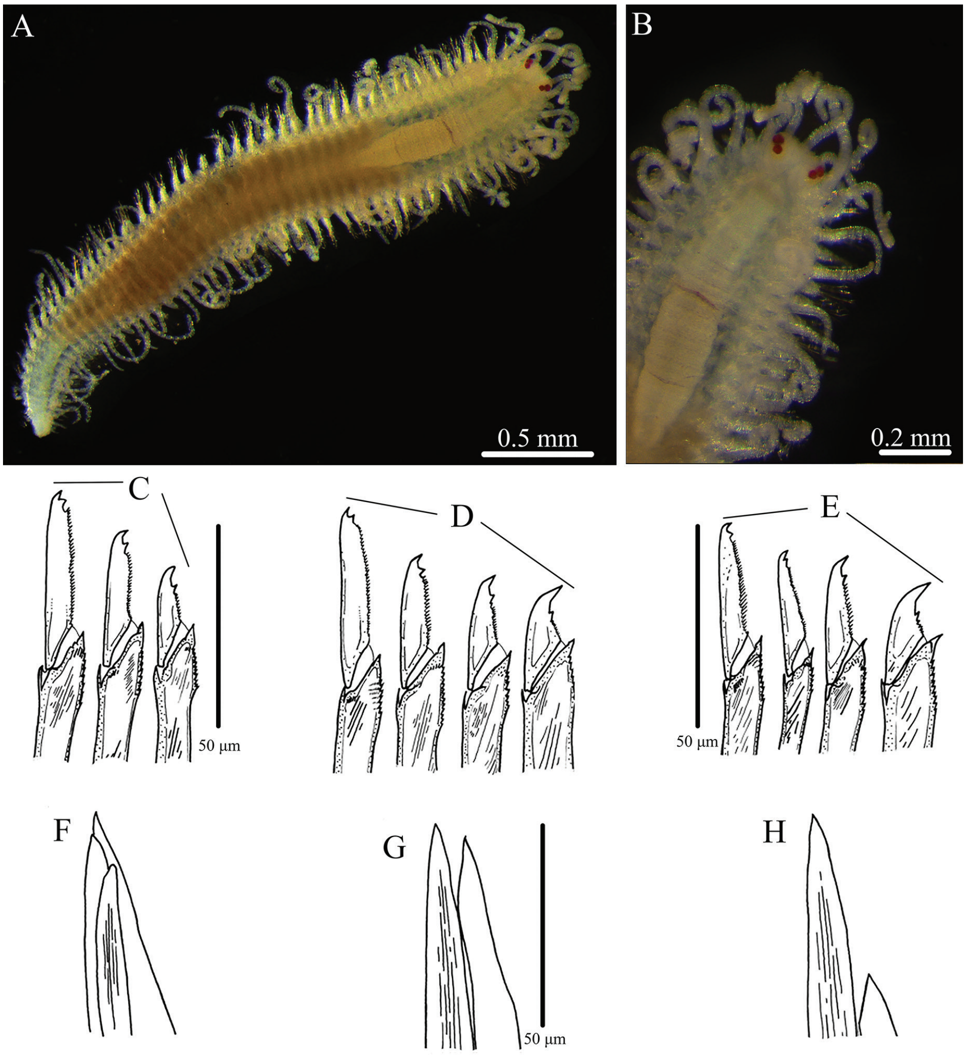

Fig. S20: *Trypanosyllis* cf. *cristoboi* Álvarez-Campos, Taboada, San Martín, Leiva & Riesgo, 2018. A. Complete specimen; B. Close-up to anterior end; C-H. Chaetae, line drawing; C. Anterior parapodia compound chaetae; D. Mid-body parapodia compound chaetae; E. Posterior parapodia compound chaetae; F. Anterior parapodia aciculae; G. Mid- body parapodia aciculae; H. Posterior parapodia aciculae.

All chaetigers uniramous. Anterior parapodia supported by 3 thick, pointed aciculae (Fig. S20F), surpassing the margin of the parapodium, with 14 compound chaetae with a strong dorso-ventral gradation in size of blades (Fig. S20C). Midbody and posterior parapodia supported by 2 sub-equal, pointed aciculae (Fig. S20G, H) surpassing the parapodium edge, with 9-11 compound chaetae showing a strong dorso-ventral gradation in size of blades (Fig. S20D, E). Uppermost 5-10 chaetae with much longer blades. Dorsal and ventral simple chaetae lacking. Compound chaetae heterogomph, with a subdistal series of well developed spines on the shaft and bidentate blades (Fig. S20C-E). Uppermost blades distinctly bidentate, with primary and secondary teeth of similar size and a well-developed spinulation along the ventral edge; lower blades with smaller secondary teeth, shifted towards the median part of the ventral edge, with well-developed spinulation (sometimes surpassing the secondary tooth in length).

Pharynx on 8 chaetigers, proventriculum slightly longer than the pharynx, on 7-8 chaetigers, with 25 muscle cell rows (Fig. S20B). Live specimens with a gray-bluish tinge and poorly contrasted dark transverse stripes, dorsal cirri reddish or pinkish. Colour pattern almost completely disappearing in ethanol-fixed specimens, with the exception of a darker tinge between the 14th and the 34th chaetiger (Fig. S20A).

Molecular data. The COI obtained for a specimen (accession number: PP808810) gave the highest identity (79%) with *Trypanosyllis zebra* on GenBank, while on BOLD it gave a 100% identity with a private sequence assigned to an unidentified Syllidae. The identity with the only available sequence of *T. cristoboi* (KX084935 – as *Trypanosyllis* sp. 1) was also around 79%. The 16S sequence from the same individual (accession number: PP810983) gave the highest match with *Trypanosyllis cristoboi* (accession number: KX084914 – as *Trypanosyllis* sp. 1) (Fig. S21).

Remarks. Among the described species of the genus *Trypanosyllis*, the examined specimens appear closer to the recently described *T. cristoboi* (Álvarez-Campos *et al.*, 2018). However, the correspondence is not perfect. Compared with the type material of *T. cristoboi*, the specimens from Lebanon show similar size and length of the dorsal cirri; although the observed colour pattern by Álvarez-Campos *et al.* (2018) is more pronounced and better preserved in fixed material, while the specimens from Lebanon almost completely lose their colour in ethanol. Lastly, the shape of the chaetae is very similar, but the dorso-ventral gradation in the size of blades is more pronounced in *T. cristoboi* than in our specimens, which, in turn, might resemble those of *T. luzonensis*. From a molecular perspective, these specimens cluster with *T. cristoboi* but are rather distant from it, likely representing a different species.

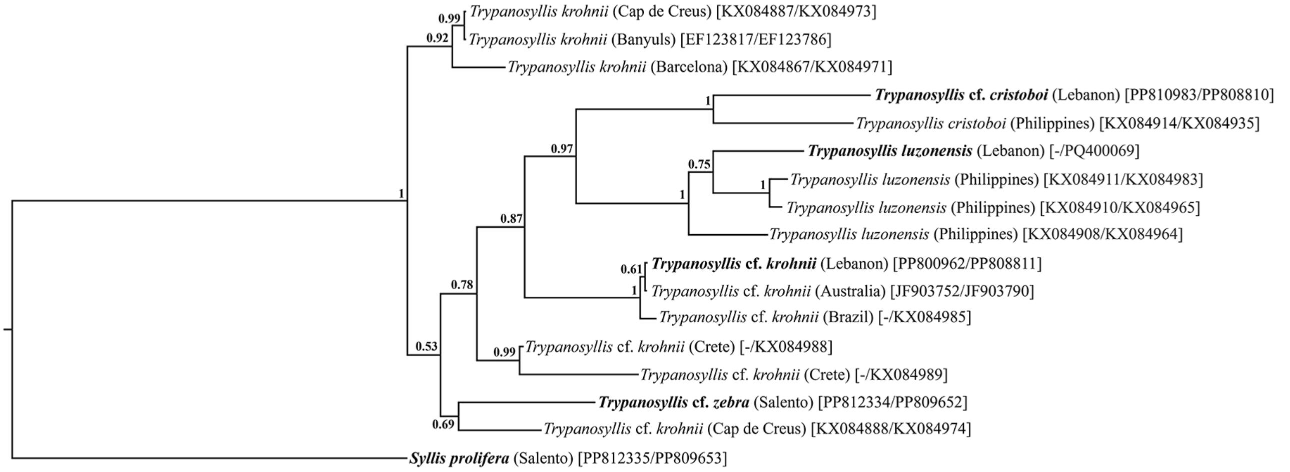

Fig. S21: Bayesian phylogenetic tree of individuals belonging to the genus *Trypanosyllis* based on concatenated 16S rDNA and COI sequences (accession numbers: [16S/COI]). *Syllis prolifera* Krohn, 1852 is used as outgroup. Node values represent Bayesian posterior probabilities, specimens in bold were sequenced in the present study.

Capitellidae

Leiochrides australis Augener, 1914

Material examined. Sample TR42/NT141, (33.28366° N, 35.19549° E), 18 November 2022, 0-6 m depth, on hard substrate with coralline and photophilous algae/ soft bottoms: 1 specimen. TR83/NT226, (33.33295° N, 35.18800°E), 22 November 2022, 35 m depth hard substrate with coralligenous formation, and freshwater output: 1 specimen.

Remarks. This species was reported as a casual non-indigenous species for a large part of the Mediterranean Sea (Zenetos *et al.*, 2010). It is currently known for Italy (Gravina *et al.*, 1996; Langeneck *et al.*, 2020a), Spain (El-Haddad *et al.*, 2007), Croatia (Mikac, 2015) and Slovenia (Pitacco *et al.*, 2021). Notably, the species was not included in the identification guide to Capitellidae of the Iberian Peninsula (Parapar *et al.*, 2015), suggesting that the record for Spain was subsequently disproved. The identification of the Mediterranean specimens with *L. australis* seems uncertain, and further studies are needed to ascertain their identity (Langeneck *et al.*, 2020a).

Notomastus aberans Day, 1957

Material examined. Sample TR83/NT236, (33.33295° N, 35.18800°E), 22 November 2022, 35 m depth hard substrate with coralligenous formation, and freshwater output: 2 specimens.

Cirratulidae
Timarete punctata (Grube, 1859)

Material examined. Sample TR104/NT174, (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, on Artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 2 specimens. TR50/NT260, (33.33019° N, 35.18475° E), 20 November 2022, 15 m depth, on hard substrate with algae and photophilous algae/ soft bottoms: 1 specimen. TR55 (33.26500° N, 35.19059° E), 20 November 2022, 0-4 m depth, on artificial hard substrate with photophilous algae: 1 specimen. Sample TR48/NT254 (33.26061° N, 35.18264° E), 20 November 2022, 15 m depth, on hard substrate with algae and photophilous algae/ soft bottoms: 1 specimen.

Remarks. Originally reported from Lebanon as *Cirriformia semicincta* (Ehlers, 1905) (Laubier, 1966) and also recorded also from vermetid reefs in the same region (Badreddine & Çinar *in* Fortić *et al.*, 2023). Elsewhere in the Mediterranean Sea, this species is known from Turkey (Çinar, 2007). Seixas *et al.* (2017) demonstrated that *T. punctata* is a species complex, including two species, one of which has a very wide distribution encompassing the tropical Pacific and Atlantic Ocean. Unfortunately, we were unable to amplify either the 16S or the COI of the available specimens from Lebanon, making correspondence with the lineages identified by Seixas *et al.* (2017) impossible.

Timarete cf. ***caribous*** (Grube, 1859)

Material examined. TR108/NT195, (33.27395° N, 35.19532° E), 26 November 2022, 0-1 m depth, on ropes inside the harbour: 2 specimens.

Remarks. This species was first reported from Turkey (Çinar, 2009) on hard substrates and more recently from soft sediments in a brackish-water basin in Spain (Sala-Mirete *et al.*, 2023). All Mediterranean specimens show consistent differences towards the type material and recent descriptions of the species (Magalhães *et al.*, 2014). Particularly, individuals from the western Atlantic Ocean are much more slender than the Mediterranean ones, suggesting that the Mediterranean taxon might represent an undescribed species (M. Lezzi, *pers. comm.*). Nonetheless, the occurrence of this species in ports suggests that it might be a non-indigenous species.

Terebellidae Johnston, 1846
Loimia cf. ***ingens*** (Grube, 1878) (Fig. S22)

Material examined. Sample LB80 (33.27538° N, 35.19548° E), 05 June 2022, 5 m depth, under rocks: 1 specimen. TR4/NT2, (33.27538° N, 35.19548° E), 17 November 2022, 5 m depth, under rocks: 2 specimens.

Description. Complete specimens (Fig. S22A) with 69-81 chaetigers, 59-112 mm total length, 14.25-17 mm L10, 7.42-8.78 mm maximum width without parapodia. Tentacles abundant, not very long, reaching around the 7th-8th chaetiger when projected backward on live specimens, without ridges, with a deep groove. Tentacular membrane very developed, without eyes. Upper lip rounded, with free edge, projecting forward, lower lip completely covered ventrally by membrane connecting lappets of segment 1 (Fig. S22B, C). Lateral lappets discontinuous, 2 pairs, on S1 and S3. First pair very large, originating ventrally, projecting forwards and merging ventrally, not covering upper lip. Second pair of lateral lappets larger, dorso-laterally ear-shaped and wrinkled, covering the base of the first two pairs of branchiae (Fig. S22B, C).

Three pairs of arborescent branchiae, very long, starting from S2, first pair longest, projecting forward in the live individual, third pair smallest; branchiae appear much smaller in preserved individuals than in live material (Fig. S22B, C). Sixteen ventral shields from S2, fused on S2-S3, progressively narrower and more indented posteriorly by neuropodia from S11-S12 to S14. Abdomen ventrally smooth. Notopodia from S4 to S20, cylindrical, with both limbate and bilimbate, chaetae with smooth margin. Thoracic neuropodia from S5 to S20, as ventro-lateral belts of uncini, decreasing in width towards the posterior thoracic region. Abdominal neuropodia long, projected posteriorly, with narrow belt of uncini along posterior margins. Thoracic uncini pectinate (Fig. S22F, G) arranged back to back in double rows from S11, with 6 teeth in a single vertical row. Abdominal uncini as thoracic uncini, but with 5 teeth in a single vertical row. All uncini with teeth gradually decreasing distally, with a small knob around half of the convex side, and a well-developed anterior filament, projected downwards (Fig. S22F-H). Abdomen formed by 52-64 chaetigers. Pygidium conical, with terminal anus, surrounded by 7 triangular papillae (Fig. S22D).

Live colour grayish to pale pink, pink ventrally, with a strong separation between the two sides; ventral shields with bright red external edge (Fig. S22A). Branchiae dark red or orange, oral tentacles striped brown and white (Fig.

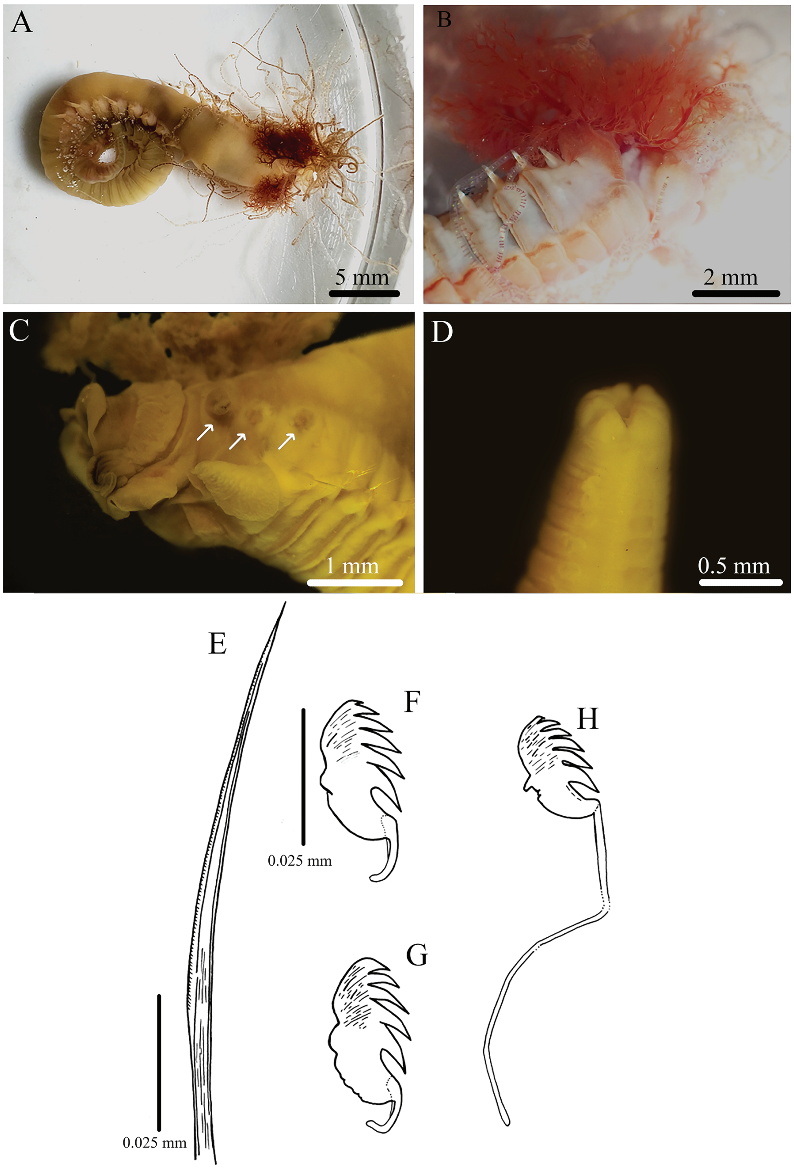

Fig. S22: *Loimia* cf. *ingens* (Grube, 1878). A. Full specimen, alive; B. Close-up to anterior end, alive specimen; C. Close-up to prostomium and peristomium, fixed material (arrows: branchial lobes); D. Pygidium, fixed material; E-H. Chaetae, line drawing; E. Notopodial limbate chaetae; F, G. Thoracic neuropodial uncini; H. Abdominal neuropodial uncini.

S22B). Preserved specimens yellowish, keeping the separation between dorsal and latero-ventral colour; oral tentacles with a longitudinal dark line. Largest specimen with oocytes in the coelome.

Molecular data. A COI sequence from one of the specimens sampled (accession number: XXXX) gave on both BOLD and GenBank the highest identity (87%) with *Loimia* sp. (GenBank accession numbers: KX525508; KX525509; KX525511; MG251651) from India and *Loimia ingens* (Grube, 1878) (GenBank accession number: AF342685) (Fig. S23).

Remarks. The taxonomy of the genus *Loimia* in the Mediterranean Sea is currently uncertain. The only reported species of the genus reported hitherto is *Loimia medusa* (Savigny, 1822), considered an established non-indigenous species in the Mediterranean Sea (Zenetos *et al.*, 2017). However, the number of records is limited, and Mediterranean specimens have never been described. The first record is from the Sea of Marmara (Rullier, 1963), followed by records for Greece (Bogdanos & Satsmadjis, 1983), Italy (Albertelli *et al.*, 1995) and Egypt (Dorgham *et al.*, 2014). The identity of Mediterranean specimens identified as *L. medusa* was challenged by Lavesque *et al.* (2017), who suggested that the majority of records might actually refer to native, undescribed species of the genus. This hypothesis is supported by the recent description of two very large species of the genus *Loimia* for European waters, namely *Loimia ramzega* Lavesque, Bonifácio, Londoño-Mesa, Le Garrec & Grall, 2017, and *Loimia davidi* Martín, Capa, Martínez & Costa, 2022 (Lavesque *et al.*, 2017; Martín *et al.*, 2022).

The examined specimens do not match *L. medusa* in several characters: *L. medusa* should have 12 ventral shields (14 in the examined specimens), eyes present (absent in the examined specimens), uncini with 4-5 teeth (5-6 teeth in the examined specimens), and a pygidium without papillae (with 7 papillae in the examined specimens) (Hutchings & Glasby, 1995; Wang *et al.*, 2020; Lavesque *et al.*, 2021). The two recently described European forms appear closer,

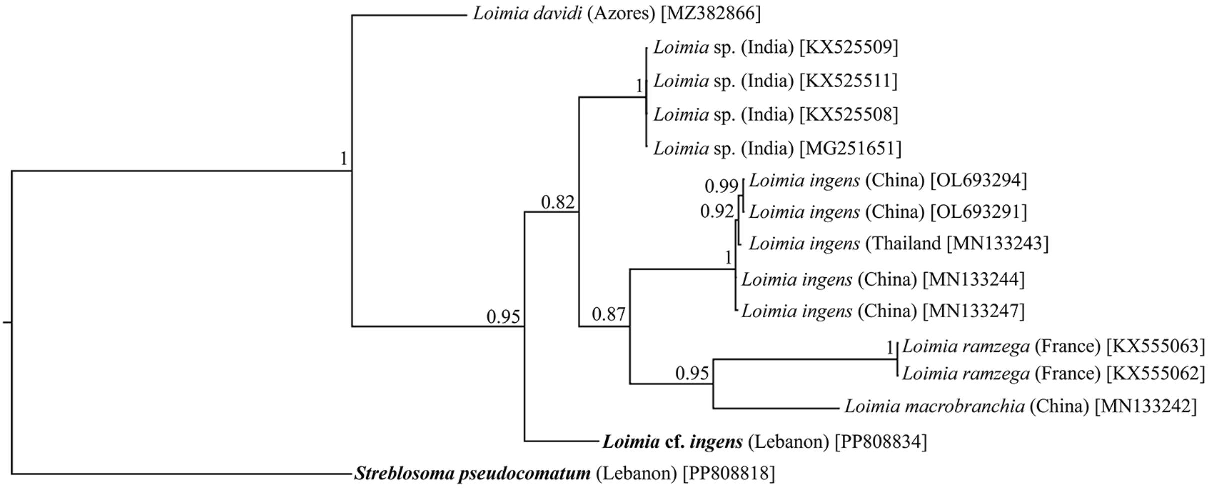

Fig. S23:Bayesian phylogenetic tree of individuals belonging to the genus *Loimia* from the Indopacific and European waters based on COI sequences. *Streblosoma pseudocomatum* is used as outgroup. Node values represent Bayesian posterior probabilities, specimens in bold were sequenced in the present study.

having a papillated anus and uncini with 5-6 teeth; however, other characters such as live colour and number of ventral shields do not match, and available molecular data confirm the distinction of the Mediterranean lineage. Morphological characters, including the live colour, show a very good correspondence with *L. ingens*, originally described from the Philippines (Grube, 1878) and widely reported across the Indo-Pacific region (Wang *et al.*, 2020). Molecular data confirm the closeness with *L. ingens*, even if the relationships within a clade comprised of the three lineages morphologically assigned to *L. ingens*, *L. ramzega* and *Loimia macrobranchia* Wang, Sui, Kou & Li, 2020 are not resolved (Fig. S22). Unfortunately, data from the type locality are currently unavailable, and sequences deposited as *L. ingens* seem to belong to two lineages, one occurring in India and Thailand (Colgan *et al.*, 2001), the other one occurring in the South China Sea (Wang *et al.*, 2020). Each of these lineages might be a good candidate for *L. ingens s.s.*, and the one we identified in Lebanon does not fully correspond to either, suggesting that *L. ingens* might be a species complex. Nonetheless, this lineage clearly has Indo-Pacific affinity and most likely represents a non-indigenous species in the Mediterranean Sea. It is likely that a critical re-examination of Mediterranean specimens identified as *L. medusa*, especially in the Eastern Mediterranean Sea, will reveal a wider distribution of *L. ingens*.

Streblosoma pseudocomatum Lezzi & Giangrande, 2018 (Fig. S24)

Material examined. Sample TR15/NT105, (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, on artificial wall covered by coralline algae and photophilous algae/ vermetid reef: ND specimens. (33.27395° N, 35.19532° E), 26 November 2022, 0-1 m depth, on ropes inside the harbour: 3 specimens.

Description. Complete specimens (Fig. S24A) with 54-64 chaetigers, 10.96-15.62 mm total length, 2.42-3.20 mm

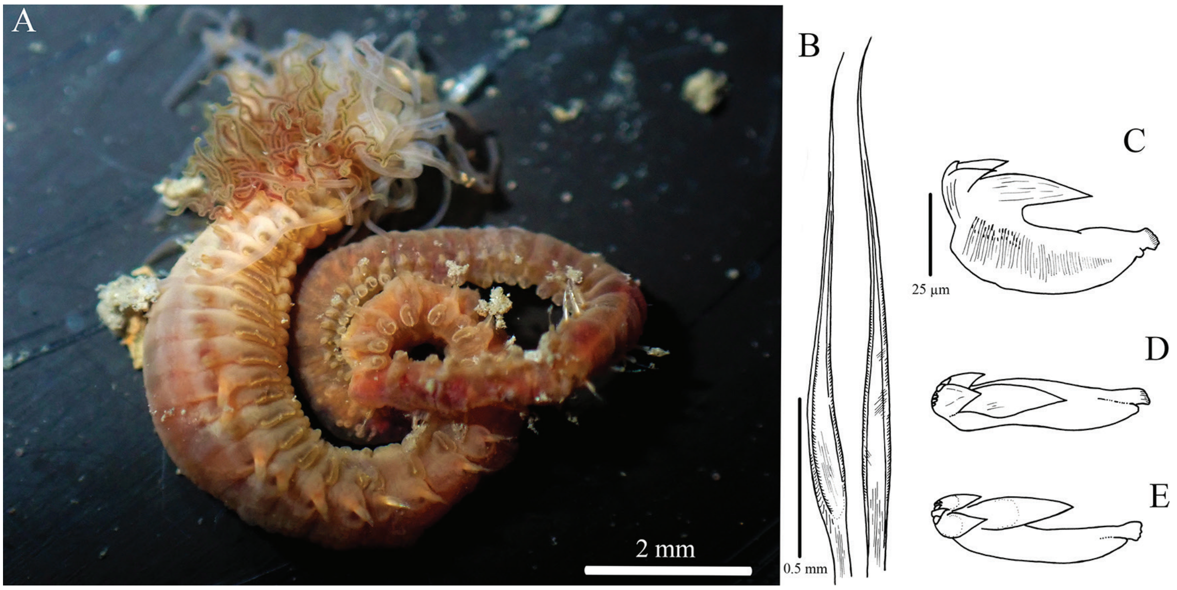

Fig. S24: *Streblosoma pseudocomatum* Lezzi & Giangrande, 2019. A. Live specimen; B-E. Chaetae, line drawing: B. Notopodial limbate chaetae; C. Neuropodial uncini, lateral view; H. Neuropodial uncini, upper view.

L10, 1.32-1.80 mm maximum width without parapodia. Incomplete specimens sometimes larger, up to 12.76 mm for 24 chaetigers, 4.10 mm L10, 2.29 mm maximum width without parapodia. Tentacles not very abundant, thick, the longest reaching around the 7th-8th chaetiger when projected backward on live specimens, without ridges, with a slight groove. Tentacular membrane very developed, with a single series of small eyespots. Upper lip hood-like, approximately as long as wide, lower lip extended around mouth, rectangular, restricted to oral area. S1 and S2 narrow, S3 partially covering S2 ventrally.

Three pairs of filamentous branchiae on S2-S4, formed by several filaments originating dorsally to notopodia, longer filaments slightly exceeding body width in live individuals (Fig. S24A). First pair of branchiae with up to 14 filaments on each side, remaining two pairs of branchiae with up to 10 pairs of filaments on each side. Fourteen glandular ventral shields from S2, fused on S2-S3, progressively more swollen and evident to S8, then gradually decreasing, posterior part of the body with a mid-ventral furrow. Thorax and abdomen not clearly distinct. Notopodia starting from S2 (first segment with branchiae) and extending almost to the end of the body. Neuropodia starting from S5 (4th chaetiger), in the anterior part of the body as straight tori, from the 13th-14th chaetiger in looped rows. Anterior notopodia with up to 21 stocky limbate chaetae (Fig. S24B), 11 chaetae in a dorsal row, 10 in a ventral row. Chaetae of the dorsal row protruding from the rim of the notopodium, chaetae of the ventral row with only the distal part protruding. Dorsal chaetae narrowly hooded, lanceolate also in the shaft, with tapering tip, ventral chaetae slightly wider than dorsal chaetae, apparently paleate, without visible shaft along the hood, with tapering, slightly curved tip (Fig. S24B). Hooks of the anterior part of the body in a straight row, approximately 100, small and very close, with a crooked main fang topped by two large teeth in a single row, not reaching half the length of the main fang (Fig. S24C-E). Median part of the body with notopodia with 18-20 stocky limbate chaetae, showing the same organisation as the anterior part of the body. Hooks almost identical to the anterior thorax (some with a small apical tooth above the row), approximately 100-120, forming a loop (Fig. S24C-E). Final part of the body formed by very short, developing segments, mostly without chaetae, pygidium conical, with terminal anus, without papillae.

Live colour pale pink, ventrally whitish, especially on the ventral shields. Branchiae greenish, oral tentacles white (Fig. S24A). Preserved specimens yellowish, keeping the separation between dorsal and latero-ventral colour; oral tentacles with a longitudinal dark line. Large oocytes in the coelome starting from the 22nd chaetiger.

Molecular data. One COI sequence (accession number: PP808818) gave a 82% identity with an unidentified polychaete on GenBank, a 100% identity with a private sequence assigned to an unidentified Terebellidae on BOLD.

Remarks. This species was originally misidentified as *Streblosoma comatus* (Grube, 1859) and reported as a non-indigenous species in the Mediterranean by Çinar (2009). Later, Lezzi & Giangrande (2019) showed that *Terebella comata* Grube, 1859 does, in fact, belong to the genus *Thelepus*, and described the species occurring in the Mediterranean Sea as *S. pseudocomatus*. Although the type locality of *S. pseudocomatus* (Taranto) is in the Mediterranean Sea, it was firs reported for the Eastern sub-basin, and the area of Taranto is known as a non-indigenous species hotspot. For these reasons, Langeneck *et al.* (2020a) suggested treating *S. pseudocomatus* as a cryptogenic species, pending more detailed studies. The examined specimens perfectly correspond to the original description and represent the first record for Lebanon. In agreement with WoRMS (2024), we are here considering "*Streblosoma pseudocomatum*" as the correct combination, rather than the original "*Streblosoma pseudocomatus*", as "*Streblosoma*" has neuter gender.

Sabellidae Latreille, 1825

Branchiomma bairdi (McIntosh, 1885) (Fig. S25 and S26)

Material examined. Sample TR34, **(**33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, on artificial hard bottom with coralline algae and photophilous algae: 7 specimens; sample TR71, (33.33019° N, 35.18475° E), 21 November 2022, 15 m depth, on hard substrate with photophilous algae/ soft bottoms: 2 specimens; Sample TR82/ NT207, (33.33295° N, 35.18800°E), 22 November 2022, 35 m depth hard substrate with coralligenous formation, photophilous algae and freshwater output.

Additional material. Tripoli, port quai, 3-5m GB & H.Z. 19/9/2002 Sabellidae HZ20020919b, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32947): 1 specimen; Beirut Airport pillar jetty 3-10m H.Z., 50 25/9/2002 HZ20020925ba, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32938): 4 specimens; Beirut Airport pillar jetty 3-11m H.Z., 46 16/7/2003 HZ20030716d, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32943): 2 specimens; Tripoli, brise-lame devant le port, côte intérieur, 2-3m H.Z., 51 20/9/2002 Sabellidae hz20020920, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32942): 1 specimen; Beirut Harbour, jetty outer side, 15 m with *Galaxaura*, G.B. & H.Z., 16/9/2002 hz20020916aaa, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32963): 16 specimens; Beirut Airport Breakwater, surface, H.Z. 25/9/2002 hz20020925c, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32956): 16 specimens.

Description. Complete specimens with body subcylindrical, anteriorly swollen, yellowish in fixed material; body 2.81-4.1 mm long; 4-5 thoracic and 30-48 abdominal chaetigers. Crown yellowish in color in fixed material, with 5-6 brownish bands (Fig. S25G, I); crown 1.54-2.16 mm long, with 4-6 pairs of radioles; ratio body/crown length 2.15-1.3.Radiolar tip 1/8-1/9 of radiole length, digitiform, blunt, darker than radiole in fixed material (Fig. S25H);

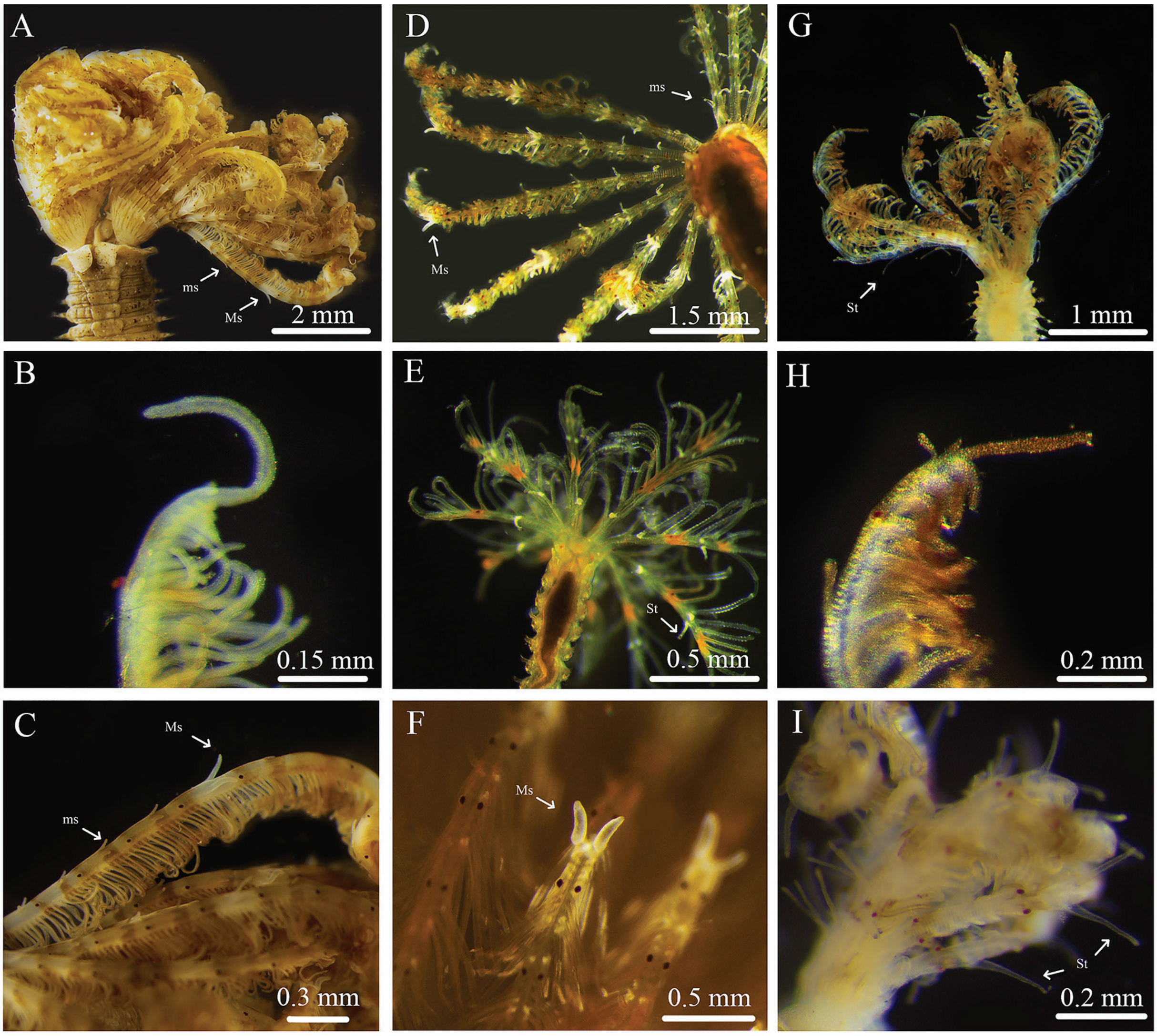

Fig. S25: Comparison of radiolar tip and stylodes among *Branchiomma* Kölliker, 1858 material analysed in this study. A-C. *Branchiomma boholense* (Grube, 1850) from Lebanon coasts (A. Anterior end and crown, fixed material; B Radiolar tip, fixed material; C. Close-up to macro- and micro-stylodes, fixed material); D-F. *Branchiomma boholense* (Grube, 1850) from Italian coasts (D. Medium size alive specimen, with macro- and micro-stylodes distinct; E. Small size alive specimen with stylodes in development; F. Close-up to macro-stylodes, frontal view); G-I. *Branchiomma bairdi* (McIntosh, 1885) from Lebanon coasts (G. Anterior end and crown, fixed material; B Radiolar tip, fixed material; C. Close-up to stylodes, fixed material). Ms. macro-stylodes; ms. micro-stylodes; st. stylodes.

pinnules up to 1/6 of radiole length, thick, blunt, darker than radiole in fixed material; longest pinnules medially (Fig. S26N); 4-7 stylodes on each radiole, strap-like, semi-transparent, with slightly swollen, rounded yellowish tips (Fig. S25H), progressively decreasing in size toward radiolar tip (Fig. S25H; S26N); larger stylodes basal, 1/6-1/8 of crown length; different size class stylodes (i.e., macro- and micro-stylodes) not found (Fig. S25G-I; S26N). Radiolar compound eyes red, protruding dorso-laterally to radioles, in correspondence of darker bands (Fig. S25H, I; S26N). Dorsal lip with triangular, flat and rounded dorsal radiolar appendages, 1/4 of crown length; dorsal radiolar appendages not found. Ventral lappets rounded, not overlapping; posterior peristomial collar covering anterior peristomium, not fused to faecal groove, leaving a wide gap dorsally. Segmental ocelli interramal, large, reddish, single (rarely double) form third chaetiger. Thoracic tori reaching thoracic ventral shields. Pygidium bilobed; pygidial eyes absent.

Thoracic neuropodial uncini with 2 rows of teeth above main fang (Fig. S26H); teeth of the ventral-most row distinctly longer than the other ones (almost half of main fang length). Frontal view unveils a third row of teeth in chessboard disposition (Fig. S26I). Breast rounded; main fang shorter than breast; neck short; handle short, thin, hooked; uncini as high as long. Abdominal notopodial uncini similar to thoracic ones (Fig. S26J, K); neck slightly longer; handle not always completely visible. Posterior abdominal uncini with 4-5 rows of teeth above main fang, forming a distinct crest (Fig. S26L); frontal view unveils a more linear disposition of teeth among the rows (Fig. S26M).

Molecular data. A COI sequence (accession number: PP808835) gave a 97% identity with *B. bairdi* from the Galapagos Islands, Tampa Bay and Veracruz (accession numbers: MG457408, MG457409, MG457415, MG457416, MG457418, MG457420, MG457443).

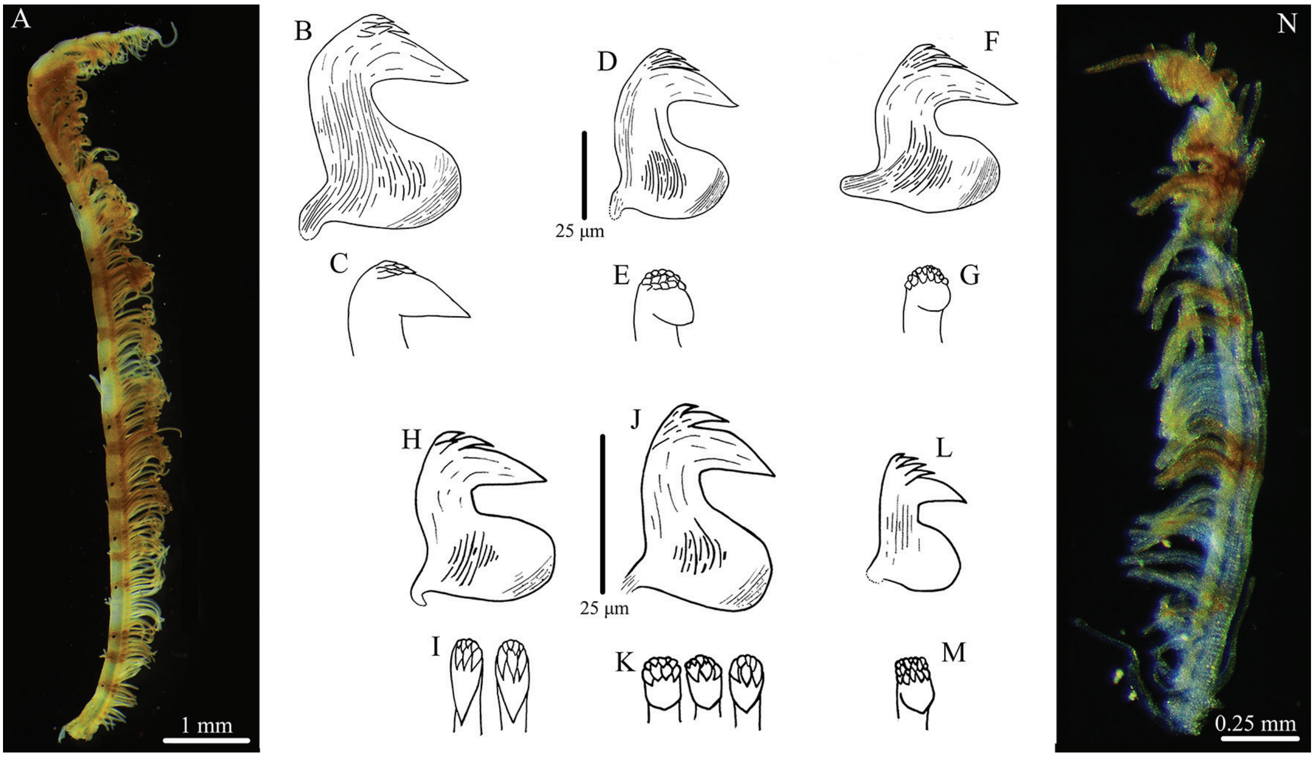

Fig. S26: Comparison between radioles and uncini among *Branchiomma* Kölliker, 1858 material analysed in this study. A-G. *Branchiomma boholense* (Grube, 1850) from Lebanon coasts: A. Radiole; B-G. Uncini, line drawings (B. Thoracic neuropodial uncini, lateral view; C. Thoracic neuropodia uncini, latero-frontal view; D. Anterior to middle abdomen notopodial uncini, lateral view; E. Anterior to middle abdomen notopodial uncini, frontal view; F. Posterior abdomen notopodial uncini, lateral view; G. Posterior abdomen notopodial uncini, frontal view); H-N. *Branchiomma bairdi* (McIntosh, 1885) from Lebanon coasts: H-M. Uncini, line drawings (H. Thoracic neuropodial uncini, lateral view; I. Thoracic neuropodia uncini, latero-frontal view; J. Anterior to middle abdomen notopodial uncini, lateral view; K. Anterior to middle abdomen notopodial uncini, frontal view; L. Posterior abdomen notopodial uncini, lateral view; M. Posterior abdomen notopodial uncini, frontal view); N. Radiole.

Branchiomma boholense (Grube, 1850) (Fig. S25 and S26)

Material examined. Sample TR59/NT276, (33.26500° N, 35.19059° E), 20 November 2022, 0-4 m depth, on artificial hard substrate with photophilous algae: 2 specimens; Sample TR105/NT20, (33.27538° N, 35.19548° E), 17 November 2022, 0-5 m depth, on Artificial wall covered by coralline algae and photophilous algae/ vermetid reef: 4 specimens.

Additional material. Beirut Airport pillar jetty 3-10m H.Z., 50 25/9/2002 HZ20020925ba, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32953): 8 specimens; Beirut Airport pillar jetty 3-11m H.Z., 46 16/7/2003 HZ20030716d, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32951): 1 specimen; Tripoli, brise-lame devant le port, côte intérieur, 2-3m H.Z., 51 20/9/2002 Sabellidae hz20020920, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32940): 4 specimens; Raoucheh, 7m H.Z. 17/10/2002 Sabellidae hz20021017, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32949): 3 specimens; Beirut Airport pillar jetty 12m H.Z. 25/9/2002 HZ20020925baa, Senckenberg Naturmuseum Polychaetes Collection (cat. number 32960): 1 specimen.

Description. Complete specimen with body subcylindrical, brownish, speckled of dark brown in fixed material; body 22.27 mm long; 8 thoracic and 64 abdominal chaetigers. Crown yellowish in color in fixed material, with at least 3 large brownish bands and several thin darker bands (Fig. S25A, C); crown 9.27 mm long, with 18 pairs of radioles; ratio body/crown length 2.4. Radiolar tip <1/31 of radiole length, digitiform, rounded, same color of clear parts of radiole in fixed material (Fig. S25B); pinnules up to 1/13-1/14 of radiole length, thick, rounded, following crown coloration pattern in fixed material; longest pinnules medially (Fig. S26A); 16-18 stylodes on each radiole, tongue-like, following crown coloration pattern, progressively decreasing in size toward radiolar tip (Fig. S25B). Macro-stylodes 1/42-1/27 of crown length; micro-stylodes around half of macro-stylodes (1/77-1/57 of crown length) (Fig. S25C); macro-stylodes medially to subdistally along the radiole; first macro-stylodes after 5 micro-stylodes, then alternating with 2-4 micro-stylodes (Fig. S26A). Radiolar compound eyes dark, protruding dorsally to radioles (Fig. S25C; S26A). Dorsal lip with elongated, flat and pointy dorsal radiolar appendages, >1/3 of crown length; single dorsal pinnular appendages really short, digitiform. Ventral lappets rounded, not overlapping; posterior peristomial collar covering anterior peristomium, not fused to faecal groove, leaving a wide gap dorsally. Segmental ocelli interramal, small, dark, reddish in posterior abdomen, single (rarely double) form third chaetiger. Pygidium bilobed; pygidial eyes absent.

Thoracic neuropodial uncini with 3 rows of short, similarly sized teeth above main fang (Fig. S26B). Frontal view unveils their ordered disposition in 3 distinct rows (Fig. S26C). Breast rounded; main fang longer than breast; neck elongates, dorsally hunchbacked; handle short, thin, hooked; uncini higher than long. Abdominal notopodial uncini similar to thoracic ones (Fig. S26D, E); handle not always completely visible. Posterior abdominal uncini with shorter neck and longer handle, not hooked (Fig. S26F, G).

Molecular data. A COI sequence (accession number: PP808836) gave a >99% identity with>30 *B. boholense* sequences deposited in GenBank.

Remarks. Among Sabellids, the genus *Branchiomma* includes a remarkable number of species considered NIS worldwide: *B. bairdi* (McIntosh, 1885), *B. boholense* (Grube, 1878), *B. curtum* (Ehlers, 1901), *B. lucullanum* (Delle Chiaje, 1828), *B. luctuosum* (Grube, 1870) and *B. conspersum* (Ehlers, 1887) (Çinar, 2013; Keppel *et al.*, 2015; Keppel *et al.*, 2018). Three of these species (*B. boholense, B. bairdi* and *B. luctuosum*) have been reported in the Mediterranean Sea (Knight-Jones *et al.*, 1991; Licciano *et al.*, 2002, 2008; Giangrande *et al.*, 2012; Arias *et al.*, 2013b). A detailed integrated taxonomic analysis by Del Pasqua *et al.* (2018) revealed significant molecular and morphological differences between Mediterranean and Atlantic populations, identifying these taxa as *B. boholense* and *B. bairdi*, respectively, thereby excluding the latter from the Mediterranean area. However, as underlined in the same study (Del Pasqua *et al.*, 2018), some morphological differences exist between Mediterranean and topotypical *B. boholense* material, suggesting a potentially more complex taxonomical situation.

Recent reports of *B. bairdi* in the Mediterranean Sea suggest its late introduction in the area (Cepeda & Rodrìguez-Flores, 2018; Abd-Elnaby, 2020; Langeneck *et al.*, 2020a; Fortić *et al.*, 2023). Although some of these reports did not consider the study of Del Pasqua *et al.* (2018) (e.g., Abd-Elnaby, 2020), we confirm the presence of *Branchiomma* specimens generally corresponding to *B. bairdi* along the coasts of Lebanon (Fortić *et al.*, 2023), along with *B. boholense*. Major morphological differences with topotypical material include the shape and length of stylodes, absence of proper macro-stylodes, presence of large interramal eyespots, shape of both thoracic and abdominal uncini and coloration. The genetic distance retrieved between the Lebanese specimen and *B. bairdi* sequenced by Del Pasqua *et al.* (2018), around 3%, might be compatible with either structured populations within a single species, or with recently diverged species.

The distinction between *B. bairdi* and *B. boholense* mainly relies on the size and colour of radiolar eyes (i.e., large as or larger than radiole width and red in the former specie, smaller and dark in the second) and uncini's dentition (i.e., two to three rows of teeth in the former specie, just one in the second). Our morphological analysis identified previously overlooked characters that might facilitate the distinction between these taxa: uncini with main fang shorter than breast, with 2 rows of apical teeth arranged in chessboard and a third apical row of tiny teeth visible only frontally in *B*. cf. *bairdi*; uncini dorsally hunchbacked with main fang longer than breast, with 3 rows of apical uncini ordinately arranged in *B. boholense*. Additionally, both species show a distinctly hooked handle, never reported before for the genus. Interestingly, our results on the morphology of uncini appear to from those of Del Pasqua *et al.* (2018). Lastly, we compared the material from Lebanon with individuals of *B. boholense* of different sizes from the coast of Salento, highlighting that the observed differences are consistent regardless from size (Fig. S25D-F). However, due to the availability of such comparison with additional specimens of *B. bairdi* and considering the small size of the specimens analysed here and the ambiguous genetic distance, we adopt a conservative approach, considering this material as *Branchiomma* cf. *bairdi*.

Serpulidae

Hydroides cf. ***dianthus*** (Verrill, 1873)

Material examined. Sample TR116/NT197,**5**(33.27395° N, 35.19532° E), 26 November 2022, 0-1 m depth on ropes inside the harbour: 1 specimen.

Remarks. This species was identified as a species complex by Sun *et al.* (2017), who based on the genetic diversity in different localities traced back the native range of *H. dianthus s.s.* to the Mediterranean Sea, while a cryptic lineage with alleged native range in the Caribbean was found in the Black Sea. Although the absence of the Caribbean lineage in the Mediterranean population studied led to the exclusion of *H. dianthus* from Mediterranean non-indigenous species (Langeneck *et al.*, 2020a), Grosse *et al.* (2021) showed the occurrence of both lineages in the Balearic Islands. In agreement with Langeneck *et al.* (2024), we suggest considering *H. dianthus* a questionable NIS in the Mediterranean Sea.

Spirobranchus aff. ***tetraceros*** (Schmarda, 1861)

Material examined. Sample TR81/NT203, (33.33295° N, 35.18800°E), 22 November 2022, 35 m depth hard substrate with coralligenous formation, and freshwater output: 1 specimen.

Remarks. This species was initially reported from Lebanon as *Spirobranchus giganteus coutierei* (Gravier, 1905)

(Laubier, 1966). It is currently known also from Greece (Ben-Eliahu, 1991), Egypt (Ben-Eliahu & Fiege, 1996), Israel (Fishelson, 2000), Türkiye (Çinar, 2006), Italy (Ulman *et al.*, 2017) and Spain (Palero *et al.*, 2020). However, the record for Cyprus by Ben-Eliahu & Payiatas (1999), based on a personal communication by H. Zibrowius, is considered dubious (Rousou *et al.*, 2023). Recently, Kupriyanova *et al.* (2022) redescribed *S. tetraceros* based on topotypic material, indicating that the species occurring in the Mediterranean Sea is not *S. tetraceros s.s.*, but belongs to a separate lineage. However, *S. tetraceros* has a long list of synonymies, and further studies are required to determine whether this lineage corresponds to a previously synonymised taxon. Nevertheless, given that the entire complex has Indo-Pacific affinity and that the first records of this taxon date back to the mid-1960s, this taxon should be considered as a confirmed non-indigenous species.

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