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Rescuing the past: description of two new species of *Meiodorvillea* Jumars, 1974 (Annelida: dorvilleidae) based on museum specimens and literature

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Abstract
The genus *Meiodorvillea* Jumars, 1974 was established to better categorize the species *M. minuta* (Hartman 1965), which was previously classified under the genus *Protodorvillea* Pettibone 1961. The prefix "*Meio*" refers to the meiofaunal size of the genus, and along with their fragile bodies makes these organisms difficult to collect and identify. As a result, many specimens are only deposited at the genus or family level in museums. By examining unidentified specimens deposited at the Smithsonian National Museum of Natural History, we identified and described two new species of the genus: *Meiodorvillea wolfi* **sp. nov**. and *Meiodorvillea smithsoniensis* **sp. nov**. The former is morphologically distinct from its congeners due to its anteriormost free maxillae plate, which has a pincer-like format. The latter species is characterized by the presence of furcate chaetae in the first two parapodia, which are subsequently replaced by a geniculate chaeta in the next few parapodia, and then revert to a furcate chaeta thereafter. An updated identification key for the species of *Meiodorvillea* and an emended diagnosis have also been provided.

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Keywords: *Taxonomy*, *morphology*, *Euncida, collections*, "*Polychaeta*"

Introduction

The family Dorvilleidae Chamberlin, 1919 presents some of the smallest annelids, measuring less than 1 mm, while certain species can reach more than 10 cm. These organisms occur worldwide from intertidal zones to great depth (Rouse et al. 2022). Dorvilleiade belongs to the order Eunicida, a taxon of Annelida characterized by the presence of an internal jaw apparatus composed of a ventral mandible and dorsal maxillae, exhibiting significant morphological diversity. Dorvilleidae are the only extant family of the order with a ctenognath-type jaw apparatus, which consists of two or four rows of paired symmetrical or subsymmetrical maxillary plates and an unpaired small, sometimes absent, carrier-like structure (Zanol et al. 2021).

Currently, Dorvilleidae comprises 32 genera, 13 of which are monotypic, while others contain only a few described species (Read & Fauchald 2024). The genus *Meiodorvillea* Jumars, 1974 was

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established to accommodate three species, including *Meiodorvillea minuta* (Hartman 1965), which was previously classified under the genus *Protodorvillea* Pettibone, 1961. The creation of this genus and the reclassification of this species were needed to avoid morphological heterogeneity within *Protodorvillea* (Jumars 1974). *Meiodorvillea* species are small-bodied dorvilleids, with the prefix "*Meio*" referring to their meiofaunal size. They exhibit small prostomial, parapodial and pygidial appendages. Their maxillae consist of a small carrier-like structure and a pair of basal plates anteriorly followed by two symmetrical rows of approximately 14 free maxillary plates each. Five species of *Meiodorvillea* have been described, three of which were recently registered and described in a taxonomic revision of the genus (de Oliveira Bonaldo et al. 2022): *M. minuta* (Hartman 1965), *M. apalpata* Jumars, 1974, *M. hartmanae* Bonaldo, Steiner and Amaral, 2022, *M. jumarsi* Bonaldo, Steiner and Amaral and *M. penhae* Bonado, Steiner and Amaral, 2022. *Meiodorvillea chilensis* (Hartmann-Schröder 1965) is classified as a *species inquirenda*, as proposed by de Oliveira Bonaldo et al. (2022).

A significant knowledge gap regarding the diversity of dorvilleids is evident in museum collections, where many specimens are deposited without specific identification or are only identified at the genus or family level. The shortage of specialized taxonomists contributes to the lack of taxonomic information about this group. An example of this issue can be found in the study by Wolf (1984), who identified, described, and illustrated annelid specimens from the northern Gulf of Mexico. Due to limited knowledge of certain Dorvilleidae groups at that time, Wolf (1984) classified them into morphotypes. He later worked on some of these morphotypes, describing new species and even new genera for the family, such as *Diaphorosoma magnavena* Wolf, 1986. However, other specimens remain identified only as morphotypes, including *Meiodorvillea* sp. A and *Meiodorvillea* sp. B *sensu* Wolf (1984).

The collection at the Smithsonian National Museum of Natural History (USNM) houses the unidentified material studied by Wolf (1984), along with many other lots of Dorvilleidae specimens collected worldwide and identified only as *Meiodorvillea* sp. Herein we present a reanalysis of these individuals based on new morphological information reported by de Oliveira Bonaldo et al. (2022). This analysis allowed us to identify *Meiodorvillea* sp. B as *M. minuta* and to describe *Meiodorvillea* sp. A as a new species, designated *M. wolfi* **sp. nov**. Additionally, the *Meiodorvillea* material from USNM revealed another new species, which we describe here as *M. smithsoniensis* **sp. nov.**

Material and methods

All *Meiodorvillea* specimens were analyzed at the Smithsonian Institution, Museum Support Center (MSC/NMNH), where they are deposited. The specimens are preserved in 70% ethanol and they were externally examined first using an Olympus SZX16 stereomicroscope and, for a better view of the structures, a Meiji Techno MX compound microscope. The drawings were made with a camara lucida attached to the microscopes.

The specimens on permanent slides were prepared as described in Wolf's (1984) original analysis, employing CMCP-10 to clarify the tissue and facilitate examination of the internal jaw apparatus. Image editing, drawings, and figure preparations were carried out using Adobe® Photoshop, Adobe® Illustrator and Inkscape®.

Results

Taxonomy

Phylum Annelida Lamarck, 1802
Order Eunicida Fauchald, 1977
Family Dorvilleidae Chamberlin, 1919

Genus ***Meiodorvillea*** Jumars, 1974

Type species

Protodorvillea minuta Hartman, 1965
Meiodorvillea minuta (Hartman 1965) designated by Jumars 1974

Diagnosis (emended after de Oliveira Bonaldo et al. 2022)

Prostomium pear-shaped. One pair of simple antennae. One pair of simple palps, sometimes absent. Two peristomial rings. Small dorsal cirri sometimes present, without acicula. Small ventral cirri present. Supra-acicular chaeta: capillary, furcate and/or geniculate. Sub-acicular chaeta: compound and occasionally cultriforms. Pygidium with two pairs of simple pygidial cirri. Jaw apparatus with paired mandible medially fused without free or fused teeth. Maxillae with one pair of V-shaped dorsal carrier-like structures and one pair of smooth, rarely dentate, basal plates, each one fused posteriorly, and

free from each other. Ten to 15 pairs of free maxillary plates in two rows, anterior to the basal plates, denticulate on its margin (free maxillary plates absent in *M. apalpata*); anteriormost free maxillary plate with rasper-like or pincer-like format.

Remarks

The revision of *Meiodorvillea* by de Oliveira Bonaldo et al. (2022) provides an updated and amended diagnosis for the genus, building on the original description by Jumars (1974). In this context, we add a description of the newly identified morphology of the anteriormost maxillary plate, as observed in *Meiodorvillea wolfi* **sp. nov.**, which is described herein.

Seven species: *Meiodorvillea minuta* (Hartman, 1965), *M. apalpata* Jumars, 1974, *M. hartmanae* Bonaldo, Steiner and Amaral, 2022, *M. jumarsi* Bonaldo, Steiner and Amaral, 2022, *M. penhae* Bonaldo, Steiner and Amaral, 2022, *M. wolfi* **sp. nov.**, and *M. smithsoniensis* **sp. nov.**

Meiodorvillea wolfi sp. nov.

(Figures 1–3)
Meiodorvillea sp. A - *sensu* Wolf (1984)
urn:lsid:zoobank.org:act:8C7D4F36-42FB-429F-8288-751A40457592

Diagnosis. One pair of simple clavate antennae and one pair of simple clavate palps. Ventral cirrus papilliform present in all parapodia, except the first. Supra-acicular chaeta: capillary and furcate. Sub-acicular chaeta: compound heterogomph, dorsalmost compound of first few anterior chaetigers presenting bifid shafts with long and symmetrical tines, and occasionally cultriforms. Pair of mandibles medially fused. Maxillae with two rows of about 13 paired free maxillary plates, with the anteriormost being in pincer-like format; carrier-like structure slightly transparent; basal plates smooth and fused posteriorly.

Etymology. Masculine. The specific epithet "*wolfi*" honors Paul S. Wolf for his contribution to the understanding of the family Dorvilleidae and for first documenting the morphotype of the species described herein.

Type locality. North Atlantic Ocean, Gulf of Mexico, off Florida, United States of America, latitude: 26.7639, longitude: −82.7531, 24 m.

Type material.

Holotype. USNM 89586 (complete specimen mounted in a slide): North Atlantic Ocean, Gulf of Mexico, off Florida, United States of America, Lat.: 26.7639, Long.: −82.7531, 24 m, November 1980.

Paratypes. USNM 89587 (one complete specimen mounted on a slide): North Atlantic Ocean, Gulf of Mexico, off Florida, United States of America, Lat.: 26.7639, Long.: −82.7531, 24 m, November 1980.); USNM 89555 (three incomplete specimens): North Atlantic Ocean, Gulf of Mexico, off Florida, United States of America; Lat.: 25.7617, Long.: −83.1844, 54 m, August 1981).

Description of holotype (USNM 89586). Holotype complete specimen with 47 chaetigers, approximately 2.6 mm long and 0.18 mm wide in anterior region. Prostomium robust and pear shaped and anterior margin broad rounded; as wide as long. Ocelli absent. One pair of simple clavate/digitiform antennae approximately ⅓ the length of prostomium; inserted dorsally in the middle of the posterior half of prostomium (Figures 1(a), 2(a), 3(b)). One pair of small simple clavate palps, similar to antennae but smaller and less robust; approximately ½ the length of antennae; inserted ventrolaterally at the base of prostomium (Figures 1(a), 2(a), 3(b)). Two apodous and achaetous robust peristomial rings, similar to the following segments (Figures 1 (a), 2(a), 3(b)).

Parapodia uniramous cylindrical and slightly conical; length half the width of segment (Figures 1(c), 2 (c,d), 3(c-e)). One internal robust acicula. First parapodium without any parapodial cirri or appendage. Dorsal cirrus absent in all parapodia. Ventral cirri small, papilliform, inserted in the middle of parapodium present in all parapodia (Figures 1(c), 2(c), 3(c,d)) except the first. Parapodia from median and mainly posterior regions lengthens along with the ventralmost chaeta (Figure 3(d)).

Supra-acicular chaetae: (1) one thin, long, and capillary chaeta; from anterior region more robust, slightly limbate (Figures 2(d), 3(f)), (2) one short furcate chaeta with short symmetrical prongs with blunt tip and evident serration below the prongs (Figures 1d(a), 3(e)); from posterior region with thinner and longer prongs (Figures 1d(b), 3(f)). Sub-acicular chaetae: (3) three compound heterogomph falcigers (Figures 1d(c), 2(c-e)); shafts with bifid tip and slightly serrated; shafts of dorsalmost from anterior region with longer and Y-format tip

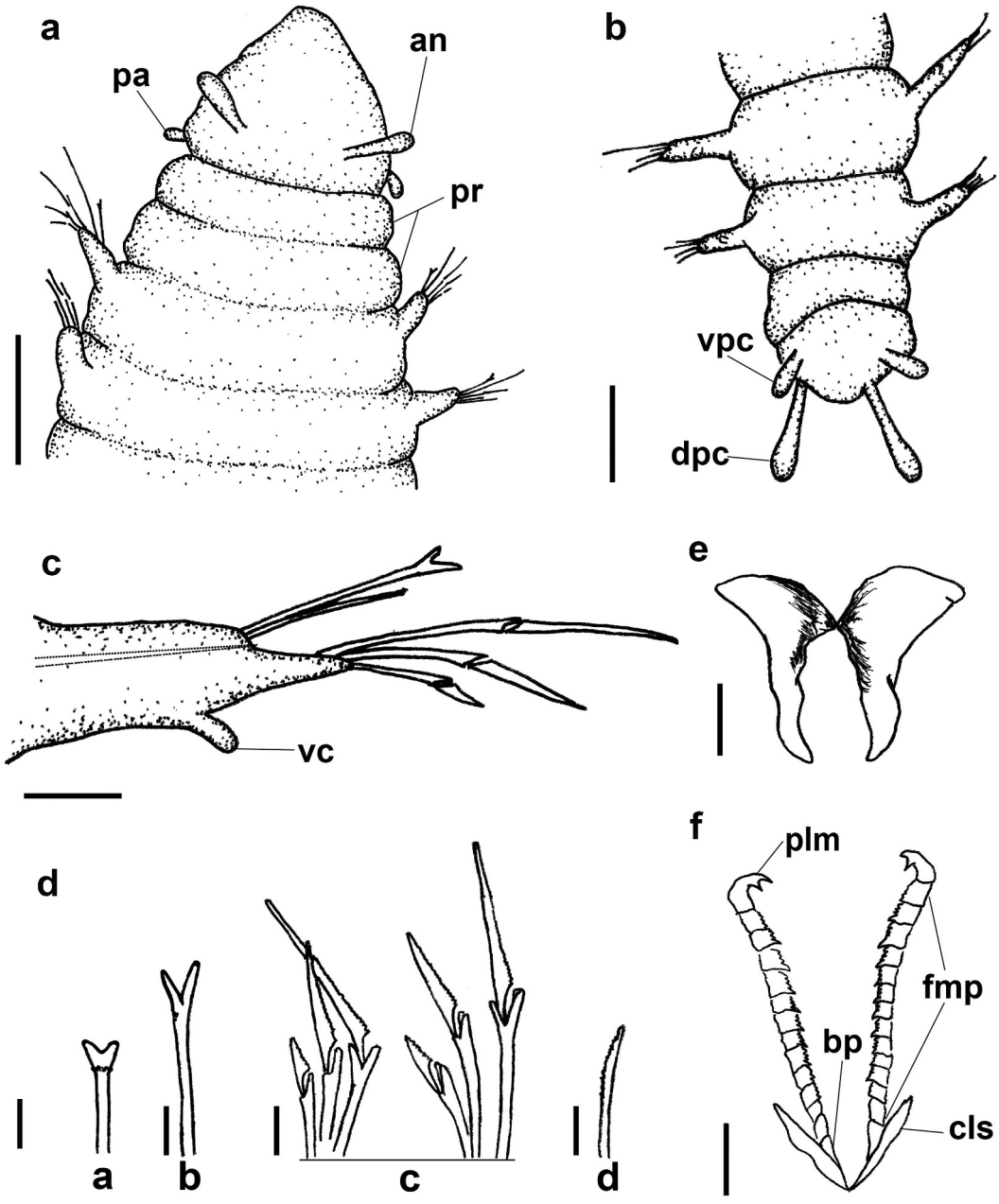

Figure 1. *Meiodorvillea wolfi* **sp. nov.** (a) anterior region in dorsal view; (b) posterior region, pygidium in ventral view; (c) parapodium; (d) chaeta, a) furcate from anterior region, b) furcate from posterior region, c) compound from two different parapodia from anterior region, d) cultriform chaeta; (e) mandible; (f) maxillae. *Abbreviations*: an: antennae, bp: basal plate, cls: carrier-like structure, dpc: dorsal pygidial cirri, fmp: free maxillary plates, pa: palps, plm: pincer-like maxillary plate, pr: peristomial rings, vc: ventral cirrus, vpc: ventral pygidial cirri. *Scale bars*: (a,b) 0.05 mm; (c,d,e,f) 0.01 mm.

(Figures 1d(c), 2(e)); blades with crescent sizes, the ventralmost shortest and dorsalmost the longest (Figures 1d(c), 2(e)); blades serrated and unidentate; (4) one serrated cultriform chaeta occasionally replacing the ventralmost compound in posterior chaetigers (Figures 1d(d), 3(d)).

Pygidium truncate, shorter than the previous segments and with two pairs of pygidial cirri; ventral pair short and clavate, approximately ½ the length of the pygidium; dorsal pair clavate, approximately 2–2.5× the length of the ventral pair (Figures 1(b), 2(b)).

Pair of mandibles butterfly shaped with anterior region broad and posterior region slender; medially connected and more sclerotized in this region; outer margin weakly sclerotized (Figures 1(e), 2(f)). Maxillae in V-format composed by two symmetrical rows of 13–14 pairs of free quadrangular maxillary

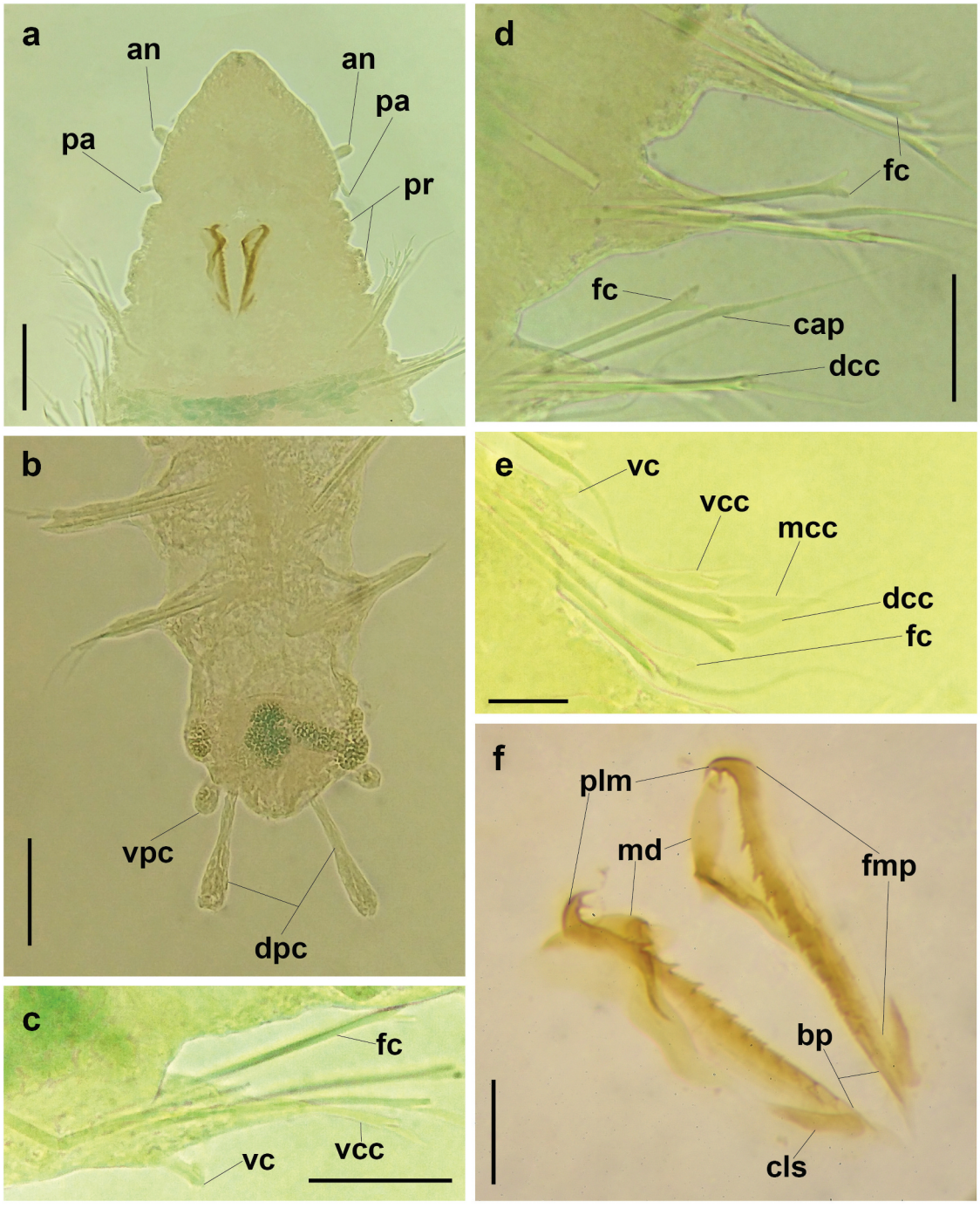

Figure 2. *Meiodorvillea wolfi* **sp. nov.** (Holotype USNM 89586) (a) anterior region in dorsal view; (b) posterior region, pygidium in ventral view; (c) parapodium from posterior region; (d) parapodia from median region and chaetae region; (e) chaetae from anterior region; (f) jaw apparatus. *Abbreviations*: an: antennae, bp: basal plate, cap: capillary chaeta, cls: carrier-like structure, dcc: dorsalmost compound chaeta, dpc: dorsal pygidial cirri, fc: furcate chaeta, fmp: free maxillary plates, mcc: median compound chaeta, md: mandible, pa: palps, plm: pincer-like maxillary plate, pr: peristomial rings, vc: central cirrus, vcc: ventralmost compound chaeta, vpc: ventral pygidial cirri. *Scale bars*: (a,b) 0.05 mm; (c,d) 0.02 mm; (e,f) 0.01 mm.

plates; plates with one anterior main fang and approximately 3–4 smaller teeth; two first posterior plates with subtle teeth and without main fang; anteriormost plate slender with more teeth and with a anterior bidentate and sharp hook; posterior basal plate smooth and weakly sclerotized,

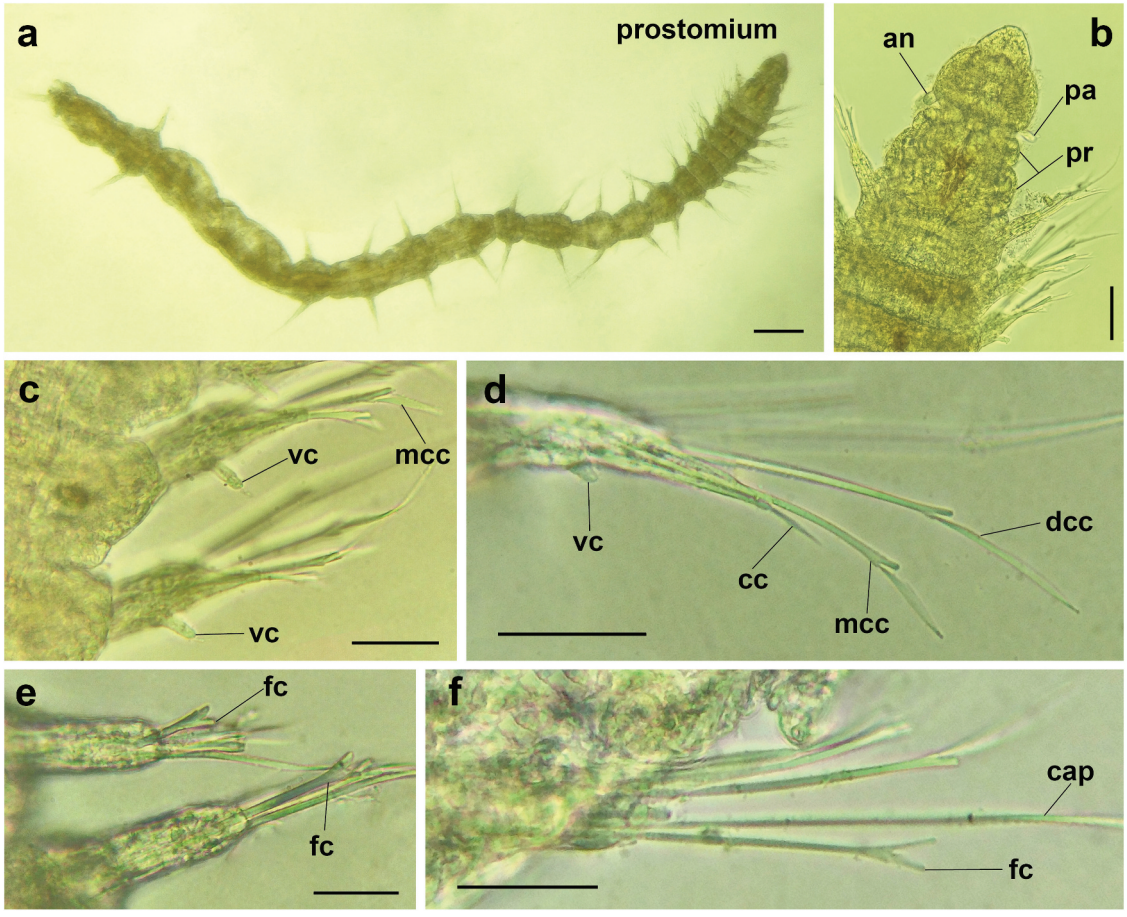

Figure 3. *Meiodorvillea wolfi* **sp. nov.** (a) incomplete specimen; (b) anterior region, in dorsal view; (c) parapodia from anterior region; (d) parapodium from posterior region; (e) first parapodia with furcate chaeta; (f) chaetae. *Abbreviations*: an: antennae, cap: capillary chaeta, cc: cultriform chaeta, dcc: dorsalmost compound chaeta, fc: furcate chaeta, mcc: median compound chaeta, pa: palps, pr: peristomial rings, vc: ventral cirrus. *Scale bars*: (a) 0.1 mm; (b) 0.03 mm; (c) 0.015 mm; (d,e,f) 0.012 mm.

apparently posteriorly fused; carrier-like structure robust, weakly sclerotized and in V-format, apparently posteriorly fused (Figures 1(f), 2(f)).

Variation. There is no significant morphological variation among the material analyzed, a complete paratype specimen, USNM 98587, presents 38 chaetigers and maxillae with 13 free maxillary plates; the antenna is shorter than that of the holotype, approximately ¼ the length of prostomium (but this may be a result of slide mounting).

Remarks. Meiodorvillea wolfi **sp. nov**. is distinguished from all its congeners primarily by its anteriormost free maxillary plate, which has a pincer-like format, whereas in other species, this plate is rounded with numerous small spines (described as rasp-like format by Wolf (1984)). *Meiodorvillea wolfi* **sp. nov**. has similarities to *M. hartmanae* in the presence of furcate chaetae and the absence of a dorsal cirrus. However, *M. wolfi* **sp. nov**. presents dorsalmost compound chaetae in the first few anterior chaetigers that feature bifids symmetrical tines, a characteristics it shares only with *M. jumarsi*. In contrast, *M. jumarsi* has a dorsal cirrus and geniculate chaeta in the first anterior chaetigers, both of which are absent in *M. wolfi* **sp. nov**. The geniculate chaetae are also present in *M. penhae*, distinguishing it from *M. wolfi* **sp. nov**. While *M. minuta* also exhibits furcate chaetae and lacks geniculate chaetae, it features a dorsal cirrus in some anterior chaetigers. Lastly, *M. apalpata* lacks both palps and furcate chaetae.

Location and bathymetry: known only from its type locality: North Atlantic Ocean, Gulf of Mexico, off Florida, United States of America, depth 24–54 m.

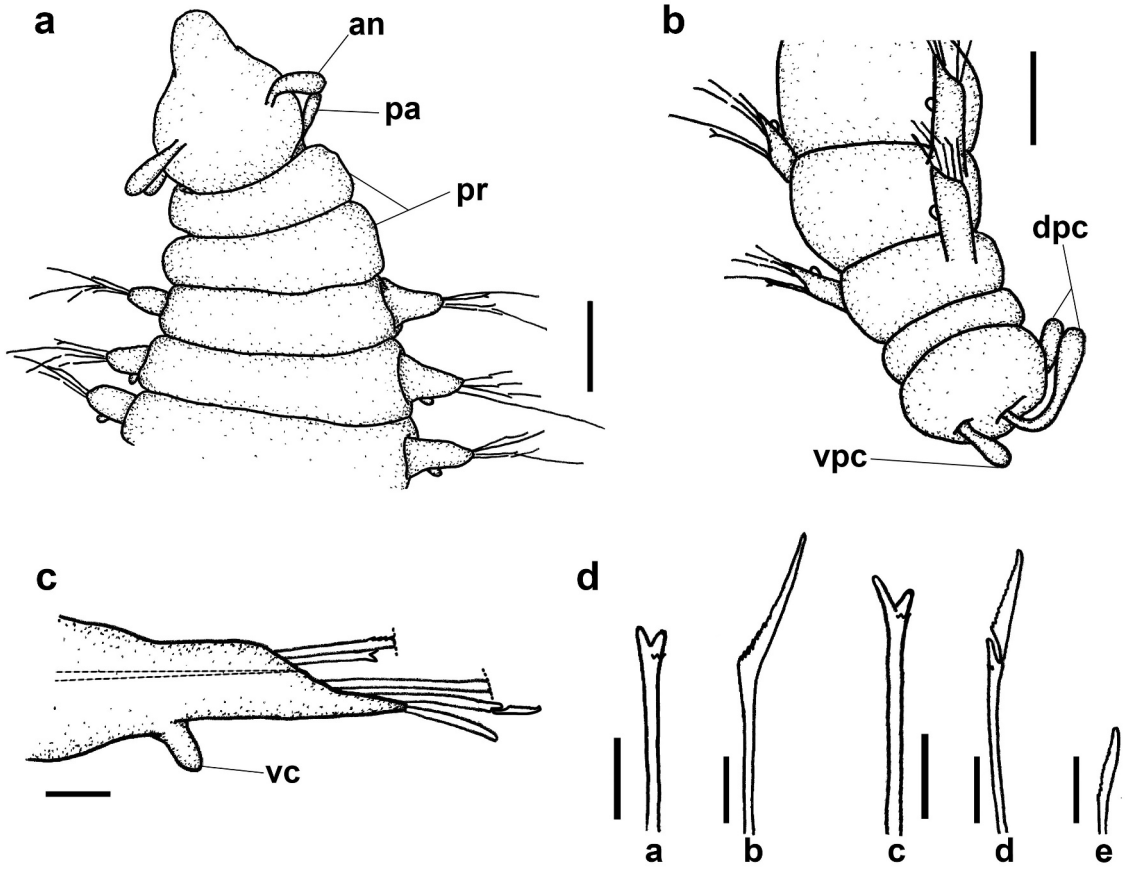

Figure 4. *Meiodorvillea smithsoniensis* **sp. nov.** (a) anterior region in dorsal view; (b) posterior region, pygidium lateral view; (c) parapodium in frontal view; (d) chaetae, a) furcate from parapodia 1 or 2, b) geniculate from anterior region, c) furcate from thereafter, d) dorsalmost compound, e) cultriform. *Abbreviations*: an: antennae, dpc: dorsal pygidial cirri, pa: palps, pr: peristomial rings, vc: ventral cirrus, vpc: ventral pygidial cirri. *Scale bars*: (a,b) 0.05 mm; (c,d) 0.01 mm.

***Meiodorvillea smithsoniensis* sp. nov.**

(Figures 4–6)
urn:lsid:zoobank.org:act:D8F8728F-642F-491E-B3DB-81984C0E457E

Diagnosis. One pair of simple clavate antennae and one pair of simple clavate palps. Ventral cirrus papilliform present in all parapodia, except the first. Supra-acicular chaeta: capillary and a furcate chaeta on parapodia 1 and 2, replaced by a geniculate chaeta present in a few anterior parapodia, replaced thereafter by a furcate chaeta. Sub-acicular chaeta: compound heterogomph falcigers/spinigers. Pair of mandibles medially fused. Maxillae with two rows of about 12–13 paired free maxillary plates, the anteriormost in rasper-like format; carrier-like structure present; basal plates smooth and fused posteriorly.

Etymology. Masculine. The specific epithet "*smithsoniensis*" refers to the Smithsonian Institution, where these specimens are deposited. This institution plays an essential role in enhancing global biodiversity knowledge and supports the research of many taxonomists, including a fellowship awarded to the first author.

Type locality. North Atlantic Ocean, Georges Bank, southern slope, off Massachusetts, United States of America, latitude: 40.48, longitude: −67.72, 175 m.

Type material.

Holotype. USNM 1606952 (complete specimen): North Atlantic Ocean, Georges Bank, southern slope, off Massachusetts, United States of America, Lat.: 40.48, Long.: −67.72, 175 m, August 1977.

Paratypes. USNM 1548511 (five incomplete specimens): North Atlantic Ocean, Georges Bank, southern slope, off Massachusetts, United States of America, Lat.: 40.48, Long.: −67.72, 175 m,

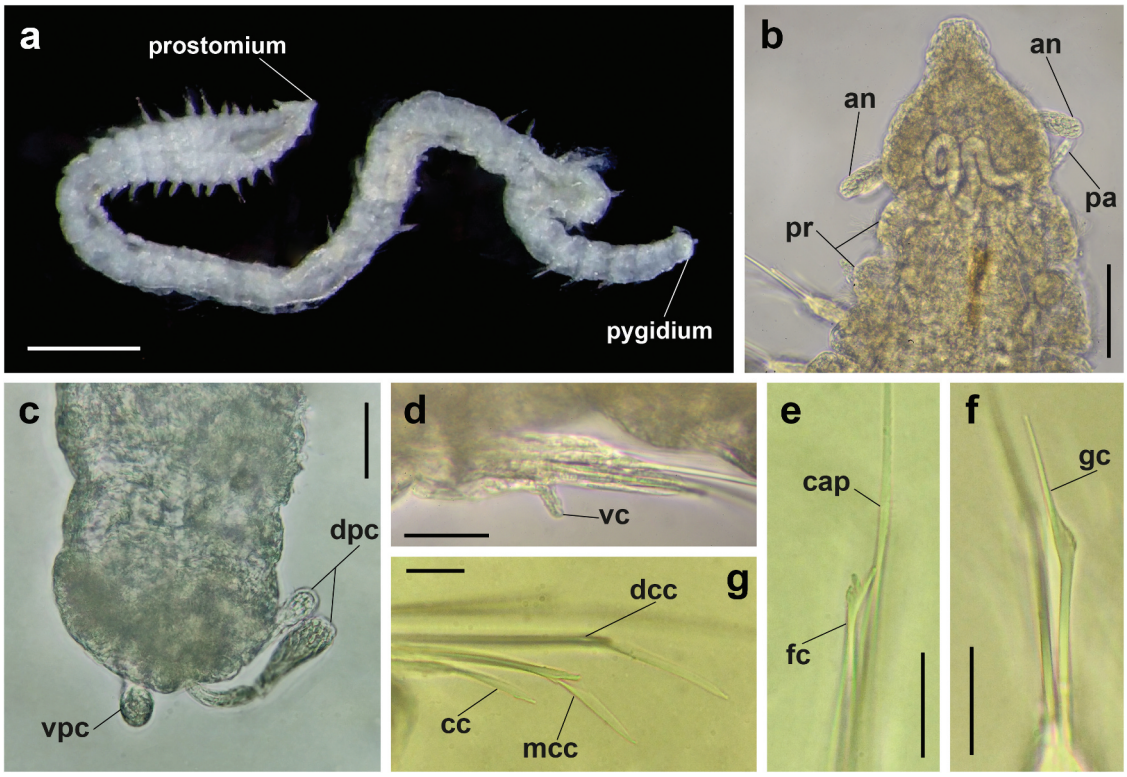

Figure 5. *Meiodorvillea smithsoniensis* **sp. nov.** (Holotype USNM 1606952). (a) entire complete specimen; (b) anterior region, prostomium in dorsal view; (c) pygidium, lateral view; (d) parapodium from median region; (e) chaetae from anterior region, furcate and capillary; (f) geniculate chaeta; (g) sub-acicular chaetae from posterior region. *Abbreviations*: an: antennae, cap: capillary chaeta, cc: cultriform chaeta, dcc: dorsalmost compound chaeta, dpc: dorsal pygidial cirri, fc: furcate chaeta, gc: geniculate chaeta, mcc: median compound chaeta, pa: palps, pr: peristomial rings, vc: ventral cirrus, vpc: ventral pygidial cirri. *Scale bars*: (a) 0.3 mm; (b) 0.055 mm; (c) 0.033 mm; (d) 0.017 mm; (e,g) 0.01 mm; (f) 0.008 mm.

August 1977; USNM 1606953 (one complete specimen): North Atlantic Ocean, Georges Bank, southern slope, off Massachusetts, United States of America, Lat.: 40.4939 Long.: −67.7203, 154 m, August 1977; USNM 1606951 (one incomplete specimen): North Atlantic Ocean, Lydonia Canyon, United States of America, Lat.: 40.3531 Long.: −67.5361, 539 m, 28 April 1985; USNM 1606946 (three complete specimens): North Atlantic Ocean, Georges Bank, southern slope, off Massachusetts, United States of America, Lat.: 40.9092 Long.: −66.7781, 92 m, November 1977.

Description of holotype (USNM 1606952). Complete specimen with 43 chaetigers, approximately 3.3 mm long and 0.19 mm wide in anterior region (Figure 5 (a)). Prostomium pear shaped with anterior margin accentuated and pointed and posterior half globular; as wide as long (Figures 4(a), 5(b)). One pair of simple clavate antennae inserted dorsally and slightly below the middle of prostomium; antennae 1/3 the length of prostomium (Figures 1(a), 2(b)). One pair of simple and small palps inserted ventrolaterally on the base of prostomium; palps ½ the length of antennae (Figures 4(a), 5(b)). Two achaetous and robust peristomial rings; slightly shorter than the following segments; anterior ring smaller than the posterior one (Figures 4a, 5b).

Parapodia robust and cylindrical/barrel shaped (Figures 4(c), 5(d)). First parapodium without dorsal and ventral cirrus. Dorsal cirrus absent in all parapodia. Ventral cirrus small and papilliform inserted in the middle of parapodium, present in all chaetigers except the first (Figures 4(c), 5(d)).

Supra-acicular chaeta: (1) one thin, long, and capillary chaeta; from anterior region more robust and slightly limbate (Figures 5(e), 6(b)), (2) one short furcate chaeta with symmetrical prongs with blunt tip and evident serration below the prongs; present only on the first two parapodia (Figures 4d (a), 5(e)), replaced thereafter by (3) one robust geniculate chaeta with distal portion tapered and

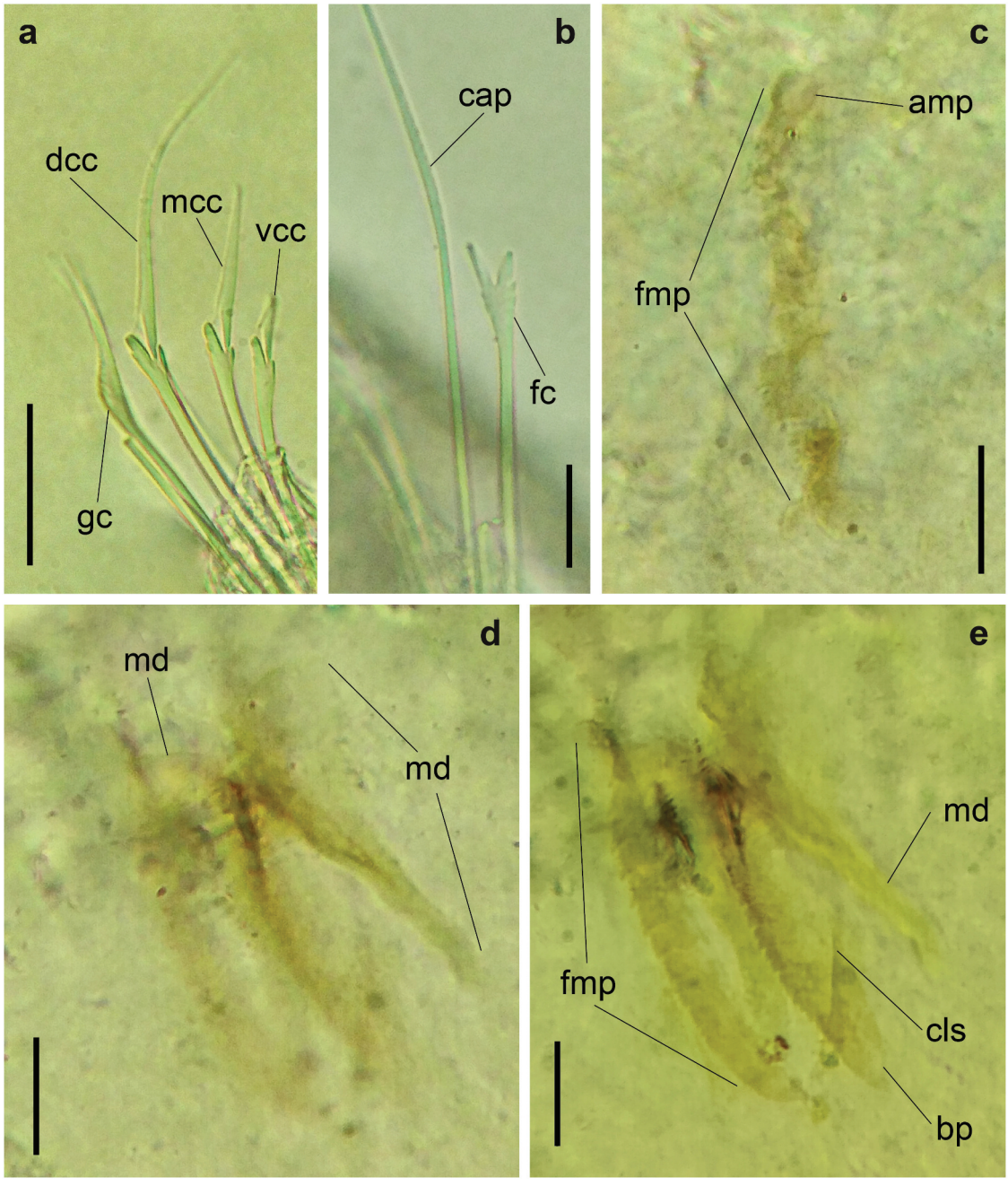

Figure 6. *Meiodorvillea smithsoniensis* **sp. nov.** (a) chaetae from anterior region; (b) supra-acicular chaetae from posterior region; (c) one row of maxillae; (d) mandible; (e) jaw apparatus. *Abbreviations*: amp: anteriormost free maxillary plate, bp: basal plate, cap: capillary plate, cls: carrier-like structure, dcc: dorsalmost compound chaeta, fc: furcate chaeta, fmp: free maxillary plates, gc: geniculate chaeta, mcc: median compound chaeta, md: mandible, vcc: ventralmost compound chaeta. *Scale bars*: (a) 0.017 mm; (b) 0.004 mm; (c-e) 0.016 mm.

serrated, present from parapodia 3 to 8 (Figures 4d (b), 5(f), 6(a)), replaced again by (4) one furcate chaeta similar to that present in parapodia 1 and 2 but with prongs and shafts larger, prongs subsymmetrical, one slightly larger, blunt tipped and with serration below the prongs (Figures 4d(c), 6(b)). Sub-acicular chaeta: (5) three compound heterogomph falcigers; shafts with bifid tip and slightly serrated; blades with crescent size, the ventralmost being the shortest and the dorsalmost the longest; blades serrated and unidentate (Figures 4d (d), 5(g), 6(a)); (6) one serrated cultriform chaeta occasionally replacing the ventralmost compound in posterior chaetigers (Figures 4d(e), 5(g)).

Pygidium truncate, less wide than the previous segments and with two pairs of pygidial cirri; dorsal pair simple clavate, a little longer than the pygidium length; ventral pair clavate, ½ the length of dorsal pair (Figures 4(b), 5(c)).

Pair of mandibles butterfly shaped and medially connected; anterior region broad and posterior region slender (Figure 6(d,e)). Maxillae composed of a pair of smooth V-format basal plates posteriorly weakly fused, followed by two symmetrical rows composed by 13 rectangular free maxillary plates; plates with posterior main fang followed by 3–4 posterior teeth; anteriormost plate rounded with numerous small spines (Figure 6(c-e)).

Variation. Complete specimens with number of chaetigers varying from 41 to 56. The first furcate chaeta can be present from parapodia 1–3, then replaced by the geniculate chaeta. Geniculate chaeta present from parapodia 3–4 to 5–8 then replaced by a furcate chaeta thereafter. The presence of cultriform chaeta replacing the ventralmost compound chaeta in some last chaetigers from the posterior region is occasional.

Remarks. The alternation between furcate and geniculate chaeta in the supra-acicular fascicles, parapodia 1 and 2 possessing furcate chaetae, replaced by geniculate chaetae in the next few anterior parapodia, transitioning to a furcate chaeta in subsequent segments, is a distinctive feature of *Meiodorvillea smithsoniensis* **sp. nov**. In contrast, *Meiodorvillea jumarsi* also exhibits geniculate chaetae in its first few anterior anterior parapodia, which are then replaced by furcate chaetae; however its parapodia 1 and 2 possess geniculate chaetae as well. Additionally, *M. jumarsi* has dorsal cirri in its first anterior parapodia, similar to *M. minuta*, which are absent in *M. smithsoniensis* **sp. nov**. Notably, geniculate chaetae are also absent in *M. minuta*. *Meiodorvillea smithsoniensis* **sp. nov**. resembles *M. hartmanae* and *M. wolfi* **sp. nov**. in lacking dorsal cirri, but it differs in having geniculate chaetae, which are absent in both of those species. *Meiodorvillea penhae* possess furcate chaetae in a few anterior parapodia, which are then replaced by geniculate chaetae, contrasting with the pattern observed in *M. smithsoniensis* **sp. nov**. Finally, *M. apalpata* can be distinguished from *M. smithsoniensis* **sp. nov**. by the absence of both furcate chaetae and palps.

Location and bathymetry. Known only from the locality of the type material: North Atlantic Ocean, United States of America: Georges Bank, southern slope, off Massachusetts and Lydonia Canyon, depth 92–539 m.

Discussion

The development of new methodologies and tools which were not available in the past, combined with the reanalysis of museum specimens, can significantly enhance taxonomic studies and lead to more accurate classification of organisms (Winston 2007). By revisiting specimens in the USNM collection and integrating data from the existing literature, we were able to identify two new species of *Meiodorvillea*.

Wolf (1984) described two morphotypes of *Meiodorvillea*: morphotype sp. A, characterized by a unique morphology of the jaw apparatus with a pincer-like format of the anteriormost free maxillary plate; and morphotype sp. B, which resembles *M. minuta* but differs in having dorsal cirri in only a few anterior parapodia. The original description of *M. minuta* indicates that dorsal cirri were present in all parapodia except the first.

de Oliveira Bonaldo et al. (2022) reexamined the type series of the two previously known species, *M. minuta* and *M. apalpata*, deposited at the Los Angeles County Museum (LACM-AHF). They found that the small and ovoid dorsal cirri of *M. minuta* are present only in a few anterior parapodia, excluding the first, contradicting Hartman's (1965) original description. This finding enabled the identification of morphotype *Meiodorvillea* sp. B as *M. minuta*. Meanwhile, the unique anteriormost free maxillary plate in pincer-like format of *Meiodorvillea* sp. A supports its classification as a new species, which we describe here as *Meiodorvillea wolfi* **sp. nov.**

Wolf (1984) noted a mosaic of morphological characteristics among *Meiodorvillea* species, a pattern that de Oliveira Bonaldo et al. (2022) also observed in their revision. Below, we discuss and compare key characteristics to distinguish the two new species from their congeners.

Furcate and geniculate chaetae

The presence and format of furcate and geniculate chaetae are key distinguishing features within the genus. All species possess a long capillary chaeta in the supra-acicular fascicle, but the accompanying chaetae vary. Species such as *M. minuta*, *M. hartmanae*, and *M. wolfi* **sp. nov**. display only furcate chaetae, while *M. apalpata* features only geniculate chaetae. *Meiodorvillea penhae* exhibits furcate chaetae in a few anterior parapodia, which are then replaced by geniculate chaetae, while *M. jumarsi* shows the opposite pattern: it presents geniculate chaetae in a few anterior parapodia which are then replaced by

geniculate chaetae thereafter. *Meiodorvillea smithsoniensis* **sp. nov**. is similar to *M. jumarsi* but it presents the two first parapodia with furcate chaetae.

Compound chaetae

The format of the three compound chaetae in the subacicular fascicle is consistent across all *Meiodorvillea* species. However, *M. jumarsi* and *M. wolfi* **sp. nov**. have dorsalmost compound chaetae in a few anterior parapodia, characterized by symmetrical prongs that are longer than the median and ventral chaetae.

Dorsal cirri

Dorsal cirri are present only in *M. minuta* and *M. jumarsi*, with both species having them in only a few anterior parapodia, excluding the first. The dorsal cirri of *M. jumarsi* are larger and more prominent..... than the small, ovoid cirri found in *M. minuta*.

Jaw apparatus

The jaw apparatus is similar across *Meiodorvillea* species, featuring a pair of fused basal plates anteriorly followed by two symmetrical rows of free rectangular and dentate maxillary plates. The number of free maxillary plates varies from 10 to 15. A notable difference is observed in *Meiodorvillea wolfi* **sp. nov**., which has a slender, curved anteriormost free maxillary plate shaped like a pincer, presenting two prominent main fangs. In contrast, other species exhibit a rounded, rasper-like format (Wolf 1984) with multiple small spines.

Wolf (1984) questioned that the basal plates of the morphotypes analyzed were neither posteriorly fused nor connected. The posterior region of the basal plates appears weakly sclerotized and transparent, complicating definitive observations. The process of preparing permanent slides can compress specimens, enhancing the visibility of morphological structures, but may also impact delicate features like the jaw apparatus. For instance, in the slide of the holotype (USNM 89586), the mandibles appear separated, despite being known to be connected in Dorvilleidae. If this separation occurs with the mandibles, which are strongly sclerotized in the medial region, it raises the possibility that a similar occurrence may affect the basal plates.

Key to identification for all the species of *Meiodorvillea*

1a) presence of palps 2
1b) absence of palps ..... *Meiodorvillea apalpata*
2a) presence of dorsal cirri on first few parapodia from anterior region 3
2b) absence of dorsal cirri 4
3a) absence of geniculate chaeta.....*Meiodorvillea minuta*
3b) presence of geniculate chaeta only in first few parapodia from anterior region.....*Meiodorvillea jumarsi*
4a) absence of geniculate chaeta 5
4b) presence of geniculate chaeta 6
5a) dorsalmost compound chaetae from anterior region with shaft robust and symmetrical Y-shaped ..... *Meiodorvillea wolfi* **sp. nov.**
5b) dorsalmost compound chaetae from anterior region with shaft short and asymmetrical .....*Meiodorvillea hartmanae*
6a) presence of geniculate chaetae in first few anterior parapodia, replaced thereafter by furcate chaetae .....*Meiodorvillea smithsoniensis* **sp. nov.**
6b) presence of furcate chaetae in first few anterior parapodia, replaced thereafter by geniculate chaetae..... *Meiodorvillea penhae*

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