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Addition to the knowledge on *Acromegalomma messapicum* (Giangrande & Licciano, 2008) (Annelida: Sabellidae)

A. GIANGRANDE^{★1}, E. MANCINI², F. TIRALONGO^{3,4}, & M. LICCIANO¹

¹Department of Biological and Environmental Sciences and Technologies (DiSTeBA), University of Salento (CoNISMa Reserch Unit), Lecce, Italy, ²Department of Ecology and Biology, Laboratory of Experimental Oceanology and Marine Ecology, University of Tuscia, Civitavecchia, Rome, Italy, ³Ente Fauna Marina Mediterranea, Avola, Italy, and ⁴Department of Biological, Geological and Environmental Science, University of Catania, Catania, Italy

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Abstract

The genus *Acromegalomma* has been recently introduced as *nomen novum* for the polychaete genus *Megalomma*. Recently specimens of *A. messapicum* were collected from the coastal area of Civitavecchia (Tyrrhenian Sea, Italy) and re-collected from the type locality (Brindisi, Adriatic Sea, Italy) allowing us to examine additional fresh material and to add some useful morphological and biological information to the original description. The present data widens the distribution of the species. The possibility to examine several specimens of *A. messapicum* collected in different areas allowed us to state with certainty the absence of variability as concerns both the distribution of the radiolar eyes and the collar shape. The new findings revealed a colouration pattern present in the thorax and in the branchial crown, as well as the presence of large pygidial eyes previously not reported. Specimens have very broadly hooded chaetae, especially at the beginning of the abdomen, becoming more slender and therefore narrowly hooded, proceeding towards the end of the abdomen. This could explain the incorrect statement in the original description, of the presence of narrowly hooded abdominal chaetae as characterising *A. messapicum*. The present data also allowed some biological observations. *Acromegalomma messapicum* is gonocoric with eggs measuring about 120 µm in diameter. Most of the specimens were collected in cold months but ripe specimens were found in warm months. In addition a scheme of groups of *Acromegalomma* species modified from that previously proposed by different authors is given, where some taxa have been moved to different groups on the basis of a new interpretation of the collar features.

Keywords: *Polychaetes, fanworms, Acromegalomma, taxonomy, biology*

Introduction

The genus *Acromegalomma*, recently introduced as a replacement name for the polychaete genus *Megalomma* Johansson, 1925 (Annelida, Sabellidae) (Gil & Nishi 2017), is characterised by the presence of large terminal compound eyes in at least the dorsal-most radioles (Fitzhugh 1989). Eye development and distribution together with the features of the collar are considered important diagnostic characters. According to the extent to which compound eyes occur in the radioles, the mid-dorsal collar margins are fused to the faecal groove, and the dorsolateral margins of the collar form pockets, species of the genus were grouped by Knight-Jones (1997) into two main groups and four artificial categories. The number of categories, however, increased with the

addition of new descriptions and increasing species variability (Capa & Murray 2009). Tovar-Hernández and Carrera-Parra (2011) tried to individuate a combination of morphological features regarding the shape of the collar dorsal margin, and proposed four stages of development of dorsal lappets. Later, this scheme was modified by Giangrande et al. (2015) to include more intermediate steps towards the progressive reduction of dorsal lappets and dorsal pockets.

The diagnosis of the genus was emended several times: Fitzhugh (2003) stated that radiolar appendages of the dorsal lips do not have an internal skeleton, and that dorsal pinnular appendages can be either present or absent. Tovar-Hernández and Salazar-Vallejo (2008) added the possible presence

*Correspondence: Adriana Giangrande, Department of Biological and Environmental Sciences and Technologies (DiSTeBA), University of Salento, Via Prov. le Lecce-Monteroni, 73100, Lecce, Italy. Tel: +39 0832 298659. Fax: +39 0832 298626. Email: adriana.giangrande@unisalento.it

of a caruncle, interramal eyespots and a long dorsal-most pair of radioles. Capa and Murray (2009) provided a good synthesis of the form and development of the dorsal margins of the collar, and the chaetal shape, describing an additional feature present in the peristomium (keel); in addition, the presence of dorsal lappets in the collar and the shape of abdominal chaetae were considered taxonomically discriminant features. The variation of the collar margin was formalised by Tovar-Hernández and Carrera-Parra (2011) and later revised by Giangrande et al. (2015). Capa and Murray (2009) also proposed a cladistic analysis to test the validity of the previous artificial classification by Knight-Jones (1997). According to these authors, the presence of dorsal collar margins fused to the faecal groove and the presence of pockets characterised an apomorphic clade of *Acromegalomma* species corresponding to Group 1 *sensu* Knight-Jones (1997), while the basal topology included species with dorsal collar margins not fused to the faecal groove traditionally recognised within Group 2. This hypothesis, however, was not supported by further analysis performed by Tovar-Hernández and Carrera-Parra (2011), who found species nested in Group 2 comprising one of the most derived clades. Thus, the phylogeny of the genus still needs to be better understood. However, the collar dorsally fused to the dorsal groove is a feature widely distributed in most of the species described up to now; therefore, it is likely that the hypothesis by Tovar-Hernández and Carrera-Parra (2011) is the most acceptable.

The genus *Acromegalomma* includes 37 species properly named from worldwide localities (Giangrande & Licciano 2008; Capa & Murray 2009; Tovar-Hernández & Carrera-Parra 2011; Mikac et al. 2013; Giangrande et al. 2015; Gil & Nishi 2017; Tovar-Hernández et al. 2017). Several authors revised the taxa present in the Mediterranean basin (Giangrande & Licciano 2008; Mikac et al. 2013; Giangrande et al. 2015), where up to now eight species have been reported: *Acromegalomma vesiculosum* (Montagu, 1815), *Acromegalomma lanigera* (Grube, 1846), *Acromegalomma vigilans* (Claparède, 1869), *Acromegalomma* cfr. *claparedei* (Gravier, 1908), *Acromegalomma messapicum* (Giangrande and Licciano, 2008), *Acromegalomma pseudogesae* (Mikac et al., 2013), *Acromegalomma adriaticum* (Giangrande et al., 2015) and *Acromegalomma longoventralis* (Giangrande et al., 2015). All these taxa, except for *A. vesiculosum*, were collected along the Italian coasts. *Acromegalomma pseudogesae* and *A. adriaticum* are endemic to the northern Adriatic Sea, and *A. messapicum* and *A. cfr. claparedei* are restricted to the southern Adriatic, whereas *A. lanigera* and *A. longoventralis* are

more widely distributed. For *M. vigilans*, which was described by Claparède (1869) for the Gulf of Naples as *Branchiomma vigilans*, no type material is known to exist (Knight-Jones 1997; Giangrande & Licciano 2008; Tovar-Hernández & Carrera-Parra 2011) and Gil and Nishi (2017) considered it a “species inquirenda”. The lack of type material and the poor definition of the original figures make comparison difficult, with the only other records by Soulier (1903) and Marion (1876).

The species *A. messapicum* was described from examining specimens colonising *Posidonia oceanica* rhizomes and collected in 1987 along the south Adriatic coasts (Giangrande & Licciano 2008). This material appeared to be badly preserved and with most of the specimens not entire. For this reason some features, especially those of the collar, were poorly described and the iconography was not well representative. In addition, no indication of intraspecific variability was possible. This often occurs in the description of *Acromegalomma* taxa because in most cases they are found with a relatively low number of specimens (Capa & Murray 2009).

Recently, specimens of *A. messapicum* were collected from Tyrrhenian coasts and re-collected from the type locality in the Adriatic Sea, allowing us to examine additional fresh material and to add some useful morphological and biological information to the original description.

Moreover, previous groups of species separated considering some traditionally used characters were revised on the basis of the new interpretation of the collar features by Giangrande et al. (2015).

Material and methods

Specimens of *A. messapicum* from Tyrrhenian Sea were collected at different times (October, March, May and August) during the years 2015–2016 on a *P. oceanica* meadow at 7 m depth on the coastal area of Civitavecchia (North Latium, central Italy, 42.08436° N, 11.79900° E; Figure 1).

Material from the South Adriatic Sea (Figure 1) was collected along the coast of Brindisi (40°38'18" N, 17°56'45"E). However, *A. messapicum* specimens were found only in material collected in July 2010, at a depth of 5 m.

In both sampling sites worms were extracted from rhizomes collected by scuba divers by means of corers.

The *Acromegalomma* specimens were fixed in 5% buffered formaldehyde seawater solution and preserved in 70% ethanol. For each specimen, the diagnostic characters were examined.



Figure 1. Map of the collecting sites.

Drawings were made with the aid of a camera lucida attached to stereo and compound microscopes; photographs were taken using a stereomicroscope equipped with a Nikon Coolpix 990 camera.

Staining patterns were obtained using methyl green stain, while features of the collar were evidenced utilising a textile fibre identification stain (Shirlastain A).

Each specimen was measured and examined for the coelom content to individuate gametes.

Results

Genus *Acromegalomma* Gil & Nishi, 2017

Branchiomma [not K lliker, 1858] – Clapar de 1869: 162–163.

Megalomma [junior homonym, not Westwood 1842] – Johansson 1925: 9–10; Johansson 1927: 130; Perkins 1984: 351–352; Fitzhugh 1989: 76; Knight-Jones 1997: 314; Fitzhugh 2003: 107; Tovar-Hern ndez & Salazar-Vallejo 2008: 1953–1954; Giangrande & Licciano 2008: 208; Capa & Murray 2009: 204 – 205; Tovar-Hern ndez & Carrera-Parra 2011: 14–15; Mikac et al. 2013: 1514; Capa et al. 2014: 27–28; Giangrande et al. 2015: 522–523.

Type species: *Branchiomma kollikeri* Clapar de, 1869 (junior synonym of *Sabella lanigera* Grube, 1846), according to recommendation 60A of the International

Commission of Zoological Nomenclature (ICZN) (1999). Type by monotypy, established by Johansson (1925).

Genus diagnosis

Medium- to large-sized species, with numerous radioles, palmate membrane and radiolar flanges absent. One or more pairs of compound eyes located on the inner radiolar margin, one terminal compound eye per radiole. Dorsal lips triangular, with radiolar appendage indicated by longitudinal ridge or “mid-rib” along entire length; distinct blood vessel and radiolar sheath tissue extending through length of appendages, without a branchial skeleton extension; dorsal pinnular appendages present or absent. Ventral lips and parallel lamellae present, usually inside branchial lobes and not visible externally. Posterior peristomial ring collar present. Inferior thoracic notochaetae broadly hooded. Abdominal neurochaetal fascicles with elongate narrowly hooded chaetae. Thoracic uncini avicular with numerous very small teeth above the main fang, breast well developed, and a variable length of the handle. Companion chaetae with very thin distal ends perpendicular to the shaft. Abdominal uncini similar to thoracic ones, but with shorter handle.

Remarks

The internal structures of the crown are very variable within the genus, starting from the length of the dorsal lips, and the presence or absence of dorsal pinnular appendages. The shapes of the ventral lips and associated structures are highly variable. Ventral lips can be more or less rounded and in some species appear very elongated, as in the case of *A. longoventralis*, *A. phyllisae* (Capa & Murray, 2009), *A. heterops* (Perkins, 1984), *A. coloratum* (Chamberlin, 1919), *A. bioculatum* (Ehlers, 1887), *A. splendidum* (Moore, 1905) and *A. georgense* (Tovar-Hern ndez & Carrera-Parra, 2011). Some species also possess ventral sacs located inside the branchial lobes and not visible externally, as occurs in *Sabella*. According to Giangrande et al. (2015), the collar can be: fused to the faecal groove with spatulate dorsal lappets covering the junction of the branchial crown, and with deep dorsal pockets; fused to the faecal groove with dorsal lappets not covering the junction of the branchial crown, but still with deep dorsal pockets; fused to the faecal groove, without dorsal lappets, and with dorsal pockets; fused to the faecal groove, without dorsal lappets, and with scarcely

developed dorsal pockets leaving uncovered the anterior peristomial ring; fused to the faecal groove without both dorsal lappets and pockets, leaving uncovered the anterior peristomial ring; not fused to the faecal groove. In [Table I](#) a modified scheme of the groups proposed by Knight-Jones (1997) and subsequently revised by Capa and Murray (2009) is reported.

Some taxa have been moved to different groups after re-interpretation of the collar fusion, lappets and presence of pockets as suggested by Giangrande et al. (2015). However, only two states were considered for eye distribution because, as pointed out by Tovar-Hernández and Carrera-Parra (2011), this last feature is too variable, with up to six states. Therefore, the groups are defined especially by the shape of the collar. Group 1 *sensu* Knight-Jones and Capa and Murray (2009) (species with dorsal collar margin fused) is split into four subgroups according to the development of the dorsal lappets. Group 2 (dorsal collar margins not fused), although containing few species, is split into four groups as well, and not into five as reported by Capa and Murray (2009), because *A. interrupta* and *A. kaikourense* are both placed in group 2A due to the eye distribution state here utilised.

Three types of inferior thoracic notochaetae were outlined: (A) subspatulate or broadly hooded with a long narrow tip; (B) subspatulate broadly hooded with a progressively tapering distal end; and (C) paleate with distal end surmounted by a mucronate tip (Tovar-Hernández & Carrera-Parra 2011; Giangrande et al. 2015). Abdominal neurochaetae have been described as elongated, narrowly hooded chaetae (Perkins 1984; Fitzhugh 1989, 2003; Tovar-Hernández & Salazar-Vallejo 2008) but some species can have broadly hooded ones with long tips. According to Capa and Murray (2009) the length of the thoracic uncinus handle could vary from medium (same length as the distance from main fang to breast) to long (twice the length of the distance from main fang to breast). However, Giangrande et al. (2015) proposed three different states showing different lengths (*l*) of the handle measured relative to the height (*h*) of the uncinus. The handle can be defined as long when the ratio (*l/h*) is > 1, medium when the ratio = 1, and short when the ratio is < 1.

Lastly the thoracic companion chaetae possess a proximal shaft or handle, generally similar in length to the thoracic uncini handle, and a distal membrane that has been described as teardrop-shaped by most authors (Perkins 1984; Fitzhugh 1989, 2002, 2003),

or as roughly symmetrical (Fitzhugh 1989; Tovar-Hernández & Salazar-Vallejo 2006; Giangrande et al. 2007), or as asymmetrical (Knight-Jones 1997). There is some variation in the form of the companion chaetae among different species, so this character may also be useful from a systematic point of view.

Acromegalomma messapicum (Giangrande & Licciano, 2008), redescription [Figures 2–3](#)

Megalomma messapicum Giangrande & Licciano 2008: 213–214, figs 5G–H, 6.

Acromegalomma messapicum – Gil and Nishi (2017): 140.

Material examined

Ten specimens from the Tyrrhenian Sea, and four from the Adriatic Sea.

The following description concerns Tyrrhenian material that was in very good condition: Specimens have from seven to nine thoracic chaetigers, eight being the most common number, and from 20 to 55 abdominal chaetigers. The body was 13.2 + 1.4 mm long (without branchial crown), and 1.5 mm wide at chaetiger 4. Branchial crown length was 3.5 ± 0.7 mm. The dorsal margin of the collar is fused to the faecal groove, leaving exposed the base of the crown, but also a large part of the peristomium, dorsal lappets absent, dorsal margin of the collar fused with the peristomium, but laterally forming small pockets ([Figure 2 \(a–d\)](#)). Dorsal collar showing brown spot colouration present also in all the thoracic chaetigers ([Figure 2 \(d,e\)](#)). Collar oblique laterally, with a small lateral cleft becoming higher ventrally, with well-developed ventral lappets, pointed, not overlapped as long as the collar ventral shield ([Figure 2 \(a,b,l\)](#)). Ventral shield of the first chaetiger squared, bilobed and twice as long as the following shields, visible also without staining with methyl green ([Figure 2 \(a,b\)](#)). Dorsal lips pointed, with mid-rib about 0.7 mm long, less than one-quarter the length of the branchial crown ([Figure 2\(f\)](#)). Dorsal pinnular appendages present. Ventral lips long and rounded ([Figure 2 \(f\)](#)), terminating in parallel lamellae, but ventral sacs not detectable. Eight or nine pairs of radioles, without palmate membrane or flanges, with three pairs of brown-coloured bands ([Figure 2\(g\)](#)); radioles with several rows of cells and rounded margin. Dorsalmost radiole bearing large rounded eyes with a small free tip ([Figure 2 \(h\)](#)); eyes absent on the following three radioles; other three radioles with smaller eyes degrading in size and with longer tip ([Figure 2\(h\)](#)); last radioles without eyes. Length of the radioles degrading towards the ventral

Table I. Groups of *Acromegalomma* species revised on the basis of the new interpretation of the collar features by Giangrande et al. (2015). *Acromegalomma vigilans* has not been included in the table due to the lack of a detailed description.

Group	Dorsal collar margin	Pockets	Dorsal lappets	Subdistal radiolar eyes	<i>Megalomma</i> species	Type locality
1-A	Fused	Present	Present	Most	<i>Acromegalomma acrophthalmos</i> (Grube, 1878)	Philippines
	Fused	Present	Present	Most	<i>A. fauchaldi</i> (Giangrande et al., 2007)	Carrie Bow
	Fused	Present	Present	Most	<i>A. lanigera</i> (Grube, 1846)	Unknown (Mediterranean)
	Fused	Present	Present	Most	<i>A. perkinsi</i> (Tovar-Hernández & Salazar-Vallejo, 2006)	Florida
	Fused	Present	Present	Most	<i>A. suspiciens</i> (Ehlers, 1904)	New Zealand
	Fused	Present	Present	Most	<i>A. vesiculosum</i> (Montagu, 1815)	England
	Fused	Present	Present	Most	<i>A. longoventralis</i> (Giangrande et al., 2015)	Adriatic Sea (Rovigni)
	Fused	Present	Present	Most	<i>A. phyllisae</i> (Capa & Murray, 2009)	Victoria, Australia
1-B	Fused	Present	Present	Less than half radiole number	<i>A. mushaense</i> (Gravier, 1906)	Red Sea
	Fused	Present	Present	Less than half radiole number	<i>A. quadroculatum</i> (Willey, 1905)	Ceylon
1-C	Fused	Present	Absent	Most	<i>A. claparedei</i> (Gravier, 1906)	Red Sea
	Fused	Present	Absent	Most	<i>A. carunculata</i> (Tovar-Hernández & Salazar-Vallejo, 2008)	Eastern Tropical Pacific
	Fused	Present	Absent	Most	<i>A. lobiferum</i> (Ehlers, 1887)	Florida
	Fused	Present	Absent	Most	<i>A. circumspectum</i> (Moore, 1923)	California
	Fused	Present	Absent	Most	<i>A. multioculatum</i> (Fitzugh, 2002)	Thailand
	Fused	Present	Absent	Most	<i>A. adriaticum</i> (Giangrande et al., 2015)	Adriatic Sea (Brindisi)
	Fused	Present	Absent	Most	<i>A. heterops</i> (Perkins, 1984)	Florida
	Fused	Present	Absent	Most	<i>A. pacifici</i> (Grube, 1859)	Costarica
1-D	Fused	Present	Absent	Less than half radiole number	<i>A. splendidum</i> (Moore, 1905)	Alaska
	Fused	Present	Absent	Less than half radiole number	<i>A. cinctum</i> (Fitzhugh, 2003)	Taiwan
	Fused	Present	Absent	Less than half radiole number	<i>A. coloratum</i> (Chamberlin, 1919)	California
	Fused	Present	Absent	Less than half radiole number	<i>A. modestum</i> (Quatrefages, 1866)	Perù
	Fused	Present	Absent	Less than half radiole number	<i>A. roulei</i> (Gravier, 1908)	Perù
	Fused	Present	Absent	Less than half radiole number	<i>A. inflata</i> (Capa & Murray, 2009)	New South Wales (Australia)
	Fused	Present	Absent	Less than half radiole number	<i>A. messapicum</i> (Giangrande et al., 2008)	Adriatic Sea (Brindisi)
	Fused	Present	Absent	Less than half radiole number	<i>A. schwindtae</i> Tovar-Hernández et al., 2017	Atlantic Ocean (Argentina)
	Fused	Present	Absent	Less than half radiole number	<i>A. jubata</i> (Capa & Murray, 2015)	Pacific Ocean (Australia)
2-A	Not fused	Present	Absent	Less than half radiole number	<i>A. kaikourense</i> (Knight-Jones, 1997)	New Zealand
	Not fused	Present	Absent	Less than half radiole number	<i>A. interrupta</i> (Capa & Murray, 2009)	Queensland
2-B	Not fused	Absent	Present	Most	<i>A. nechamae</i> (Knight-Jones, 1997)	Red Sea
2-C	Not fused	Absent	Absent	Most	<i>A. trioculatum</i> (Reish, 1968)	Marshall Islands
2-D	Not fused	Absent	Absent	Less than half radiole number	<i>A. bioculatum</i> (Ehlers, 1887)	Florida
	Not fused	Absent	Absent	Less than half radiole number	<i>A. gesae</i> (Knight-Jones, 1997)	El Salvador
	Not fused	Absent	Absent	Less than half radiole number	<i>A. pigmentum</i> (Reish, 1963)	California
	Not fused	Absent	Absent	Less than half radiole number	<i>A. miyukiae</i> (Nishi, 1998)	Thailand
	Not fused	Absent	Absent	Less than half radiole number	<i>A. georgiense</i> (Tovar-Hernández & Salazar-Vallejo, 2011)	Georgia (USA)
	Not fused	Absent	Absent	Less than half radiole number	<i>A. pseudogesae</i> (Mikac et al., 2013)	Adriatic Sea (Rovigni)

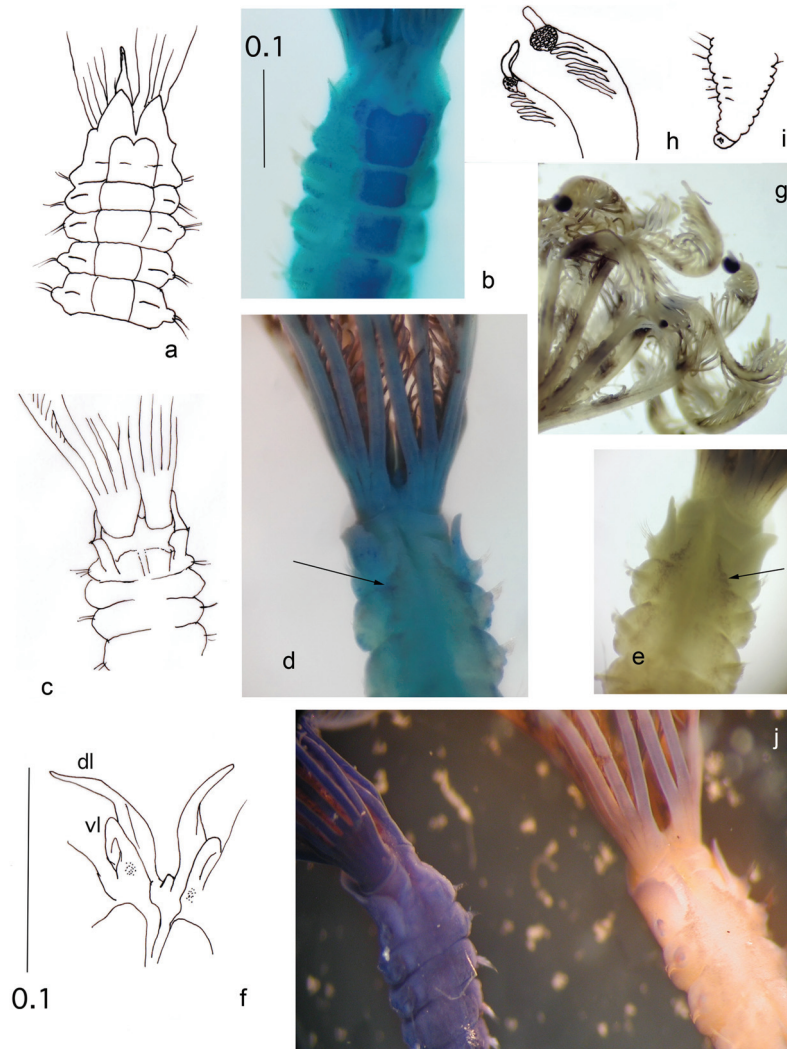


Figure 2. *Acromegalomma messapicum*. (a) Anterior ventral view; (b) anterior ventral view, methyl green pattern; (c) anterior dorsal view; (d) anterior dorsal view, methyl green pattern; (e) photograph of anterior dorsal view – arrows indicate coloured spots evident both in methyl green coloured and in not coloured specimens; (f) internal structures of the crown – D1 = dorsal lip with radiolar appendage; V1 = ventral lip; (g) detail of the crown; (h) terminal eyes of the radioles – the larger one is referred to the dorsalmost radioles (first radiole), the smaller one to a lateral radiole; (i) pygidium; (j) comparison between a specimen from the Adriatic Sea (on the left) and one from the Tyrrhenian Sea (on the right). Specimens treated with SHIRLASTAN colourant.

side. Superior thoracic notochaetae elongate, narrowly hooded, numbering four (Figure 3(a)). Inferior thoracic notochaetae subspatulate broadly hooded with a progressively tapering distal end (Type B), numbering five (Figure 3(b)). Thoracic uncini arranged in a short arc leaving a wide gap between torus and ventral shield (Figure 2(a,e)), numbering 10, avicular, with a well-developed breast and short handle (Figure 3(d)). Companion chaetae with roughly asymmetrical tips, teardrop-shaped membrane, and a large dentate region (Figure 3(c)). Abdominal uncini avicular, with manubrium shorter than that of the thoracic ones. Abdominal

neurochaetae in two transversal rows of broadly hooded chaetae, wider hood in anterior abdominal chaetigers (Figure 3(e)). Pygidium with eyes (Figure 2(i)).

The methyl green pattern was evidenced only in the ventral shield (Figure 2(d)).

Examined worms were all adults, and analysis of the coelom content revealed the species to be gonocoric. Gametes were detected only in three specimens (two females and one male) collected in warm months from the Tyrrhenian Sea. The mean egg diameter was about 120 μm . Sperm was of ect-aquasperm type with rounded nucleus.

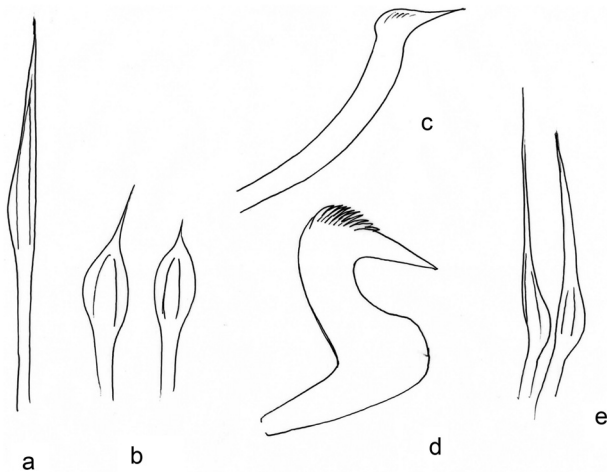


Figure 3. *Acromegalomma messapicum*. (a) Thoracic notochaeta from superior fascicle; (b) thoracic notochaetae from inferior fascicle; (c) companion chaeta; (d) thoracic hook; (e) neurochaetae from an anterior abdominal segment.

No further detailed information was possible, because observation was made only by light microscope.

Conclusions

Results from the present study allowed a better description of the species. The fusion of the dorsal margin of the collar to the faecal groove, the presence of dorso-lateral pockets, and eyes located on dorsalmost and lateral radioles suggest *A. messapicum* belongs to Group 1 C (*sensu* Knight-Jones). The finding of this new material allowed us to confirm the peculiar distribution of the eyes within radioles of the species, which is consistent in all of the examined specimens. Moreover, the better quality of fixation and preservation of this material compared to that of the type material allowed us to better define collar features, which appeared consistent among specimens from both Tyrrhenian and Adriatic seas. The collar of *Acromegalomma messapicum* is characterised by dorsal margin fused to ventral groove without lappets, but with well defined dorsal pockets corresponding to a quite uncommon shape within the genus reported as “D state” by Giangrande et al. (2015). The dorsal margin of the collar is very low, leaving the anterior peristomial ring uncovered, a condition almost corresponding to the “E state” *sensu* Giangrande et al. (2015) which was, however, considered a further reduction of the dorsal margin of the collar due to the lack of pockets. These authors, however, comparing *A. messapicum* with the newly described *A. adriaticum* in order to provide keys for Mediterranean taxa, incorrectly reported *A.*

messapicum as lacking “dorsal pockets”. Actually, the pockets are absent in *A. adriaticum* whilst *A. messapicum* is distinguished from the former species by the ventral margin of the collar that is very low, without lappets, but forming two visible ventral pockets. In the original description (Giangrande & Licciano 2008), the collar of *A. messapicum* was described as having two small pockets with bases not reaching the posterior end of the first chaetiger, whereas results from the present work show that the pockets are more developed and reach the first chaetiger.

The better preservation of these new specimens revealed a colouration pattern present in the thorax and in the branchial crown, as well as the presence of large pygidial eyes previously not reported. As already pointed out, the lack of pigments on the radioles may be due to the long preservation period of the material from Brindisi that was utilised for the original description of the species (Giangrande & Licciano 2008).

As far as the shape of the abdominal chaetae, we found that specimens have very broadly hooded chaetae, especially at the beginning of the abdomen, becoming more slender and therefore narrowly hooded, proceeding towards the end of the abdomen. This could explain the wrong statement in the original description of the presence of abdominal narrowly hooded chaetae as characterising *A. messapicum*.

According to Fitzhugh (2003), “diagnostic features” may be misinterpreted when a low number of specimens are examined. Examples are provided by some *Acromegalomma* species showing variation in the number and development of subdistal compound eyes, which may not necessarily be related to the size of the specimens (Nishi 1998). As highlighted by Capa and Murray (2009), usually a low number of specimens of *Acromegalomma* taxa are collected and recorded in ecological and taxonomic studies; therefore, several *Acromegalomma* species described during the last few decades (Giangrande & Licciano 2008; Capa & Murray 2009; Tovar-Hernández & Carrera-Parra 2011; Mikac et al. 2013), including *A. messapicum*, were erected despite the paucity of the examined material preventing the documentation of intraspecific variability. By contrast, intraspecific variability can be high when a large number of specimens are available, as reported for instance by Giangrande et al. (2012) for the *A. lanigera* population from Faro Lake (South Italy, Ionian Sea). These authors highlighted how some diagnostic features, such as the shape and measurement of soft structures, are actually useless as they could reflect artefacts and deformations due to fixation and preservation processes.

The possibility to examine several specimens of *A. messapicum*, even collected in different areas, allowed

us to state with certainty the absence of variability as concerns both the distribution of the radiolar eyes and the collar shape.

Acromegalomma messapicum had been until now reported only for the South Adriatic Sea, where it was first collected in 1987, and more recently in 2010. Present data widens its distribution also to the Tyrrhenian Sea. In both the areas specimens were collected on *Posidonia* beds. The coastal morphology of the sampling site in the Tyrrhenian Sea (Civitavecchia) is characterised by dominance of terraces where the irregular seabed is composed by rocky outcrops and natural depressions covered by sediments. The *P. oceanica* meadow in the study site occurs from 3 m depth and its architecture exhibits an almost continuous cover with the presence of several different sizes of sand patches. The density does not change over the year, showing a quite constant range of 260–312 shoots m⁻². The sediment input from the mainland is scarce, represented only by few small streams originating from the nearby Tolfa Mountains. The bed sediment is composed by gravelly coarse sand where the gravel fraction (20–60%) is totally formed by bioclasts composed by shells and skeletal fragments. The coastal site is characterized by moderate–high wave conditions, with dynamic sediments constrained by resuspension processes reaching the maximum in autumn and winter and the minimum in summer, according to seasonal oscillation of wave intensity (Paladini de Mendoza et al. 2016).

Finally, the present data allowed us to make some biological observations. *Acromegalomma messapicum* is gonocoric, with eggs measuring about 120 µm in diameter. Most of the specimens were collected in cold months, characterised by short leaves of *P. oceanica* and large resuspension of sediment induced by waves. Ripe specimens, however, were found in warm months when minimum sediment resuspension occurs and *P. oceanica* is in its maximum growth phase (Gacia & Duarte 2001). Within the genus *Acromegalomma*, reproductive information is available for several species (Giangrande 1997; Fitzhugh 2003; Tovar-Hernández & Salazar-Vallejo 2008; Tovar-Hernández et al. 2009; Tovar-Hernández & Carrera-Parra 2011; Sanders 2014). Most of the studied species are gonochoric: *A. vesiculosum*, *A. pacifici*, *A. coloratum*, *A. circumspatum*, *A. cinctum* (Fitzhugh, 2003) and probably also *A. georgense*. The egg size is reported only for *A. vesiculosum* (150 µm), *A. coloratum* (109.7 µm) and *A. carunculata* (from 70 to 150 µm). The egg size here reported for *A. messapicum* is in accordance with these observations. *Acromegalomma pacifici* and *A.*

coloratum are reported to have continuous reproduction. By contrast, *A. vesiculosum* has a seasonal cycle similar to the species investigated here, *A. messapicum*. Up to now, the only species showing also asexual reproduction is *A. cinctum* (Fitzhugh 2003). Finally the morphology of the spermatozoa is known for *A. coloratum*, *A. circumspatum*, *A. pigmentum* and *A. splendidum*, all showing an ect-aquasperm type according to our observations of the presently investigated species, and therefore until now free spawning has been the most widely distributed strategy within the genus *Acromegalomma*.

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