

Eusyllinae, Anoplosyllinae, and Exogoninae (Polychaeta: Syllidae) for the Mediterranean Coasts of Egypt, Together the Description of One New Species

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Abstract: In this paper, 18 species of the subfamilies Exogoninae, Anoplosyllinae, and Eusyllinae (Syllidae, Polychaeta) are reported from the Mediterranean Egyptian coasts, 8 of them are new records for the area: *Odontosyllis fulgurans* (Audouin and Milne Edwards, 1833); *Syllides japonicus* Imajima, 1966; *Salvatoria clavata* (Claparede, 1863); *Salvatoria euritmica* (Sardá, 1984); *Sphaerosyllis glandulata* Perkins, 1981; *Parapionosyllis labornica* Cognetti, 1965; *Sphaerosyllis* sp.; and *Prosphaerosyllis* sp. Five species were reported previously in the area. Four species are new records for Mediterranean Sea: *Palposyllis prosostoma* Hartmann-Schröder, 1977; *Paraehlersia weissmaniodes* (Augener, 1913); *Streptosyllis compoyi* Brito, Núñez and San Martín, 2000; and *Exogone africana* Hartmann-Schröder, 1974); *P. weissmaniodes* and *Exogone africana* are two widely distributed Indo-Pacific species, so they could be considered as Lessepsian migrants. Finally, one new species is described, *Parapionosyllis aegyptia*.

[F. A. Abd-Elnaby and G. San Martín. Eusyllinae, Anoplosyllinae, and Exogoninae (Polychaeta: Syllidae) for the Mediterranean Coasts of Egypt, Together the Description of One New Species. Life Science Journal 2010;7(4):132-138]. (ISSN: 1097-8135).

Keywords: *Eusyllinae, Anoplosyllinae, Exogoninae, Taxonomy, Mediterranean, Egypt, New species.*

1. Introduction:

Syllidae represent one of the most diverse and systematically challenging families of Polychaeta (Glasby, 2000; Rouse & Pleijel, 2001; San Martín, 2003, 2005; San Martín & Hutchings, 2006; Aguado & San Martín, 2009). It is a widely distributed group, found from the intertidal zone to the abyssal plains all over the world (Glasby, 2000), but less common at depth, with some species symbiotic or parasitic on other marine invertebrates (Martín and Britayev, 1998).

This family is currently divided into 5 subfamilies (Aguado & San Martín 2009): Eusyllinae Malaquin, 1893; Exogoninae Langerhans, 1879; Autolytinae Langerhans, 1879; Syllinae Grube, 1850; and the recently erected Anoplosyllinae Aguado and San Martín, 2009.

To detect newly recorded or new species we will depend on accurate taxonomic identifications and the local biodiversity. The possible existence of complexes of species, whose identity is blurred under one common specific name are present (Aguado and San Martín, 2007).

Knowledge about Polychaetes in the Egyptian waters is still far from complete; as result of

less taxonomical studies and less sufficient data about this group. This paper is the second report about Egyptian Syllids, collected from the Northwestern Coast of Egypt through Salsabeel cruise, Autumn 2008 and Spring 2009, also from Gamasa (Spring 2009), under the frame work organized by National Institute of Oceanography and fisheries branch Alexandria, and from Port Said Harbour (Spring 2008), to study the benthic invertebrates. While the first report about syllid and sabellid species in the Northwestern coast of Egypt, were done by Selim (2008a & b respectively), Abd- Elnaby (2009) also studied polychaetes in Gamasa.

Generally, scarce attention has been given to the polychaetes in Egyptian waters. Fauvel (1927) recorded 8 syllid species from the Suez Canal waters of which 6 belonging to genus *Syllis*. On his work on the polychaetes collected from the fishery grounds near Alexandria, Fauvel (1937) gave a checklist of polychaetes were recorded in this area.

Only 16 species of Syllidae were recorded in that paper. More recently, Selim (1978) reported two syllids species in the Eastern Harbour of Alexandria, namely *Syllis* (*Typosyllis*) *variegata* and *Trypanosyllis zebra*. Later, the same author (Selim,

1996) added 6 syllid species from Alexandria coast (*Branchiosyllis exilis*, *Syllis gracilis*, *S. hyalinae*, *S. mediterranea*, *S. prolifera* and *S. variegata*). Finally, Abd-Elnaby (1999) recorded 7 syllid species, and later (2005) 21 species from Alexandria coast.

The Syllidae of the neighbouring areas were studied by several authors; from Aegean Sea by Çinar & Ergen (2002); Çinar (2003); and Çinar (2005); from Israel and the Gulf of Elat by Ben-Eliahu (1977a & 1977b), and anteriorly Fauvel (1955, 1957), from Cyprus by Ben-Eliahu (1972), Çinar (2003a&b) and Çinar & Ergen (2003); Lebanon by Aguado & San Martín (2007), and from Turkey by Ergen (1976). A checklist, distribution, and ecological features of Syllidae and other polychaetes from Greece can be reported in Simboura & Nicolaidou (2001), also from Cyprus by many authors, the most recent one Musco et al. (2005), and the biogeographic revision on Syllidae from the Mediterranean Sea (East and West areas) was carried out by Musco & Giangrande (2005).

During the present study 18 species were recorded, 11 of which are new records for the Egyptian waters. Four species are considered as new species for Mediterranean Sea. Three species are considered as new species, although two of them are under process of description, and one species is described here as new for Science. In this paper, detailed description is given also of some interesting species

2. Materials and methods

Two cruises were carried out on the Northwestern Mediterranean coast of Egypt; on two stations (El Hammam, El Alamein), during Autumn 2008 and Spring 2009, and also one collection Spring 2008. The stations are; Port Said Harbour (station 1), in which samples were collected during Spring 2008, and Gamasa (station 2, Spring 2009), depth ranging from 0.25m to 20 m. (Fig. 1). Sediment samples were collected by a Van Veen grab; while, samples from Port Said Harbour were collected by knife and net used for collecting fauna. Sediment samples were washed up and sieved through 0.3 µm sieve, then sorted under Stereomicroscope. Specimens of Syllidae were extracted and fixed in 10 % formaldehyde in sea water-solution. Examinations and identification were done by using compound microscope. Drawings were made by a camera lucida. The specimens were Preserved in the Marine Reference Collection Center of National Institute of Oceanography and Fisheries, Alexandria, under Code Number (N. Sp. 2/8/3).

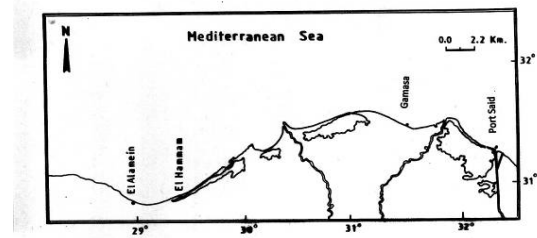


Fig. (1) Map showing the sampling sites, (North western Coast of Egypt, Gamasa and Port Said).

3. Results

In the present study, 18 species belonging to the subfamilies Exogoninae, Anoplosyllinae and Eusyllinae (Syllidae, Polychaeta) were recorded and identified from the Mediterranean Egyptian coasts, 8 of them considered new records for the Egyptian Mediterranean waters: *Odontosyllis fulgurans* (Audouin and Milne Edwards, 1833); *Syllides japonicus* Imajima, 1966; *Salvatoria clavata* (Claparede, 1863); *Salvatoria euritmica* (Sarda, 1984); *Sphaerosyllis glandulata* Perkins, 1981; *Parapionosyllis labronica* Cognetti, 1965; *Sphaerosyllis* sp.; and *Prosphaerosyllis* sp.; the two later are new species in process of description, although a description of both without any specific name is given by San Martín (2003). Five species were reported previously from different places of Egypt. In addition, four species are considered as a new records for the Mediterranean Sea (*Palposyllis prosostoma* Hartmann-Schröder, 1977; *Paraehlersia weissmaniodes* (Augener, 1913); *Streptosyllis compoyi* Brito, Núñez and San Martín, 2000; and *Exogone africana* Hartmann-Schröder, 1974). Finally one species *Parapionosyllis aegyptia* is described as new species. The locations, dates, depth, number of specimens and geographical distribution are presented in Table (1).

The most important species will be described in details. *Paraehlersia weissmaniodes* (Augener, 1913) (Fig. 2 A-J)

Table(1): Showing the Polychaete species recorded in the present study, Location, Date, Depth, Bottom, Number of specimens, and Distribution.

Name of the species	Location	Depth (m)	Date	No.	Bottom	Distribution
** <i>Palposyllis prosostoma</i> Hartmann-Schröder, 1977	Gamasa	13.7	Spring 2009	1	S-M	At
** <i>Paraehlersia weissmanioides</i> (Augener, 1913)	Port Said	0.25	Spring 2008	3	F	At
**** <i>Brevicirrosyllis weismanni</i> Langerhans, 1879	El Alamein	20.0	Autumn 2008	1	C-S	At, Med
*** <i>Odontosyllis fulgurans</i> (Audouin and Milne Edwards, 1833)	Port Said	0.25	Spring 2008	1	F	Cos
** <i>Streptosyllis compoyi</i> Brito, Núñez and San Martín, 2000	Elhammam	20.0	Autumn 2008	1	C-S	At
*** <i>Syllides japonicus</i> Imajima, 1966	Elhammam	20.0	Spring 2009	2	C-S	At, Med, P
*** <i>Salvatoria clavata</i> (Claparède, 1863).	Elhammam	20.0	Spring 2009	1	C-S	Cos
*** <i>Salvatoria eurimica</i> (Sardá, 1984)	Elhammam	8.0	Spring 2009	1	C-S	At, Med, P
**** <i>Salvatoria vieitezi</i> San Martín 1984	El Alamein	20.0	Autumn 2008	2	C-S	At, Med, P
** <i>Sphaerosyllis glandulata</i> Perkins, 1981	Gamasa	13.7	Spring 2009	1	S-M	At, Med
**** <i>Sphaerosyllis taylori</i> Perkins, 1981	Elhammam	20.0	Spring 2008	1	C-S	At, Med
*** <i>Sphaerosyllis</i> sp.	El Alamein	20.0	Autumn 2008	1	C-S	At
*** <i>Prosphaerosyllis</i> sp.	Elhammam	8.0	Spring 2009	1	C-S	At
** <i>Exogone africana</i> Hartmann-Schröder, 1974	Port Said	0.25	Spring 2008	2	F	At
* <i>Parapionosyllis aegyptia</i> n. sp.	El Alamein	20.0	Autumn 2008	2	C-S	n. sp.
**** <i>Parapionosyllis brevicirra</i> Day, 1954	El Alamein	20.0	Autumn 2008	2	C-S	At, Med
**** <i>Parapionosyllis elegans</i> (Pierantoni, 1903)	El Alamein	20.0	Autumn 2008	2	C-S	At, Med
*** <i>Parapionosyllis labronica</i> Cognetti, 1965	Gamasa	13.7	Spring 2009	1	S-M	At, Med

At= Atlantic Ocean, P= Pacific Ocean, Med= Mediterranean, Cos= Cosmopolitan, S-M= Sandy mud, C-S= Coarse Sand, F= Fouling

*= New species, **= New record for Mediterranean Sea, ***= New record for Egyptian waters, ****= Recorded before from Egyptian waters

Ehlersia ferrugina non Langerhans. Böggemann & Westheide, 2004: 418, fig. 6. *Paraehlersia weissmanioides* San Martín & *Paraehlersia weissmanioides* San Martín & Hutchings, 2006: 312, figs. 43A-C, 47A-I, 48 A-F, 49 D-F.

Material examined. Port Said 0.25 m depth, Spring 2008, one specimen.

Description. Body broad anteriorly, tapered posteriorly, 11 mm long, 0.2 mm wide, with 41 chaetigers (fig. 2 A). Prostomium oval (75 µm), 4 eyes in trapezoidal arrangement, and 2 anterior eyespots; lateral antenna 162.5 µm long, median antenna 150 µm long. Palps broad (87.5 µm), basally fused. Dorsal tentacular cirri 147.5-162.5 µm long, ventral tentacular cirri about one third in length of dorsal tentacular cirri. Antennae, tentacular and anterior dorsal cirri; elongated, indistinctly articulated; articulation variable with short and long articles, up to 22 articles; dorsal cirri becoming progressively smoother posteriorly. Infracirral papillae not seen. Parapodia conical, slightly elongate. Ventral cirri digitiform, slightly longer than parapodial lobes. Parapodia with 12-15 falcigerous compound chaetae; blades strongly bidentate, with fine spines on margin (fig. 2 B), 2-3 distalmost ones longer than remaining (30-42.5 µm) (fig. 2 C). Most dorsal compound chaetae, spiniger-like, blades (75 µm long) on midbody, and about 93 µm on posterior parapodia with fine spines on margin (figs. 2 C, E), absent on

most posterior parapodia; indistinctly bidentate. Compound falcigers becoming wider progressively along body, with stronger proximal tooth, slightly hooked (fig. 2G). Dorsal simple chaetae appear from chaetiger 19, truncate, bifid with short spines margin (fig. 2 F, H). Ventral simple chaetae on posterior parapodia, thick, with few long spines on margin, strongly bidentate, proximal tooth large, slightly hooked, and distal one shorter than proximal one (fig. 2 J).

Anterior parapodia with 2-3 slender aciculae, two of them distally rounded with small bending tip and one straight (fig. 2D); from proventricular segments onwards, acicula solitary, with oblique, short tip (fig. 2 I). Pharynx through 6 segments; pharyngeal tooth anteriorly located. Proventricle, rectangular through 4 segments with about 21 muscle cell rows.

Distribution: Australia, Seyhelles. New report for the Mediterranean Sea.

Remarks: The Egyptian specimen is similar to Australian ones; it is likely an Indo-Pacific migrant through Suez Canal.

Exogone africana Hartmann- Schröder, 1974
(Fig. 3 A-I)

Exogone verugera africana Hartmann-Schröder, 1974a: 137, figs. 164-168; 1979; 108, figs. 164-168.

Exogone africana San Martín, 2005: 143, fig. 90 a-f.

Material examined. Port Said, 0.25 m depth, on fouling, Spring 2008, 2 specimens.

Description. Body small, slender, relatively broad anteriorly, 3 mm long, 0.23 mm wide, 28 chaetigers. Prostomium oval (fig.3 A); 4 eyes in trapezoidal arrangement. Antennae short, oval, close to each other, inserted between anterior to eyes; median antenna slightly longer and thicker than lateral one. Palps broad, longer than prostomium, totally fused, with a dorsal furrow (fig. 3A). Peristomium shorter than subsequent segments; one pair of small, papilliform tentacular cirri. Dorsal cirri similar to antennae and tentacular cirri, slightly longer than lateral antennae, present on all segments. Compound chaetae of two types on all parapodia: 1-2 spiniger-like, with long blades 31 μm long (fig. 3 B) on anterior parapodia, slightly short on posterior one (25-27.5 μm), distally bifid, with short marginal spines (fig. 3 C), and 4 compound chaetae with short falcigerous blades about 7.5 μm , bidentate, subdistal tooth long and distal tooth short, moderate marginal spines (fig. 3 D); posterior falcigers smaller, three in number, blades about 5 μm long (fig. 3 E). Dorsal simple chaetae from anterior segments, with rounded tips (fig. 3 F), subdistally serrated, thicker posteriorly with pointed tip (fig. 3 G). Ventral simple chaetae on posterior parapodia, sigmoid, thick, with some short spines on base of teeth, bidentate, subdistal tooth longer and thicker than distal tooth (fig. 3 H). Acicula solitary, slender, distally rounded (fig. 3 I). Pharynx long, through 4 segments; pharyngeal tooth located on anterior rim. Proventricle occupying 4 segments with 18 muscle cell rows. Pygidium with 2 long anal cirri.

Distribution: Circumtropical. First report to the Mediterranean Sea.

Parapionosyllis aegyptia n. sp.
(Fig. 4 A-G)

Material examined. El Alamein 20 m depth, Autumn 2008. Holotype and Paratype, coarse sand.

Description. Holotype 3.5 mm, 0.15mm wide 29 chaetigers (fig. 4 A). Prostomium ovate, wider than long; 2 pairs of eyes, anterior pair larger than posterior ones, arranged in trapezoidal arrangement, and 2 small anterior eye-spots. Antennae spindle-shaped to bowling-pin shaped, longer than prostomium; median antenna (77.6 μm) slightly longer than lateral ones (67.5 μm), arising between anterior eyes; lateral antennae arising on anterior margin of prostomium (right one missing on holotype). Palps basally fused, shorter than prostomium. Peristomium with 2 pairs of bowling-pin shaped tentacular cirri, smaller than antennae. Parapodia somewhat elongated (32.5 μm). Dorsal cirri bowling-pin shaped, from 36- 45 μm in length

anteriorly to 65 μm on posterior parapodia. Ventral cirri digitiform, shorter than parapodial lobes.

Anterior parapodia with 7 compound falcigers, unidentate with hooked tips and serrated margin (fig. 4 B); about 10 μm long; shafts becoming posteriorly thick with long curved acute tip, blades with serrated margin on 2 most dorsal ones, and 4-5 unidentate curved, smooth (fig. 4 D). Superior dorsal simple chaetae thin with pointed tip, present in all parapodia, except first one (fig. 4 C), become thicker posteriorly (fig. 4 E). Ventral simple chaetae unidentate, sigmoid (fig. 4 F). Acicula solitary, bent with hollow rounded tip (fig. 4 G). Pharynx extending through 3.5 setigers; mid dorsal tooth on anterior edge. Proventricle extending through 2.5 segments, with 17 rows of muscle cells. Glands small, with granular material, pair on each segment, present from first chaetiger.

Remarks. About 16 species are recognized as *Parapionosyllis*, 6 of them recorded in the Mediterranean Sea. The most similar species is *P. labronica* also found in this collection; both species have posterior compound chaetae with thick shafts, distally curved, and short, unidentate blades, smooth or almost smooth. However, the anterior compound chaetae of *Parapionosyllis aegyptia* are more elongated and provided with somewhat longer spines on margin, and the dorsal simple chaetae are different, being smooth and unidentate in *P. aegyptia* and provided with a sub-distal, thick spine and others shorter, in *P. labronica*. The remaining Mediterranean species are clearly different of these two species, because they have longer compound chaetae (see San Martín, 2003); also, other species of other seas also have more elongated compound and different dorsal simple chaeta.

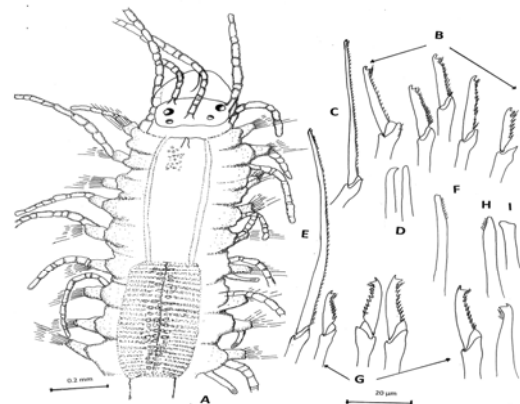


Figure 2.- *Parapionosyllis weissmannioides* (Augener, 1913). A, anterior end, dorsal view. B, falcigers, anterior parapodium. C, Spiniger-like compound chaeta, anterior parapodium. D, anterior aciculae. E, Spiniger-like compound chaeta, posterior parapodium. F, dorsal simple chaeta, anterior parapodium. G, falcigers, posterior parapodium. H, dorsal simple chaeta, posterior parapodium. I, aciculum, posterior parapodium. J, ventral simple chaeta. Scale (A) 0.2 mm; (B-J) 20 μm .

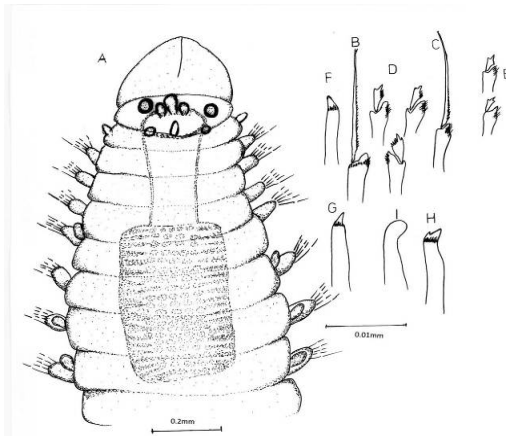


Fig. (3): *Exogone Africana* A: anterior part of body, B: anterior spiniger-like seta, C: posterior spiniger-like seta, D: anterior falcigers setae, E: posterior falcigers setae, F: anterior dorsal simple seta, G: posterior dorsal simple seta, H: ventral simple seta, I: acicula.

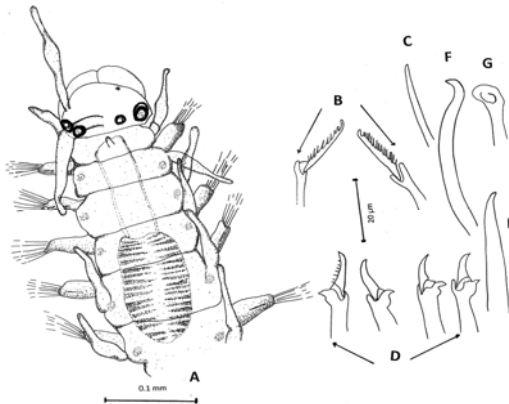


Figure 4.- *Parapionosyllis aegyptia*, n. sp. A, anterior end, dorsal view. B, compound chaetae, anterior parapodium. C, dorsal simple chaeta, anterior parapodium. D, compound chaetae, posterior parapodium. E, dorsal simple chaeta, posterior parapodium. F, ventral simple chaeta. G, aciculum. Scale (A) 0.1 mm; (B-G) 20 µm.

Etymology. The species is named after the country in which has been found, Egypt.

4. Discussion

The number of Syllids recorded on Egyptian waters reach about 60 species, a low number when compared with the 190 Syllid species were reported by Musco and Giangrande (2005) from the whole Mediterranean waters, which represents the 31.6 % of

the total Mediterranean Syllidae. Also, many other species may possibly remain unreported because of the most coastal area of Egypt are unexplored and many studies are still needed.

Tovar- Hernández *et al.* (2002) referred to the dominance and diversity of syllid members in carbonate sediments, this observation was confirmed by Selim (2008), where El Hammam and El Alamein coasts contain carbonate bottom sediments.

Most of the studied species are well known, common and widely reported for Mediterranean and Atlantic Ocean. The analysis of samples resulted into 18 species, 11 of them new record for the Egyptian Mediterranean waters. Four species were reported previously, (*Brevicirrosyllis weismanni* Langerhans, 1879; *Parapionosyllis elegans* (Pierantoni, 1903); *P. brevicirra* Day, 1954 and *Sphaerosyllis taylori* Perkins, 1981, from many Mediterranean coastal areas and one more (*Salvatoria vieitezi* San Martín 1984) from the Suez Canal. Two of the studied syllids are considered apparently cosmopolitan: *Salvatoria clavata*, and *Odontosyllis fulgurans*. In addition, 11 species were known before from Spanish coasts, only 4 species were previously recorded in Greece, 9 from North West Italian, 9 from Turkish Aegean and 6 from Cyprus. Also four species are considered as a new record for Mediterranean Sea: *Palposyllis prosostoma* Hartmann-Schröder, 1977; *Paraehlersia weissmaniodes* (Augener, 1913); *Streptosyllis compoyi* Brito, Núñez and San Martín, 2000; and *Exogone africana* Hartmann-Schröder, 1974.

According to geographic distribution through literature there are 9 species belong to Atlantic-Mediterranean category and one species (*Salvatoria vieitezi*) was recorded before from Suez Canal (Selim, 2009), and four species are new for Mediterranean, that means they are Lessepsian migrants; 3 species are amphi-Atlantic, *Sphaerosyllis taylori*, *Shphaerosyllis glandulata* and *Salvatoria vieitezi*. Two species are considered cosmopolitan species, *Odontosyllis fulgurans* and *Salvatoria clavata* and five species are considered Atlantic-Pacific categories.

In spite of it, many new recorded species usually discovered by way in new researches, still more not recorded until now, more studies requisite to be done along the Mediterranean and Red Sea coasts of Egypt to cover this point.

The present study showed richness of Eusyllinae, Anoplosyllinae and Exogoninae species inhabiting Egyptian water benthic assemblage.

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9/25/2010