

A New Species of *Heterospio* (Polychaeta, Longosomatidae) from Offshore Angola

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A new polychaete species of the longosomatid genus *Heterospio* is described from the coastal shelf off Angola in the Southeast Atlantic. This species was found from two sampling points at depths of 105 and 146 m, and differs from other members of the family in having eight short thoracic setigers, in the lack of neuropodial acicular hooks in the first setiger, and in having only three pairs of branchiae. The material consists of 21 adults with gametes in the body cavity of posterior segments and one juvenile. Size-dependent variation in morphological features such as the length of midbody setigers, number of spines per rami, and occurrence of cinctures, is discussed. A key to the currently recognized species and possible undescribed forms of *Heterospio* is given.

Key words: males, females, juvenile, developmental stages, morphology, Angola, world key

INTRODUCTION

Longosomatidae Hartmann, 1944 is a small family of the Polychaeta and comprises only one genus, *Heterospio* Ehlers, 1874. Borowski (1994) reviewed this genus and recognized six species, all characterized by a short branchiate thorax and a modified midbody region with extremely elongated segments. Most of these species are very rare and have been found only from restricted geographic regions: *H. catalinensis* (Hartman, 1944) from California; *H. sinica* Wu and Chen, 1966 from China; *H. peruana* Borowski, 1994 from Peru; *H. mediterranea* Laubier, Picard and Ramus, 1973; and *H. reducta* Laubier, Picard and Ramus, 1973 from the Mediterranean Sea. In contrast, *H. longissima* Ehlers, 1874 has been reported from a much broader area including West, North, and East Atlantic and Pacific regions, and the Arabian Sea and Red Sea.

During a benthic investigation of the coastal shelf zone off Namibia and Angola, we collected 22 specimens. We identified them to the genus *Heterospio*, but they differed from any known species of the genus in some morphological features. We thus described them as a new species.

MATERIALS AND METHODS

Benthic organisms were collected by grab from depths of 105 and 146 m during the cruise of the research vessel *Alexander von Humboldt* in May and June 2004 (AHAB-9). Sample were fixed in 4% buffered formalin in seawater and later sorted under a stereomicroscope. The animals were then preserved in 70% ethanol and examined with a light microscope at up to 800X magnification. Scanning electron microscopic (SEM) studies were performed by means of a Cam Scan 44WEX. Specimens were viewed at a temperature of 4°C, a pressure of 500–600 Pa, and a humidity of 60–70% without any further pretreatment. Specimens of *Heterospio*

peruana Borowski, 1994 deposited in the Senckenberg Museum (SMF 5091/1; Frankfurt, Germany), and *H. mediterranea* and *H. reducta* deposited in Museum national d'Histoire naturelle Paris (AE 448, AE 449) were also examined.

The holotype and four paratypes of *Heterospio angolana* sp. nov. were deposited in the Senckenberg Museum, Frankfurt, Germany (SMF); four paratypes were deposited in The Natural History Museum, London, UK (BMNH); and four paratypes were deposited in National Museum of Natural History, Smithsonian Institution, Washington, USA (USNM).

SYSTEMATICS

Longosomatidae Hartman, 1944

Heterospio Ehlers, 1874

Heterospio angolana sp. nov.

(Figs. 1–5)

Diagnosis. A species of *Heterospio* with 15 or more setigers in adults; anterior region with eight short setigers, with two to three pairs of branchiae beginning on setiger 2, without neuropodial hooks; middle region with at least seven greatly elongated setigers, cinctures of setae beginning on setiger 11 in adults, cinctures of subuluncini and distally pointed spines arranged in two rows from setigers 12 to at least 15.

Material examined. *Holotype.* South-East Atlantic, coastal shelf off Angola, 105 m, 25 May 2004, AHAB9, CL5-71-1, S. Forster, grab sampling, 9°26.192'S, 12°49.925'E, salinity 35.7 psu, temperature 16.4°C, oxygen 1.36 ml/l, anterior fragment of 15 setigers (SMF 18808).

Paratypes. Anterior fragments with eight thoracic setigers and three or four midbody setigers, 19–43 mm long, same data as for holotype. South-East Atlantic, coastal shelf off Angola, 146 m, 25 May 2004, AHAB9, CL4–72, S. Forster, grab sampling, 9°26.373'S, 12°44.841'E, salinity 35.6 psu, temperature 15.6°C, oxygen 1.17 ml/l: two males, anterior fragments of 12 setigers (SMF 18809, SMF 18812); four females, anterior fragments of 12 or 13 setigers (SMF 18810, USNM 1128951, USNM 1128953, BMNH 2009.12);

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doi:10.2108/zsj.26.735

one juvenile, anterior fragment of 13 setigers (SMF 18811); five paratypes, anterior fragments of 11 or 12 setigers (USNM 1128952, 1128954, BMNH 2009.10, BMNH 2009.11, BMNH 2009.12).

Other material. Nine anterior fragments deposited at the Leibniz Institute for Baltic Sea Research Warnemünde (IOW-AN0001 to IOW-AN0009).

Etymology. The name refers to Angola, whose shelf contains the type locality of this species.

Description of adults. Body threadlike. Pale in ethanol without special pigmentation. Body divided into two regions: thoracic region short; midbody region with greatly elongated, cylindrical setigers. Holotype an anterior fragment with 15 setigers, length 42 mm; maximum width 0.23 mm in the first three setigers. Prostomium anteriorly conical, rounded (Figs. 1, 2). Eyes absent. Nuchal grooves posterio-lateral to prostomium. Tentacles or tentacle scars in all specimens absent. Pharynx sac-like, unarmed.

Thorax with eight setigers (Figs. 1, 2). Anterior region slightly flattened dorso-ventrally until setiger 7. Body rounded posteriorly from setiger 8. Thoracic setigers 1–5 somewhat more than twice as wide as long. Setigers 2–4 slightly longer than setigers 1 and 5. Setigers progressively longer from setiger 6 onwards. Setiger 6 only slightly wider than it is long (length:width=0.75:1); setiger 7 longer than it is wide (1.2:1), 0.23 mm long; setiger eight 0.3 mm long (2.1:1). Setiger 8 with posterior margin indistinct. Holotype with two pairs of branchiae on setigers 2 and 3 and one additional branchia on setiger 4. All other thoracic setigers abbranchiate.

Setiger 9 is the first elongated midbody setiger, 1.7 mm long; setigers becoming progressively longer, with setigers 10, 11, and 12 measuring 5.2, 9.0, and 18 mm, respectively. All midbody setigers cylindrical in cross section. Posterior region and pygidium unknown.

All setigers with biramous parapodia. Neuropodial setal lobes present from setigers 1–5, becoming progressively smaller. Noto- and neuropodial setal fascicles well separated in setigers 1–10. Parapodia dorso-lateral in setigers 1–4, reaching highest dorsal position in setigers 2 and 3.

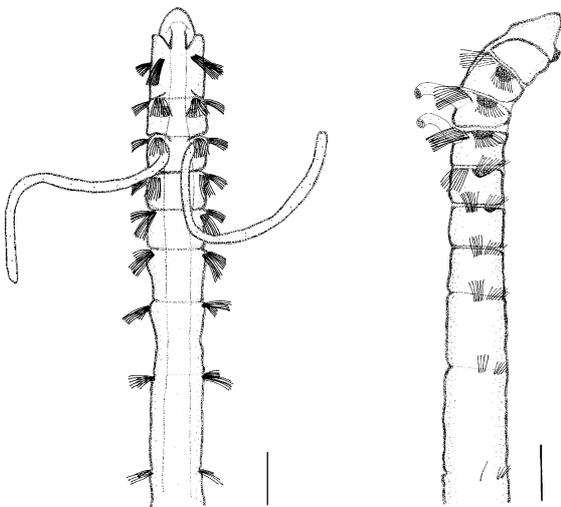


Fig. 1. *Heterospio angolana* sp. nov. in dorsal view. Scale bar, 200 μ m.

Fig. 2. *Heterospio angolana* sp. nov. in lateral view. Scale bar, 200 μ m.

Notopodia of setigers 2 and 3 in dorsal position anterior to branchiae. Parapodia of setiger 5 lateral and posteriorly latero-ventral to setiger 9.

Parapodia from setiger 11 onwards forming nearly closed, flange-like cinctures. Setae of setigers 1–10 simple capillaries, 2 μ m in diameter, in fan-shaped fascicle (Fig. 3). Notopodial setae from setigers 1–9 are 1.5 times as long as neuropodial setae. Number of setae per fascicle is 20–30 in setigers 1–7 and decreases posteriorly to 15–20 in setigers 7–10. Setae of setigers 1–7 are 100–150 μ m long; setae of setigers 8–10 are markedly shorter and finer and are only 50–100 μ m long.

Neuropodial hooks absent in thoracic setigers. Setae of setiger 11 simple capillaries 50–70 μ m long, arranged as cincture. Setae of setigers 12–15 arranged in two rows. In anterior row, subuluncini 2.8–3.4 μ m in diameter and 70–80 μ m long; in posterior row, distally pointed spines 4.5–5 μ m in diameter and 40–50 μ m long (Figs. 3–5).

Description of juveniles. Paratype SMF 18811, an

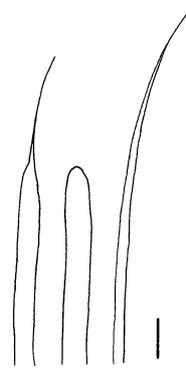


Fig. 3. Setae of *Heterospio angolana* sp. nov. Subuluncini from setiger 12 (left), distally pointed spine from setiger 12 (middle), and capillary seta typical of anterior setigers (right). Scale bar, 10 μ m.



Fig. 4. SEM micrograph of setiger 12 of *Heterospio angolana* sp. nov., showing the subuluncini in the anterior row. Scale bar, 20 μ m.



Fig. 5. SEM micrograph of setiger 12 of *Heterospio angolana* sp. nov., showing the distally pointed spines in the posterior row. Scale bar, 20 μ m.

anterior fragment with 13 setigers, length 10 mm. One pair of branchiae on setiger 2. No further branchial scars visible. Body resembles adult animals in main features. Substantial differences between juvenile and adult *H. angolana* sp. nov. occur in number of branchiae, length of midbody setigers, and setal arrangement in midbody segments. All thoracic setigers are slightly shorter compared to adults. Setigers become progressively longer from setiger 7 onwards (from setiger 6 in adults), setiger 9 twice as long as setiger 8, length of each midbody setiger 1.6–1.8 mm. Setae of setigers 11–16 not arranged in cinctures. Setiger 11 simple capillaries in fan-shaped fascicles. Setae of setigers comprise 12–16 two rows of subuluncini and distally pointed spines in fan-shaped fascicles, 12–15 setae per row and fascicle.

Distribution. Known only from type locality.

Remarks. The holotype and most paratypes have two pairs of branchiae on setigers 2 and 3 and one additional pair of branchiae on setiger 4. Branchiae are lacking in some specimens, but branchial scars are clearly visible on setigers 2–4. Only one paratype has three pairs of branchiae on setigers 2–4.

Heterospio angolana sp. nov. can be clearly distinguished from most other longosomatids by the smaller number of thoracic setigers. The first elongated setiger in *H. angolana* sp. nov. is setiger 9, whereas it is setiger 10 in most other longosomatids (Borowski, 1994). Specimens are easily distinguished from *H. reducta*, which has seven thoracic setigers, with setiger 8 the first elongated setiger. *Heterospio angolana* sp. nov. most closely resembles *Heterospio mediterranea*, *Heterospio* sp. A, and *Heterospio* sp. 1 (Uebelacker, 1984; Borowski, 1994). *Heterospio angolana* sp. nov. is clearly distinguished from *Heterospio* sp. A by the lack of acicular hooks in the first neuropodia, the first occurrence of subuluncini and parapodia in cinctures, and the lower number of branchiae. It is separated from *H. mediterranea* by the shape of the prostomium and the much lower number of branchiae: five or six pairs in *Heterospio* sp. A and seven pairs in *H. mediterranea* from setigers 2–8. In contrast, *H. angolana* sp. nov. has three pairs of branchiae, only from setigers 2–4. *Heterospio* sp. A has subuluncini and cinctures from setigers 13–16, whereas *H. angolana* sp. nov. has subuluncini from setiger 12 onwards. *Heterospio angolana* sp. nov. is distinguished from *Heterospio* sp. 1 by the shape of the prostomium, which is slender and rectangular with rounded corners in *Heterospio* sp. 1, but slender, conical, and anteriorly rounded in *H. angolana* sp. nov.

The finding and description of a juvenile of *H. angolana* sp. nov. is of significant taxonomic interest. The juvenile shows the general morphological features of the adult in relative setiger lengths in the thoracic setigers. Adult *H. angolana* sp. nov. develop more branchiae during growth, and the short midbody setigers of the juvenile stage are 4–10 times as long in adults. The great length of the midbody setigers could be related to the production of gametes, which were numerous from setiger 12 onwards.

World key to adults of species of *Heterospio*

1 Body with seven thoracic setigers, first elongated segment is setiger 8

H. reducta Laubier, Picard and Ramus, 1973

- Body with more than seven thoracic setigers 2
2 Body with eight thoracic setigers, first elongated segment is setiger 9 3
- Body with nine thoracic setigers, first elongated segment is setiger 10 7
3 Acicular hooks in neuropodium 1

Heterospio sp. A

- Without acicular hooks in neuropodium 1 4
4 Only up to three pairs of branchiae on setigers 2–4 6
- At least seven pairs of branchiae from setiger 2 onwards 5

5 Simple capillaries and subuluncini in cinctures on setiger 12

Heterospio mediterranea Laubier, Picard and Ramus, 1973

- Simple capillaries in fan shaped fascicles on setiger 12

Heterospio longissima Ehlers, 1874

6 Three pairs of branchiae on setigers 2–4, setal cinctures present from setiger 11

H. angolana sp. nov.

- One pair of branchiae on setigers 2, setal cinctures absent on setiger 11

H. sp.1.

7 Acicular hooks in neuropodium 1

H. catalinensis (Hartman, 1944)

- Without acicular hooks in neuropodium 1 8

8 Aristate setae present in elongated segments 9

- Aristate setae absent in elongated segments

H. longissima sensu Hartman

9 Aristate setae present from setigers 10 or 11

H. peruana Borowski, 1994

- Aristate setae present from setiger 13

H. sinica Wu and Chen, 1966

ACKNOWLEDGMENTS

We thank Angus Atkinson for checking the English language.

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(Received October 23, 2008 / Accepted July 2, 2009)