

Ampharetidae (Annelida: Polychaeta) from the Red Sea reef Al Fahal (Saudi Arabia) with the description of a new species

MICHAEL G. REUSCHER

Harte Research Institute for Gulf of Mexico Studies, Texas A&M University – Corpus Christi, 6300 Ocean Drive, Unit 5869, Corpus Christi, TX 78412-5869, USA

A new species of Ampharetidae, Amphicteis fiegei sp. nov., is described from the Red Sea reef Al Fahal off Thuwal, Saudi Arabia. It is characterized by the possession of prominent nuchal ridges that are elevated from the prostomium, relatively short paleae, which are few in numbers (five on each side), and transverse rows of cilia in one of its branchial pairs. Furthermore, Samytha storchi Reuscher & Wehe in Wehe, 2009 is recorded for the first time since its original description.

Keywords: Polychaeta, Ampharetidae, *Amphicteis*, *Samytha*, new species, Red Sea

Submitted 31 October 2015; accepted 6 January 2016; first published online 11 February 2016

INTRODUCTION

The Red Sea is one of the most understudied bodies of water in terms of biodiversity (Terraneo *et al.*, 2014), including the polychaete fauna (Faulwetter *et al.*, 2011). For this reason, the Red Sea Research Center at the King Abdullah University of Science and Technology (KAUST) in Jeddah, Saudi Arabia launched a project to describe and catalogue the biodiversity of the Red Sea off the coast of Saudi Arabia. An international team of taxonomists have been participating in this project. In this paper I am describing the polychaetes of the family Ampharetidae that were sampled at the Al Fahal reef off Thuwal and deposited at the Florida Natural History Museum at the University of Florida.

Previously only three species of ampharetid polychaetes have been recorded from the Red Sea: *Ampharete acutifrons* (Grube, 1860), *Amphicteis gunneri* (M. Sars, 1835), and *Isolda pulchella* (F. Müller, 1858) (Wehe & Fiege, 2002). The identification of *Isolda pulchella*, a species originally described from Brazil, by Kiseleva (1971) was only tentative. The records of *Ampharete acutifrons* and *Amphicteis gunneri*, both species described from arctic and subarctic seas, are based on species lists without any kind of descriptions. Both records seem doubtful to me. In addition to the three Red Sea records, *Samytha storchi* Reuscher & Wehe in Wehe, 2009 was described from the adjacent Gulf of Aqaba. This species was also found in the Red Sea samples of the present study. Additionally, a new species, *Amphicteis fiegei* sp. nov., is described here.

MATERIALS AND METHODS

The specimens examined in this study were collected by hand during scuba dives at the Al Fahal coral reef off Thuwal, Saudi

Arabia (Figure 1) in March 2013. They were relaxed in magnesium chloride, fixed in 10% formalin and preserved in 75% ethanol.

Preserved specimens were examined with Olympus SZX7 and Wild Heerbrugg M8 stereo microscopes and Leica DMLB and Olympus CX41 compound microscopes. Pencil drawings were made using camera lucidas, attached to the Wild Heerbrugg M8 and Leica DMLB microscopes.

The drawings were digitized with a Wacom Intuos drawing tablet and Adobe Illustrator, according to the methods of Coleman (2003). Shadings were added in Adobe Photoshop. The 'ID cards' were prepared in Adobe Illustrator.

All specimens are deposited in the Florida Natural History Museum at the University of Florida (UF).

SYSTEMATICS

Ampharetidae Malmgren, 1866
Ampharetinae Malmgren, 1866
Amphicteis Grube, 1850

TYPE SPECIES

Amphitrite gunneri Sars, 1835

SYNONYMS

Crossostoma Gosse, 1855

GENERIC DIAGNOSIS

Prostomium with paired longitudinal glandular ridges and oblique or transverse nuchal ridges. Buccal tentacles smooth. Four pairs of cirriform branchiae. Notochaetae in segment II present and usually developed as paleae. Seventeen thoracic chaetigers with capillary chaetae-bearing notopodia from segment III. Notopodia with tuberculate ventral cirrus. Elevated or modified notopodia absent. Fourteen thoracic uncini with uncini-bearing neuropodial tori from segment VI. No intermediate uncini. Abdominal

Corresponding author:

M.G. Reuscher

Email: michael.reuscher@tamucc.edu

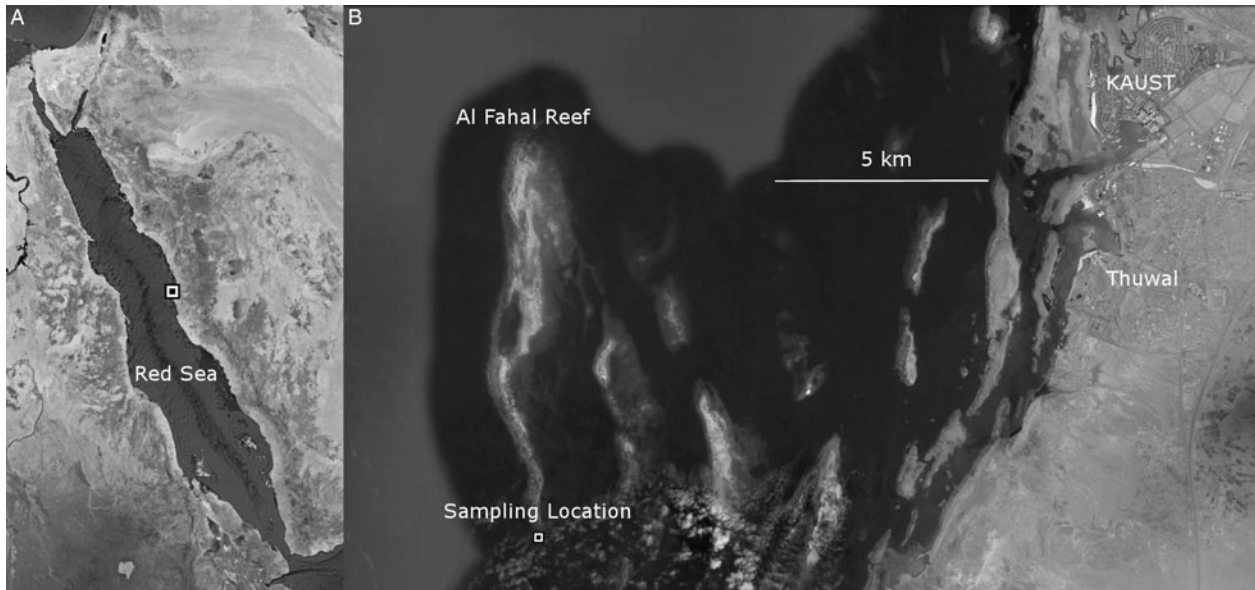


Fig. 1. Study site. (A) Sampling location within the Red Sea; (B) Aerial view of the Al Fahal Reef and the sampling location.

uncinigers with rudimentary notopodia and uncini-bearing pinnules with dorsal cirrus. Usually one pair of anal cirri present, inserted laterally in pygidium. Thoracic uncini with single row of teeth.

Amphicteis fiegei sp. nov. (Figure 2A–H)

SPECIMENS EXAMINED

Holotype: UF 3572, Saudi Arabia, southern point of Al Fahal reef, off Thuwal, 22.2227°N 38.9677°E, 12 m, 20 March 2013. Paratype: UF 3554, Saudi Arabia, sheltered side of offshore reef Al Fahal, off Thuwal, 22.2227°N 38.9677°E, 18 m, 19 March 2013.

DESCRIPTION OF THE HOLOTYPE

Length 11 mm, width 1.6 mm. Mature female, with eggs visible in abdomen. Paired prostomial longitudinal glandular ridges, bulbous anteriorly, not separated by median gap (Figure 2A). Paired prostomial nuchal ridges separated by median gap, arranged at wide angle to each other, crescent shaped, thick, and elevated from prostomium. Several small brown eyespots located in front of nuchal ridges and one or two brown eyespots located at right and left prostomial margins, respectively. Buccal tentacles smooth, with shallow ventral groove. Lower lip with longitudinal furrows (Figure 2B). Four pairs of smooth cirriform branchiae in 2 transverse rows in segments III and IV; both groups of branchiae separated by median gap of twice the branchial width; innermost pair of branchiae in posterior transverse row connected by dermal fold; innermost branchiae of anterior transverse row (pair 1) originating from segment II, outermost branchiae of anterior transverse row (pair 2) originating from segment III, innermost branchiae of posterior transverse row (pair 3) originating from segment IV, outermost branchiae of posterior transverse row (pair 4) originating from segment V (Figure 2C); branchiostyles of fourth pair present, others broken; three detached cirriform branchiae present, one of which with numerous transversal rows of cilia, surrounding about half of branchial perimeter

(Figure 2D). Segment II with 5 paleae on either side, not reaching anterior end of prostomium; paleae slightly curving and tapering to very fine tips (Figure 2E). Notopodia with capillary chaetae from segment III, present in 17 chaetigers; anterior notopodia small, increasing in size from first to fifth pair (Figure 2B); tuberculate notopodial cirri commencing in segment VII. Neuropodial tori with uncini and tuberculate dorsal lobe from segment VI, present in 14 thoracic uncinigers. Continuous ventral shields conspicuous to thoracic unciniger 11, faint in thoracic unciniger 12. Elevated or modified notopodia absent. Intermediate uncinigers absent. Fifteen abdominal uncinigers with club shaped rudimentary notopodia (Figure 2F). Pinnules with tuberculate dorsal cirrus. Pygidium with terminal anus and paired long, lateral, cirriform anal cirri. Thoracic uncini with 4 teeth in 1 vertical row over basal prow and rostral tooth, lacking subrostral process (Figure 2G). Abdominal uncini with 3 teeth in 1 vertical row over basal prow and rostral tooth, lacking subrostral process (Figure 2H).

REMARKS

The paratype specimen is a mature male. It measures 7.5 mm in length, but is broken after abdominal unciniger 12. Branchiae of the paratype specimen are missing.

Only three other species of the genus *Amphicteis* were described with a combination of short (too short to reach the anterior end) and few (less than 10) paleae: *A. dalmatica* Hutchings & Rainer, 1979, *A. midas* (Gosse, 1855), and *A. trichophora* (Hartman, 1965). The latter species differs from *A. fiegei* sp. nov. by the lack of eyespots, different branchial arrangement, and the very long 'threadlike processes' in the last four thoracic parapodia. In *A. midas* the branchiae lack transversal rows of cilia and the paleae are much sturdier than in the new species. Most similar to the new species is *Amphicteis dalmatica* from Australia. It differs from the new species by its distinct spotted pigmentation pattern, the smaller gap between branchial groups, and the lack of transverse rows of cilia in any of its branchiae.

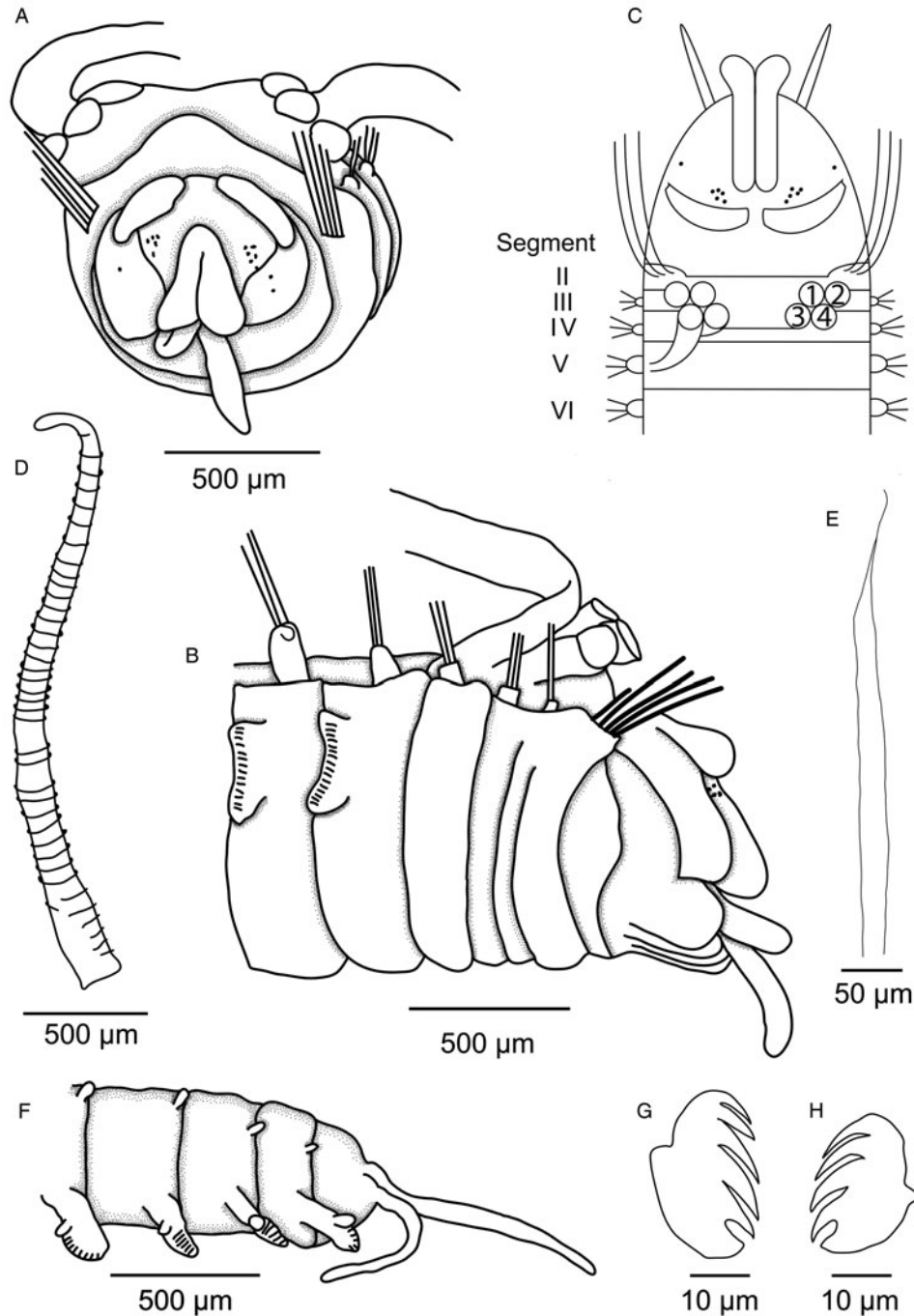


Fig. 2. *Amphicteis fiegei* sp. nov.: (A) Anterior end of holotype, frontal view; (B) Same, lateral view; (C) Species 'ID Card'; (D) Branchiostyle with transverse rows of cilia, illustrated is the side with cilia; (E) Palea; (F) Posterior end of holotype, lateral view; (G) Thoracic uncinus, lateral view; (H) Abdominal uncinus, lateral view.

To my knowledge, branchiae with transversal rows of cilia have not been described for any other *Amphicteis* species. Unfortunately, the ciliated branchia was detached from the holotype specimen. Therefore, it is impossible to determine if it belongs to the first, second or third pair.

The nuchal ridges are elevated from the prostomium. This is quite unusual because other *Amphicteis* species have relatively flat nuchal ridges that are not elevated from the prostomium. It is possible, however, that this may be caused by fixation artifacts, rather than morphological differences.

The uncini of *A. fiegei* sp. nov. lack a subrostral process, in contrast to the majority of *Amphicteis* species (Reuscher *et al.*,

2015). However, this character has often been neglected in species descriptions. In many cases its presence or absence has only been documented in accompanying drawings, if at all. Few other species also seem to have uncini without a subrostral process, including *A. dalmatica* and *A. trichophora*. In *A. midas* the presence of a subrostral process is unknown.

Two species of *Amphicteis*, *A. gunneri* (M. Sars, 1835) and *A. posterobranchiata* Fauvel, 1932, have been recorded from the seas surrounding the Arabian Peninsula, according to the checklist of Wehe & Fiege (2002). The only species that has been identified from the Red Sea is *A. gunneri* (Wehe &

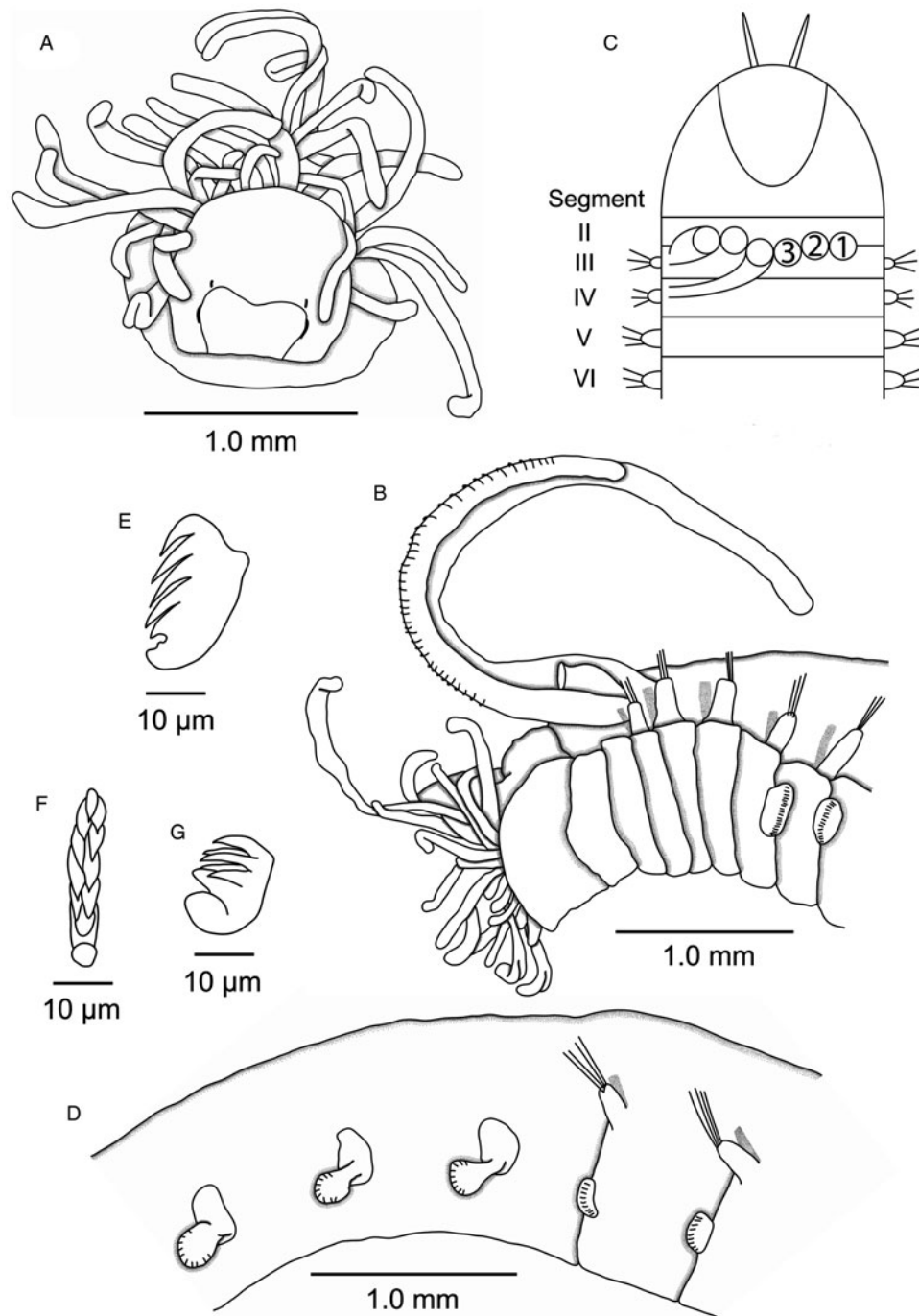


Fig. 3. *Samytha storchi*. (A) Anterior end, frontal view; (B) Same, lateral view; (C) Species 'ID Card'; (D) Last two thoracic and first three abdominal uncinigers, lateral view; (E) Thoracic uncinus, lateral view; (F) Thoracic uncinus, frontal view; (G) Abdominal uncinus, frontolateral view.

Fiege, 2002). The latter species differs from *A. fiegei* sp. nov. by the higher number of paleae. In his redescription of *A. gunneri*, Hartley (1985) examined type material and additional specimens and determined the range of the number of paleae in adults to be 11–23. The paleae in *A. gunneri* are also longer than in the new species. Furthermore, the nuchal ridges in *A. gunneri* are flat and not elevated from the prostomium. *Amphicteis posterobranchiata* differs from the new species by the longer and more numerous (20–25) paleae, the fourth pair of branchiae located in segment V, and the lower number of abdominal uncinigers (13).

ETYMOLOGY

This new species is dedicated to Dieter Fiege (Senckenberg Forschungsinstitut und Naturmuseum Frankfurt), who introduced me to the 'world of polychaetes'.

DISTRIBUTION

Only known from the Al Fahal reef off Thuwal (Saudi Arabia).

I suspect that some of the *A. gunneri* records from the Red Sea and other seas surrounding the Arabian Peninsula may actually belong to *A. fiegei* sp. nov. The records of

A. gunneri from the Red Sea are based simply on species lists (Kiseleva, 1971; Amoureux, 1983). Fauvel (1932) provided a short description of *A. gunneri* from the Gulf of Oman. However, this description is insufficient to determine if the identification was correct.

Samytha Malmgren, 1866

TYPE SPECIES

Sabellides sexcirrata Sars, 1856

GENERIC DIAGNOSIS

Prostomium without glandular ridges, with middle lobe encircled by surrounding lobe. Buccal tentacles smooth. Three pairs of cirriform branchiae. Segment II without chaetae. Thorax with 17 chaetigers and 14 uncinigers. Modified or intermediate segments absent. Abdomen with glandular pads above pinnules.

Samytha storchi Reuscher and Wehe in Wehe, 2009
(Figure 3A–G)

SPECIMENS EXAMINED

UF 3573, Saudi Arabia, southern point of Al Fahal reef, off Thuwal, 22.2227°N 38.9677°E, 12 m, 20 March 2013.

DESCRIPTION

Length 11 mm, width 1.7 mm, broken after abdominal unciniger 7. Mature female with eggs in coelomic cavity. Prostomium with paired black eyespots, without glandular ridges (Figure 3A); posterior prostomium with median lobe, delimited by groove from surrounding lobe. Lower lip smooth (Figure 3B). Buccal tentacles extended, with ventral groove, smooth. Three pairs of cirriform branchiae, arranged in one transverse row in segments II and III, without median gap; branchiae fused basally; second outermost branchiostyle in left group missing; second outermost branchiae of transverse row (pair 1) originating from segment II, outermost branchiae of transverse row (pair 2) originating from segment III, innermost branchiae of transverse row (pair 3) originating from segment IV (Figure 3C). Segment II without chaetae. Notopodia with capillary chaetae from segment III, present in 17 chaetigers; notopodia increasing in size from first to third pair, without cirri (Figure 3C). Neuropodial tori with uncini from segment VI, present in 14 thoracic uncinigers; tori without cirri. Continuous ventral shields conspicuous to thoracic unciniger 9. Elevated or modified notopodia absent. Intermediate uncinigers absent. Abdominal uncinigers with glandular pads above pinnules, but without cirriform rudimentary notopodia (Figure 3D). Pinnules without dorsal cirrus. Pygidium unknown. Thoracic uncini with nine teeth in two alternating vertical rows above rostral tooth, small subrostral process, and basal prow (Figure 3E, F). Abdominal uncini with five teeth in two alternating vertical rows above rostral tooth and basal prow (Figure 3G).

REMARKS

The specimen described here differs from the original description by the possession of small eyespots. This may be caused by fixation artifacts or intraspecific variation.

DISTRIBUTION

Samytha storchi was originally described from the Gulf of Aqaba (Wehe, 2009). This is only the second specimen found. It is a new record from Saudi Arabia.

ACKNOWLEDGEMENTS

I am grateful to Gustav Paulay (Florida Museum of Natural History) for providing the specimens for this study. Arthur Anker (Museu de Zoologia da Universidade de São Paulo), Camrin Braun (King Abdullah University of Science and Technology), Jenna Moore and Patrick Norby (both Florida Museum of Natural History) collected the polychaetes. Jenna Moore also provided more information on the sampling stations and procedures. I am indebted to Richard D. Kalke and Fabio Moretzsohn (both Texas A&M University – Corpus Christi) for lending me their camera lucidas.

FINANCIAL SUPPORT

Financial support was provided through the Texas Research Development Fund Post-Doctoral Support Program, awarded to my supervisor Paul A. Montagna by the Division of Research, Commercialization and Outreach at Texas A&M University – Corpus Christi.

REFERENCES

- Amoureux L. (1983) Annelides polychètes du Golfe d'Aqaba (Mer Rouge). Description d'un genre nouveau et de deux espèces nouvelles. *Bulletin du Muséum National d'Histoire Naturelle, Paris, série 4* 5, 723–742.
- Coleman C.O. (2003) "Digital inking": how to make perfect line drawings on computers. *Organisms, Diversity & Evolution* 3(Electronic Supplement 14), 1–14. doi: 10.1078/1439-6092-00081.
- Faulwetter S., Chatzigeorgiou G., Galil B.S. and Arvanitidis C. (2011) An account of the taxonomy and distribution of Syllidae (Annelida, Polychaetes) in the eastern Mediterranean, with notes on the genus *Prosphaerosyllis* San Martín, 1984 in the Mediterranean. *ZooKeys* 150, 281–326. doi: 10.3897/zookeys.150.2146.
- Fauvel P. (1932) Annelida Polychaeta of the Indian Museum, Calcutta. *Memoirs of the Indian Museum* 12, 1–262.
- Gosse P.H. (1855) Notes on some new or little-known marine animals. *The Annals & Magazine of Natural History* 16, 27–36. doi: 10.1080/037454809495473.
- Grube E. (1850) Die Familien der Anneliden. *Archiv für Naturgeschichte* 16, 249–364.
- Grube E. (1860) Beschreibung neuer oder wenig bekannter Anneliden. Fünfter Beitrag. *Archiv für Naturgeschichte* 26, 71–118.
- Hartley J.P. (1985) The re-establishment of *Amphitecis midas* (Gosse, 1855) and redescription of the type material of *A. gunneri* (M. Sars, 1835) (Polychaeta: Ampharetidae). *Sarsia* 70, 309–315.
- Hartman O. (1965) Deep-water benthic polychaetous annelids off New England to Bermuda and other North Atlantic areas. *Occasional Papers of the Allan Hancock Foundation* 28, 1–378.
- Hutchings P. and Rainer S. (1979) The polychaete fauna of Careel Bay, Pittwater, New South Wales, Australia. *Journal of Natural History* 13, 745–796. doi: 10.1080/00222937900770561.

- Kiseleva M.I.** (1971) Qualitative composition and quantitative distribution of polychaetes in the Red Sea. In Vodyanitzkii V.A. (ed.) *Benthos of the Red Sea shelf*. Kiev: Naukova Dumka, pp. 44–76 [In Russian].
- Malmgren A.J.** (1866) Nordiska Hafs-Annulater. *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* 5, 355–410.
- Müller F.** (1858) Einiges über die Annelidenfauna der Insel Santa Catharina an der brasilianischen Küste. *Archiv für Naturgeschichte* 24, 211–220.
- Reuscher M.G., Fiege D. and Imajima M.** (2015) Ampharetidae (Annelida: Polychaeta) from Japan. Part III: the genus *Amphicteis* Grube, 1850 and closely related genera. *Journal of the Marine Biological Association of the United Kingdom* 95, 929–940. doi: 10.1017/S0025315414001623.
- Sars M.** (1835) *Beskrivelser og Jagttagelser over nogle moerkelige eller nye i Havet ved den Bergenske Kyst levende Dyr af Polypernes, Acalephernes, Radiaternes, Annelidernes og Molluskernes classer, med en kort Oversigt over de hidtil af Forfatteren sammesteds fundne Arter og deres Forekommen*. Bergen: Thorstein Halleger's Forlag hos Chr. Dahl. doi: 10.5962/bhl.title.13017.
- Sars M.** (1856) Nye Annelider. *Fauna Littoralis Norvegiae* 2, 1–24.
- Terraneo T.I., Berumen M.L., Arrigoni R., Waheed Z., Bouwmeester J., Caragnano A., Stefani F. and Benzoni F.** (2014) *Pachyseris inattesa* sp. n. (Cnidaria, Anthozoa, Scleractinia): a new reef coral species from the Red Sea and its phylogenetic relationships. *ZooKeys* 433, 1–30.
- Wehe T.** (2009) Aspekte zur Diversität der Polychaeta (Annelida) unter besonderer Berücksichtigung der Publikationen von Volker Storch nebst der Beschreibung einer neuen Art der Ampharetidae. *Umweltwissenschaften und Schadstoff-Forschung* 21, 223–233. doi: 10.1007/s12302-009-0048-2.
- and
- Wehe T. and Fiege D.** (2002) Annotated checklist of the polychaete species of the seas surrounding the Arabian Peninsula: Red Sea, Gulf of Aden, Arabian Sea, Gulf of Oman, Arabian Gulf. *Fauna of Arabia* 19, 7–238.

Correspondence should be addressed to:

M.G. Reuscher
Harte Research Institute for Gulf of Mexico Studies,
Texas A&M University – Corpus Christi, 6300 Ocean Drive,
Unit 5869, Corpus Christi, TX 78412-5869, USA
email: michael.reuscher@tamucc.edu