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MARIA LUIZA DE FRANÇA DUDA

TAXONOMY OF GENUS *Campylaspis* G. O. SARS, 1865 (CUMACEA, NANNASTACIDAE) FROM SERGIPE SUB-BASIN AND CAMPOS BASIN

Recife
2024

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Master thesis submitted to the Graduate Program in Oceanography at Federal University of Pernambuco, as a requirement for obtaining the title of Master in Oceanography. Concentration área: Biological Oceanography.

Supervisor: Dr. Jesser Fidelis de Souza Filho

Co-supervisor: Dra. Débora Lucatelli de Albuquerque

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EXAMINATION COMISSION MEMBERS

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Prof. Dr. Jesser Fidelis de Souza Filho (Orientador)
Universidade Federal de Pernambuco

_____

Profa. Dra. Brenda Lia Doti
Universidad de Buenos Aires - UBA

_____

Profa. Dra. Cristiana Silveira Serejo
Universidade Federal do Rio de Janeiro - UFRJ

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ABSTRACT

Campylaspis constitutes the most diverse genus within the Nannastacidae family. From the 205 species described worldwide 29 occur in the South Atlantic, and 14 of them are recorded from Brazilian waters. However, the diversity is still underestimated due to the lack of specialists in the group. The main objective of this study is to conduct an investigation of the taxonomy and bathymetric distribution of the *Campylaspis* in the Sergipe Sub-Basin and the Campos Basin, Brazil to reveal its diversity and identify ecological preferences. Specimens were collected through the Descartes (Sergipe) and PMAR-BC (Rio de Janeiro) surveys. The abiotic data includes geographic coordinates, depth, and sediment type. The collection of specimens was carried out using a box corer, and after collection, they were classified at the family level and preserved in 75% ethanol. Then, specimens from the Nannastacidae family were identified at the lower level following the specific literature. By the end of the study, a total of 239 *Campylaspis* specimens collected at 7 stations in the Sergipe and 126 stations in Campos Basins were analyzed. The faunistic composition checklist presents a total of 19 species, with distribution along the continental slope ranging between 984 and 1060 meters in the Sergipe Sub-Basin, and between 79 and 847 meters in the Campos Basin. Among these, three are under description as new to science (*Campylaspis* n. sp.15, *Campylaspis* n. sp.16, and *Campylaspis* n. sp.17) and 14 morphotypes are potentially new species. Additionally, two other morfotypes were identified as *Campylaspis* cf. *nitens* and *Campylaspis* cf. nuda, already known for Recife (Brazil), but recorded for the first time in the Sergipe Sub-Basin. Based on the results of the bathymetric study, 5 species (*Campylaspis* sp.6, *Campylaspis* sp.8, *Campylaspis* sp.9, *Campylaspis* sp.11 and *Campylaspis* sp.13) are distributed at depths of less than 200 meters, 3 species (*Campylaspis* sp.3, *Campylaspis* sp.5 and *Campylaspis* sp.12) at depths up to 400 meters, 7 species at depths between 650 and 800 meters (*Campylaspis* sp.1, *Campylaspis* sp.2, *Campylaspis* sp.4, *Campylaspis* sp.7, *Campylaspis* sp.14, *Campylaspis* sp.15 and *Campylaspis* sp.16), and 4 species (*Campylaspis* sp.10, *Campylaspis* sp.17, *Campylaspis* cf. *nitens* and *Campylaspis* cf. *nuda*) at depths beyond 950 meters. Therefore, the present study increased the number of *Campylaspis* species in the South Atlantic and expanded the knowledge of continental slope diversity including an updated key for the genus from the Atlantic Ocean.

Keywords: Brazilian shelf; Continental slope; Crustacean diversity; Bathymetric distribution; New species.

RESUMO

Campylaspis constitui o gênero mais diversos dentro da família Nannastacidae. Das 205 espécies descritas em todo o mundo, 29 ocorrem no Atlântico Sul, e 14 delas são registradas em águas brasileiras. No entanto, a diversidade ainda é subestimada devido à falta de especialistas no grupo. O principal objetivo deste estudo é conduzir uma investigação taxonômica e de distribuição batimétrica de *Campylaspis* na Sub-Bacia de Sergipe e na Bacia de Campos, Brasil, para revelar sua diversidade e identificar preferências ecológicas. Os espécimes foram coletados através dos levantamentos Descartes (Sergipe) e PMAR-BC (Rio de Janeiro). Os dados abióticos incluem coordenadas geográficas, profundidade e tipo de sedimento. A coleta dos espécimes foi realizada utilizando um box corer, e após a coleta, foram classificados ao nível de família e preservados em etanol a 75%. Em seguida, os espécimes da família Nannastacidae foram identificados em nível inferior, seguindo a literatura específica. Ao final do estudo, um total de 239 espécimes de *Campylaspis* coletados em 7 estações na Sub-Bacia de Sergipe e 126 estações na Bacia de Campos foram analisados. A lista de verificação da composição faunística apresenta um total de 19 espécies, com distribuição ao longo da inclinação continental variando entre 984 e 1060 metros na Sub-Bacia de Sergipe e entre 79 e 847 metros na Bacia de Campos. Entre estas, três estão em descrição como novas para a ciência (*Campylaspis* n. sp.15, *Campylaspis* n. sp.16 e *Campylaspis* n. sp.17) e 14 morfotipos são potencialmente novas espécies. Além disso, dois outros morfotipos foram identificados como *Campylaspis* cf. *nitens* e *Campylaspis* cf. *nuda*, já conhecidos em Recife (Brasil), mas registrados pela primeira vez na Sub-Bacia de Sergipe. Com base nos resultados do estudo batimétrico, 5 espécies (*Campylaspis* sp.6, *Campylaspis* sp.8, *Campylaspis* sp.9, *Campylaspis* sp.11 e *Campylaspis* sp.13) são distribuídas a profundidades inferiores a 200 metros, 3 espécies (*Campylaspis* sp.3, *Campylaspis* sp.5 e *Campylaspis* sp.12) a profundidades de até 400 metros, 7 espécies a profundidades entre 650 e 800 metros (*Campylaspis* sp.1, *Campylaspis* sp.2, *Campylaspis* sp.4, *Campylaspis* sp.7, *Campylaspis* sp.14, *Campylaspis* sp.15 e *Campylaspis* sp.16), e 4 espécies (*Campylaspis* sp.10, *Campylaspis* sp.17, *Campylaspis* cf. *nitens* e *Campylaspis* cf. *nuda*) a profundidades superiores a 950 metros. Portanto, o presente estudo aumentou o número de espécies de *Campylaspis*

no Atlântico Sul e expandiu o conhecimento da diversidade da inclinação continental, incluindo uma chave atualizada para o gênero do Oceano Atlântico.
Palavras-chave: Plataforma brasileira; Talude continental; Diversidade de crustáceos; Distribuição batimétrica; Novas espécies.

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SUMMARY

1 INTRODUCTION

1.1 TAXONOMY AND MORPHOLOGY

The superorder Peracarida encompasses the orders Cumacea, Amphipoda, Bochusacea, Ingolfiellida, Isopoda, Lophogastrida, Mictacea, Mysida, Stygiomysida, Tanaidacea and Thermosbaenacea (WoRMS, 2023). The order Cumacea Krøyer, 1846 is nowadays represented for about 1,760 described species (Watling & Gerken, 2023), currently, 80 species are reported for the Brazilian coast distributed in 28 genera and five families (Brito, 2023). The families Nannastacidae Bate, 1866, Diastylidae Bate, 1856 and Bodotriidae T. Scott, 1901 are the most diverse ones (Watling & Gerken, 2023 2011). The family Nannastacidae is notable for its diversity with 25 genera and 528 species (Watling & Gerken, 2023) and is also a highly frequent family in samples from the continental shelf to the deep sea.

Some important studies about the relationship among sister groups within the class Peracarida have been proposed (Drumm, 2010, Meland, 2015 & Höpel, 2022), however, there is still insufficient information to determine the sister group of the order Cumacea (Gerken, 2022). According Poore (2005), assuming that the orders Cumacea and Tanaidacea are sister groups, the shared characteristics include the cephalothorax and the gill folds extending to thoracic segment 2, the inner branch of antenna 1 is typically short, the palp of maxilla 1 is curved, in males, pleopods, when present, are reduced posteriorly, and the endopod of the uropod has three or more articles. Assuming that the orders Cumacea and Isopoda are sister groups, they both share a pattern of heart arteries with a pair of auxiliary arteries from the anterior fifth thoracic segment, the remaining pairs each support one pair of pereopods, and the last pair of heart arteries run internally into the pleon, where the lateral arteries terminate in each segment (Wirkner and Richter, 2010).

The cumaceans exhibit a distinctive morphology that sets them apart from other groups, they are unique in the modification of the three first thoracic appendages in maxillipeds that are used for feeding and not only locomotion. As though the fusion between the three first segments of body to the carapace, which is much larger than the body that is slender and more curved (Gerken, 2022). Some of their key characteristics include a bulbous carapace composed of fused dorsal parts, such as

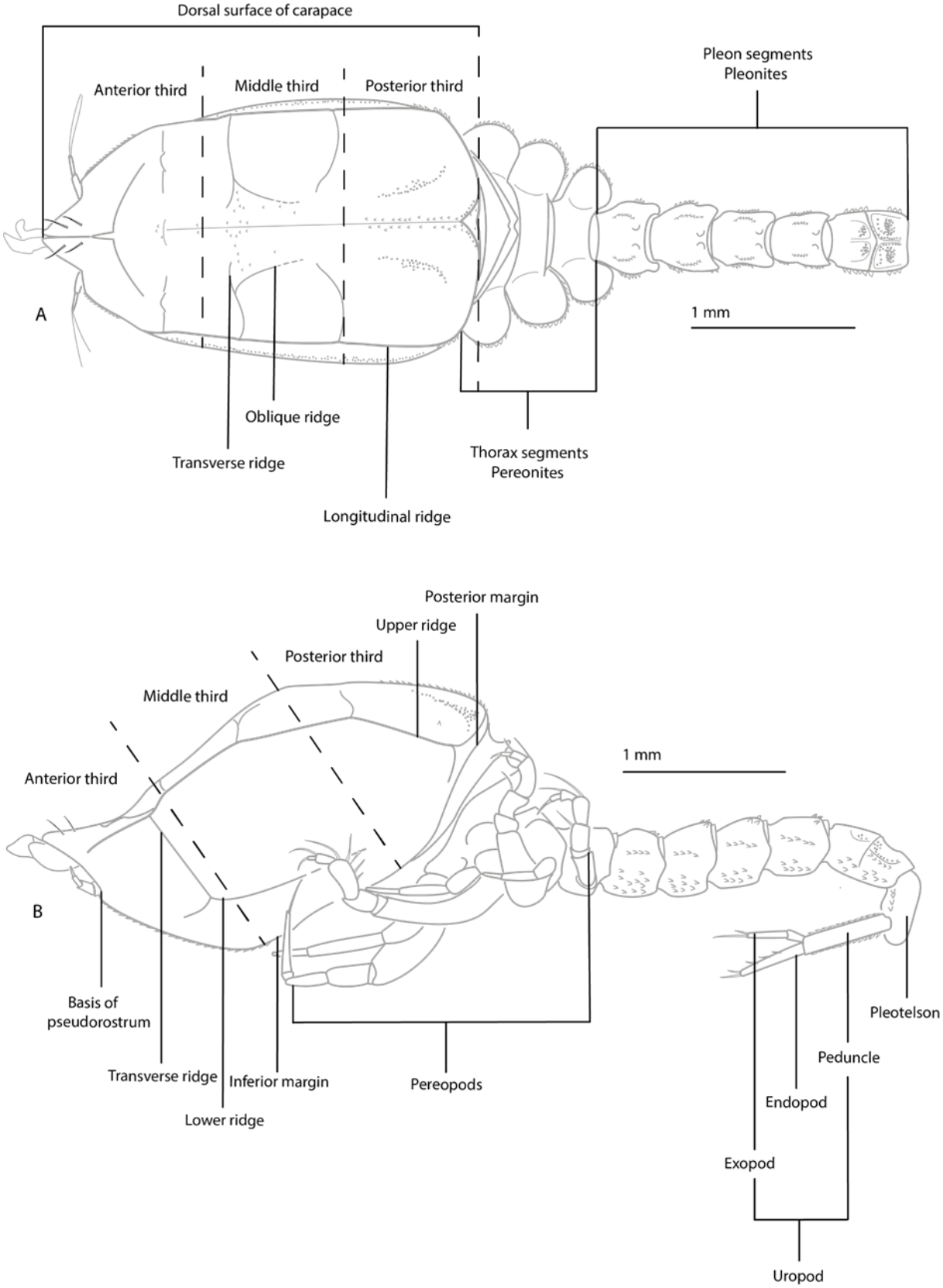
the cephalon and the first thoracic somites; a slender and elongated abdomen; a single pair of also elongated uropods; absence of mandibular palps; maxilla 1 with a posterior palp bearing one or more terminal setae; maxilla 2 with three movable endites or reduced and sparse setae; the first three pairs of thoracic legs modified into maxillipeds for feeding (Heard et al., 2007).

In the genus *Campylaspis*, the ornamentation of the carapace is a highly expressive feature, depicting patterns of ornamentation with spines, tubercles, bristles, depressions, and ridges arranged in different ways on the dorsal or lateral surface of the carapace. In the available literature, the nomenclature for such ornamentations or their positioning on the carapace is not homogenous. Jones (1974) uses grooves, furrows, and sulcus to define different types of depressions on the carapace. Serrated and dentate are defined based on the size of the projection, with small ones being serrated and larger ones resembling teeth, termed dentate. Additionally, ridges and folds are classified based on the size of the protrusion in relation to the carapace's surface and their direction. If formed inward into the carapace, it's called a fold, and if formed protruding from the carapace, it's a ridge. Muradian (1976) also uses folds and carinae, with folds referring to a more subtle fold that protrudes slightly from the carapace, as indicated in the description of *Campylaspis bacescui* Muradian, 1976. On the other hand, carinae is described as a more pronounced elevation corresponding to the elevation of carapace, as seen in the redescription of *Campylaspis quadriplicata* Lomakina, 1968. Petrescu (2006, 2016, and 2018) uses terms as carinae and ridges, but follows a similar framework as Jones. Depressions are referred to as furrow or sulcus, while ornamentations are classified as various types of tubercles, such as acute and spiny tubercles. There are also rotundities, which bear a resemblance to the protrusions mentioned in Jones (1974) identification key for the genus *Campylaspis*.

For taxonomic analysis and species description, the most important characteristics include the shape and ornamentation of the carapace, the size and shape of the eyelobe, the size and angle of the pseudorostrum, proportions of the second and third maxillipeds, proportions of the second pereopods, and proportions of the uropods (Jones, 1974).

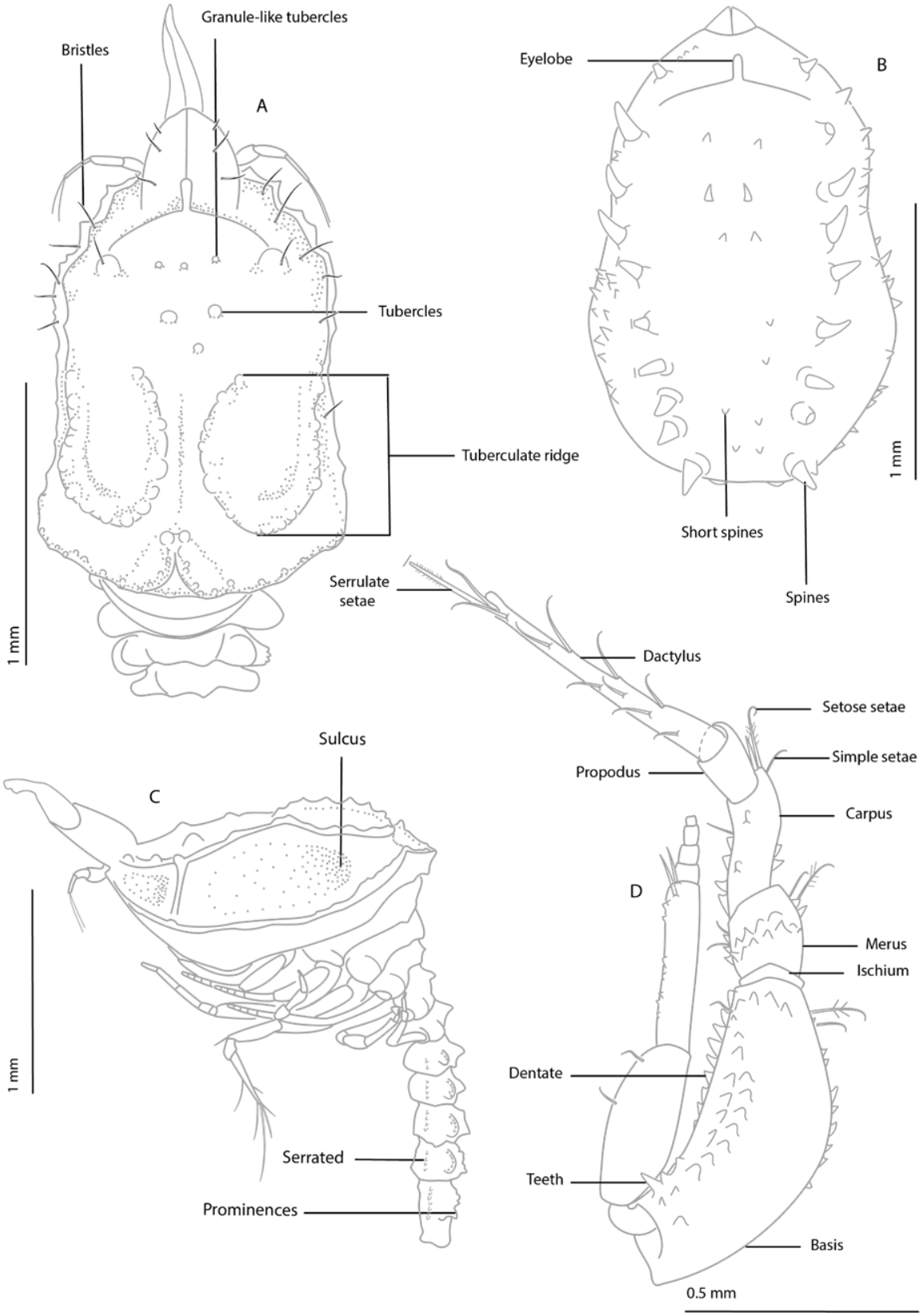
Taken this into account, a standardized pattern of *Campylaspis* species was schematized, based on the aforementioned literature, including not only the ornamentations but also the portions of carapace and the nomenclature of the appendages used throughout the work (Figures 1 and 2).

Figure 1– Portions of carapace, ridges and segments of *Campylaspis* sp.16. A. Dorsal view; B. Lateral view.



Fonte: A autora (2023).

Figure 2 – Ornamentations of carapace. A. Dorsal view of *Campylaspis* sp.15; B. Dorsal view of *Campylaspis* sp.17; C. Lateral view of *Campylaspis* sp.15; D. Pereopod 2 of *Campylaspis* sp.16.



Fonte: A autora (2023).

1.2 HISTORICAL WORKS IN THE GENUS CAMPYLASPIS FOR BRAZILIAN WATERS

Jones (1974) realized a taxonomic study of *Campylaspis* from deep sea Atlantic, including the first new species of the genus for Brazilian waters as *C. aculeata*, *C. bicarinata*, *C. cognata*, *C. exarata*, *C. glebulosa*, *C. nuda*, *C. plicata*, *C. redacta*, and *C. submersa*. Also, *C. nitens* Bonnier, 1896 and *C. spinosa* Calman, 1906 were reported for the first time in Brazil. This work still is important for the taxonomy comprehension of the genus *Campylaspis* in Brazilian waters, even because the number of species described is almost 40% of the total known species for the science in this locality.

Jones (1984) also wrote another important taxonomic study, describing various species along the Atlantic coast, where several species were recorded off the states of Pernambuco and Paraíba. Whereas the species *C. antipai*, *C. brasilianus*, and *C. holthuisi*, were described as new for Rio de Janeiro during the Geo II Rio expedition (Brazil) in 1986 by Bacescu and Petrescu (1989).

Taxonomy studies focused on the genus *Campylaspis* are scarce for Brazilian waters since 1989, while notable research for other groups of cumaceans were published since then, such as: genera *Apocuma* and *Cyclaspis*, family Bodotriidae (Roccatagliata et. al., 2012; Brito & Serejo, 2020); genera *Diastylis*, *Leptostylis*, *Leptostyloides*, *Divacuma*, *Austrostylis* and *Pseudoleptostyloides*, family Diastylidae (Alberico & Roccatagliata, 2008; Cristales et. al. 2014; Alberico & Roccatagliata, 2011; Alberico & Roccatagliata, 2013; Mühlenhardt-Siegel, 2015; Mühlenhardt-Siegel, 2018;); genus *Chalarostylis*, family Lampropidae (Alberico et. al., 2013).

More recently, Petrescu (2018) published the largest contribution to the genus *Campylaspis*, describing a total of 31 new species for Australia. According to WoRMS database, the 2010 decade were the most significant for species descriptions within the genus, with the major contributors to these descriptions being Gerken in 2002 and 2012, along with Petrescu in 2002, 2003, and 2018. Together, they accounted for 85.53% of authorship in species descriptions over the past two decades. This number illustrates how many more species, exclusively within the genus *Campylaspis*, can still be identified and described in the coming years to Brazil.

1.3 ECOLOGY AND DISTRIBUTION

The representatives from Cumacea are specially marines, living from the coastal regions until great depths, but little less than 20 species are found in brackish waters (all of them from the region Ponto-Caspian) (Jaume & Boxshall, 2007). Few temporary populations can be found in regions with greater freshwater influence (e.g. estuaries, lagoons and/or coastal lagoons), as they are not able to establish themselves definitively in non-marine environments (Jaume & Boxshall, 2007). Globally, the species richness presents a reverse trend to the latitude increase, being the polar region less diverse than the tropics (Gage, 2004).

For the entire Brazilian coast, there have been few ecological and distribution studies conducted for the order Cumacea (Santos & Pires-Vanin, 1999), with the majority of publications focusing on taxonomy. In a study conducted on the Ubatuba shelf, between São Sebastião Island and Ubatumirim Bay, it was observed that the South Atlantic Central Water (SACW) led to an increase in the abundance of Cumacea species during the summer, due to the availability of food in the presence of cold water. In the same study, specimens of *Campylaspis brasilianus* and three other morphotypes were sampled at depths below 70 meters (Santos & Pires-Vanin, 1999).

The North Atlantic Ocean is known for being extensively sampled for deep-sea Cumacea, yet biogeographical studies remain rare (Jones, 1974; 1984; Watling, 2009). In the South Atlantic, a significant data collection effort on the diversity, distribution, and biogeography of the genus *Campylaspis* took place from 1960 to 1969 by ships from the Woods Hole Oceanographic Institution (Jones & Sanders, 1972; Jones, 1974). The transect known as Dakar - Recife resulted in 25 new species for the genus, with over half of these species not found in the North Atlantic (Watling, 2009).

1.4 CUMACEA SAMPLES AT THE CARCINOLOGICAL COLLECTION FROM MOUFPE

In general, the preservation of specimens in biological collections like that of Museu de Oceanografia Prof. Petrônio Alves Coelho at the Universidade Federal de Pernambuco (MOUFPE) is of utmost importance, as it allows their use in current and future scientific studies and research. It also enables molecular studies using the collection as a genetic bank. Furthermore, these collections are a valuable source of information about the biodiversity of different regions of the planet and can provide important data about the geographical distribution, behavior, and ecology of various species. Maintaining these collections requires investments in infrastructure, human resources, and technology, as many biological collections are digitizing their data to make their holdings more easily accessible to other researchers and the non-scientific community (Marinoni, 2010).

Among the material already deposited in the carcinological collection of the MOUFPE there are lots with specimens collected in the Potiguar Basin, Sergipe Sub-basin and Campos Basin, including specimens that have not yet been identified. In general, there are 233 species registered in the collection, where 44 samples represent Nannastacidae and from this 44, 10 specimens are from the genus *Campylaspis*.

Therefore, this project aims to expand knowledge of the genus *Campylaspis* G. O. Sars, 1865, through a taxonomic and vertical distribution study. The genus *Campylaspis* was frequently found in samples from the continental shelf and deep-sea of the Campos Basin and Sub-basin of Sergipe (RJ). Thus, the project will contribute to the knowledge of Cumacea, which is relatively understudied in Brazil, as well as to the expansion of research status in the group internationally. Another important contribution is related to biodiversity in a general context, aligning with the United Nations' Decade of Ocean Science for Sustainable Development (Challenge 2 - Protect and restore ecosystems and biodiversity - UNESCO, 2021) and Sustainable Development Goal 14 (Conserve and sustainably use the oceans, seas, and marine resources for sustainable development), both promoted by the UN.

2 OBJECTIVES

2.1 GENERAL OBJECTIVE

To conduct a taxonomic and bathymetric distribution study of the genus *Campylaspis* in the Sergipe Sub-basin and Campos Basin, in order to understand distribution patterns and species richness.

2.2 SPECIFIC OBJECTIVES

a) To conduct a taxonomic study of the genus *Campylaspis* in the Campos Basin and Sergipe Sub-basin

b) To create an updated taxonomic key for the genus *Campylaspis* for Atlantic Southwestern Ocean.

c) To describe potential new species of the genus *Campylaspis* within the study areas.

d) To perform a bathymetric distribution study of the genus *Campylaspis* in the Campos Basin and Sergipe Sub-basin.

e) To compare diversity between the Campos Basin and Sergipe Sub-basin to better understand the environmental factors that most influence this distribution.

3 MATERIAL AND METHODS

3.1 DESCRIPTION OF STUDY AREAS

The Campos Basin, located off the northern coast of Rio de Janeiro, is one of the most important oil-rich regions of Brazil and has been extensively studied in faunal inventories due to the significant fishing prospecting. The Campos Basin has regions that are unknown to science, indicating that it can continue to be a cradle for species yet to be studied (Martins, 2017). The region is known for the abundance of certain crustacean groups, such as Amphipoda, Tanaidacea, Isopoda, and Cumacea. When identified, these organisms can provide important information about the environment in which they were found and the composition of the macrofauna (Nascimento, 2017).

The Sergipe Sub-basin is part of the Sergipe-Alagoas Basin. The individualization of the basin occurred during the Paleozoic era and during the phase of the Atlantic Ocean opening after several tectonic cycles (Souza-Lima, 2006). Therefore, sediment and stratigraphy vary from the Sergipe region to the Alagoas region (Fontes et al., 2017). As the material was collected in the Sergipe portion, the focus of the topic will be to describe the Sergipe Sub-basin, which is characterized by metamorphic deposits. The material from the Sergipe Sub-basin was collected in areas of the slope, and canyons, predominantly on muddy substrates.

The formation of the South Atlantic is correlated with sequences of evolutionary depositions, including an extension on the continental shelf with multiple layers of sediment (Mohriak, 2003).

The South Equatorial Current exerts a significant influence on the two basins mentioned in this study, giving rise to two equally important currents: the North Brazil Current (NBC), which directly influences the Sergipe Sub-basin, and the Brazil Current (BC), extending further south and exerting its influence over the Campos Basin (Peterson & Stramma, 1991). The system of ocean currents that traverses these two basins can affect the survival of sun-coral larvae during the advection process, depending on the season, whether it be summer or winter (Coelho et. al., 2022). Notably, during the winter, a higher mortality rate is observed for larvae in the Sergipe Sub-basin compared to the Campos Basin (Coelho et. al., 2022). The authors discussed how the currents of region can impact the distribution and migration of

organisms of the genus *Campylaspis* sampled in this region and addressed in this work.

3.2 SAMPLING METHODS

The specimens studied were collected during monitoring surveys conducted by the Laboratório de Carcinologia (LabCarcino) at the MOUFPE. A total of 8 specimens of the genus Campylaspis were collected for the Sergipe Basin during the Descartes campaign. For the Campos Basin, 244 specimens during the PMAR-BC campaign (Appendix A). The collection period was 2017 for the Sub-basin of Sergipe and from December 2018 to April 2019 for the Campos Basin (Figure 3) and both campaigns used box corer to sampling. The material was preserved in 70% ethanol and cataloged in the carcinological collection of the MOUFPE.

Figure 3 – Map of the study areas with collection sites from Sergipe Sub-basin and Campos Basin.

Fonte: A autora (2023).

3.3 LABORATORY METHODS

All samples containing Cumacea specimens were reviewed and identified using specific literature. For the identification of family level, the key by Jarquín-González & García-Madrigal (2013) was employed. Concerning Nannastacidae genera, the key provided by Corbera, Segonzac, and Cunha (2008) was utilized, and it was also updated in this study. Regarding species-level identification for the genus Campylaspis, the key developed by Jones (1974) was employed.

Due to the poor conservation of some samples, several specimens were removed from the present study. At the end of the curation of the genus *Campylaspis* material, 7 specimens from the Sergipe Sub-basin and 232 specimens from the Campos Basin remained for taxonomic analysis.

The specimens were examined at the LabCarcino using Leica DME and a Carl Zeiss Axioskop compound microscope coupled with a camera lucida. The illustrations were created using the same equipment. Subsequently, they were digitally traced using a Wacom tablet and Adobe Illustrator, following the methods outlined by Coleman (2003). Carapace length was measured from the tip of the pseudorostrum to the rear end of the dorsal view. The pseudorostrum angle was measured between the baseline of the pseudorostrum and the rear end of the carapace. For the classification of setae and spines, Garm & Watling (2013) and Brandt (1988) were used, respectively, since illustrations were made of appendages with different types of setae and spines, along with other sensory accessories like bristles.

All specimens under investigation are cataloged in the Carcinological Collection at the Museu de Oceanografia Prof. Petrônio Alves Coelho (MOUFPE), Federal University of Pernambuco (UFPE), Brazil.

3.4 STRUCTURE OF THE WORK

The dissertation follows the template of the UFPE library, with general introduction, Objectives, Material & Methods, Results, Discussion, Conclusions and References. The results are divided in two articles following scientific paper templates, based on the main taxonomic and bathymetric objectives of the dissertation.

The first article is entitled “Diversity of the genus *Campylaspis* G. O. Sars, 1865 (Cumacea: Nannastacidae) with Bathymetric Distribution from Brazil" presents the

general diversity and bathymetric distribution of the genus in the continental slope of the Southeast of Brazil. An updated key for the family Nannastacidae is also provided. This will be submitted to the Marine Biodiversity journal.

The second is “On Three New Deep-Sea Species of the genus *Campylaspis* G.O. Sars, 1865 (Cumacea: Nannastacidae) from Brazil”**,** comprising new species and updated key for the genus. The formating follows the Zootaxa scientific journal outline.

4. ARTICLE I: DIVERSITY OF THE GENUS CAMPYLASPIS G. O. SARS, 1865 (CUMACEA: NANNASTACIDAE) WITH BATHYMETRIC DISTRIBUTION FROM BRAZIL

MARIA LUIZA DE FRANCA DUDA[1,2], DEBORA LUCATELLI[2] & JESSER FIDELIS DE SOUZA-FILHO[1,2]

[1]Post-graduation Program of Oceanography (PPGO), Department of Oceanography (DOCEAN), Federal University of Pernambuco (UFPE), Av. Arquitetura s/n, Cidade Universitaria, Recife, Brazil, CEP: 50740-550.

[2]Laboratorio de Carcinologia (LabCarcino), Museu de Oceanografia Prof. Petronio Alves Coelho (MOUFPE), Federal University of Pernambuco (UFPE), Av. Arquitetura s/n, Cidade Universitária, Recife, Brazil, CEP: 50740-550.

MLFD: marialuiza.duda.sci@gmail.com; DLA: dla.lucatelli@gmail.com; JFSF: jesser.fidelis@ufpe.br;

ABSTRACT

The *Campylaspis* genus is known to be the most diverse within the Nannastacidae family, and its records are extensive worldwide. However, the diversity of this genus in Brazil is not well-known, with the most relevant works focusing on taxonomy and being published in the 1970s and 1980s. This study describes 17 new morphotypes of the *Campylaspis* genus and two new records, *Campylaspis* cf. *nitens* and *Campylaspis* cf. *nuda*, in the Sergipe sub-basin and Campos Basin in Rio de Janeiro, Brazil. Specimens were collected during oceanographic surveys and from Brazilian Petroleum Corporation (Petrobras). Morphotypes *Campylaspis* sp.10, *Campylaspis* cf. *nitens*, and *Campylaspis* cf. *nuda* were found in the Sergipe sub-basin, while the others were collected in the Campos Basin. Morphotype *Campylaspis* sp.17 occurred in both basins at similar depths. The present results increased the diversity of cumacea from 14 to 31 species in Brazilian waters. Some species were considered rare found in only one station (Campylaspis sp. 7, sp. 9, sp.10, sp.11, *C*. cf. *nitens* and *C.* cf. *nuda*). *Campylaspis* sp.1 showed the widest bathymetric distribution from 100-700 m. Ten of the species depicted a preference to deeper waters below 400 m (*Campylaspis* sp. 2, sp.4, sp.7, sp.10, sp.14, sp.15, sp.16, sp.17, *C*. cf. *nitens* and *C.* cf. *nuda*). The high number of morphotypes illustrates the hidden diversity in Brazilian waters and the importance of the continental slope to marine biodiversity. Furthermore, this is the first study focused on *Campylaspis* diversity in Brazilian waters.

Keywords: Campos Basin; Crustacean diversity; Continental slope; Nannastacidae; Brazilian shelf.

4.1 INTRODUCTION

Organisms of the order Cumacea are representatives of the infauna, occurring from the intertidal region to the abyssal zone (Jones, 1969). Changes in the benthic environment can be reflected by cumaceans because they live partially buried in the substrate, either to prey on food or to dig and feed on organic matter (Santos & Pires-Vanin, 1999). These organisms are important for the marine food web as fish (Drazen et al., 2001), larger crustaceans (Carvalho et al., 2023), mollusks (Morton & Machado, 2019; Golikov et al., 2022), and even whales (Blanchard et al., 2019) feed on cumaceans.

The distribution of cumaceans on the southeast coast of Brazil shows a higher density and diversity of specimens in the summer (Santos & Pires-Vanin, 1999; Cristales & Pires-Vanin, 2014). This increase is due to intense eutrophication caused by the South Atlantic Current Water on the continental shelf. This movement of water mass enhances phytoplankton productivity and biomass in the water column, allowing organic matter to reach the ocean floor (Venturini et al., 2011a).

The genus *Campylaspis* is the most representative of the family Nannastacidae and is usually well-sampled during collections made along the southeast coast of Brazil (Santos & Pires-Vanin, 1999; Cristales & Pires-Vanin, 2014; Pires-Vanin, 2014). Studies on the diversity of the genus *Campylaspis* in Brazil are still scarce, and even though 14 species have been described for this region, almost all species were described by Jones (1974, 1984) and Bacescu & Petrescu (1989).

This article aims to do a taxonomic study of the genus *Campylaspis* based on sampled from Sergipe sub-basin and Campos Basin in the southwestern Atlantic.

4.2 MATERIAL AND METHODS

The specimens were collected during two different oceanographic campaigns that took place off the states of Sergipe and Rio de Janeiro, Brazil. The Descartes campaign occurred in 2017 in the Sergipe Sub-basin, collected through dredging at depths ranging from 984 to 1060 meters between 11°10'32.90'' S, 036°47'40.11'' W, and 11°8'51.49'' S, 036°46'18.10'' W (Figure 4). For the Campos Basin, collections were made between December 2018 and April 2019 using a box corer, resulting in 234

specimens of the genus *Campylaspis* at depths ranging from 78 to 801 meters between 23°11'0.449"S 41°44'58.502"W, and 23°46'50.297"S 41°25'49.03"W.

The specimens were analyzed at the Laboratory of Carcinology (LabCarcino) of the Museu de Oceanografia Prof. Petrônio Alves Coelho (MOUFPE) using Leica DME and a Carl Zeiss Axioskop compound microscope, all equipped with camera lucida. The drawings were made using the same equipment. Afterwards, they were vectorized using a Wacom tablet and Adobe Illustrator, following Coleman (2003). Carapace length was taken from the tip of the pseudorostrum to the hind end of dorsal view of carapace. Pseudorostrum angle taken between the line at the base of pseudorostrum and the posterior end of the carapace.

All the studied material is deposited in the MOUFPE Carcinological Collection, at Federal University of Pernambuco (UFPE), Brazil.

Figure 1 – Map of the study areas with collection sites. In blue, the Sergipe Sub-basin, and in red, the Campos Basin.

Fonte: A autora (2023).

4.3 RESULTS

Order Cumacea Krøyer, 1846

Family Nannastacidae Bate, 1866

Key to genera of Nannastacidae adapted from Corbera, Segonzac and Cunha, 2008

1. Molar process of the mandible truncate.....2
   Molar process of the mandible styliform.....19

2.Ocular elements separate in two groups.....3
Ocular elements fused in a single median lobe or absent 5
3. Branchial siphons separate.....***Schizotrema* Calman 1911**
Branchial siphons united medially 4
4. Anteroventral corner of carapace large, acute and strongly projecting, pseudorostral lobes short, directed slightly upward..... ***Nannastacus* Bate 1865**
Anteroventral corner of carapace in female acute or subacute, not projecting, pseudorostral lobes elongate, united in front of head.....
……***Scherocumella* Watling 1991**
5. Female without exopods.....6
Female with at least 2 pairs of exopods.....8
6. Eylobe short or absent .....***Aotearocumella* Gerken 2012**
Eylobe present 7
7. Eyelobe rounded not reaching the tip of pseudorostrum, peduncle of uropods shorter than pleonite 6..... ***Elassocumella* Watling 1991**
Eyelobe narrow, elongate, reaching the tip of pseudorostrum, peduncle of uropods longer than pleonite 6…..... ***Styloptocumoides* Petrescu 2006**
8. Antenna rudimentary in males as in females …….....9
Antenna of males with a flagellum more or less long 10
9. Three pairs of exopods in pereopods 1-3 in both sexes……..……..
……..…***Almyracuma* Jones and Burbanck 1959**
Male with four pairs of exopods..... ***Claudicuma* Roccatagliata 1981**
10. Antenna of male with a short flagellum not exceeding posterior margin of carapace……...11
Antenna of male with a long flagellum exceeding the posterior margin of carapace.....14
11. Antenna of male with flagellum shorter than peduncle.....12
Antenna of male with flagellum shorter than peduncle.....13
12. Both sexes with three pairs of exopods……...
……..……***Thalycrocuma* Corbera, Segonzac and Cunha, 2008**
Females with at least two pairs of exopods.....***Bathypicrocuma* Siegel 2011**
13. Gut spirally coiled .....***Platycuma* Calman 1905**
Gut not coiled ..... ***Cumellopsis* Calman 1905**
14. Eyelobe narrow, elongate, reaching the end of pseudorostral lobes……..
.....***Styloptocuma* Bacescu and Muradian 1974**
Eyelobe rounded with or without lenses.....15
15. Branchial siphons separate..... ***Schizocuma* Bacescu 1972**
Branchial siphons united medially 16
16. Pars incisiva of mandible with four teeth, peduncle of antennula article 2 with a tubercle..... ***Vemacumella* Petrescu 2001**
Pars incisiva of mandible with three teeth, peduncle of antennula without tubercle
……17
17. Peduncle of uropod shorter than pleonite 6 18
Peduncle of uropod as long as or longer than pleonite 6 .....***Cumella* Sars 1865**

18. Pereopod 2 without ischium.....***Humesiana*** **Watling and Gerken 2001**
    Pereopod 2 with ischium..... ***Bacescella*** **Petrescu 2000b**
19. Females without exopods..... ***Normjonesia*** **Petrescu and Heard 2001**
    Females with at least three pairs of exopods (on maxilliped 3 and pereopods 1 and 2).....20
20. Females with exopods in Pereopods 1-2 and rudimentary exopods on pereopods 3 and 4…….....***Bathycampylaspis*** **Mühlenhardt-Siegel 1996**
    Females with exopods in Pereopods 1-2.....21
21. Dactylus of maxilliped 2 with long spines or teeth.....22
    Dactylus of maxilliped 2 short, ending in two or more spines……..…….23
22. Dactylus of maxilliped 2 in from of a trident .....***Campylaspides*** **Fage 1929**
    Dactylus of maxilliped 2 shaped like a rake .....***Procampylaspi*****s Bonnier 1896**
23. Males with four pairs of exopods (maxilliped 3, legs 1–3)……
    ……..……***Cubanocuma*** **Bacesu and Muradian 1977**
    Males with five pairs of exopods (maxilliped 3, legs 1–4) 24
24. Male with a very large and well-developed penis on last pereonite.....
    .....***Campylaspenis*** **Bacescu and Muradian 1974**
    Male without a well-developed penis 25
25. Pseudorostral lobes not meeting in front of head……...
    ……..……..……***Pavlovskeola*** **Lomakina 1955**
    Pseudorostral lobes meeting in front of head.....26
26. Carpus of maxilliped 3 expanded laterally, anterolateral angle well produced…….
    ..... ***Paracampylaspis*** **Jones 1984**
    Carpus of maxilliped 3 not expanded..... ***Campylaspis*** **Sars 1865**

Genus *Campylaspis* Sars, 1865

Diagnosis. Carapace longer than 0.5 body length, usually flat on males and vaulted on females; thorax segments partially covered by carapace, lateral projections present; pleonite 5 with dorsal transverse division; Maxilliped 1 with three articles and a diminutive dactylus; maxilliped 2 dactylus ending in three spines; pereopod 2 dactylus with usual, digitiform, tapered tip or digital process extremity; female maxilliped 3 and pereopods 1 and 2 and male maxilliped 3 and pereopods 1-4 with exopods (modified from Petrescu 2018) .

Remarks. Fifteen species were previously recorded for Brazilian waters (Jones 1974, Bacescu & Petrescu 1989) (see Table 1), and 17 species were added for the same location in this study, comprising now 223 species for the genus all over the world.

Table 1 – *Campylaspis* species registered in Brazil

Species	Distribution in Brazil	Depth
Campylaspis aculeata	São Pedro e São Paulo archipelago	500 – 5000m
Campylaspis antipai	Rio de Janeiro	40m
Campylaspis bicarinata	Pernambuco and São Paulo	834 – 4680m
Campylaspis brasilianus	Rio de Janeiro	60m
Campylaspis cognata	Pernambuco	587 – 1493m
Campylaspis exarata	Pernambuco	587m
Campylaspis glebulosa	Pernambuco	587 – 3783m
Campylaspis holthuisi	Pernambuco and São Paulo	60m
Campylaspis nitens	Pernambuco	950m
Campylaspis nuda	Pernambuco	587 – 1007m
Campylaspis pilosa	Pernambuco	587 – 1007m
Campylaspis plicata	Pernambuco	943 – 1007m
Campylaspis redacta	Pernambuco	587m
Campylaspis spinosa	Pernambuco	950 – 1100m
Campylaspis submersa	Pernambuco	1493m

Fonte: A autora (ano).

***Campylaspis* sp.1**

Fig. 2

Material examined. 1 juvenil female (3.3 mm), PA100S 1#09, 23º9'14.231"S 41º11'15.662"W, 102.06 m depth, Petrobras, MOUFPE 21700; 1 juvenil male, T700C 4#20, 22º32'13.679"S 40º18'15.494"W, 686 m depth, Petrobras, MOUFPE 21038;

Description of the juvenil female (based on PA100S 1#09).

Integument with hexagonal pattern.

Carapace armature oval-shaped, 1.7 longer than wide. Pseudorostrum a sixth of carapace length, little upturned. Eyelobe linguiform, much longer than wide, lenses present. Lateral side with an upper distinct ridge neither meeting the basis of pseudorostrum nor posterior part of carapace. Distinct lower ridge absent. Lateral shallow sulcus below the upper ridge, not much broader behind. Dorsal surface with few scattered slender setae. At least one pair of dorsal protuberances not much larger.

Torax pereonites 1-2 covered by carapace. All segments with lateral prominent structure.

Pleon pleonite 1 with dorsal short prominence; pleonites 2-3 without distinct ornamentations.

Pereopod 2 dactylus subequal to carpus length, with one subapical and two apical setae.

Uropod peduncle as long as the last segment of pleon and inner margin fairling serrated. Endopod length 0.7 times peduncle length, serrated on both margins, with four spines on inner edge and two apical ones. Exopod 0.8 times shorter than endopod length, with two apical spines.

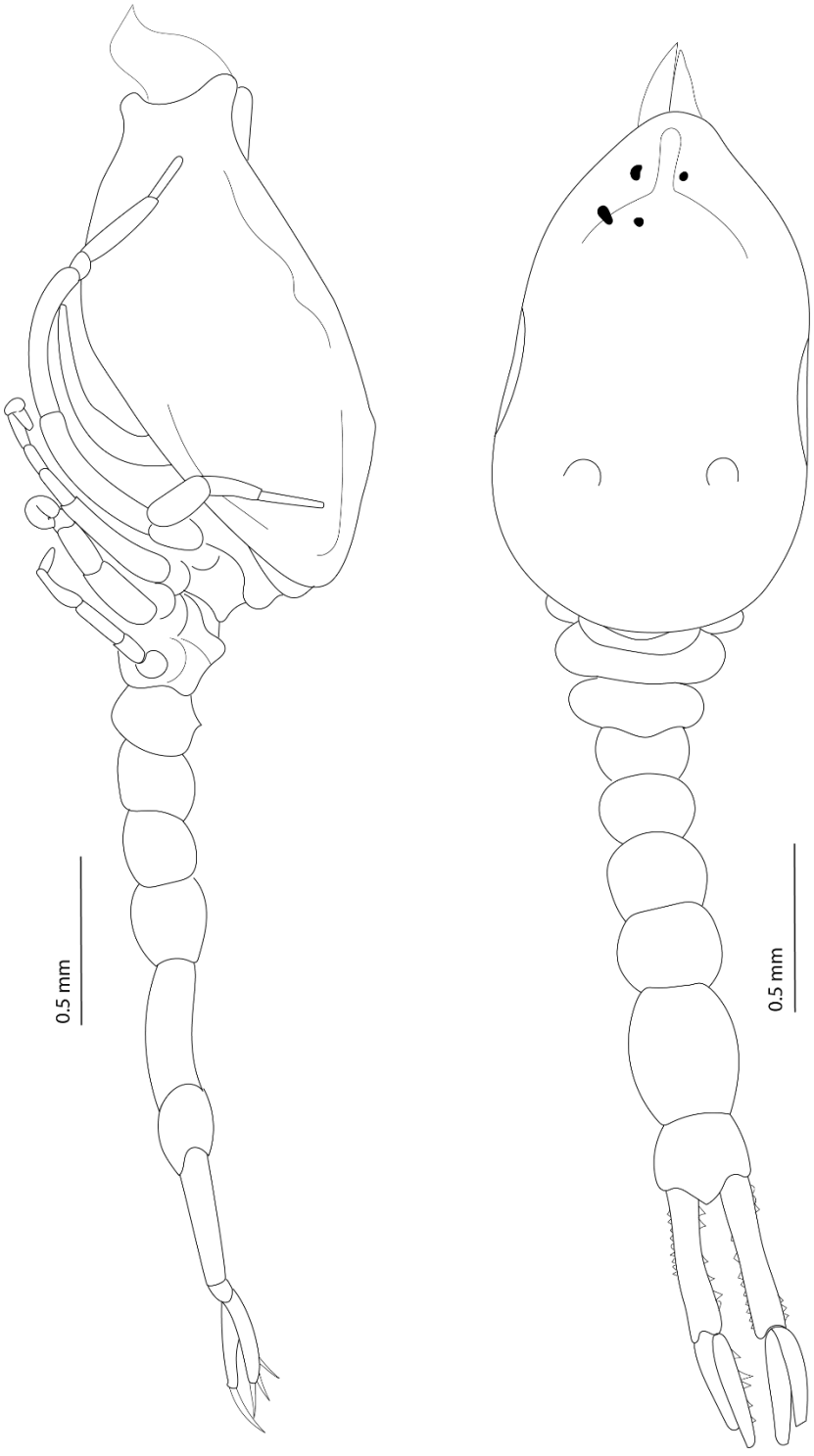
Distribution. Campos Basin, Rio de Janeiro State, Brazil (23º9'14.231"S 41º11'15.662"W), 102.06 - 686 m depth.

Remarks. *Campylaspis* sp. 1 is closely related to *Campylaspis cognata* Jones, 1974 in having an upper lateral ridge not meeting both anterior and posterior limit of carapace, and also a shallow lateral sulcus. The differences between the *Campylaspis* sp.1 and *C. cognata* are (*C. cognata* in parenthesis): no protuberances on anterior third of dorsal portion of carapace (vs. two pairs); one distinct pair of protuberances on posterior third dorsal portion of carapace (vs. absent), and upper lateral ridge without marginal spines (vs. with two).

Campylaspis sp.1 also resembles *C. redacta* by the shallow lateral sulcus on caparace and weak ornamentation on pereonites and pleonites. However, *Campylaspis* sp.1 is

readly distinguished *C. redacta* in lacking protuberances on anterior third of dorsal portion of carapace (vs. two pairs) and one pair of dorsal protuberance on posterior dorsal not close to midline of carapace (vs. two pairs close to midline).

Figure 2 – *Campylaspis* sp.1. Female, A. Habitus in lateral view; B. Habitus in dorsal view, Campos Basin, 686 m, MOUFPE 21038.



Fonte: A autora (2023).

***Campylaspis* sp.2**

Fig. 3

Material examined. 1 subadult female (1.7 mm), T700N 3#01, 21º21'53.24"S 40º11'35.095"W, 690 m depth, Petrobras, MOUFPE 21043; 1 juvenil, T700N 5#06, 21º18'31.658"S 40º12'32.854"W, 721 m depth, Petrobras, MOUFPE 21044.

Description of the subadult female (based on T700N 3#01).

Integument with hexagonal pattern.

Carapace armature oval-shaped, 1.7 longer than wide. Pseudorostrum short, a fifth of carapace length and little upturned. Eyelobe longer than wide, lenses absent. Lateral side with an upper distinct ridge neither meeting the basis of pseudorostrum nor posterior part of carapace. Oblique ridge on posterior portion. Chromatophores scattered laterally and dorsally on carapace. Lateral shallow sulcus below the upper ridge, not much broader behind and delimited by the oblique ridge; Dorsal surface with a transverse low ridge not reaching the total width of carapace. One pair of dorsal protuberances behind the eyelobe line.

Torax pereonites 1-3 covered by carapace. All segments with lateral prominent structure and chromatophores.

Pleon all segments without ornamentations, and with at least one pair of chromatophores.

Pereopod 2 basis 0.5 times shorter than remaining articles together. Merus 0.3 times shorter than basis, long setae on distal angle present. Carpus 1.4 times longer than merus, with two setae on distal angle. Propodus 0.5 times shorter than carpus. Dactylus 3.2 times longer than propodus with three apical setae and digital process 0.1 times shorter than article.

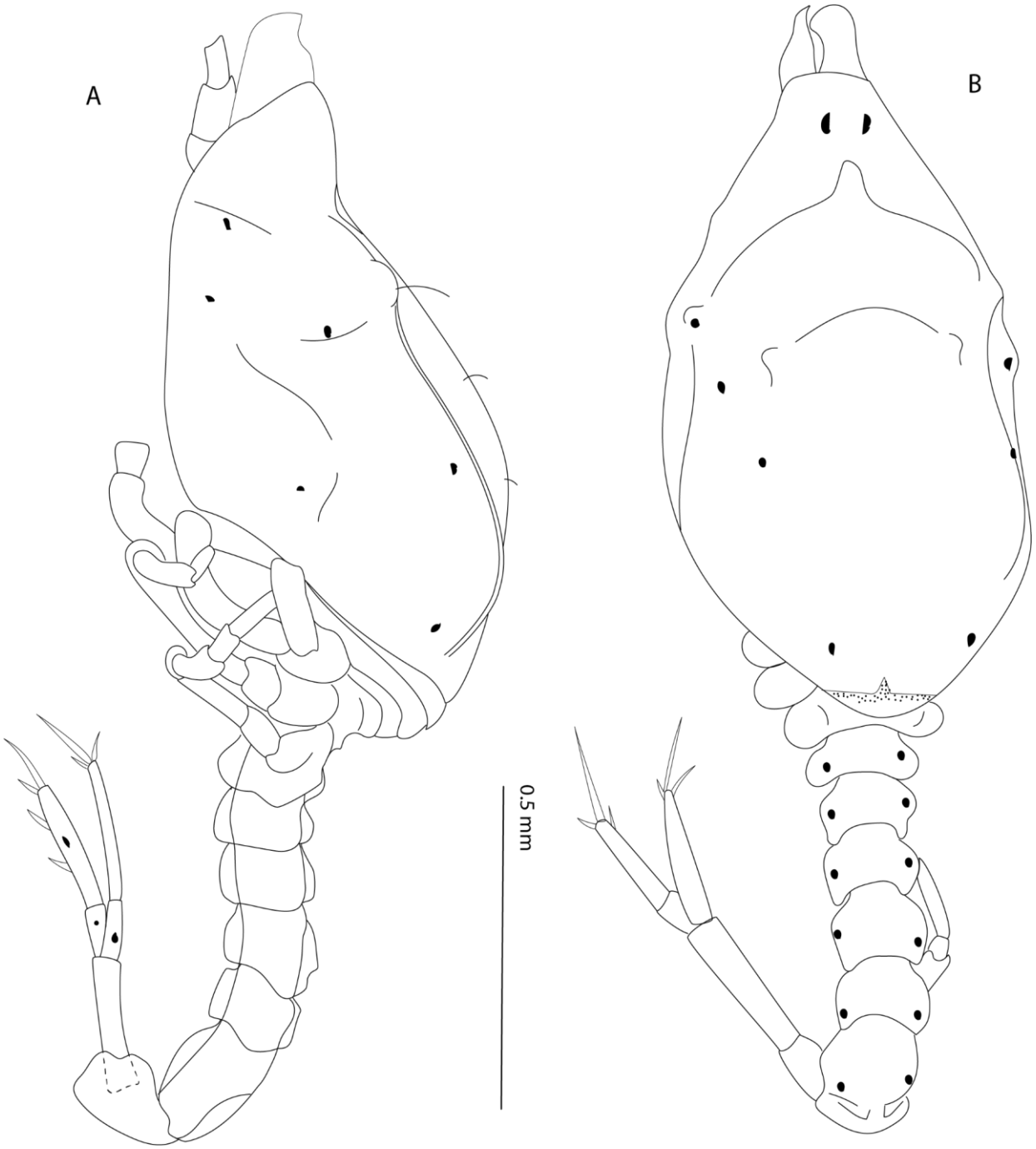
Uropod peduncles 0.4 as long as the last two pleon segments, with inner margin serrated. Endopod 0.9 as long as the peduncle with two spines on inner margin and three apical ones, one much longer than others. Exopod as long as the endopod with one subapical and 2 apical spines.

Distribution Campos Basin, Rio de Janeiro State, Brazil (21º21'53.24"S 40º11'35.095"W), 690 - 721 m depth.

Remarks. *Campylaspis* sp.2 is closed related to *Campylaspis cognata* Jones, 1974 in having an upper lateral ridge very defined, a shallow lateral sulcus and two pairs of protuberances on dorsal surface. The differences between the *Campylaspis* sp.2 and *C. cognata* are (*C. cognata* in parenthesis): dactylus of pereopod 2 longer than carpus

and propodus together (vs. shorter than carpus and propodus together), protuberances on middle third of dorsal surface of carapace (vs. protuberances on anterior third); and upper lateral ridge without marginal spines (vs. with two).

Figure 3 – *Campylaspis* sp.2. Female, A. Habitus in lateral view; B. Habitus in dorsal view, Campos Basin, 690 m, MOUFPE 21044.



Fonte: A autora (2023).

***Campylaspis* sp.3**

Fig. 4

Material examined. 1 subadult male (2.4 mm), PA100N 8#04, 21º8'27.744"S 40º15'56.563"W, 99 m depth, Petrobras, MOUFPE 21047; 1 subadult male, PL100S 1#14, 23º13'11.51"S 41º43'50.999"W, 119,61 m depth, Petrobras, MOUFPE 21045; 1 juvenil, PL100S 1#19, 23º9'48.884"S 41º50'48.044"W, 114.61 m depth, Petrobras, MOUFPE 21700; 1 subadult female, PC100C 2#15, 22º20'39.336"S 40º32'54.906"W, 98 m depth, Petrobras, MOUFPE 21046; 1 subadult female, PL100S 1#16, 23º12'8.672"S 41º41'28.576"W, 113.43 m depth, Petrobras, MOUFPE 21048; 1 subadult, T400C 4#02, 22º39'14.353"S 40º32'15.997"W, 388 m depth, Petrobras, MOUFPE 21701; 1 subadult, PL100S 1#18, 23º11'0.449"S 41º44'58.502"W, 128.42 m depth, Petrobras, MOUFPE 21702; 1 subadult, PC100S 5#5-0, 23º2'13.06"S 41º7'55.031"W, 97 m depth, Petrobras, MOUFPE 21703.

Description of the subadult male (based on PA100N 8#04).

Carapace covered by chromatophores, armature oval-shaped, 1.5 longer than wide. Pseudorostrum a fifth of carapace length and little upturned. Eyelobe much wider than long, lenses present. Lateral with a shallow sulcus neither bordered by ridges and not reaching the limits of carapace. Oblique lateral posterior ridge reaching the inferior posterior margin. Low tubercles in rows crossing the lateral sides and dorsal surface. Each tubercle with a chromatophore. Dorsal surface with two transverse low ridges on middle third and one oblique on posterior third, also visible laterally.

Torax pereonites 1-2 covered by carapace. First segment forming an upturned hook. All segments with lateral projections, one pair of dorsal prominences present. Segments covered by chromatophores.

Pleon all segments without ornamentations, covered by chromatophores.

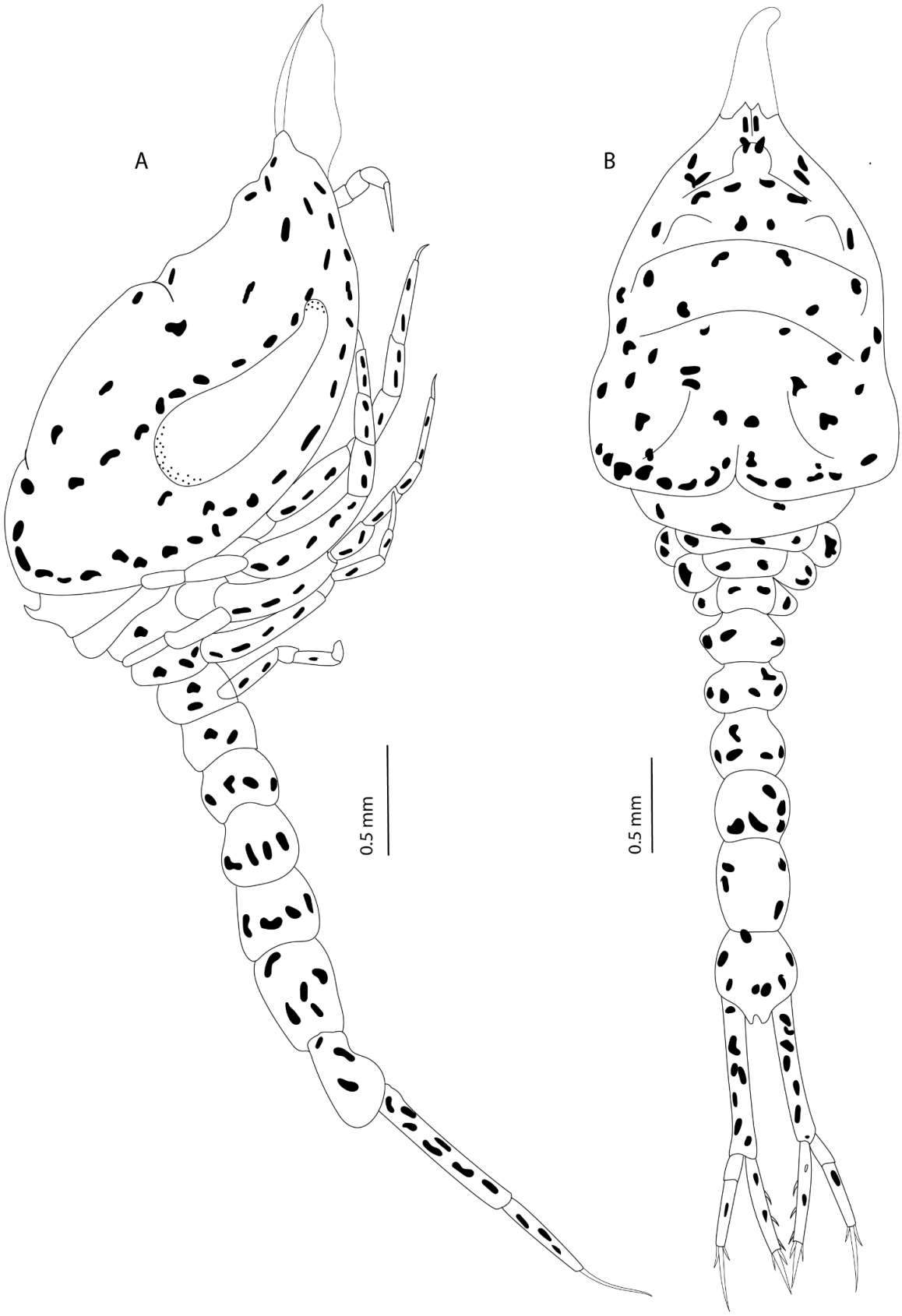
Pereopod 2 basis 0.5 times shorter than remaining articles together. Merus 0.3 times shorter than basis. Carpus 1.1 times longer than merus. Propodus 0.7 times shorter than carpus. Dactylus longer than carpus and propodus together. Two subapical and two apical spines present.

Uropod peduncle 1.3 as long as the last pleon segment, poorly serrated. Endopod 0.6 times shorter than peduncle with three spines on inner margin and three apical spines, one much longer than others. Exopod 0.8 times shorter than endopod with two spines on outer margin, one spine on inner margin and two apical ones.

Distribution Campos Basin, Rio de Janeiro State, Brazil (21º8'27.744"S 40º15'56.563"W), 97 - 388 m depth.

Remarks. *Campylaspis* sp.3 is most similar with *Campylaspis maculata* Zimmer, 1909 in having short pseudorostrum, longitudinal rows of tubercles and chromatophores, lateral shallow sulcus not bordered by ridges and not meeting both anterior and posterior limit of carapace, and also chromatophores on thorax and pleon. The differences between the *Campylaspis* sp.3 and *C. maculata* are (*C. maculata* in parenthesis): eyelobe wider with lenses (vs. lenses absent); transverse ridges present on dorsal surface (vs. transverse ridges absent); oblique lateral ridge on posterior third (vs. absent). *Campylaspis* sp.3 also resembles *C. zimmeri* Gerken, 2012 by the short pseudorostrum, longitudinal rows of tubercles and chromatophores presence throughout the entire body. However, *Campylaspis* sp.3 is readly distinguished *C. zimmeri* in: eyelobe with lenses (vs. lenses absent); sulcus lateral (vs. sulcus absent); transverse ridges on dorsal surface of carapace (vs. transverse ridge absent); oblique ridge on posterior third of carapace (vs. oblique ridge absent).

Figure 4 – *Campylaspis* sp.3. Male, A. Habitus in lateral view; B. Habitus in dorsal view, Campos Basin, 99 m, MOUFPE 21047.



Fonte: A autora (2023).

***Campylaspis* sp.4**

Fig. 5

Material examined. 1 subadult male (2.9 mm), T700N 4#18, 21º6'51.775"S 40º11'35.196"W, 741 m depth, Petrobras, MOUFPE 21049; 3 juvenile females, T700N 4 #11, 21º11'59.15"S 40º12'30.323"W, 721 m depth, Petrobras, MOUFPE 21636 - 21638.

Description of the subadult male (based on T700N 4#18).

Integument with irregular hexagonal pattern.

Carapace armature rectangular-shaped, 1.8 longer than wide. Pseudorostrum a fifth of carapace length and upturned. Eyelobe longer than wide, without lenses. Lateral with two horizontals subparallel, one transverse and one oblique ridges on each side, leaving a deep sulcus in between. Upper horizontal ridge running from the posterior part beyond the basis of pseudorostrum. Lower ridge subparallel the upper one ending in the inferior anterior margin of carapace. Oblique ridge posteriorly connecting the upper to lower horizontal ridge. Transverse ridge dividing the sulcus in a posterior large area and a small anterior area. Dorsal surface with one pair of tubercles by the end of the eyelobe line, and with one pair of protuberances right behind. Two transverse low ridges, first one in the direction of lateral transverse ridge and the second almost reaching the half of carapace. Trapezoid area on posterior part formed by two transverse dorsal ridge (the lower one almost hind ending on inferior margin of carapace), and the two oblique lateral ridges.

Torax pereonites 1-3 covered by carapace. All segments with lateral projections serrated.

Pleon all segments with dorsal ridges serrated.

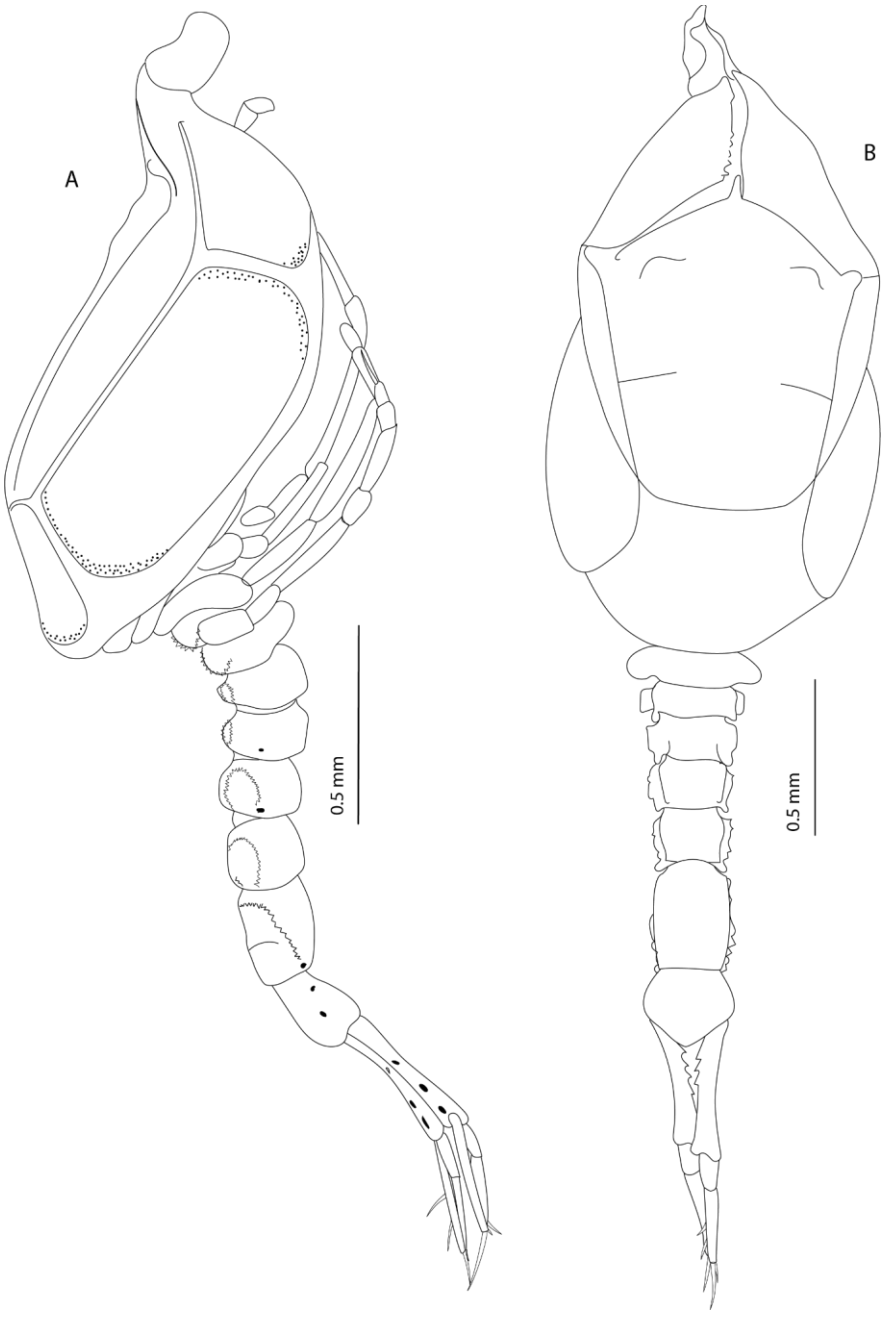
Uropod peduncle 1.3 times longer than last pleon segment, serrated on inner margin. Endopod 0.8 times shorter than peduncle, on inner margin two lateral spines present and two apical ones. Exopod as long as the endopod, setae on outer margin and two apical spines present.

Distribution Campos Basin, Rio de Janeiro State, Brazil (21º6'51.775"S 40º11'35.196"W), 721 - 741 m depth.

Remarks. *Campylaspis* sp.4 is most similar with *Campylaspis vitrea* Calman, 1906 in having long pseudorostrum, eyelobe short without lenses, two lateral transverse ridges, dorsal surface with one transverse ridge on posterior third, forming a trapezoidal area with the lateral ridges. The differences between the *Campylaspis* sp.4

and *C. vitrea* are (*C. vitrea* in parenthesis): dorsal surface with two transverse ridges on middle and posterior third (vs. only one transverse ridge on posterior third). *Campylaspis* sp.4 also resembles *Campylaspis* sp.13 by the lack of prominences on dorsal surface and a posterior area formed by the transverse dorsal ridge and the two lateral ridges. However, *Campylaspis* sp.4 is readly distinguished *Campylaspis* sp. 13 in the presence of longitudinal ridges on the dorsal surface, absent in *Campylaspis* sp.4.

Figure 5 – Campylaspis sp.4. Male, A. Habitus in lateral view; B. Habitus in dorsal view, Campos Basin, 741 m, MOUFPE 21049.



Fonte: A autora (2023).

***Campylaspis* sp.5**

Fig. 6

Material examined. 1 subadult male (2.3 mm), T400S 5#21, 23º33'28.75"S 41º15'6.296"W, 399m depth, Petrobras, MOUFPE 21501; 1 juvenil female, PL100S 1#18, 23º11'0.449"S 41º44'58.502"W, 128.42m depth, Petrobras, MOUFPE 21500; 1 subadult female T400C 4#11, 23º39'26.298"S 41º21'28.692"W, 368m depth, Petrobras, MOUFPE 21502; 3 juvenile females, PC100N 8# 05, 21º26'42.346"S 40º14'45.114"W, 100 m depth, Petrobras, MOUFPE 21611 - 21613.

Description of the subadult male (based on T400S 5#21).

Integument with hexagonal pattern.

Carapace armature rectangular-shaped, 1.5 times longer than wide. Pseudorostrum one fifth of carapace total length not upturned. Eyelobe wider than long without lenses. Lateral sides with one upper lateral ridge well defined, running from below of pseudorostrum backwards to posterior margin of carapace. Lower ridge not so sculptured and not reaching the basis of pseudorostrum. One transverse ridge on posterior third. Dorsal surface of carapace with one pair of prominences behind the eyelobe. Spines, tubercles or setae absent. Scattered chromatophores all over the carapace with a high concentration on the upper ridge.

Torax pereonites 1-2 covered by carapace, all segments with lateral prominent structure.

Pleon all segments with chromatophores dorsally and laterally. No ornamentations.

Pereopod 2 basis 0.5 times shorter than remaining articles together. Ischium glabrous. Merus 0.4 times shorter than basis. Carpus 1.2 times longer than merus. Propodus 0.4 times shorter than dactylus. Dactylus as long as carpus and propodus together, three apical setae present, with digital process 0.1 times shorter than article.

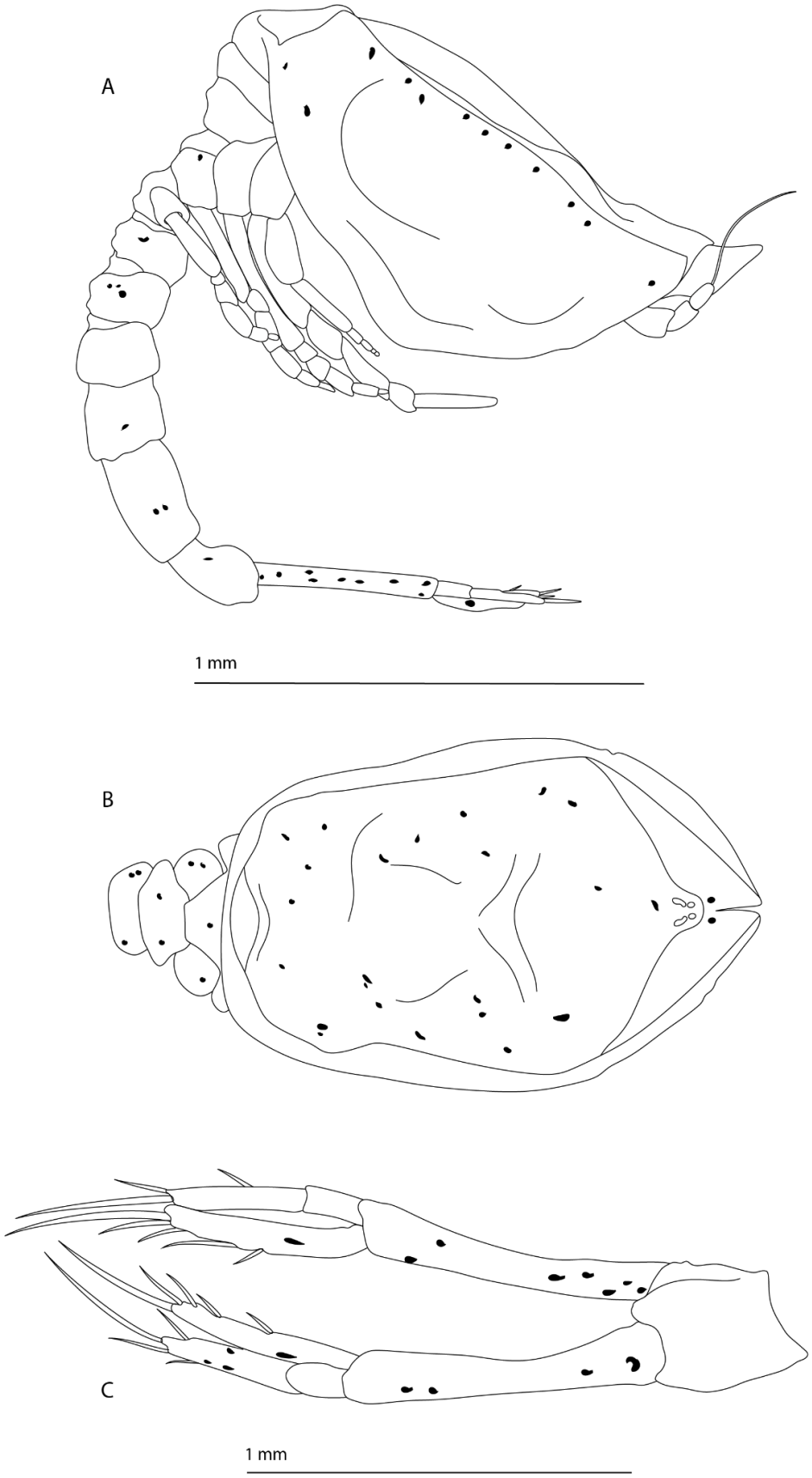
Uropod peduncle not serrated. Endopod 0.5 as long as the peduncle length, with three lateral spines on inner margin, one subapical and two apical spines. Exopod as long as the endopod length, with one lateral spine on outer margin, one lateral on inner margin and two apical ones.

Distribution. Campos Basin, Rio de Janeiro State, Brazil (23º33'28.75"S 41º15'6.296"W), 100 - 399 m depth.

Remarks *Campylaspis* sp.5 shares with *Campylaspis bulbosa* Jones, 1974 a pseudorostrum, eyelobe without lenses, one lateral transverse ridge on posterior third and one pair of prominences behind the eyelobe. The differences between

Campylaspis sp.6 and *C. bulbosa* are (*C. bulbosa* in parenthesis): lateral transverse ridge not meeting their fellows mid-dorsally (vs. lateral transverse ridge meeting their fellows mid-dorsally); transverse dorsal ridges absent (vs. two transverse dorsal ridges not meeting the midline) and dactylus of pereopod 2 with a digital process (vs. digital process absent). *Campylaspis* sp.5 also resembles *Campylaspis mansa* Jones, 1974 by the presence of one pair of prominences on the dorsal surface, dactylus of pereopod 2 as long as carpus and propodus together and lateral sulcus not much broader behind. However, *Campylaspis* sp.5 is readly distinguished *Campylaspis mansa* by (*C. mansa* in parenthesis): transverse ridge on posterior third portion of carapace (vs. transverse ridge absent), and dactylus of pereopod 2 with three terminal long spines and digital process present (vs. three short stout terminal spines and digital process absent).

Figure 6 – *Campylaspis* sp.5. Male, A. Habitus in lateral view; B. Dorsal view of carapace, C. Uropod. Campos Basin, 399 m, MOUFPE 21501.



Fonte: A autora (2023).

***Campylaspis* sp.6**

Fig. 7

Material examined. 1 subadult male (6.0 mm) and 2 subadult females (2.3 mm), PL100S 1#19, 23º9'48.884"S 41º50'48.044"W, 117.61 m depth, Petrobras, MOUFPE 21579 - 21581; 1 subadult female, PC100C 2#09, 22º23'19.734"S 40º35'34.249"W, 101 m depth, Petrobras, MOUFPE 21563; 1 subadult female, PL100S 1#05, 23º21'59.958"S 41º34'37.769"W, 122.62 m depth, Petrobras, MOUFPE 21564; 1 female PL100S 1#12, 23º14'17.585"S 41º42'41.94"W, 119.61 m depth, Petrobras, MOUFPE 21565; 1 female PL100S 1#11, 23º16'24.74"S 41º45'5.404"W, 125.62 m depth, Petrobras, MOUFPE 21566; 1 subadult male PL100S 1#14, 23º13'11.51"S 41º43'50.999"W, 119.61 m depth, Petrobras, MOUFPE 21567; 1 subadult male PL100S 1#08, 23º19'43.5"S 41º41'37.738"W, 125.43 m depth, Petrobras, MOUFPE 21568; 1 subadult female, PL100S 1#10, 23º16'26.08"S 41º43'55.43"W, 124.75 m depth, Petrobras, MOUFPE 21569; 1 subadult female, PL100S 1#02, 23º25'8.314"S 41º41'44.56"W, 132.4 m depth, Petrobras, MOUFPE 21570; 1 subadult male, PL100S 1 #06, 23º21'48.298"S 41º46'21.99"W, 132.82 m depth, Petrobras, MOUFPE 21571; 4 subadult females, PC100C 2#09, 22º23'19.734"S 40º35'34.249"W, 101 m depth, Petrobras, MOUFPE 21572 - 21575; 1 juvenil and 1 subadult females, PL100S 1#05, 23º21'59.958"S 41º34'37.769"W, 122.62 m depth, Petrobras, MOUFPE 21576 - 21577; 1 subadult male, PL100S 1#12, 23º14'17.585"S 41º42'41.94"W, 119.61 m depth, Petrobras, MOUFPE 21578; 1 adult, 3 subadult and 4 juvenile females, PL100S 1#14, 23º13'11.51"S 41º43'50.999"W, 119.61 m depth, Petrobras, MOUFPE 21582 - 21589; 3 subadult and 4 juvenile females, PL100S 1#08, 23º19'43.5"S 41º41'37.738"W, 125.43 m depth, Petrobras, MOUFPE 21590 - 21597; 1 female, PL100S 1#10, 23º16'26.08"S 41º43'55.43"W, 124.75 m depth, Petrobras, MOUFPE 21598; 4 subadult, 1 female, PL100S 1 #02, 23º25'8.314"S 41º41'44.56"W, 132.4 m depth, Petrobras, MOUFPE 21599 - 21601; 1 juvenil male and 1 juvenil female, PL100S 1#06, 23º21'48.298"S 41º46'21.99"W, 132.82 m depth, Petrobras, MOUFPE 21602 - 21603; 7 females, PC100C 2#09, 22º23'19.734"S 40º35'34.249"W, 101 m depth, Petrobras, MOUFPE 21604 - 21610; 1 male, PL100S 1#05, 23º21'59.958"S 41º34'37.769"W, 122.62 m depth, Petrobras, MOUFPE 21614;

Carapace armature oval-shaped. Pseudorostrum in males straight and very short, less than a sixth of carapace length. In females little upturned and a fifth of carapace length. Two subparallel lateral ridges circulating the carapace, forming a lateral sulcus also

defined posteriorly. Both ridges running until the basis of pseudorostrum. Lower ridge not meeting the inferior margin of carapace. Chromatophores bordering the ridges. Dorsal surface with one pair of protuberances. Carapace in males more flattened than females.

Torax pereonites 1-2 covered by carapace in males and 1-3 segments in females. First segment forming an upturned hook. All segments with lateral projections.

Pleon all segments without ornamentations.

Description of the appendages of subadult male (based on PL100S 1#19).

Pereopod 1 basis as long as remaining articles together with three setae. Ischium 0.1 times basis length with a long setae. Merus twice as long as ischium, with eight setae. Carpus as long as merus length, with nine setae. Propodus 0.8 times shorter than carpus, with seven setae. Dactylus 0.5 times shorter than propodus, with two lateral and two apical setae.

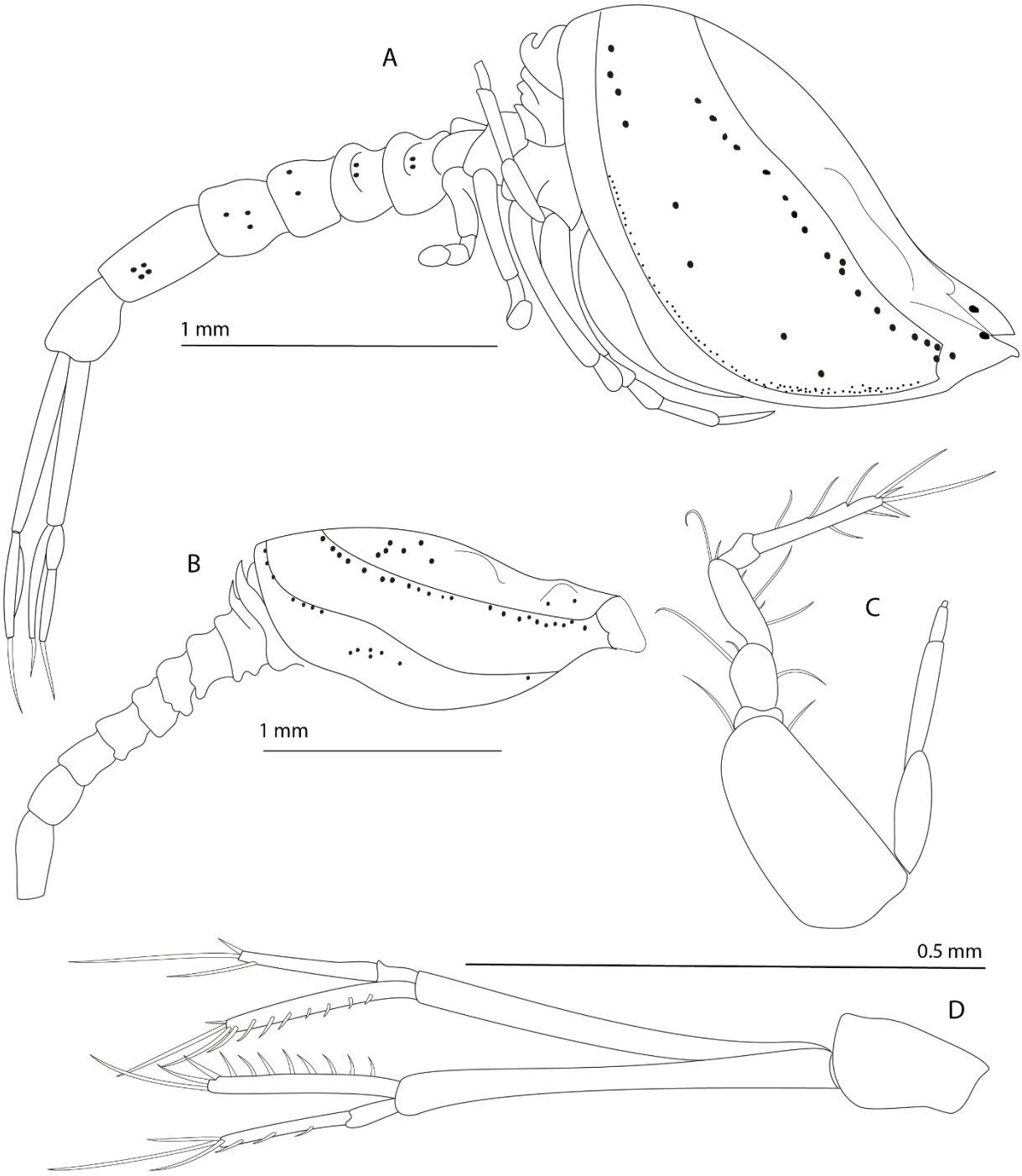
Pereopod 2 basis 0.6 times shorter than remaining articles together, with two setae. Ischium glabrous. Merus with three setae. Carpus 1.4 times longer than merus, distally with two setae, laterally with four setae. Propodus glabrous, 0.3 times shorter than carpus. Dactylus as long as carpus and propodus together, with five setae laterally, one subapical and three apical setae.

Uropod peduncle as long as the last three segments of pleon, with three spines on inner margin not serrated or poorly serrated, setae present. Endopod 0.4 times shorter than peduncle length, with eight spines on inner edge, one subapical and two apical ones. Exopod as long as endopod length, with three spines on outer margin, one subapical and two apical ones.

Distribution. Campos Basin, Rio de Janeiro State, Brazil (23º9'48.884"S 41º50'48.044"W), 101 - 132,82 m depth.

Remarks. *Campylaspis* sp.6 is closed related to *Campylaspis bicarinata* Jones, 1974 in having carapace not elevated dorsally, short pseudorostrum, lateral sulcus encircling the carapace, chromatophores throughout the lateral ridges and dactylus of pereopod 2 as long as carpus and propodus together. The differences between the *Campylaspis* sp.6 and *C. bicarinata* are (*C. bicarinata* in parenthesis): male without spines on dorsal surface (vs. small spines on dorsal surface present); female without a small spine behind the eyelobe (vs. small spine present); dactyl of pereopod 2 with one subapical and three apical spines (vs. one short stout terminal spine and a longer setae).

Figure 7 – *Campylaspis* sp.6. A. Female: Habitus in lateral view; B-D. Male: B. Habitus in lateral view; C. Pereopod 2; D. Uropod. Campos Basin, 61 m, MOUFPE 21579 - 21581.



Fonte: A autora (2023).

***Campylaspis* sp.7**

Fig. 8

Material examined. 1 subadult female (6.0 mm), T700C 4#21, 22º31'26.681"S 40º16'48.101"W, Petrobras, MOUFPE 21503;

Integument with hexagonal pattern.

Carapace armature oval-shaped, 1.5 longer than wide. Smooth and without sulcus or ridges. Pseudorostrum a sixth of carapace length, upturned. Eyelobe wider than long, lenses absent. Chromatophores on anterior third of carapace near to midline. One pair of low protuberances closer to eyelobe line.

Torax pereonites 1-5 covered by carapace, ornamentations absent.

Pleon all segments without ornamentations.

Pereopod 2 dactylus as long as carpus length, with three apical setae and digital process.

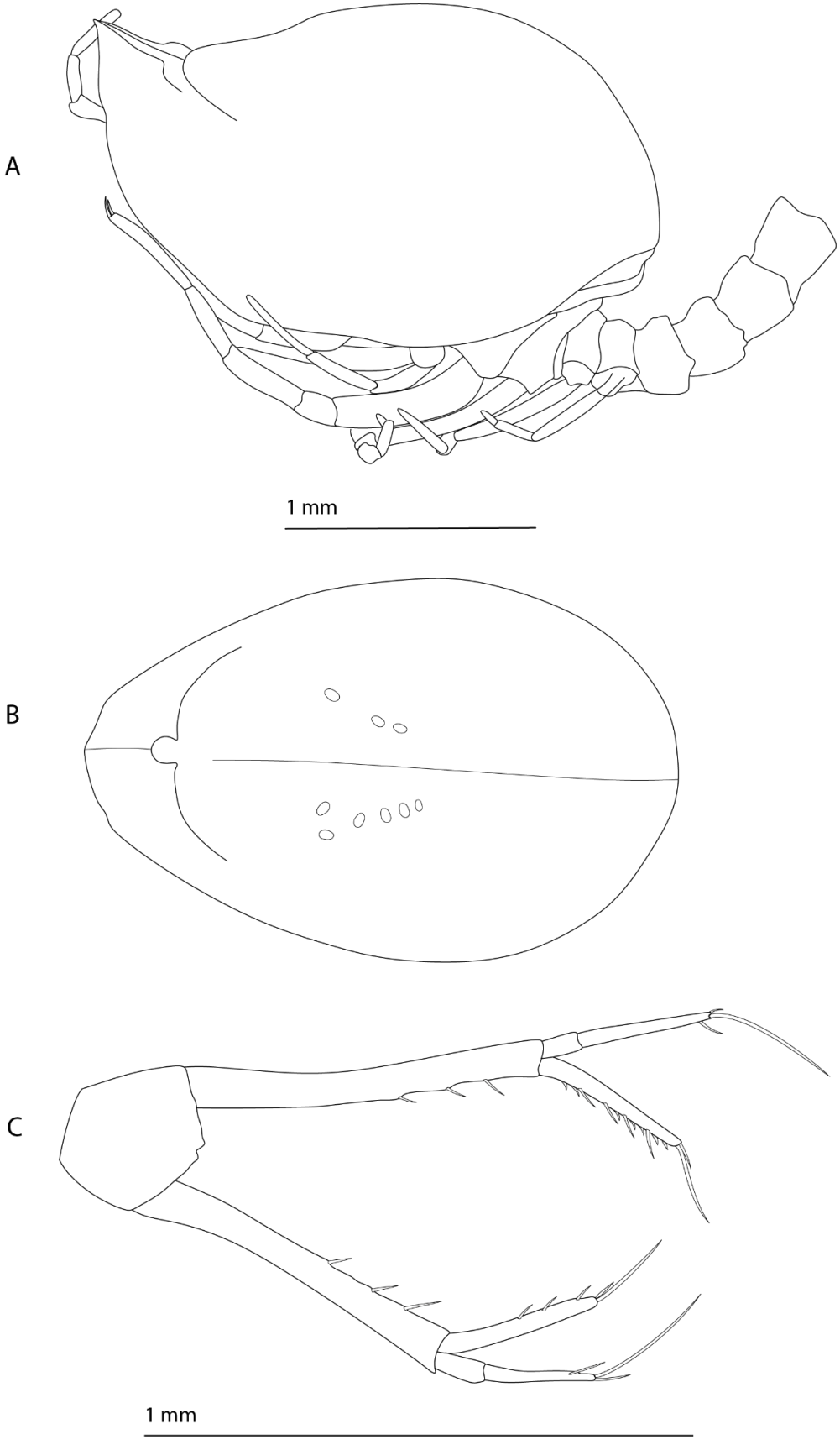
Uropod peduncles serrated on inner margin, as long as last four segments of pleon, three lateral spines present. Endopod 0.3 times shorter than peduncle length, with four long and some short lateral spines on inner margin and two apical spines. Exopod as long as endopod length, with one lateral spine on inner margin and two apical spines.

Distribution Campos Basin, Rio de Janeiro State, Brazil (22º31'26.681"S 40º16'48.101"W), 693 m depth.

Remarks. *Campylaspis* sp.7 is most similar with to *Campylaspis amblyoda* Gamo, 1960 in having carapace vaulted, eyelobe wider than long, pseudorostrum longer than eyelobe in length, lateral sulcus absent, one pair of dorsal protuberances near the eyelobe line and chromatophores on dorsal surface near the midline. The differences between the *Campylaspis* sp.7 and *C. amblyoda* is (*C. amblyoda* in parenthesis) eyelobe lenses absent (vs. lenses present).

Campylaspis sp.7 also resembles *Campylaspis paeneglabra* Stebbing, 1912 by eyelobe without lenses, presence of chromatophores near the midline on anterior third of surface of carapace, absence of lateral sulcus or ridges, merus, carpus and propodus of maxilliped 3 serrated, and dactylus of pereopod 2 shorter than carpus and propodus together. However, *Campylaspis* sp.7 is readly distinguished *Campylaspis paeneglabra* by (*C. paeneglabra* in parenthesis): one pair of protuberances right behind the eyelobe (vs. pair of protuberances absent); dactylus of pereopod 2 with a digital process (vs. digital process absent).

Figure 8 – *Campylaspis* sp.7. Female, A. Habitus in lateral view, B. Dorsal view of carapace, C. Uropod. Campos Basin, MOUFPE 21503.



Fonte: A autora (2023).

***Campylaspis* sp.8**

Fig. 9

Material examined. 1 juvenil female (2.6 mm), PA100C 2#12, 22º16'5.102"S 40º32'32.51"W, 78m depth, Petrobras, MOUFPE 21504; 1 subadult male, PL100S 1#12, 399m depth, Petrobras, MOUFPE 21696;

Carapace armature oval-shaped. Pseudorostrum less than a sixth of carapace length, and little upturned. Eyelobe wider than long with three lenses. Lateral side with a unique ridge starting from the basis of pseudorostrum circling the entire carapace. The ridge crosses the dorsal almost on half of carapace.

Torax Pereonites 1-3 covered by carapace, with lateral projections.

Pleon All segments without ornamentations.

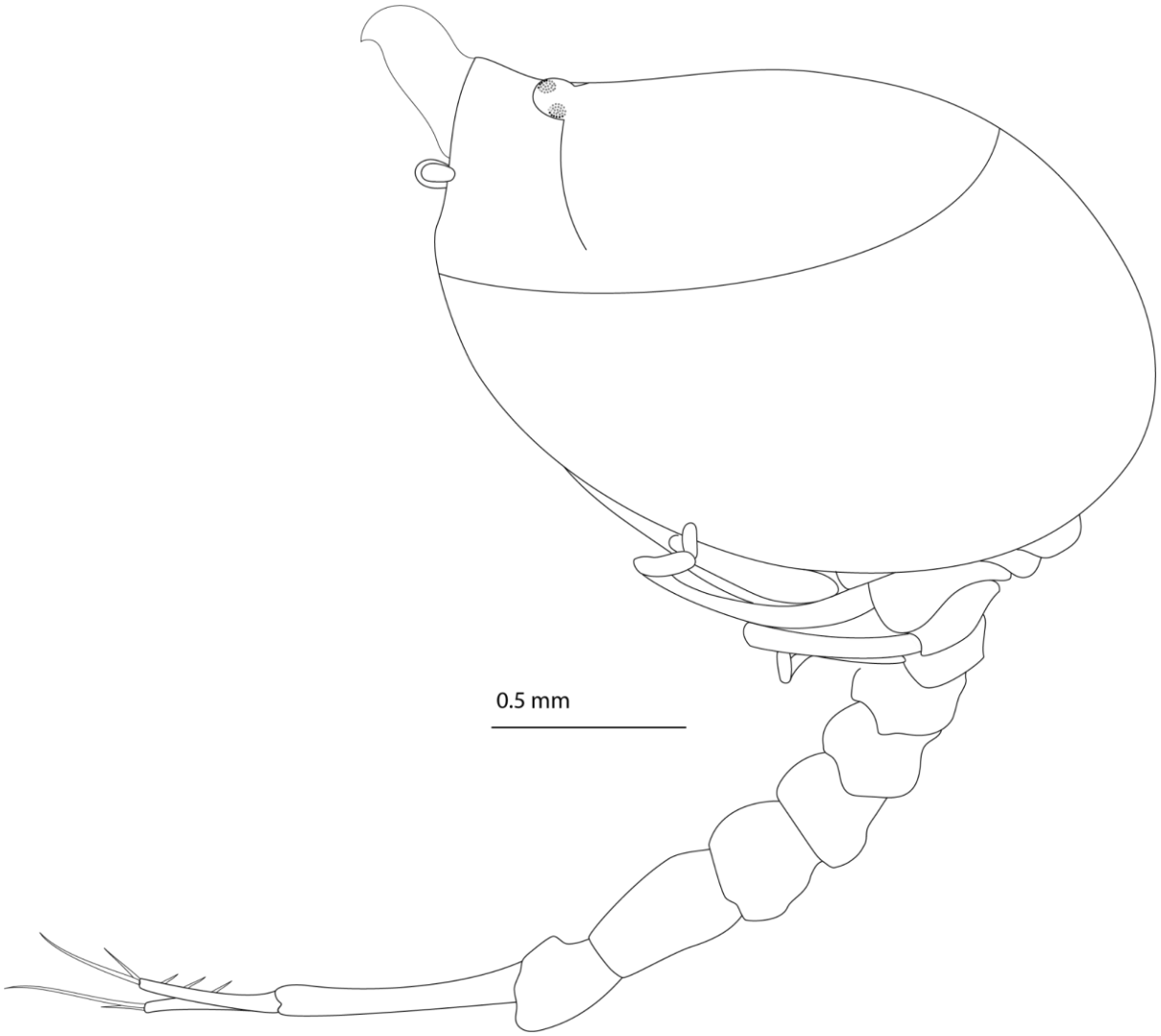
Pereopod 2 Dactylus with three apical spines and one digitiform tapered process.

Uropod Peduncles as long as the last two segments of pleon. Endopod 0.6 times shorter than peduncle length, with three spines on inner margin and two apical ones. Exopod 0.8 times shorter than endopod length, with two apical spines.

Distribution Campos Basin, Rio de Janeiro State, Brazil (22º16'5.102"S 40º32'32.51"W), 78 - 399 m depth.

Remarks. *Campylaspis* sp.8 is closed related to *Campylaspis uniplicata* Hale, 1945 in having a unique oblique ridge encircling the carapace, eyelobe wider than long with lenses, pseudorostrum short and lateral sulcus absent. The differences between the *Campylaspis* sp.9 and *C. uniplicata* is (*C. uniplicata* in parenthesis) dactylus of pereopod 2 with a distal digital process (vs. digital process absent) and endopod 0.6 times shorter than peduncle of uropod (vs. peduncle three times longer than endopod).

Figure 9 – *Campylaspis* sp.8. Female, A. Habitus in lateral view. Campos Basin, 78M, MOUFPE 21504.



Fonte: A autora (2023).

***Campylaspis* sp.9**

Fig. 10

Material examined. 1 subadult female (3.9 mm), PC100S 2#14, 22º59'0.499"S 41º5'14.525"W, 98.26 m depth, Petrobras, MOUFPE 21505; 1 female, PC100S 2#05, 23º0'37.775"S 41º4'41.531"W, 97 m depth, Petrobras, MOUFPE 21506; 1 juvenil male, PC100S 2#08, 23º0'51.336"S 41º3'53.32"W, 97 m depth, Petrobras, MOUFPE 21507; 1 juvenil male, PC100S 2#04, 23º0'22.46"S 41º4'23.747"W, 97 m depth, Petrobras, MOUFPE 21508.

Description of the subadult female (based on PC100S 2#14).

Carapace armature rectangular-shaped, 1.6 longer than wide. Pseudorostrum short, less than a sixth of carapace and little upturned. Eyelobe wider than long, lenses present. Lateral sides with two ridges subparallel meeting posteriorly before the inferior margin, and reaching the basis of pseudorostrum, forming a lateral sulcus with scattered low tubercles. Dorsal surface with two pairs of tubercles behind the eyelobe line. Lateral ridges almost reaching the dorsal midline. Chromatophores present.

Torax pereonites 1-3 covered by carapace. First segment forming an upturned hook. Lateral projections absent.

Pleon dorsal ornamentations absent. Chromatophores present.

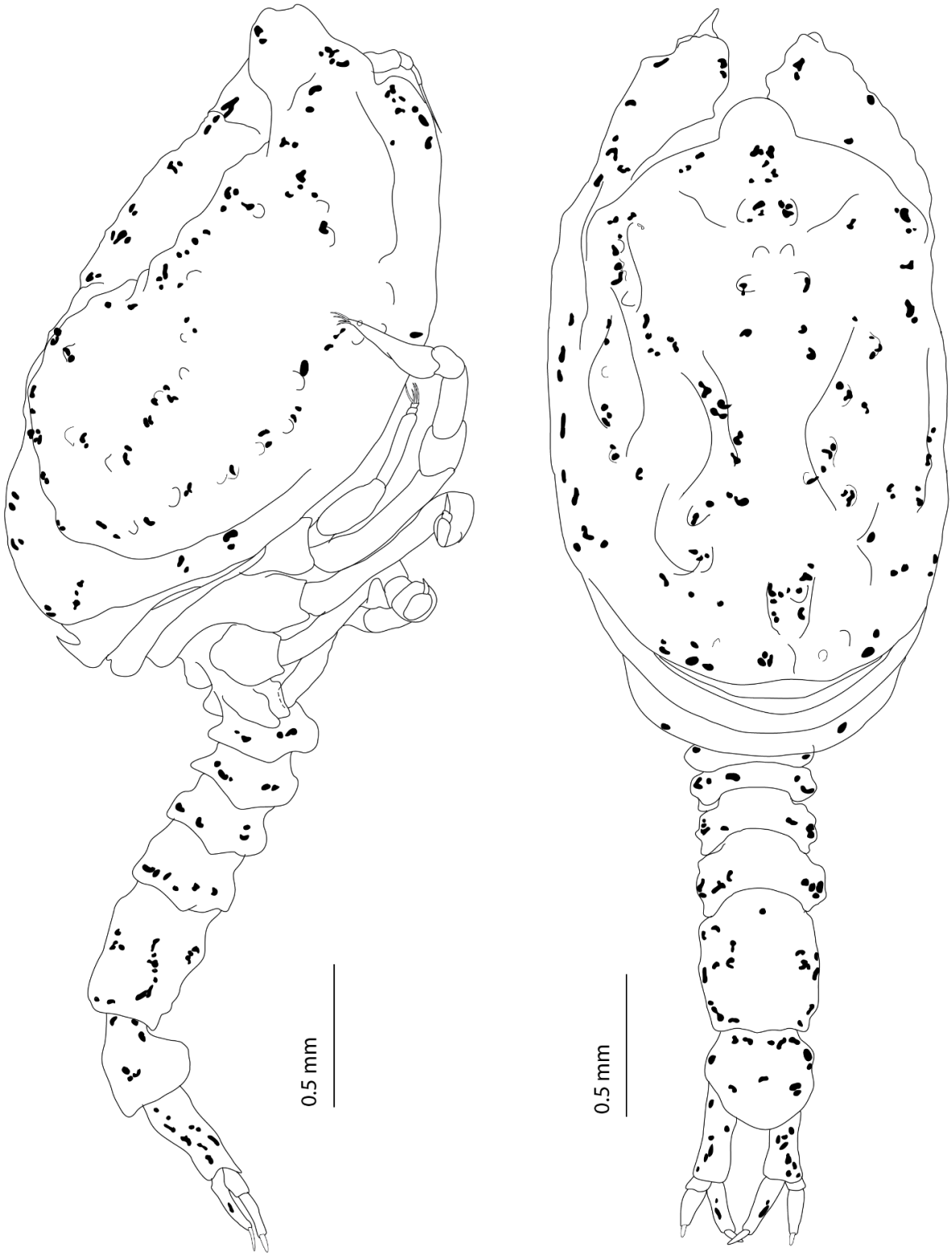
Pereopod 2 dactylus much broader on basis, tapering until the distal end, with two apical setae and one robust spine.

Uropod peduncle 0.6 times shorter than last segment of pleon, chromatophores present. Endopod 0.5 times shorter than peduncle, serrated on both margins, two robust apical spines present. Exopod as long as endopod, lateral setae and robust apical spine present.

Distribution Campos Basin, Rio de Janeiro State, Brazil (22º16'5.102"S 40º32'32.51"W), 97 - 98.26 m depth.

Remarks. *Campylaspis* sp.9 is closed related to *Campylaspis crispa* Lomakina, 1955 in having pseudorostrum short, longitudinal lateral ridges and chromatophores bordering then and uropod peduncle short. The differences between the *Campylaspis* sp.9 and *C. crispa* are (*C. crispa* in parenthesis): two longitudinal lateral ridges on carapace (vs. three longitudinal ridges); two pairs of tubercles present on dorsal surface of carapace (vs. tubercles on carapace absent); dactylus of pereopod 2 broader and little tapered on distal end (vs. dactylus of pereopod 2 narrow) and dactylus of pereopod 2 with three very short stout apical spines (vs. two longer spines).

Figure 40 – *Campylaspis* sp.9. Female, A. Habitus in lateral view, B. Habitus in dorsal view. Campos Basin, 98.26m, MOUFPE 21505.



Fonte: A autora (2023).

***Campylaspis* sp.10**

Fig. 11

Material examined. 1 male (2.9 mm), G1 R3, 11°10’26,41’’S 036°47’34,81’’W, 984 m depth, Petrobras, MOUFPE 21705;

Integument with hexagonal pattern.

Carapace armature oval-shaped flatten. Pseudorostrum a sixth of carapace length, not upturned (straight). Eyelobe small, without lenses. Smooth and without sulcus or ridges.

Torax pereonites 1-3 covered by carapace. Ornamentations absent.

Pleon dorsal ornamentations absent.

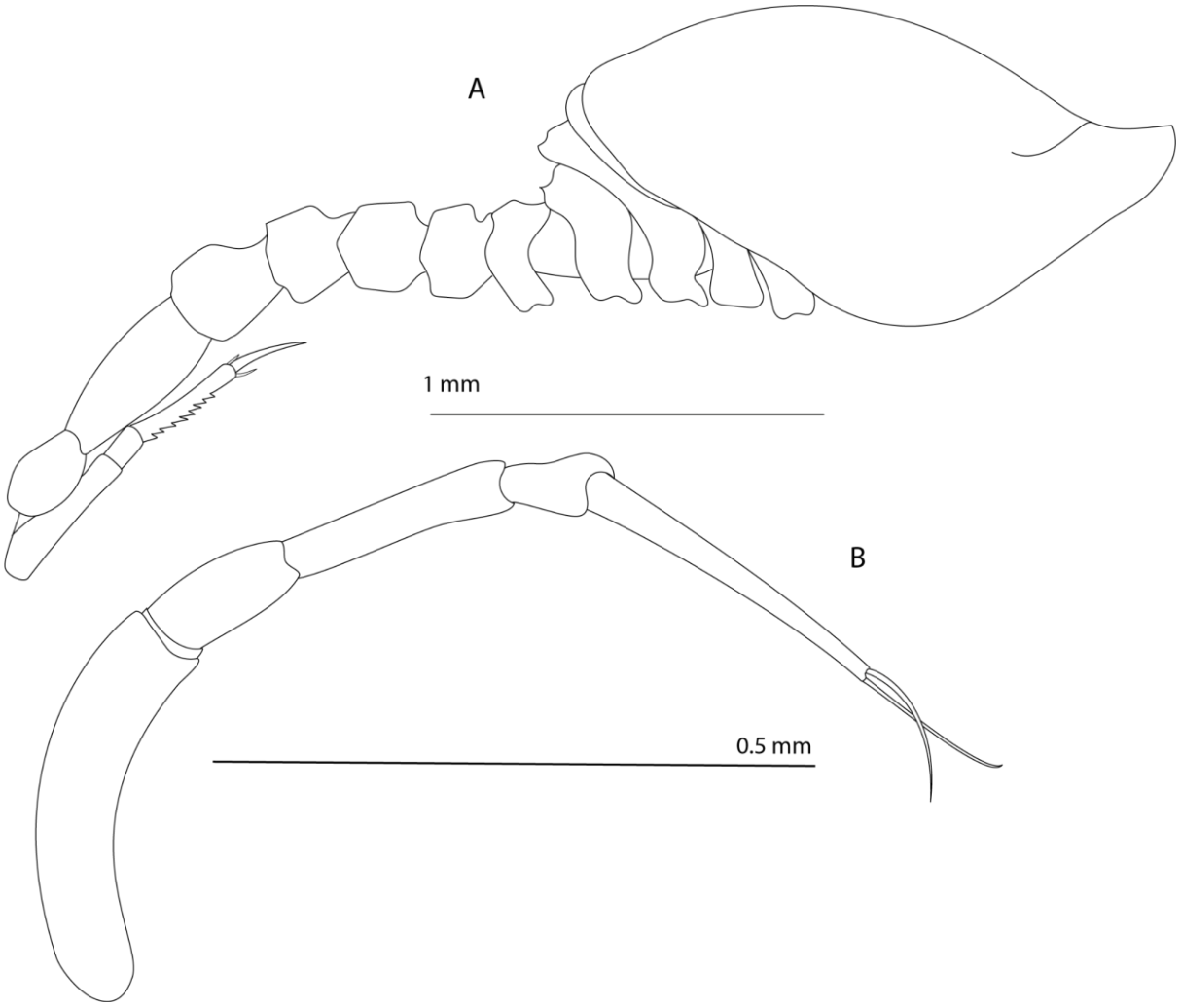
Pereopod 2 basis 0.4 times longer than remaining articles together. Dactylus longer than carpus and propodus together, neither tapered nor digitiform by the end, two apical setae present.

Uropod peduncles 0.8 times shorter than last two segments of pleon. Endopod 0.5 times shorter than peduncles length. Exopod as long as endopod, serrated.

Distribution Sergipe Sub-Basin, Sergipe State, Brazil (11°10’26,41’’S 036°47’34,81’’W), 984 m depth.

Remarks. *Campylaspis* sp.10 resembles *Campylaspis nitens* Bonnier, 1896 and *Campylaspis nuda* Jones, 1974 in having a carapace little vaulted dorsally, eyelobe short without lenses, pseudorostrum short and carapace without ornamentations. The differences between the *Campylaspis* sp.10 and the cited species are: *C. nitens*: dactylus of pereopod 2 broad and digitiform; *C. nuda*: dactylus of pereopod 2 narrow and tapering; *Campylaspis* sp.10: dactylus of pereopod 2 neither digitiform, nor tapering, but straight.

Figure 51 – *Campylaspis* sp.10. Male, A. Habitus in lateral view, B. Pereopod 2. Sergipe Basin, 984m, MOUFPE 21705.



Fonte: A autora (2023).

***Campylaspis* sp.11**

Fig. 12

Material examined. 1 subadult female (2.6 mm), PC100C 1#16, 22º26'59.701"S 40º38'38.944"W, 100 m depth, Petrobras, MOUFPE 21699;

Carapace armature oval-shaped, vaulted dorsally. Pseudorostrum short. Eyelobe wider than long. Sulcus and ridges if present, ill-defined. Dorsal surface with longitudinal rows of granule-like tubercles reaching the posterior third until anterior third.

Torax pereonites 1-3 covered by the carapace. Ornamentations absent.

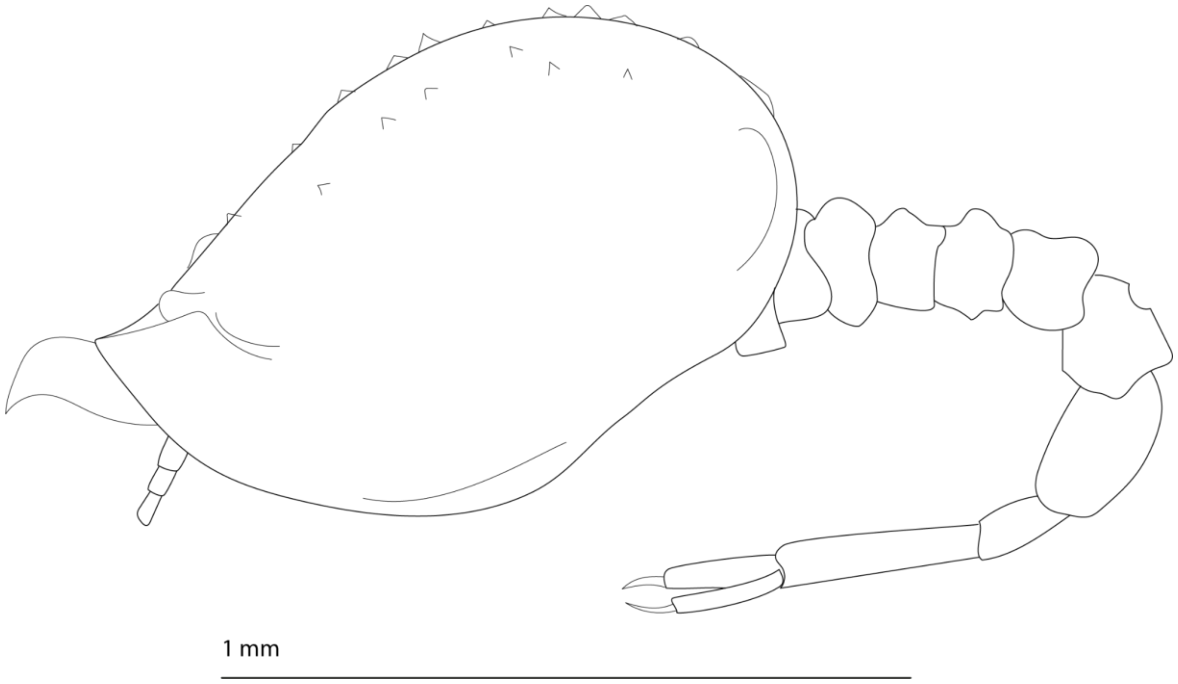
Pleon all segments without ornamentations.

Uropod peduncles 0.7 times shorter than last two segments of pleon. Endopod 0.6 times shorter than peduncles. Exopod as long as endopod.

Distribution Campos Basin, Rio de Janeiro State, Brazil (22º26'59.701"S 40º38'38.944"W), 100 m depth.

Remarks. *Campylaspis* sp.11 is closed to *Campylaspis laticarpa* Hansen, 1920 e *Campylaspis roscida* Hale, 1945 in having the same vault armature of carapace dorsally, granule-like tubercles on dorsal surface, eyelobe wide or of normal size and pseudorostrum short. The differences between the *Campylaspis* sp.11 and the cited species are: *C. laticarpa*: granule-like tubercles only on anterior and middle third of dorsal surface of carapace and eyelobe linguiform; *C. roscida*: granule-like tubercles on the entire dorsal surface of carapace with larger ones near the midline; *Campylaspis* sp.11: two longitudinal rows of granule-like tubercles on dorsal surface of carapace.

Figure 12 – Campylaspis sp.11. Female, A. Habitus in lateral view. Campos Basin, 100m, MOUFPE 21699.



Fonte: A autora (2023).

***Campylaspis* sp.12**

Fig. 13

Material examined. 2 adult female (4.4 mm) and 1 subadult male (4.9 mm), T400C 4#07, 22º36'49.295"S 40º30'3.002"W, 390 m depth, Petrobras, MOUFPE 21615 - 21617; 1 subadult female, T400C 4#06, 22º37'37.117"S 40º30'46.012"W, 393 m depth, Petrobras, MOUFPE 21621; 1 female, PL100S 1#10, 23º16'26.08"S 41º43'55.43"W, 124.75 m depth, Petrobras, MOUFPE 21695.

Description of the subadult male (based on T400C 4#07).

Carapace armature rectangular-shaped. Pseudorostrum short and little upturned. Eyelobe short without lenses. Lateral side longitudinal upper ridge present, and transverse ridges or sulcus absent. Dorsal surface with a unique transverse ridge on posterior third of carapace, forming a posterior rectangular area with longitudinal lateral and transverse dorsal ridges. Also, on dorsal, longitudinal ridges starting from the transversal ridge and disappearing before the eyelobe line.

Torax pereonites 1-2 covered by the carapace. Lateral projections present.

Pleon all segments with low ridges forming small areas on dorsal, similar to *Campylaspis vitrea* Calman, 1906.

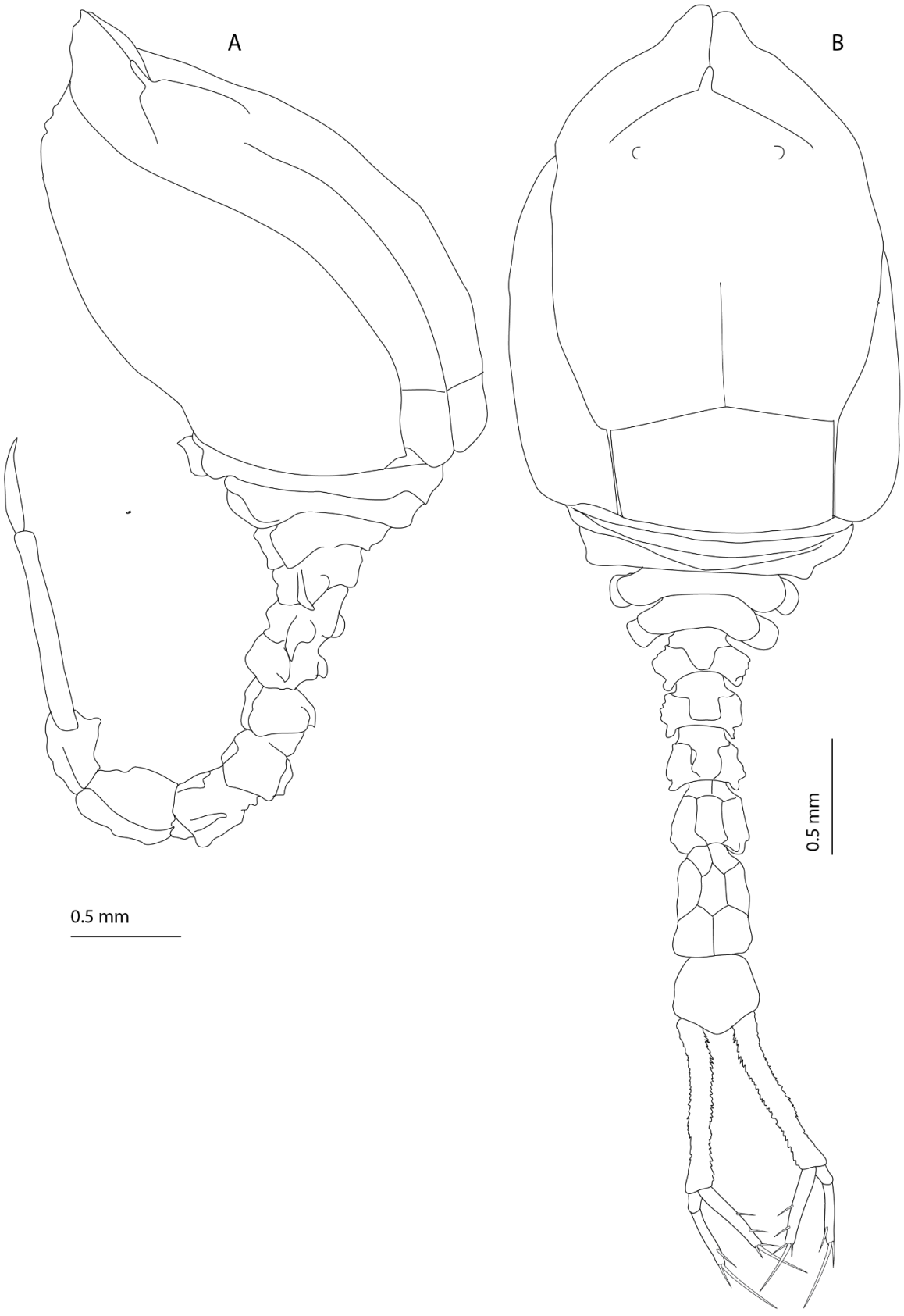
Pereopod 2 dactylus as long as carpus and propodus together, with one subapical and two apical setae. Digital process present.

Uropod peduncles 0.7 times shorter than last two segments of pleon. Endopod 0.6 times shorter than peduncles. Exopod as long as endopod.

Distribution Campos Basin, Rio de Janeiro State, Brazil (22º36'49.295"S 40º30'3.002"W), 124,75 - 393 m depth.

Remarks. *Campylaspis* sp.12 shares with *Campylaspis vitrea* Calman, 1906 a posterior rectangular area formed by the longitudinal lateral and transverse dorsal ridges, pleon segments with longitudinal ridges, eyelobe lenses absent, tubercles or other large prominences absent. The differences between the *Campylaspis* sp.12 and *C. vitrea* are (*C. vitrea* in parenthesis): lateral transverse ridges absent (vs. two lateral transverse ridges present); dorsal longitudinal ridges present (vs. dorsal longitudinal ridges absent); dactyl of pereopod 2 with a distal process present (vs. distal process absent).

Figure 13 – *Campylaspis* sp.12. Female, A. Habitus in lateral view, B. Habitus in dorsal view. Campos Basin, 390m, MOUFPE 21615.



Fonte: A autora (2023).

***Campylaspis* sp.13**

Fig. 14

Material examined. 2 subadults females (4.8 mm), PC100N 8#06, 21º26'6.284"S 40º14'37.352"W, 118 m depth, Petrobras, MOUFPE 21522 - 21523; 1 female, PA100S 1#04, 23º12'13.608"S 41º12'27.227"W, 104.64 m depth, Petrobras, MOUFPE 21509; 1 female, PA100C 2#14, 22º14'45.143"S 40º29'19.568"W, 79.83 m depth, Petrobras, MOUFPE 21510; 1 female, PA 100 C 2#12, 22º16'5.102"S 40º32'32.51"W, 78 m depth, Petrobras, MOUFPE 21511; 1 male, PA100N 8#2, 21º9'27.5"S 40º16'2.136"W, 106 m depth, Petrobras, MOUFPE 21512; 1 female, PA100N 8#1, 21º10'16.496"S 40º16'23.383"W, 100 m depth, Petrobras, MOUFPE 21513; 2 subadult female, PC100C 2#14, 22º23'36.416"S 40º35'33.922"W, 99 m depth, Petrobras, MOUFPE 21514 - 21515; 1 male and 2 female, PC100N 8#11, 21º23'22.913"S 40º15'26.071"W, 99 m depth, Petrobras, MOUFPE 21516, 21681 - 21682; 3 females, PC100N 8#05, 21º26'42.346"S 40º14'45.114"W, 100 m depth, Petrobras, MOUFPE 21517, 21683 - 21684; 2 female, PC100N 8#09, 21º24'35.953"S 40º14'53.61"W, 112 m depth, Petrobras, MOUFPE 21518 - 21519; 2 females, PC100N 8#12, 21º22'55.369"S 40º15'32.789"W, 111 m depth, Petrobras, MOUFPE 21520 - 21521; 2 females, PC100N 8#10, 21º24'3.035"S 40º15'18.4"W, 95 m depth, Petrobras, MOUFPE 21524 - 21525; 2 females, PC100N 8#14, 21º22'12.209"S 40º15'40.45"W, 107 m depth, Petrobras, MOUFPE 21526 - 21527; 1 subadult, PC100N 10, 21º24'3.035"S 40º15'18.4"W, 95 m depth, Petrobras, MOUFPE 21528; 3 females, PC100N 8#13, 21º21'2.257"S 40º16'6.19"W, 99 m depth, Petrobras, MOUFPE 21529; 4 females, PC100N 8#03, 21º28'10.243"S 40º14'35.639"W, 97 m depth, Petrobras, MOUFPE 21532; 8 subadult, PC100N 8#02, 21º28'46.668"S 40º14'19.54"W, 105 m depth, Petrobras, MOUFPE 21533 - 21540; 7 subadult, PC100N 8#04, 21º27'27.122"S 40º14'45.301"W, 97 m depth, Petrobras, MOUFPE 21541 - 21547; 1 male, PL100S 17, 23º11'2.774"S 41º42'38.153"W, 111.78 m depth, Petrobras, MOUFPE 21548; 2 male and 2 female, PL100S 1#02, 23º25'8.314"S 41º41'44.56"W, 132.4 m depth, Petrobras, MOUFPE 21549 - 21552; 1 male and 1 female, PL100S 1#13, 23º14'12.808"S 41º47'22.974"W, 124.2 m depth, Petrobras, MOUFPE 21553 - 21554; 2 males and 3 females, PL100S 1#06, 23º21'48.298"S 41º46'21.99"W, 132.82 m depth, Petrobras, MOUFPE 21555 - 21559; 2 females, PL100S 1#03, 23º25'6.946"S 41º42'55.184"W, 133.12 m depth, Petrobras, MOUFPE 21560 - 21561; 1 male,

PL100S 17, 23º11'2.774"S 41º42'38.153"W, 111.78 m depth, Petrobras, MOUFPE 21562.

Description of the subadult female (based on PC100N 8#06).

Carapace armature rectangular-shaped, 1.2 longer than wide. Pseudorostrum short and upturned. Eyelobe wider than long with lenses. Lateral side longitudinal upper ridge present, and one transverse ill-defined ridge on anterior third of carapace. Lateral sulcus divided by the transverse ridge, not much broader behind not bordered by a second ridge. Dorsal surface with scattered long bristles, lateral upper ridge curved dorsally, bordered by granule-like tubercles. Two longitudinal rows of tubercles starting from the curved upper lateral ridge until eyelobe line. Inferior margin of carapace serrated.

Torax pereonites 1-2 covered by the carapace. Lateral projections present.

Pleon all segments with lateral margin serrated.

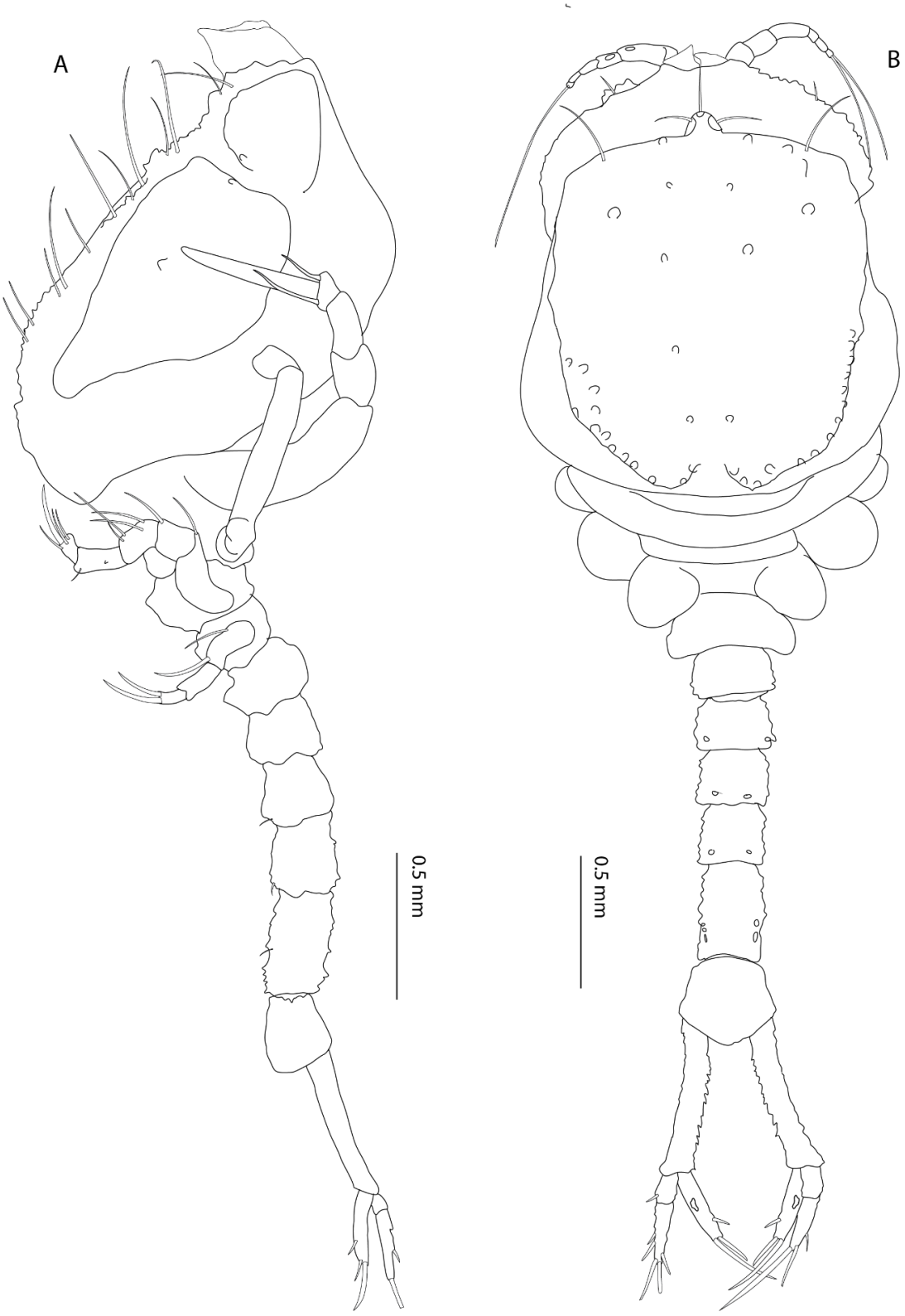
Pereopod 2 dactylus longer than carpus and propodus together, distally tapering. With two apical spines and two apical setae.

Uropod peduncles 0.8 times shorter than last two segments of pleon, both inner and outer margin serrated. Endopod 0.4 times shorter than peduncles, with one spine on inner edge and three apical spines, being one much larger than others. Exopod 1.1 times longer than endopod, with one setae and one spine on outer margin, and two subapical and one apical spines.

Distribution Campos Basin, Rio de Janeiro State, Brazil (22º36'49.295"S 40º30'3.002"W), 78 - 133.12 m depth.

Remarks. *Campylaspis* sp.13 is closed related to *Campylaspis macrophthalma* Sars, 1878 in having lateral transverse ridge on anterior third of carapace, pseudorostrum short and upturned, eyelobe with lenses, upper longitudinal lateral ridge curved on dorsal surface of carapace and low granule-like tubercles on dorsal surface. The differences between the *Campylaspis* sp.13 and *C. macrophthalma* are (*C. macrophthalma* in parenthesis): eyelobe much wider than long (vs. eyelobe linguiform, longer than wide); dorsal surface with two longitudinal rows of granule-like tubercles (vs. longitudinal rows of tubercles absent) and endopod with a unique spine on inner margin (vs. endopod with at least four spines on inner margin).

Figure 14 – *Campylaspis* sp.13. Female, A. Habitus in lateral view, B. Habitus in dorsal view. Campos Basin, 119m, MOUFPE 21522.



Fonte: A autora (2023).

***Campylaspis* sp.14**

Fig. 15

Material examined. 3 subadult, T700N 4 #11, 21º11'59.15"S 40º12'30.323"W, 721 m depth, Petrobras, MOUFPE 21639 - 21641; 2 subadult, T700N 4 #19, 21º6'34.517"S 40º11'52.285"W, 702 m depth, Petrobras, MOUFPE 21642 - 21463; 2 subadult, T700N 4 #20, 21º6'15.966"S 40º11'54.089"W, 688 m depth, Petrobras, MOUFPE 21644 - 21645; T700N 4 #18, 21º6'51.775"S 40º11'35.196"W, 741 m depth, Petrobras, MOUFPE 21646; 2 subadult, T700N 4 #06, 21º18'31.658"S 40º12'32.854"W, 721 m depth, Petrobras, MOUFPE 21647 - 21648; 2 subadult, T700N 4 #22, 21º5'41.539"S 40º11'34.951"W, 723 m depth, Petrobras, MOUFPE 21649 - 21650; 4 subadult, T700N 4 #16, 21º9'0.709"S 40º12'29.57"W, 700 m depth, Petrobras, MOUFPE 21651 - 21654; T700N 4#05, 21º18'55.764"S 40º12'32.616"W, 721 m depth, Petrobras, MOUFPE 21655; T700N 4#10, 21º14'34.508"S 40º12'39.398"W, 727 m depth, Petrobras, MOUFPE 21656; T700N 4#03, 21º20'15.846"S 40º12'17.089"W, 695 m depth, Petrobras, MOUFPE 21657; T700N 4#01, 21º21'53.24"S 40º11'35.095"W, 690 m depth, Petrobras, MOUFPE 21658; 2 subadult, T700S 18 5 #07, 23º44'10.327"S 41º22'5.862"W, 678 m depth, Petrobras, MOUFPE 21659 - 21660; 6 subadult, T700S 3#01, 23º46'50.297"S 41º25'49.03"W, 684 m depth, Petrobras, MOUFPE 21661 - 21666; T700S 18 5 #22, 23º34'9.43"S 41º12'31.784"W, 709 m depth, Petrobras, MOUFPE 21667; 3 subadult, T700S 18 5 #11, 23º42'18.04"S 41º20'18.722"W, 682 m depth, Petrobras, MOUFPE 21668 - 21670; 3 subadult, T700S 5#12, 23º41'37.514"S 41º19'50.3"W, 682 m depth, Petrobras, MOUFPE 21671 - 21673; T700S 5#02, 23º46'42.258"S 41º25'32.225"W, 688 m depth, Petrobras, MOUFPE 21674; T700S 5#14, 23º40'50.102"S 41º19'23.783"W, 682 m depth, Petrobras, MOUFPE 21675; 2 subadult, T700S 5#03, 23º46'10.783"S 41º24'38.426"W, 702 m depth, Petrobras, MOUFPE 21676 - 21677; T700S 5#09, 23º43'30.601"S 41º21'21.449"W, 683 m depth, Petrobras, MOUFPE 21678; T700S 5#19, 23º34'41.527"S 41º13'24.654"W, 687 m depth, Petrobras, MOUFPE 21679; T700S 5#10, 23º42'57.884"S 41º20'44.801"W, 679 m depth, Petrobras, MOUFPE 21681; T700C 4 #08, 22º38'24.058"S 40º25'18.498"W, 687 m depth, Petrobras, MOUFPE 21682; T700C 5#12, 22º36'25.15"S 40º22'39.835"W, 693 m depth, Petrobras, MOUFPE 21683; T700S 18, 23º35'35.588"S 41º15'46.469"W, 690 m depth, Petrobras, MOUFPE 21684; 4 subadult, T700S 5 #06, 23º45'22.198"S 41º23'26.538"W 686 m depth, Petrobras, MOUFPE 21685 - 21688; C 700 S 5#01, 23º28'21.673"S 41º6'21.125"W, 801 m depth,

Petrobras, MOUFPE 21689; 3 subadult, C 700 S 3#12, 23º27'41.414"S 41º7'4.062"W, 663 m depth, Petrobras, MOUFPE 21690 - 21692; C700S 5#11, 23º27'39.449"S 41º6'56.203"W, 660 m depth, Petrobras, MOUFPE 21693; C700S 5#10, 23º27'46.746"S 41º6'57.208"W, 680 m depth, Petrobras, MOUFPE 21694;

Integument circle-shaped irregular.

Carapace armature oval-shaped, 1.6 longer than wide. Pseudorostrum short and straight. Eyelobe longer than wide with two short setae. Two longitudinal lateral ridges starting from the basis of pseudorostrum. Upper ridge curved on dorsal surface and lower ridge encircling the carapace. Lateral transverse ridges absent. Lateral sulcus encircling the carapace. Larger prominences absent. Scattered long bristles on dorsal surface present.

Torax pereonites 1-3 covered by carapace. All segments with lateral projections.

Pleon segments 1-4 with serrated line on dorsal.

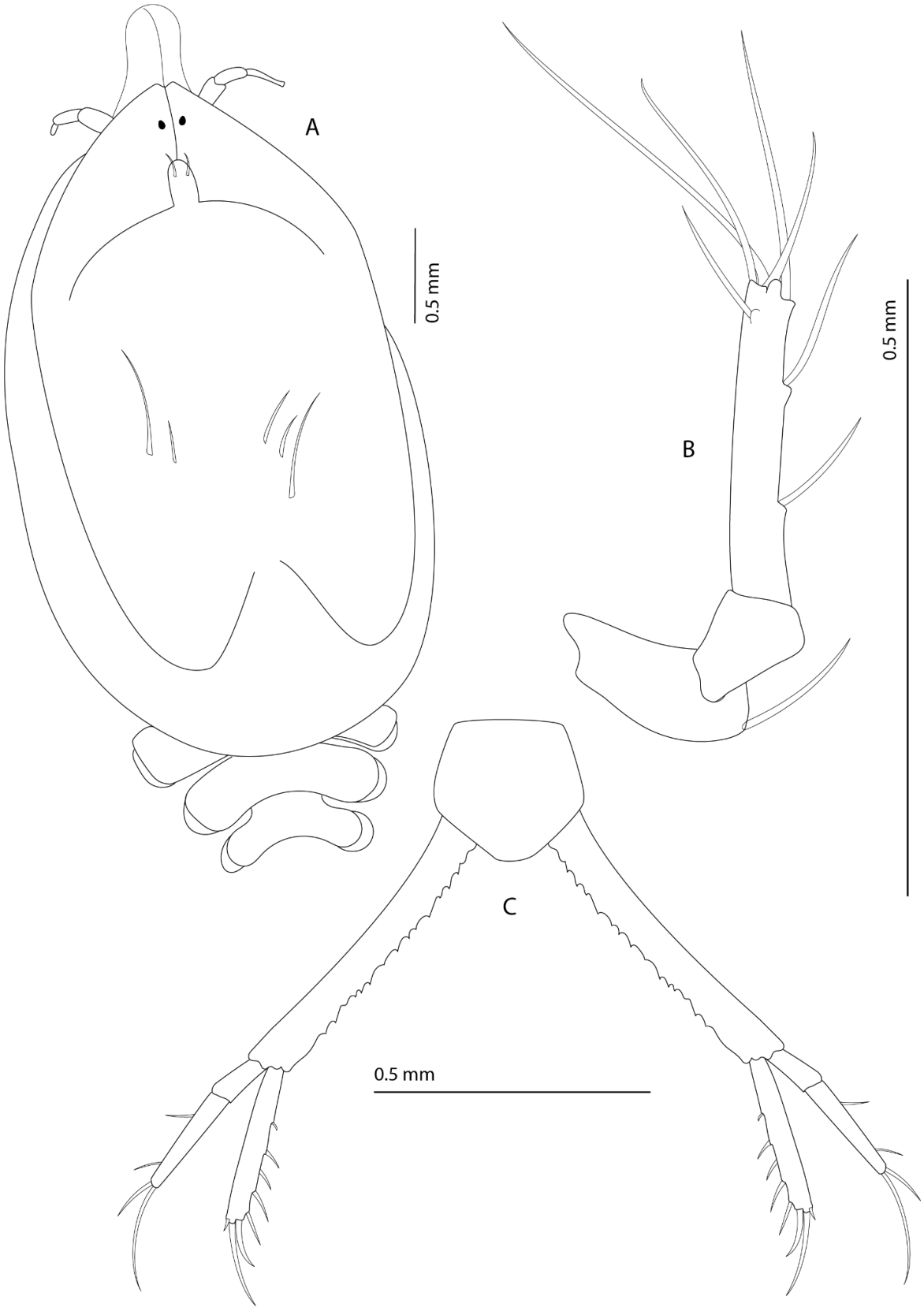
Pereopod 2 dactylus as long as propodus and carpus together, with one subapical and four apical setae.

Uropod peduncles 0.7 times shorter than last three segments of pleon, inner margin serrated. Endopod 0.3 times shorter than peduncle length, five spines on inner margin and three apical ones. Exopod as long as endopod length, with two apical spines.

Distribution Campos Basin, Rio de Janeiro State, Brazil (21º11'59.15"S 40º12'30.323"W), 384 - 801 m depth.

Remarks. *Campylaspis* sp.14 is closed related to *Campylaspis bicarinata* Jones, 1974 in having carapace not elevated dorsally, short pseudorostrum, lateral sulcus encircling the carapace, chromatophores throughout the lateral ridges and dactyl of pereopod 2 as long as carpus and propodus together. The differences between the *Campylaspis* sp.14 and *C. bicarinata* are (*C. bicarinata* in parenthesis): upper ridge curved on dorsal surface (vs. upper ridge not curved); male without spines on dorsal surface (vs. small spines on dorsal surface present); female without a small spine behind the eyelobe (vs. small spine present); dactyl of pereopod 2 with four apical spines (vs. one short stout terminal spine and a longer setae).

Figure 15 – *Campylaspis* sp.14. Male, A. Dorsal view of carapace, B. Pereopod 2, C. Uropod. Campos Basin, 721m, MOUFPE 21639.



Fonte: A autora (2023).

***Campylaspis* sp.15**

Fig. 16

Material examined. 1 subadult female, T700N 4#10, 21º14'34.508"S 40º12'39.398"W, 700m depth, Petrobras, MOUFPE 21056; 1 juvenile female, T700N 4#20, 21°6'15.966"S 40°11'54.089"W, 688m depth, Petrobras, MOUFPE 21039; 1 subadult male T700N 4#17, 21º8'20.076"S 40º12'20.329"W, 726m depth, Petrobras, MOUFPE 21040; 1 subadult male T700N 4#04 (dissected and drawn), 21º19'43.262"S 40º12'25.232"W, 700m depth, Petrobras, MOUFPE 21042; 1 subadult male (SEM photographs) T700N 4#19, 21º6'34.517"S 40º11'52.285"W, 702m depth, Petrobras, MOUFPE 21041; 1 juvenile male, T700S 5#10, 23º42'57.884"S 41º20'44.801"W, 686m depth, Petrobras, MOUFPE; 1 juvenile female, T700N 4#12, 21º11'42.702"S 40º12'30.265"W, 733m depth, Petrobras, MOUFPE; 1 juvenile male, T700N 4#02, 21º21'4.849"S 40º11'51.918"W, 705m depth, Petrobras, MOUFPE.

Description of the subadult female (based on T700N 4#10).

Integument hexagonal-shaped pattern.

Carapace armature rectangular, 1.6 times longer than wide. Pseudorostrum upturned 60° to dorsum of carapace, 0.14 carapace total length. Eyelobe much longer than wide, no lenses. Few scattered setae both dorsally and laterally. Sides with 2 lateral tuberculate ridges, leaving a deep sulcus in between. Sulcus divided into a posterior large area and a small anterior area by a vertical ridge. Upper oblique ridge starts from base of pseudorostrum, directed backwards, and turns forward forming a U-shape. Rounded area partially encircled a third area. Lower oblique ridge starts from antennal notch running backwards close to carapace inferior margin to finally meet the opposite lower oblique ridge at mid-dorsal line, right and left ridges delimiting a small triangular area dorsally. With two large tubercles just in front of this triangular area. Frontal lobe with a transverse row of 5 tubercles, lateral tubercles large and carrying 1–2 setae, 3 central tubercles smaller without setae (other specimens examined with 2, 3, or 5 central tubercles). Two rows of 2 tubercles, behind the frontal lobe, anterior tubercles larger than posterior ones (two additional specimens examined with 6 tubercles arranged in three rows, anterior pair larger than the others). Anteroventral margin smooth or faintly serrate.

Torax pereonites 3-5 with 2 dorsal tubercles. All segments with serrated lateral projections.

Pleon pleonites 1–4 with 2 tubercles dorsally, 1 serrate projection and 1 row of teeth (below the projection), on each side. Pleonite 5 with 1 transverse carina at mid-way of segment, and 1 row of teeth laterally.

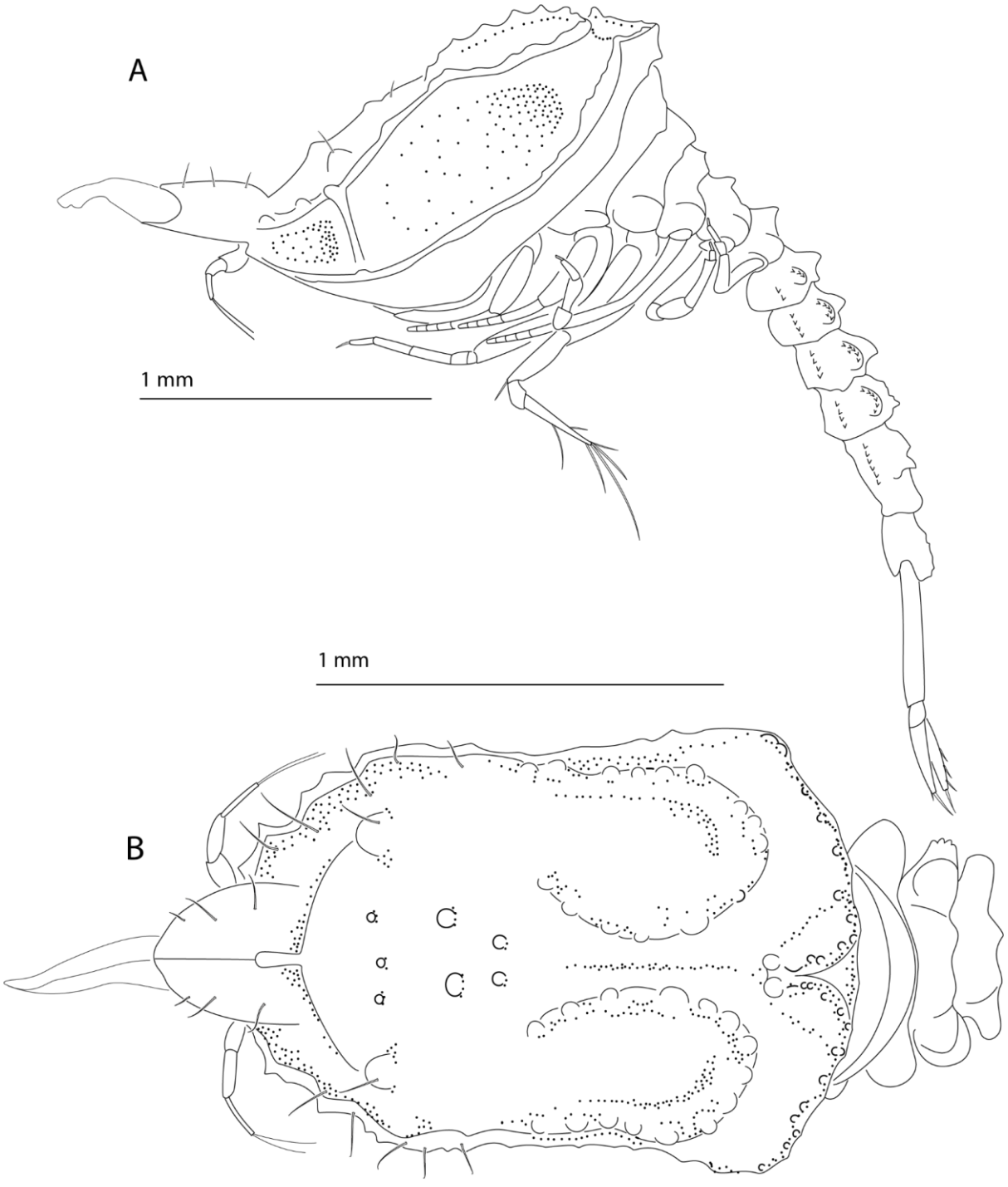
Pereopod 2 basis 0.5 times shorter than remaining articles together, with 2 setae. Ischium glabrous. Merus with 3 setae. Carpus 1.5 times longer than merus. Propodus glabrous. Dactylus 1.5 times longer than carpus, digitiform process present.

Uropod peduncle 1.8 times longer than the last segment of pleon, with serrations on both margins. Endopod 0.6 times shorter than peduncle length, with 3 setae on inner edge (2 lateral, 1 subterminal), and 2 robust setae distally. Exopod as long as endopod with 1 seta on each margin, and 2 setae distally.

Distribution Campos Basin, Rio de Janeiro State, Brazil (21º14'34.508"S 40º12'39.398"W), 686 - 733 m depth.

Remarks. *Campylaspis* sp.15 is closed related to *Campylaspis chisamerai* Petrescu, 2018 in havin pseudorostrum long and upturned, sides of carapace with two oblique ridges, frontal lobe with a transverse row of tubercles, three lateral well defined by three lateral ridges, dactylus of pereopod 2 with a digitiform distal process. *Campylaspis* sp.15 can be easily separated from *C. chisamerai* by having (*C. chisamerai* in parenthesis): well-developed u-shaped upper ridge (vs. incipient in *C. chisamerai*) and a long eyelobe (vs. small in *C. chisamerai*).

Figure 16 – *Campylaspis* sp.15. Female, A. Habitus in lateral view, B. Dorsal view of carapace. Campos Basin, 700m, MOUFPE 21056.



Fonte: A autora (2023).

***Campylaspis* sp.16**

Fig. 17

Material examined. 1 subadult male, T700N 4#23, 21º4'59.884"S 40º11'29.965"W, 703m depth, Petrobras, MOUFPE 21052; 2 subadult females, T700C 4#15, 1 subadult male (dissected and drawn), and 1 juvenile male (SEM photos), 22º34'15.47"S 40º19'51.64"W, 692m depth, Petrobras, MOUFPE 21051; 1 subadult female, T700N 4#10, 21°19′43.262″S 40°12′25.232″W, 727m depth, Petrobras, MOUFPE 21050; 1 subadult male, C700S 5#10 23º27'46.746"S 41º6'57.208"W, 680m depth, Petrobras, MOUFPE 21058; 1 subadult female, T400C 4#05, 22º38'1.37"S 40º31'13.163"W, 393m depth, Petrobras, MOUFPE; 1 subadult male, T700S 5#20, 23º34'18.275"S 41º12'39.838"W, 695m depth, Petrobras, MOUFPE 21680;

Description of the subadult female (based on T700N 4#23).

Integument hexagonal-shaped ill-defined.

Carapace armature rectangular, 1.6 times longer than wide. Pseudorostrum 0.2 carapace length. Eyelobe much longer than wide, no lenses. Setae, spines or tubercles absent. Sides with an upper lateral ridge well defined, running from below of pseudorostrum backwards to posterior margin of carapace, sector on pseudorostrum lobes serrate. Lower lateral ridge ill-defined not reaching end of carapace. Dorsal ventral ridge joining upper and lower lateral ridges, anteriorly. Shallow sulcus formed by three lateral ridges. Dorsal surface of carapace with 3 low transverse ridges: anterior ridge just behind frontal lobe, composed of 3 protuberances. Median ridge at middle third of carapace. Posterior ridge at posterior third of carapace. Neither median nor posterior ridges reach the midline of carapace. Median transverse ridge bifurcates distally, almost in contact with posterior transverse ridge, encircling a shallow depression area dorsally. Carapace inferior margin serrate.

Torax pereonites 1-3 covered by carapace. Pereonites 3-5 with lateral serrated projections.

Pleon pleonites 1-6 with lateral row of teeth. Pleonite 5 with a transverse ridge at midway of segment delimiting 2 shallow depression areas at each side. Pleonites 1-5 with scattered teeth ventrally.

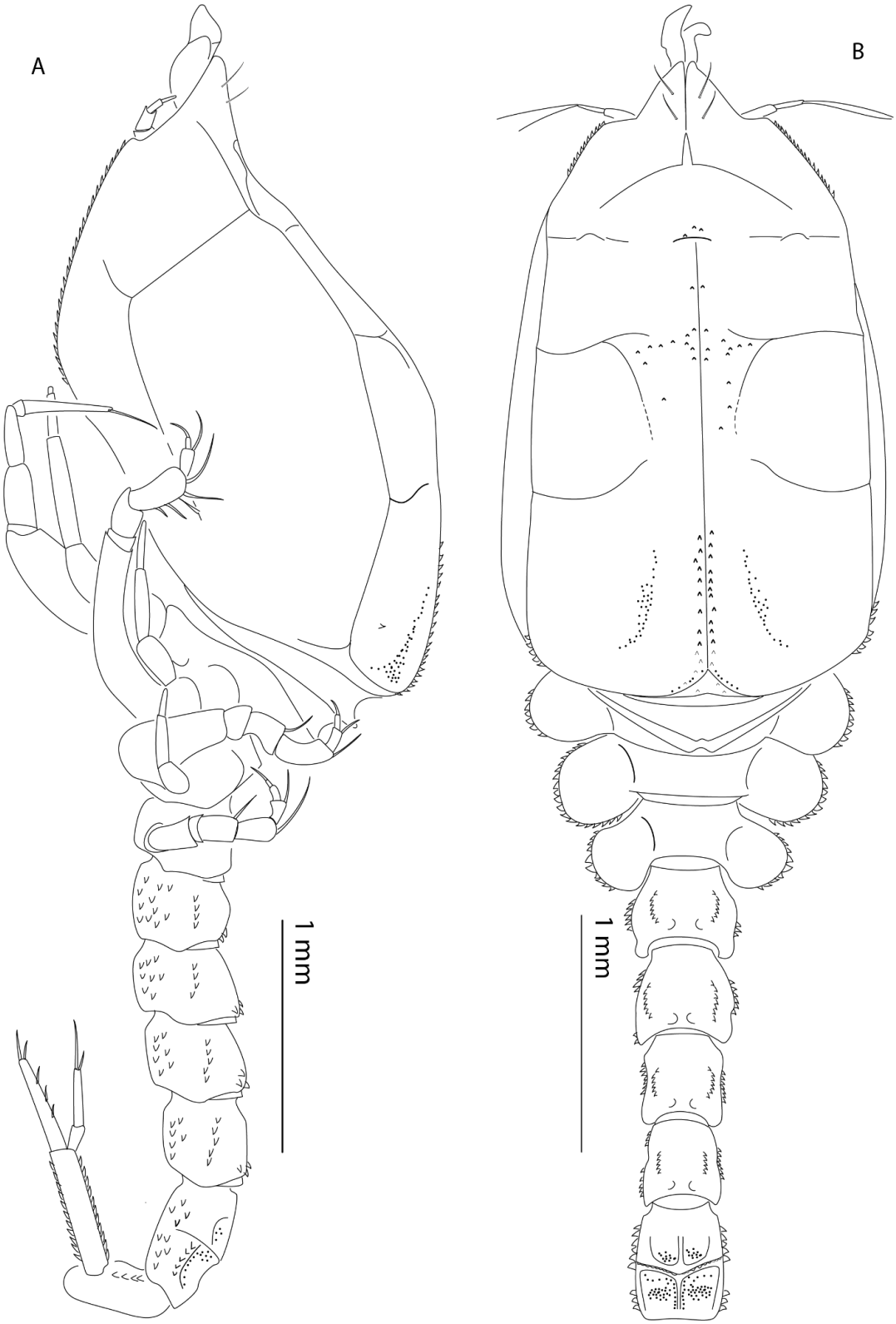
Pereopod 2 basis 0.6 times shorter than remaining articles together with strong serrations; Merus 0.8 times shorter than carpus, serrated; Carpus with setae laterally. Propodus glabrous. Dactylus 2.3 times longer than carpus, digitiform process present.

Uropod peduncle 2.2 times longer than last segment of pleon, with strong serration on both margins. Endopod 0.4 times shorter than peduncle, inner margin with 4 robust setae, distal end with 2 robust setae, outer margin with strong serration. Exopod as long as endopod, outer margin with 3 setae, distal end with 3 setae (2 subterminal and 1 terminal slightly longer than article).

Distribution Campos Basin, Rio de Janeiro State, Brazil (21º4'59.884"S 40º11'29.965"W), 393 - 727 m depth.

Remarks. *Campylaspis* sp.16 is closed related to *Campylaspis valida* Jones, 1984, in having the upper margin running backwards until the posterior edge, two horizontal ridges forming two areas with a shallow depression dorsally. *Campylaspis* sp.16 can be easily separated from *C. valida* by having (*C. valida* in parenthesis): carapace with one pair of low tubercles (vs. with two pairs of tubercles); pseudorostrum not upturned and a fourth of the total carapace length (vs. pseudorostrum slightly upturned and a fifth of the total carapace length); dactylus of pereopod 2 with a digitiform process (vs. without digitiform process on pereopod 2).

Figure 176 – *Campylaspis* sp.16. Female, A. Habitus in lateral view, B. Habitus in dorsal view. Campos Basin, 703m, MOUFPE 21052.



Fonte: A autora (2023).

***Campylaspis* sp.17**

Fig. 18

Material examined. 1 subadult female, C700S 5#12, 23º27'55.336"S 41º6'42.484"W, 663m depth, Petrobras, MOUFPE 21053; 1 subadult females, C700S 5#07, 23º27'41.414"S 41º7'4.062"W, 737m depth, Petrobras, MOUFPE 21055; 1 juvenile female, C700S 5#14, 23º27'16.646"S 41º5'30.037"W, 847m depth, Petrobras, MOUFPE 21054; C3 R1, 11°10’3,56’’S 036°46’57,16’’W, 1060 m depth, Petrobras, MOUFPE 21708; A1 R3, 11°8’51,49’’S 036°46’43,52’’W, 1004 m depth, Petrobras, MOUFPE 21709; D3 R3, 11°10’16,93’’S 036°47’7,39’’W, 1020 m depth, Petrobras, MOUFPE 21710; A2 R3, 11°9’10,74’’S 36°46’18,10’’W, 1041 m depth, Petrobras, MOUFPE 21711;

Integument circle-shaped irregular.

Carapace armature oval-shaped, 1.6 longer than wide. Pseudorostrum short and straight. Eyelobe longer than wide with two short setae. Two longitudinal lateral ridges starting from the basis of pseudorostrum. Upper ridge curved on dorsal surface and lower ridge encircling the carapace. Lateral transverse ridges absent. Lateral sulcus encircling the carapace. Larger prominences absent. Scattered bristles on dorsal surface present. Carapace with at least 19 strong spines on two rows and fully covered by tiny spines.

Torax pereonites 1-3 covered by carapace. All segments with lateral projections.

Pleon segments 1-4 with serrated line on dorsal.

Pereopod 2 dactylus as long as propodus and carpus together, with one subapical and four apical setae.

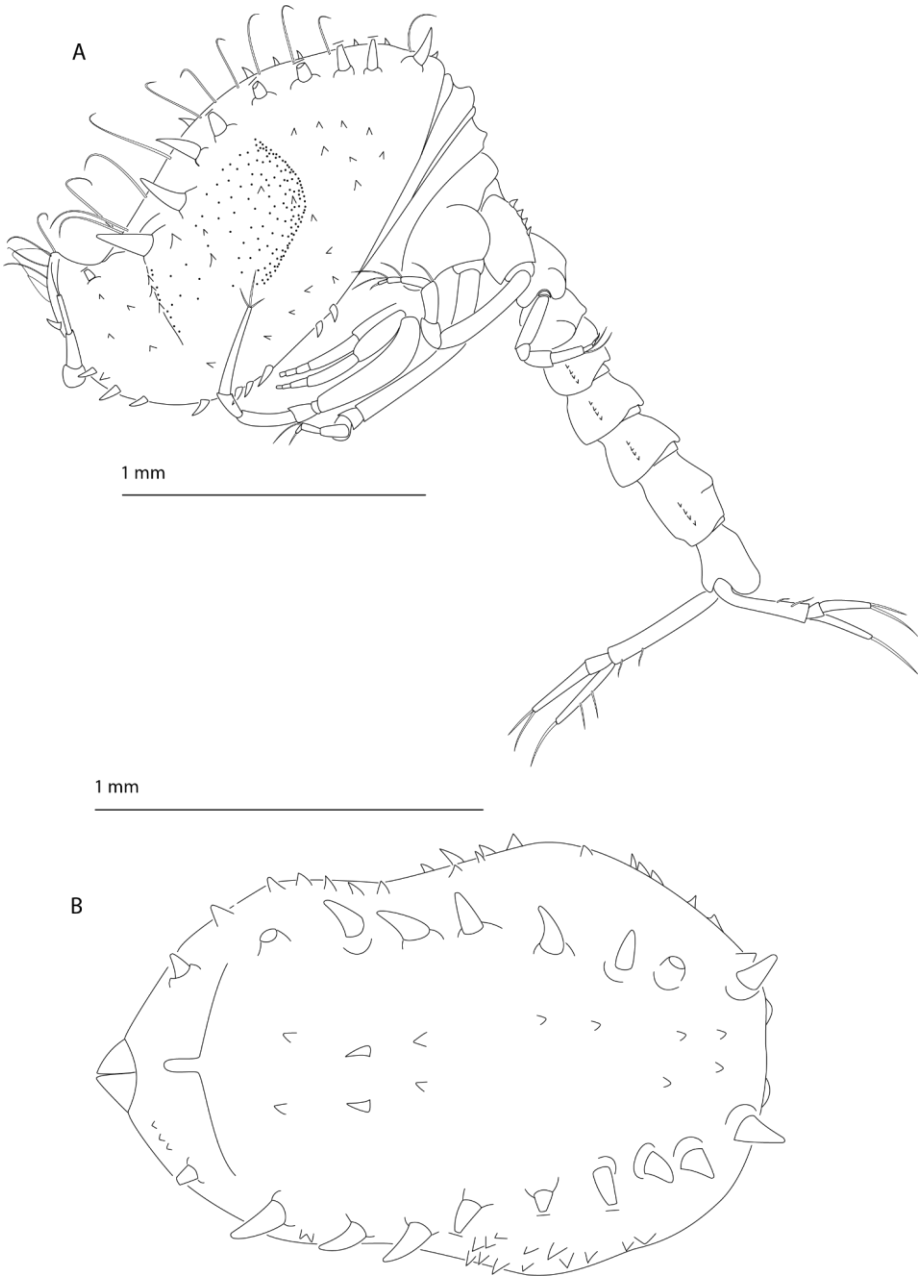
Uropod peduncles 0.7 times shorter than last three segments of pleon, inner margin serrated. Endopod 0.3 times shorter than peduncle length, three spines on inner margin and two apical ones. Exopod as long as endopod length, with two apical spines.

Distribution Sergipe Sub-Basin and Campos Basin, Brazil (11°8’51,49’’S 036°46’43,52’’W - 23º27'55.336"S 41º6'42.484"W), 663 - 1060 m depth.

Remarks. The material examined is closely related to *C. spinosa* Calman, 1906 and *C. rex* Gerken & Rider, 2002. *Campylaspis* n. sp.17 and *C. spinosa* have the same disposition of spines, in rows and small spines covering the whole carapace. The *Campylaspis* n. sp.17 differs from *C. spinosa* as follows (characters for *C. spinosa* in parenthesis): two rows of 10 and 9 spines (with two rows of 8 spines); uncountable setae on carapace surface (with 6 setae on carapace surface); pseudorostrum short

and upturned with a pair of small spines near the basis (pseudorostrum with a prominent spine near the basis extending above de carapace); prominent tooth on basis of pereopod 2 (without prominent tooth); dactylus of pereopod 2 with more than 11 distal and 1 apical setae and a digital process (without digital process and 4 distal and 1 apical setae). *Campylaspis* n. sp.17 also resembles *C. rex* which has 11 spines, called stout tubercles by Gerken and Rider (2002), forming a semicircle starting from the pseudorostrum.

Figure 78 – *Campylaspis* sp.17. Female, A. Habitus in lateral view, B. Dorsal view of carapace. Campos Basin, 663m, MOUFPE 21053.



Fonte: A autora (2023).

Campylaspis *cf. nitens* Bonnier, 1896

Fig. 19

Material examined. 1 female, D3 R2, 11°10’16,91’’S 036°47’7,37’W, 1021 m depth, Petrobras, MOUFPE 21706;

Carapace armature oval-shaped, vaulted dorsally. Pseudorostrum short and not upturned. Smooth, without sulcus, ridges or prominences. Inferior margin of carapace serrated on anterior third.

Torax pereonites 1-2 covered by carapace. Lateral projections present.

Pleon all segments without ornamentations.

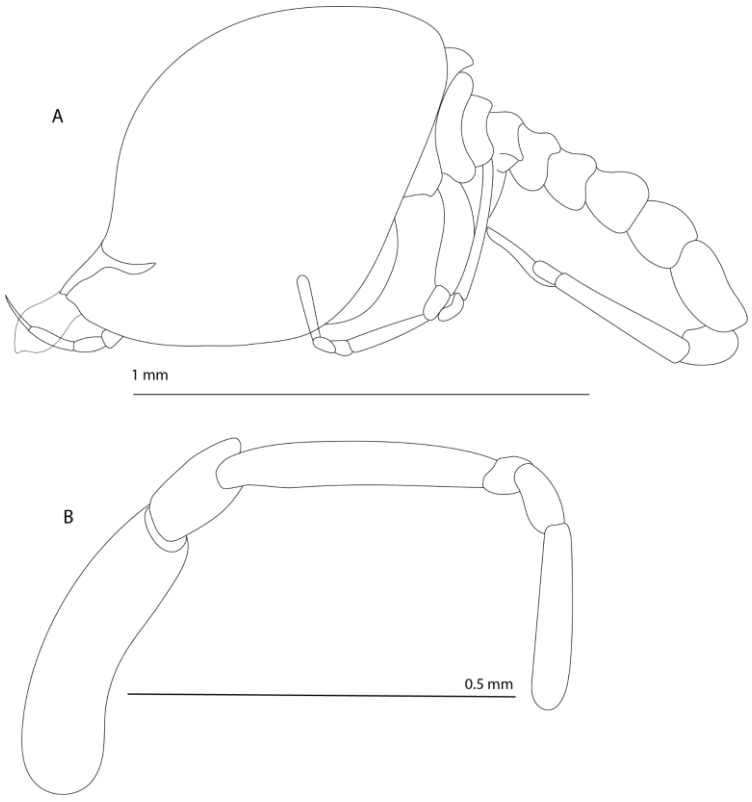
Pereopod 2 dactylus digitiform, longer than carpus and propodus together.

Uropod peduncles as long as last two segments of pleon. Endopod 0.5 times shorter than peduncles length. Exopod as long as endopod.

Distribution Sergipe Sub-Basin, Sergipe state, Brazil (11°10’16,91’’S 036°47’7,37’W), 1021 m depth.

Remarks. *Campylaspis* cf. *nitens* is closed related to *Campylaspis nitens* Bonnier, 1896 in having posterior carapace vaulted dorsally and smooth, pseudorostrum short and dactyl of pereopod 2 digitiform.

Figure 198 – *Campylaspis* cf*. nitens*. Female, A. Habitus in lateral view, B. Pereopod 2. Sergipe Basin, 1021m, MOUFPE 21706.



Fonte: A autora (2023).

***Campylaspis cf. nuda* Jones, 1974**

Fig. 20

Material examined. 1 male, H2 R2, 11°10’32,90’’S 036°47’40,11’’W, 1014 m depth, Petrobras, MOUFPE 21704;

Carapace armature oval-shaped, little vaulted dorsally. Pseudorostrum short and not upturned. Eyelobe short, lenses absent. Smooth, without sulcus, ridges or prominences.

Torax pereonites 1-3 covered by carapace. Lateral projections present.

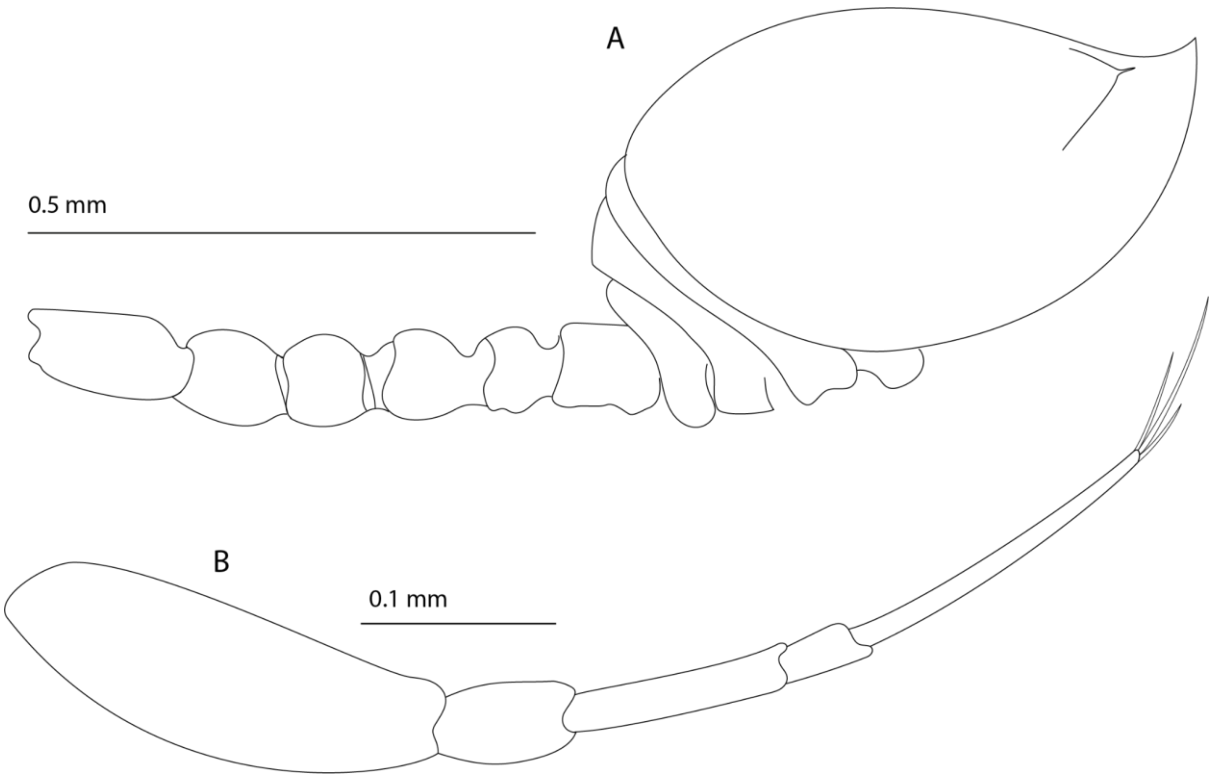
Pleon all segments without ornamentations.

Pereopod 2 dactyl tapered tip, longer than carpus and propodus together.

Distribution Sergipe Sub-Basin, Sergipe State, Brazil (11°10’32,90’’S 036°47’40,11’’W), 1014 m depth.

Remarks. *Campylaspis* cf. *nuda* is closed related to *Campylaspis nuda* Jones, 1974 in having posterior carapace vaulted dorsally and smooth, pseudorostrum short and dactyl of pereopod 2 tapered tip.

Figure 90 – *Campylaspis* cf. *nuda*. Male, A. Habitus in lateral view, B. Pereopod 2. Sergipe Basin, 1014m, MOUFPE 21704.



Fonte: A autora (2023).

Key to species of *Campylaspis* from Southwestern Atlantic Ocean including the species here in described.

1. Carapace smooth, ornamentations absent.....2
   Carapace ornamented.....5
2. Eyelobe with lenses.....***Campylaspis laevigata* Jones, 1974**
   Eyelobe without lenses 3
3. Dactylus of pereopod 2 digitiform, distally broad……
   ……..….***Campylaspis nitens* Bonnier, 1896**
   Dactylus of pereopod 2 not digitiform ……..……4
4. Dactylus of pereopod 2 narrow and distally tapered……..
   .....***Campylaspis nuda* Jones, 1974**
   Dactylus of pereopod 2 straight, not tapered.....***Campylaspis* sp.10** (Fig. 11)
5. Carapace without lateral sulcus …….....6
   Carapace with lateral sulcus or ridge 10
6. Carapace covered by spines 7
   Carapace with tubercles or other protuberances 8
7. Pseudorostrum long, carapace with short spines present……...
   ….....***Campylaspis aculeata* Jones, 1974**
   Pseudorostrum short and upturned, carapace with long spine rows…….……..
   .....***Campylaspis spinosa* Calman, 1906**
8. Carapace dorsal surface with one pair of elevations..……..……
   ……..……..….***Campylaspis* sp.7** (Fig. 8)
   Carapace dorsal surface with tubercle rows.....9
9. Carapace dorsal surface with granule-like tubercles…….
   ..……..***Campylaspis* sp.11** (Fig. 12)
   Carapace dorsal surface with larger and prominent tubercles……..……..
   ..……..***Campylaspis nodulosa* Sars, 1886**
10. Carapace lateral sulcus present.....11
    Carapace lateral sulcus absent and lateral ridges present.....36
11. Carapace lateral ridges present 12
    Carapace lateral ridges absent 28
12. Carapace with dorsal cavities..... ***Campylaspis redacta* Jones, 1974**
    Carapace without dorsal cavities.....13

13. Carapace upper lateral ridge curved dorsally .....……..……14
    Carapace upper lateral ridge not curved dorsally 19
14. Carapace lateral transverse ridge present 15
    Carapace lateral transverse ridge absent 17
15. Pseudorostrum long and upturned .....***Campylaspis* n. sp.15** (Fig. 16)
    Pseudorostrum short and upturned 16
16. Eyelobe lenses present ……..…..……***Campylaspis* sp.13** (Fig. 14)
    Eyelobe lenses absent.……...***Campylaspis johnstoni* Hale, 1937**
17. Carapace encircling lateral sulcus present.....18
    Carapace lateral sulcus limited posteriorly.....***Campylaspis* sp.9** (Fig. 10)
18. Eyelobe short. Pseudorostrum long ……***Campylaspis exarata* Jones, 1974**
    Eyelobe long. Pseudorostrum short …..…..…….. ***Campylaspis* sp.14** (Fig. 15)
19. Eyelobe normal size or long. ……20
    Eyelobe short. Lenses absent ……...24
20. Carapace lateral sulcus broad on posterior third..……***Campylaspis* sp.5** (Fig. 6)
    Carapace lateral sulcus narrow ……...21
21. Pseudorostrum very short ……22
    Pseudorostrum 1/5-1/6 of carapace length ……23
22. Carapace longitudinal lateral ridges present.……...***Campylaspis* sp.6** (Fig. 7)
    Carapace oblique lateral ridges present……..……..……..
    ..……..***Campylaspis bacescui* Muradian, 1976**
23. Carapace dorsal surface with tubercles and chromatophore rows…….
    ……..…....***Campylaspis* sp.3** (Fig. 4)
    Carapace dorsal surface without protuberances……..…….
    ……..……***Campylaspis alveolata* Muradian, 1976**
24. Carapace lateral sulcus reaching anterior and posterior margin of carapace
    (encircling)..…….……***Campylaspis bicarinata* Jones, 1974**
    Carapace lateral sulcus not meeting both anterior and posterior limits of carapace
    ……25
25. Carapace lateral ridge with spines ……26
    Carapace lateral ridge without ornamentations ……27
26. Carapace lateral ridge with two spines……...***Campylaspis cognata* Jones, 1974**
    Carapace lateral ridge serrated…..……***Campylaspis* n. sp.16** (Fig. 17)
27. Carapace dorsal transverse ridge on posterior portion forming a trapezoidal area

…..……..***Campylaspis* sp.4** (Fig. 5)

Carapace dorsal transverse ridge on middle third …….***Campylaspis* sp.2** (Fig. 3)

28. Eyelobe short. Pseudorostrum long.....29

Carapace without large and round prominences 30

29. Carapace with dorsal transverse ridges .....***Campylaspis glebulosa* Jones, 1974**

Carapace without dorsal transverse ridges……..……

……***Campylaspis submersa* Jones, 1974**

30. Carapace with spines in horizontal rows over the dorsal part……..……

……..…….***Campylaspis* n. sp.17** (Fig. 18)

Carapace without spines 31

31. Carapace surface with scattered bristles.....32

Carapace surface without bristles.....33

32. Eyelobe rudimentary ……..***Campylaspis pilosa* Jones, 1974**

Eyelobe linguiform with lenses.....***Campylaspis* sp.1** (Fig. 2)

33. Dactylus of pereopod 2 with a digityliform process in the end.....34

Dactylus of pereopod 2 with digityliform appearance.....35

34. Endopod of uropod with 8 robust setae on inner margin and 3 apical spines……...

..……***Campylaspis holthuisi* Bacescu & Petrescu, 1989**

Endopod of uropod with 5 spines on inner margin and 2 apical spines……..

..……..….***Campylaspis antipai* Bacescu & Petrescu, 1989**

35. Eyelobe with 4 lenses..... ***Campylaspis tuberculata* Muradian, 1976**

Eyelobe with 3 lenses .....***Campylaspis brasilianus* Bacescu & Petrescu, 1989**

36. Carapace with one lateral ridge.....***Campylaspis* sp.8** (Fig. 9)

Carapace with more than one lateral ridge 37

37. Carapace with 2 lateral ridges bifurcating in two more ridges. 4 lateral ridges……

……***Campylaspis quadriplicata* Lomakina, 1968**

Carapace with 2 lateral ridges, the upper one bifurcated. 3 lateral ridges……

…..……***Campylaspis plicata* Jones, 1974**

Bathymetric Distribution

The observed material was distributed across depths ranging from 78 to 1060 meters, with an average of 1020.57 meters for the Sergipe Sub-basin and 353.29

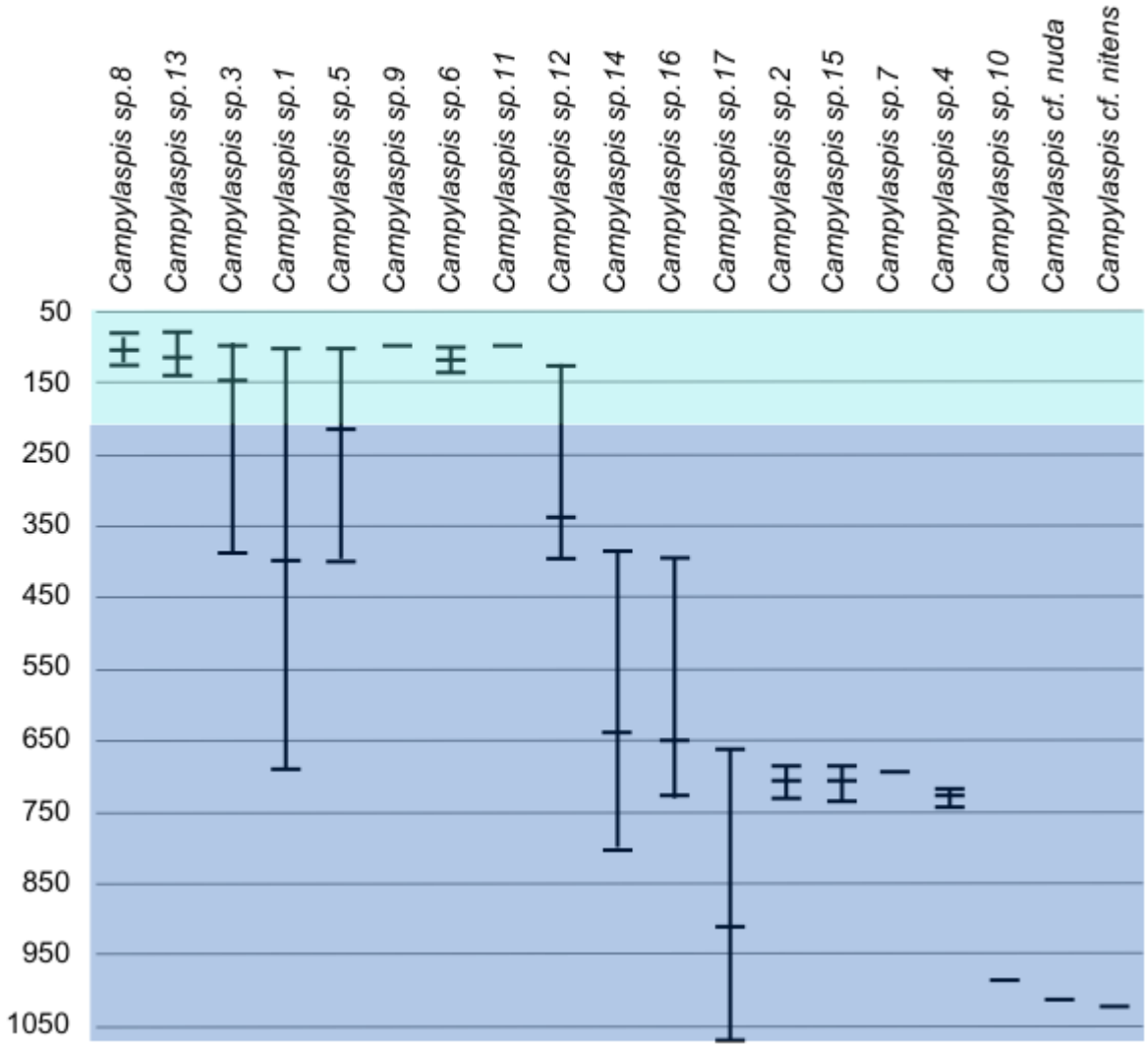
meters for the Campos Basin. In total, 8 specimens from the Sergipe Sub-basin and 226 from the Campos Basin were analyzed.

The morphotypes from the Sergipe Sub-basin, included *Campylaspis* sp.10, *Campylaspis* sp.17, *Campylaspis* cf. *nitens*, and *Campylaspis* cf. *nuda*, with *Campylaspis* sp.17 being the only one with more than one specimen and also sampled for the Campos Basin, with an average depth of 1031.25 (±28.0) meters for the Sergipe Sub-basin and 749 (±92.0) meters for the Campos Basin. The others morphotypes, *Campylaspis* sp.10, *Campylaspis* cf. *nitens*, and *Campylaspis* cf. *nuda*, each had 1 specimen, occurring at depths of 984, 1021, and 1014 meters, respectively.

For the Campos Basin, the morphotypes *Campylaspis* sp.1, *Campylaspis* sp.2, *Campylaspis* sp.7, *Campylaspis* sp.8, and *Campylaspis* sp.11 were represented by only 1 or 2 specimens, explaining the restricted distribution shown in Figure 24, except for *Campylaspis* sp.1 which deserves special mention. The *Campylaspis* sp.1 has a distribution range that span from 102.06 meters on the Continental Shelf to 686 (±274.48) meters on the slope. *Campylaspis* sp.3, *Campylaspis* sp.5, and *Campylaspis* sp.12 also exhibit a broad distribution range from the continental shelf at a depth of 100 meters to the slope at a depth of 400 meters with average depths of 145.13 (±151.1), 213.4 (±149.7), and 337.55 (±134.97) meters, respectively. *Campylaspis* sp.14 and *Campylaspis* sp.16 have a distribution between the isobaths of 400 and 700 meters on the slope, with average depths of 638.43 (±208.48) and 648.33 (±167.31) meters, respectively. *Campylaspis* sp.14, in particular, had the largest sample size among the morphotypes, with 72 specimens.

The remaining morphotypes maintain a consistent distribution along a depth range with little variation, such as *Campylaspis* sp.4 at an average depth of 726 (±10.0) meters, *Campylaspis* sp.6 at an average depth of 118.57 (±15.88) meters, *Campylaspis* sp.13 at 109.09 (±27.61) meters, and *Campylaspis* sp.15 at an average depth of 705 (±23.46) meters. Campylaspis sp.6 and *Campylaspis* sp.13 stand out from the rest due to their significant samples of 49 and 54 specimens, respectively.

Figure 21 – Bathymetric distribution of *Campylaspis* in the study area, with minimum, average and maximum depths for all the species.



Fonte: A autora (2023).

5. ARTICLE 2 – ON THREE NEW DEEP-SEA SPECIES OF THE GENUS *CAMPYLASPIS* G.O. Sars, 1865 (CUMACEA: NANNASTACIDAE) FROM BRAZIL

MARIA LUIZA DE FRANÇA DUDA[1,2], DANIEL C. ROCCATAGLIATA[3], DEBORA LUCATELLI[2] & JESSER F. SOUZA- FILHO[1,2]

[1]Post-graduation Program of Oceanography (PPGO), Department of Oceanography (DOCEAN), Federal University of Pernambuco (UFPE), Av. Arquitetura s/n, Cidade Universitaria, Recife, Brazil, CEP: 50740-550.

[2]Laboratorio de Carcinologia (LabCarcino), Museu de Oceanografica Prof. Petronio Alves Coelho (MOUFPE), Federal University of Pernambuco (UFPE), Av. Arquitetura s/n, Cidade Universitaria, Recife, Brazil, CEP: 50740-550.

[3]National Scientific and Technical Research Council, conicet · - Instituto de Biodiversidad y Biología Experimental y Aplicada (IBBEA).

MLFD: marialuiza.duda.sci@gmail.com; DLA: dla.lucatelli@gmail.com; JFSF: jesser.fidelis@ufpe.br; DCR: daniel.roccatagliata@gmail.com

ABSTRACT

Currently, there are 14 known species of the *Campylaspis* genus in Brazil, all described in 1974 and 1989 for São Paulo, Rio de Janeiro and Pernambuco states, between 40 and 4680 meters of depth. There is a scarcity of taxonomic studies on *Campylaspis* in Brazil, highlighting a gap in the knowledge of new species. In this study, material from the continental shelf and slope (398-897m) of Campos Basin in Rio de Janeiro were analyzed. The specimens were collected during the PMAR-BC campaign in 2019. As a result, three new species are herein described: *Campylaspis* n. sp.15, *Campylaspis* n. sp.16, and *Campylaspis* n. sp.17. This work contains an updated identification key encompassing 25 species from the Southwest Atlantic.

Keywords: Campos Basin; Biodiversity; Crustacean diversity; Continental slope; Tropical waters; Brazilian shelf.

5.1. INTRODUCTION

The genus *Campylaspis* was erected by Sars (1865) in his study of the Nordic Sea cumaceans. The species described were *Campylaspis rubicunda* (type species),

C. costata and *C. undata* (Sars, 1865). The main diagnostic features of *Campylaspis* were the carapace globular shape, the presence of a wide variety of ornamentations (tuberculated ridges, wide tubercles and sulcus), the first two thoracic segments shorter than the others, short abdomen with carinated lateral shields, robustness of maxilíped 2 and maxilíped 3, and robust lateral appendages with a gradual reduction in size from the first to the last pair (Sars, 1865). The following diagnosis for the genus *Campylaspis* is an update from Petrescu (2018), the most recent work with new species described for the genus: Carapace longer than 0.4 body length, when ornamented has tubercles, spines, ridges and other ornamentations following a clear pattern; Absence or presence of lenses in eyelobe; Pseudorostrum length and angle of ascent or descent (upturned, straight or downturned); Maxilliped 1 with 3 articles; Maxilliped 2 dactylus ending in 3 diverging spines, and serrations present on inner and/or outer margins; Pereopod 2 dactylus with usual or digitiform extremity; Females with exopods in maxilliped 3, pereopod 1 and 2, males with maxilliped 3 and pereopods 1-4 with exopods.

Currently the genus *Campylaspis* includes 205 species (WoRMS, 2023) from that. 23 occur in the Southwestern Atlantic, and 14 are registered from the Brazilian coast (Roccatagliata, 1998). Jones (1974) wrote an important contribution on the genus *Campylaspis* from the deep-sea Atlantic, including the description of numerous new species collected by the RV Atlantis II (WHOI) in 1967 along the Dakar-Recife profile. The species described by Jones in 1974 were *C. aculeata*, *C. bicarinata*, *C. cognata*, *C. exarata*, *C. glebulosa*, *C. nuda*, *C. plicata*, *C. redacta* and *C. submersa*. In addition, the author also reported to Brazilian waters the species *C. spinosa* Calman, 1906 and *C. nitens* Bonnier, 1896, originally described for Capri and Biscay Bay, respectively. Lastly, Bacescu and Petrescu (1990) described three other species from Brazil: *C. antipai*, *C. brasiliana* and *C. holthuisi*.

In this paper we expand the knowledge of the genus by describing three new species, *Campylaspis* n. sp.15, *Campylaspis* n. sp.16 and *Campylaspis* n. sp.17 from Campos Basin, Rio de Janeiro (Brazil) and updating the identification key that includes 25 known species of the Southwestern Atlantic.

5.2 MATERIAL AND METHODS

Fourteen specimens were collected in 2019 as part of the Petrobras monitoring project in the Campos Basin, Rio de Janeiro (Brazil). Some specimens were stained with a dilute solution of Chlorazol Black dissolved in 70% ethanol, and their appendages dissected and mounted in permanent slides with glycerin jelly. Drawings were made with a Leica MZ8 microscope, Leica DME and a Carl Zeiss Axioskop compound microscope, all equipped with camera lucida drawings devices. Afterwards, they were vectorized using a Wacom tablet and Adobe Illustrator, following the techniques in Coleman (2003). Body length was taken from the tip of the pseudorostrum (siphon omitted) to the end of the pleonite 6. Articles of the appendages were measured along their longer margin. Pseudorostrum angle taken between the line at the base of pseudorostrum and the posterior end of the carapace.

Specimens that went through SEM photographs were cleaned with 0.5% nonionic detergent Triton X100 and ultrasound. Then, these specimens were dehydrated through a graded ethanol series and after that transferred to increasing concentrations of hexamethyldisilazane (HMDS). Finally, specimens in HMDS 100% were allowed to air dry, then coated with gold-palladium and mounted on aluminum stubs. Specimens were examined using a Zeiss Gemini SEM 360 microscope at the Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina.

All the studied material is deposited in the Carcinological Collection of the Museum of Oceanography Prof. Petrônio Alves Coelho (MOUFPE), of the Federal University of Pernambuco (UFPE), Brazil.

5.3 RESULTS

Order Cumacea Krøyer, 1846
Family Nannastacidae Bate, 1866
Genus *Campylaspis* G.O. Sars, 1865

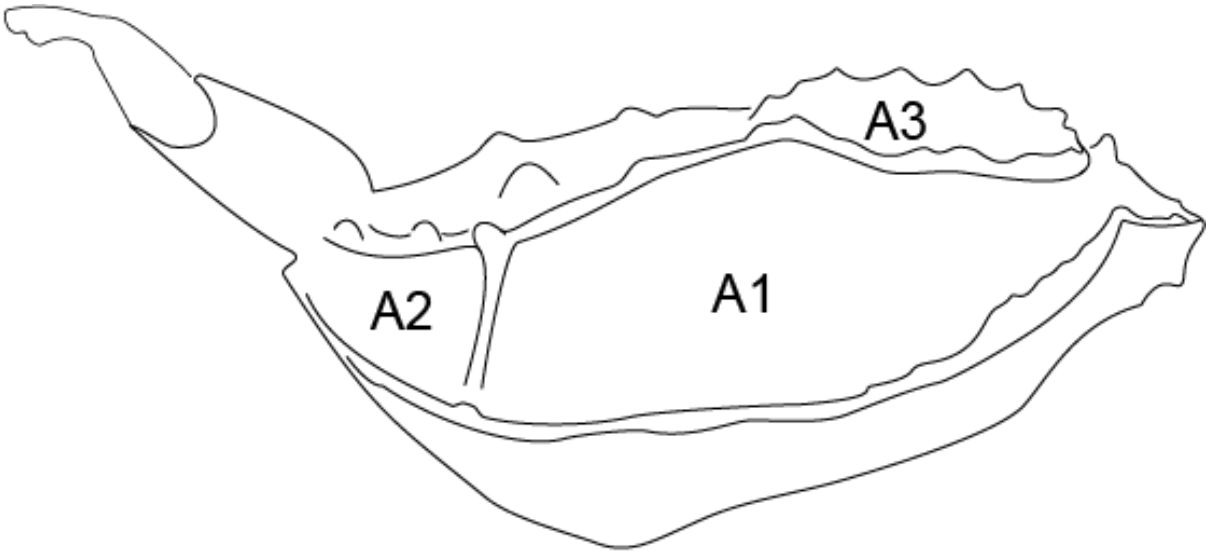
***Campylaspis* n. sp.15**
(Figs. 2–4)

Material examined. Holotype: 1 subadult female (3.4 mm), T700N 4#10, 21º14'34.508"S 40º12'39.398"W, 700m depth, Petrobras, MOUFPE 21056. Paratypes: 1 juvenile female (2.0 mm), T700N 4#20, 21°6'15.966"S 40°11'54.089"W, 688m depth, Petrobras, MOUFPE 21039; 1 subadult male (2.2 mm) T700N 4#17, 21º8'20.076"S

40º12'20.329"W, 726m depth, Petrobras, MOUFPE 21040; 1 subadult male T700N 4#04 (dissected and drawn), 21º19'43.262"S 40º12'25.232"W, 700m depth, Petrobras, MOUFPE 21042; 1 subadult male (SEM photographs) T700N 4#19, 21º6'34.517"S 40º11'52.285"W, 702m depth, Petrobras, MOUFPE 21041; 1 juvenile male (1.8 mm), T700S 5#10, 23º42'57.884"S 41º20'44.801"W, 686m depth, Petrobras, MOUFPE; 1 juvenile female (1.2 mm), T700N 4#12, 21º11'42.702"S 40º12'30.265"W, 733m depth, Petrobras, MOUFPE; 1 juvenile male (2.2 mm), T700N 4#02, 21º21'4.849"S 40º11'51.918"W, 705m depth, Petrobras, MOUFPE.

Diagnosis. Carapace strongly sculptured. Upper and lower lateral ridges surrounding a deep depressed area (sulcus). Sulcus divided into a posterior large area (A1) and a small anterior area (A2) by a vertical ridge. Upper lateral ridge u-shape at its posterior half, to form an oval dorsal area (A3), see Figure 1. Eyelobe much longer than wide, no lenses. Second pereopod, dactylus 1.5 carpus length, with a digitiform distal process.

Figure 110 – Carapace in lateral view of the subadult female (Holotype T700N 4#10). Abbreviations: A1: sulcus posterior large area, A2 sulcus anterior small area, A3: rounded dorsal area.



Fonte: A autora (2023).

Description of the subadult female (based on the HOLOTYPE T700N 4#10; see also SEM photos PARATYPE T700N 4#19).

Integument well calcified, showing a hexagonal pattern (Fig.4 E).

Carapace (Fig. 2 A, B) 1.6 times longer than wide, with a few scattered setae both dorsally and laterally. Sides with 2 lateral tuberculate ridges, leaving a deep sulcus in

between. Sulcus divided into a posterior large area (A1) and a small anterior area (A2) by a vertical ridge. Upper oblique ridge starts from base of pseudorostrum, directed backwards, and turns forward forming a U-shape. Rounded area partially encircled a third area (A3). Lower oblique ridge starts from antennal notch running backwards close to carapace inferior margin to finally meet the opposite lower oblique ridge at mid-dorsal line, right and left ridges delimiting a small triangular area dorsally. With two large tubercles just in front of this triangular area. Pseudorostrum upturned 60° to dorsum of carapace, 0.14 carapace total length. Siphonal tubes moderately long. Eyelobe much longer than wide, no lenses.Frontal lobe with a transverse row of 5 tubercles, lateral tubercles large and carrying 1–2 setae, 3 central tubercles smaller without setae (other specimens examined with 2, 3, or 5 central tubercles). With 4 tubercles, arranged in two rows, behind the frontal lobe, anterior tubercles larger than posterior ones (two additional specimens examined with 6 tubercles arranged in three rows, anterior pair larger than the others). Anteroventral margin smooth or faintly serrate. Antennal notch small.

Thorax, segments 3-5 with 2 dorsal tubercles. All segments with lateral margins serrate.

Abdomen, 0.6 cephalothorax length. Pleonites 1–4 with 2 tubercles dorsally, and with 1 serrate projection and 1 row of teeth (below the projection), on each side. Pleonite 5 with 1 transverse carina at mid-way of segment, and 1 row of teeth laterally.

Description of the appendages (based on a subadult male PARATYPE T700N 4#04).

Antenna 1 (Fig. 3.A) Peduncle of 3 articles, first article 1.3 as long as second article, with 3 simple setae, second subequal to third article, with 1 simple seta; third article with 2 simple and 2 broom setae. Main flagellum of 3 articles, decreasing in length distally, first article glabrous, second article with 1 aesthetasc and 1 short simple seta; third article with 1 aesthetasc and 2 simple setae (1 long, 1 short). Accessory flagellum of 1 article, with 1 short simple seta and 2 broom setae.

Antenna 2 on development, with 2 articles.

Mouthparts Typical of the genus. Mandible with the molar process styliform. Second maxilla reduced to a simple plate without movable endites.

Maxilliped 1 (Fig. 2.D): basis as long as remaining articles together, with 2 coupling setae, endite with 1 simple and 2 setose setae. Ischium visible only on one side.

Merocarpus 0.8 basis length, inner margin with 6 simple setae, outer margin with 2 setae (1 setose, 1 simple). Dactylus 0.2 merocarpus length with 1 simple terminal seta.

Maxilliped 2 (Fig. 2.E): basis as long as remaining articles together, with 1 large setose seta on inner distal margin and 1 simple seta on outer margin. Merus 0.4 basis length, with 1 large setose seta distally. Carpus 0.5 merus length, with 2 setose setae and 2 teeth distally. Propodus with a process on outer distal angle extending beyond dactylus teeth. Dactylus with 3 teeth, central one shortest.

Maxilliped 3 (Fig. 2.F): basis 0.9 as long as remaining articles together, with 2 setose and 1 simple setae. Ischium with teeth on inner margin. Merus 0.4 basis length, with 3 simple setae and serrations on inner margin. Carpus 0.3 merus length, both margins with 1 setose seta and serrations. Propodus twice as long the carpus, with 2 setose setae on inner margin, 1 setose seta on distal angle, and teeth on both margins; dactylus 0.6 propodus length, with 3 simple setae; Exopod, basis without any seta, flagellum of 4 articles with setae (not drawn).

Pereopod 1 (Fig. 3.B): Basis 0.4 as long as remaining articles together. Ischium 0.3 basis length, with 2 setose setae. Merus with 8 barely setose or simple setae, outer margin with a few teeth. Carpus 0.7 as long as merus length, with 8 barely setose or simple setae, outer margin with a few teeth. Propodus 1.1 as long as carpus, with 9 barely setose or simple setae. Dactylus 0.7 propodus length, with 9 simple setae. Exopod, basis with a simple seta and a few teeth, flagellum of 5 articles with setae (not drawn).

Pereopod 2 (Fig. 3.C): Basis 0.5 as long as remaining articles together, with 2 barely setose setae. Ischium glabrous. Merus with 3 barely setose or simple setae. Carpus 1.5 as long as merus, distally with 1 barely setose, 1 simple and 1 short robust setae, laterally with 2 simple and 1 setose setae. Propodus glabrous. Dactylus (Fig. 3.D, including distal process) 1.5 as long as carpus, with simple and barely setose setae laterally, and 4 setae (3 large setulate; 1 minute, simple) distally, largest distal seta almost as long as article; distal end with a digitiform process extending beyond setae insertion (see detail). Exopod, flagellum of 5 articles with large setae (not drawn).

Pereopod 3 (Fig. 3.E): Basis 1.0 as long as remaining articles together, with barely setose and simple setae. Ischium with 1 simple seta on outer distal angle. Merus 1.4 as long as ischium with 2 simple setae (1 broken) on outer distal angle. Carpus 1.9 as long as merus with 5 simple setae (3 laterally, 2 on outer distal angle). Propodus 0.4 as long as carpus, with 2 simple setae distally. Dactylus 0.5 as long as propodus, with

3 setae (distal one approximately 2 times as long as article). Exopod, flagellum of 2 articles.

Pereopod 4 (Fig. 3.F): Basis 0.8 as long as remaining articles together, with barely setose and simple setae. Ischium glabrous. Merus with 2 setae (1 simple, 1 serrulate) on outer distal angle. Carpus twice as long as merus with 4 simple setae (2 at mid-half of article, 2 unequals on distal outer angle). Propodus 0.4 as long as carpus, with 1 simple seta on outer distal angle. Dactylus 0.7 as long as propodus, with 3 setae (distal one approximately 2 times as long as article). Exopod, flagellum of 1 article.

Pereopod 5 (Fig. 3.G): Basis 0.3 as long as remaining articles together, with 2 simple setae and 1 tooth. Ischium 0.3 as long as basis, with one simple setae; Merus 1.4 as long as ischium, with 1 simple setae; Carpus 1.8 as long as merus, without any setae; Propodus 0.4 as long as the carpus, with 1 simple setae on distal angle; Dactylus 0.6 as long as the propodus, with 3 simple setae (distal one approximately 2.6 as long as article)

Uropod (Fig. 2.C): peduncle 1.8 times last pleonite length, with serrations on both margins. Rami subequal. Endopod 0.6 peduncle length, with 3 robust setae on inner edge (2 lateral, 1 subterminal), and 2 robust setae distally (1 large, 1 small). Exopod second article with 1 small seta on each margin, and 2 unequal setae (largest slightly longer than article) distally.

Distribution. Known only from the type locality: Campos Basin, Rio de Janeiro State, Brazil, 21º328684'S, 40º207009'W, 700 m depth.

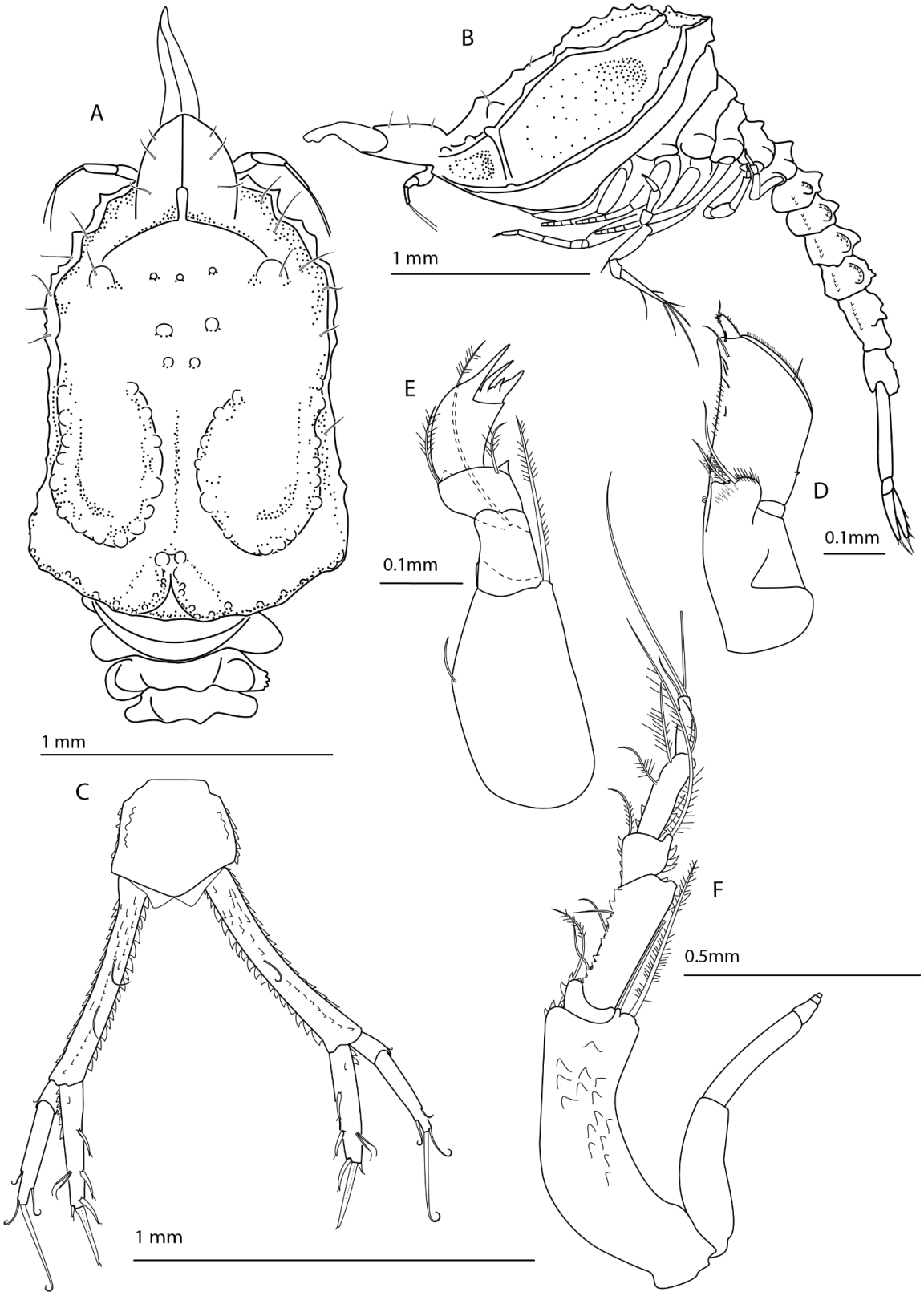
Remarks. *Campylaspis* n. sp.15 is most closely related to *C. chisamerai* Petrescu, 2018. Both species share the following features: Pseudorostrum long and upturned. Sides of carapace with two oblique ridges. Frontal lobe with a transverse row of tubercles. Areas A1, A2 (schematized in Figure 2) well defined. Dactylus of pereopod 2 with a digitiform distal process. *Campylaspis* n. sp.15 can be easily separated from *C. chisamerai* by having a well-developed u-shaped upper ridge (incipient in *C. chisamerai*) and a long eyelobe (small in *C. chisamerai*). Differences of *Campylaspis* n. sp.15 with other closely related species are listed in Table 1 and illustrated in Fig. 5.

Table 1 – Morphological characters of *Campylaspis* n. sp.15 and closely related species.

Species	Distribution	Depth (m)	Pseudorostrum	Anterior vertical ridge presence	Upper lateral ridge shape	Carapace tubercles	Ocular lobe	P2, dactylus digitiform process
Campylaspis n. sp.15	Brazil	686–733	Long, upturned	Present	Present. U-shaped. tuberculated.	Many	Longer than wide, without lenses	Present
C. undata	Noruega	1470	Short, upturned	Absent	Present. U-shaped, without tubercles	Few	Wider than long, with lenses	Absent
C. tasmaniensis	Australia	800	Long, upturned	Incipient	Incipient	Many	Small, without lenses	Absent
C. rostrata	Ireland	585	Long, not upturned	Incipient	Absent (Tubercles in 2 straight rows)	Many	Small, without lenses	Absent
C. chisemerai	Australia	366	Long, upturned	Present	Incipient	Many	Small, without lenses	Present
C. horrida	Noruega	120–300	Short, upturned	Present	Absent (Tubercles in 4 rows)	Many	Longer than wide, with lenses	Absent
C. macrophthalma	Noruega	270	Short, upturned	Present	Absent	Few	Longer than wide, with lenses	Absent
C. aegypta	Egypt	200	Short, upturned	Present	Present. Y-shaped.	Many	Longer than wide, without lenses	Absent
C. exarata	Brazil	587	Long, upturned	Absent	Absent	Few	Samll, without lenses	Absent

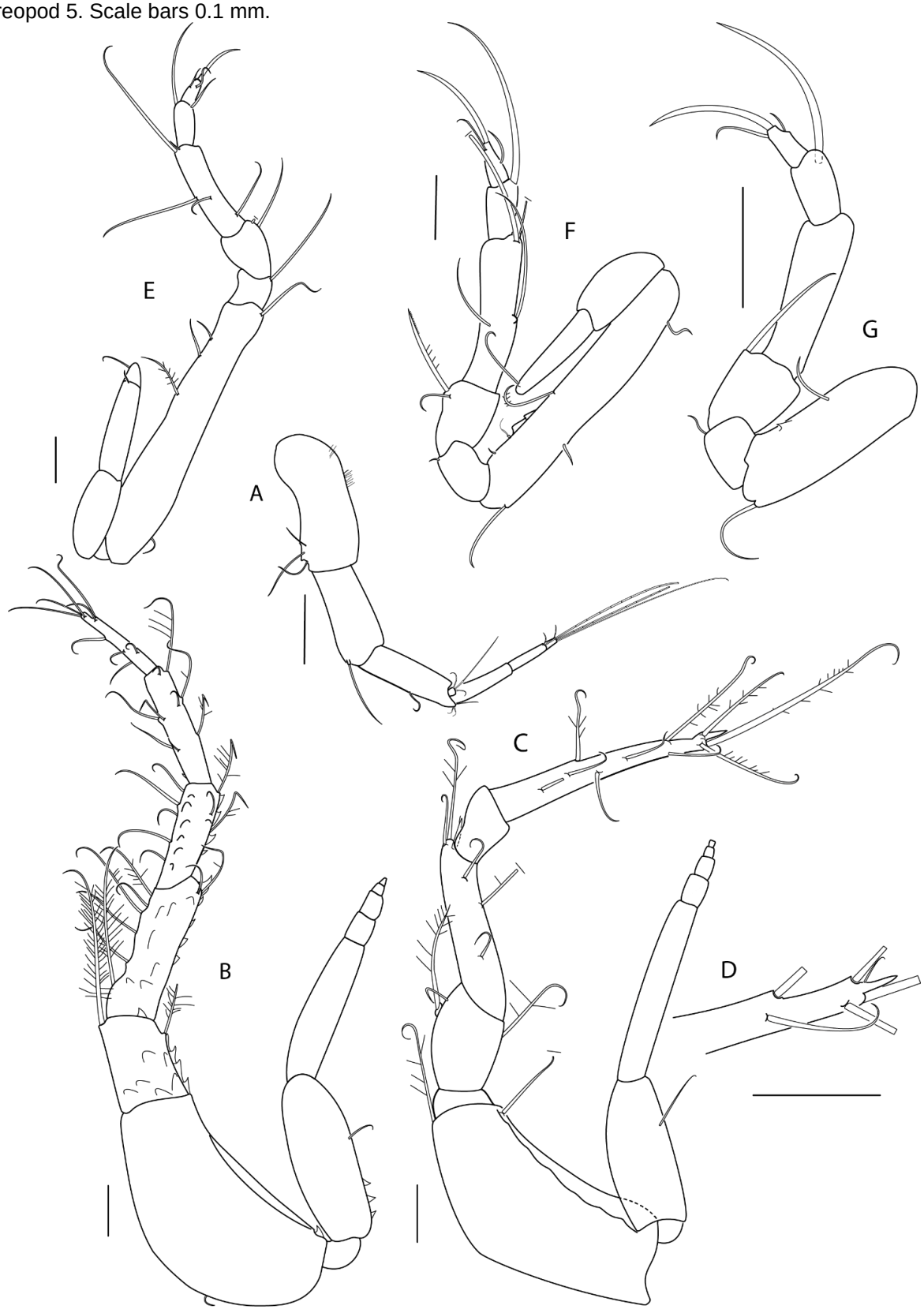
Fonte: A autora (ano).

Figure 11 – *Campylaspis* n. sp. 15 A–B subadult female (Holotype T700N 4#10 - MOUFPE 21056), C–F subadult male (Paratype T700N 4#04 - MOUFPE 21042). A. Dorsal view; B. Lateral view; C. Uropod; D. Maxilliped 1; E. Maxilliped 2; F. Maxilliped 3.



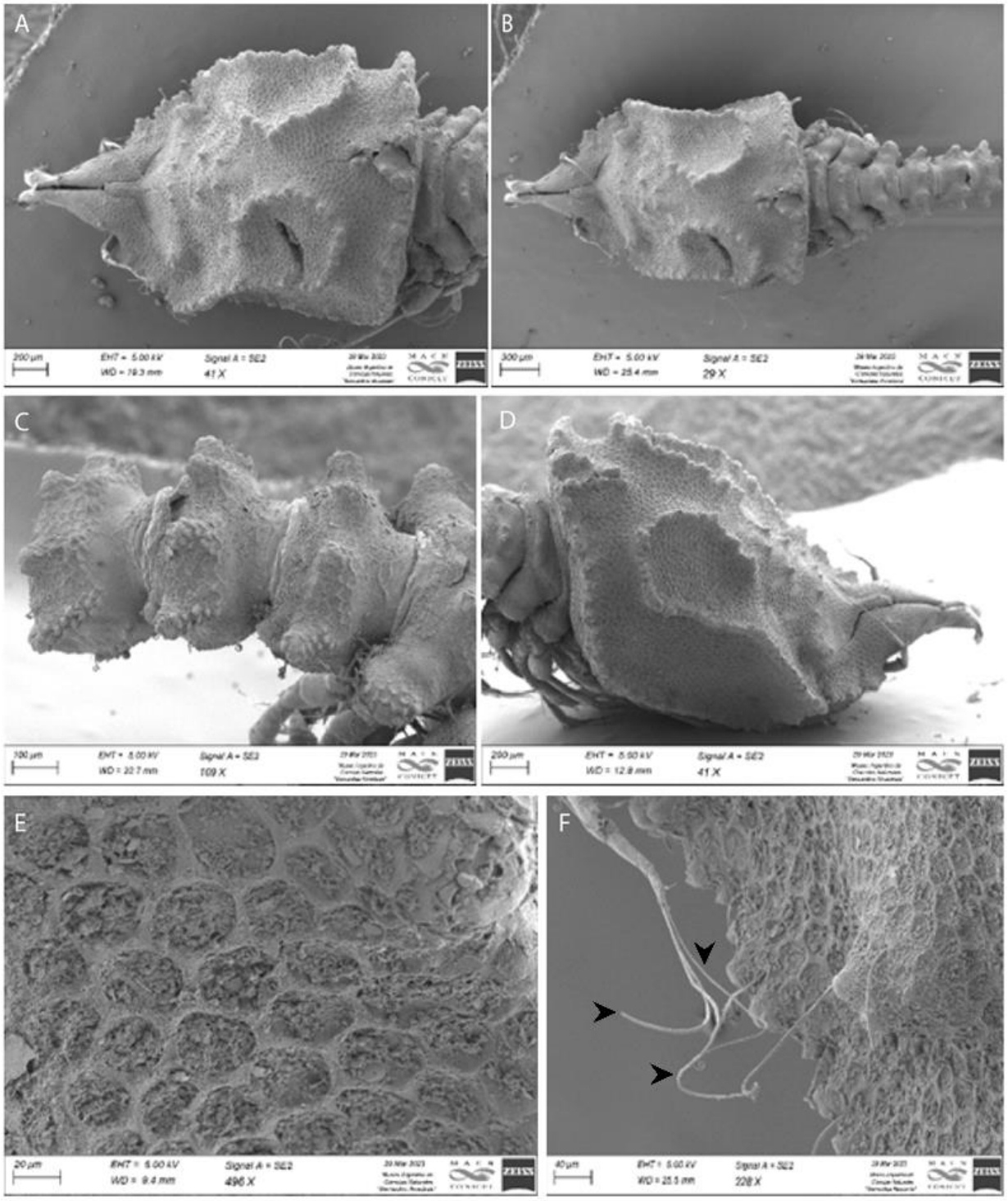
Fonte: A autora (2023).

Figure 312 – *Campylaspis* n. sp. 15 male pereopods (Paratype T700N 4#04 – MOUFPE 21042). A. Antenna 1; B. Pereopod 1; C. Pereopod 2; D. Dactylus of Pereopod 2 magnified; E. Pereopod 3; F. Pereopod 4; G. Pereopod 5. Scale bars 0.1 mm.



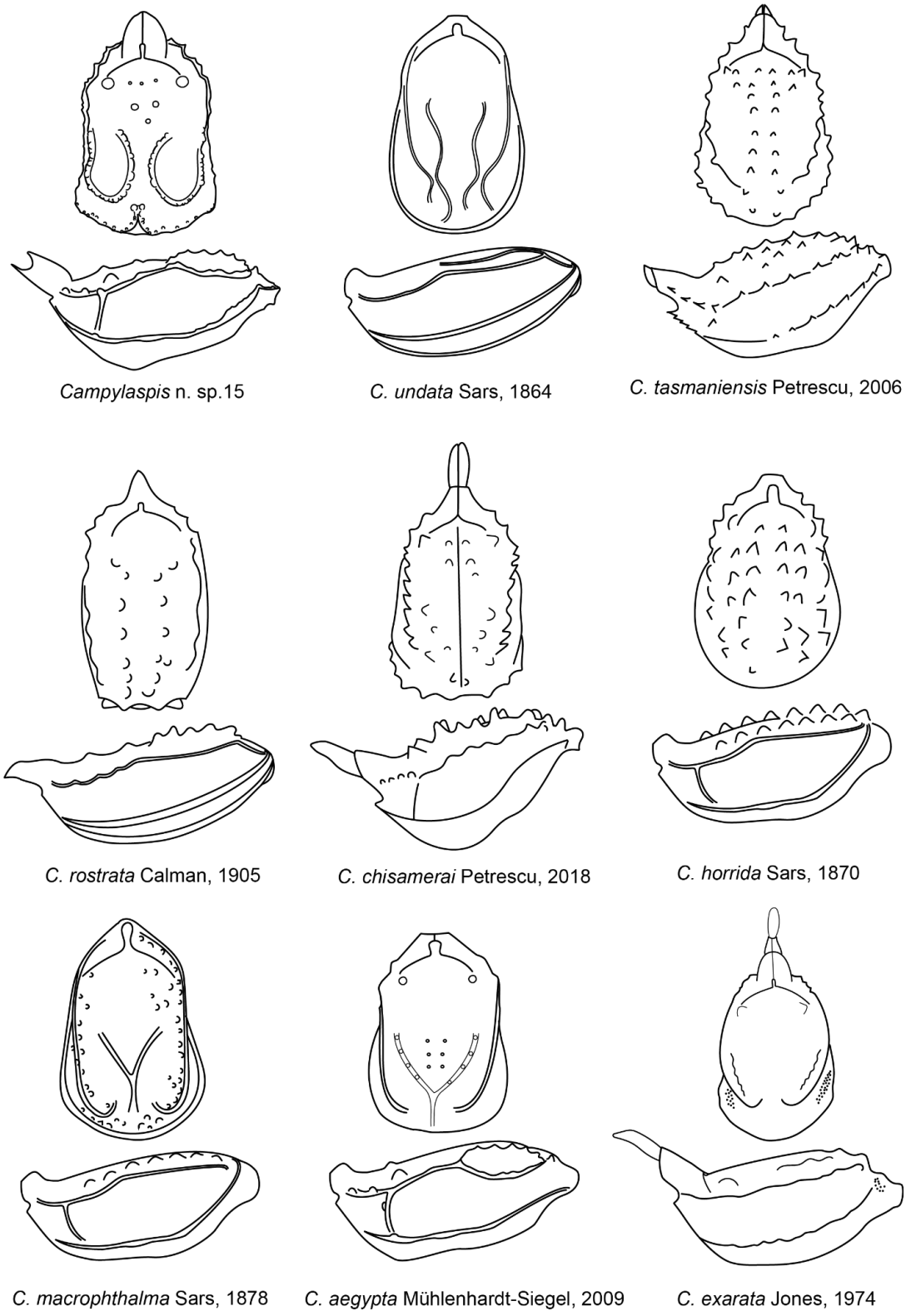
Fonte: A autora (2023).

Figure 413 – *Campylaspis* n. sp. 15 SEM photos (Paratype T700N 4#19 – MOUFPE 21041). A. Carapace dorsal view; B. Carapace, pereion and first three pleonites; C. Lateral view of first three pleonites; D. Carapace lateral view; E. Integument of carapace; F. anterior part of carapace, head arrows point antenna 1 aesthetascs and carapace left lateral tubercle.



Fonte: A autora (2023).

Figure 5 – Carapaces in lateral and dorsal views of the species most similar with *Campylaspis* n. sp.15. *C. undata* (redrawn from Sars, 1864), *C. tasmaniensis* (redrawn from Petrescu 2006), *C. rostrata* (redrawn from Calman 1905), *C. chisamerai* (redrawn from Petrescu 2018), *C. horrida* (redrawn from Sars 1870), *C. macrophthalma* (redrawn from Sars, 1878), *C. aegypta* (redrawn *C. spinosa* (redrawn from Mühlenhardt-Siegel, 2009) and *C. exarata* (redrawn from Jones, 1974).



Fonte: A autora (2023).

***Campylaspis* n. sp.16**

(Figs. 6–8)

Material examined. Holotype: 1 subadult male (4.2 mm), T700N 4#23, 21º4'59.884"S 40º11'29.965"W, 703m depth, Petrobras, MOUFPE 21052. Paratypes: 2 subadult females (mm), T700N 4#15, 1 subadult mm (dissected and drawn), and 1 juvenile mm (SEM photos), 21º10'22.228"S 40º12'29.034"W, 732m depth, Petrobras, MOUFPE 21051; 1 subadult female (mm), T700N 4#10, 21°19′43.262″S 40°12′25.232″W, 700m depth, Petrobras, MOUFPE 21050; 1 subadult male, (mm) C700S 5#10 23º27'46.746"S 41º6'57.208"W, 680m depth, Petrobras, MOUFPE 21058; 1 subadult female (mm), T400C 4#05, 22º38'1.37"S 40º31'13.163"W, 393m depth, Petrobras, MOUFPE.

Diagnosis. Carapace with a unique pair of anterior dorsal tubercles. Laterally with 3 ridges without forming depressed areas (2 horizontal and 1 transversal). Dorsally with 3 transversal ill-marked ridges, the posterior one recurves horizontally near the dorsal midline, on each side. Eyelobe rudimentary, no lenses. Second pereopod, dactylus 2.3 carpus length, with a distal digitiform process.

Description of the subadult male (based on the HOLOTYPE T700N 4#23; see also SEM photos PARATYPE T700N 4#15).

Integument, with an ill-defined hexagonal pattern (Fig. 8 D).

Carapace, (Fig. 6 A, B) 1.6 times longer than wide, without setae, spines or tubercles. Sides with (1) an upper lateral ridge well defined, running from below of pseudorostrum backwards to posterior margin of carapace, sector on pseudorostral lobes serrate, (2) a lower lateral ridge ill-defined not reaching end of carapace and (3) a dorso-ventral ridge joining upper and lower lateral ridges, anteriorly. These 3 ridges enclose a large shallow depression (sulcus). Dorsal surface of carapace with 3 low transverse ridges: anterior ridge just behind frontal lobe, composed of 3 protuberances (1 at midline and 2 near to end of frontal sutures); median ridge at half-way along carapace; posterior ridge at three-quarters of carapace length. Neither median nor posterior ridges reach the midline of carapace. Median transverse ridge bifurcates distally, getting almost in contact with the posterior transverse ridge, encircling a shallow depression area dorsally. Pseudorostrum 0.2 carapace length. Eyelobe much longer than wide, no lenses. Carapace inferior margin serrate. Note: in the juvenile (SEM) the right and left transverse median ridges meet on the middle line of carapace (Fig. 8 B, C).

Thorax, pereonites 3-5, lateral margins serrate.

Abdomen, pleonites 1-6 with lateral row of teeth; pleonite 5 with a transverse ridge at midway of segment delimiting 2 shallow depression areas at each side; pleonites 1-5 with scattered teeth ventrally.

Description of appendages (based on subadult male PARATYPE T700N 4#15).

Antenna 1 (Fig. 7.G): Peduncle of 3 articles. Article 1 is 1.2 article 2, with 4 simple setae and a few distal teeth; article 2 1.6 article 3, with 4 broom setae distally. Article 3 with 1 simple seta and 3 broom setae, distally. Main flagelum of 3 articles, decreasing in length distally, second article with 1 aesthetasc, third article with 1 aesthtasc.

Mouthparts Typical of the genus. Mandible with molar process styliform. Second maxilla lost.

Maxilliped 1 (Fig. 6.C): basis 1.3 as long as remaining articles together, with 2 coupling setae; endite with 1 simple and 3 plumose setae. Ischium visible only on one side. Merocarpus 0.7 basis length with 8 simple setae on inner margin, 2 simple setae on dorsal surface, 1 setose seta and 1 simple seta on outer margin. Dactylus minute, 0.06 merocarpus length, with 1 simple terminal seta.

Maxilliped 2 (Fig. 6.D): basis 0.4 as long as remaining articles together, with bristles on outer margin and 1 large setose seta and 2 small simple seta, distally. Ischium short. Merus 0.3 basis length. Carpus 0.7 merus length, with 1 large setose seta on outer margin. Propodus 1.2 as long as carpus length, with a process on outer distal angle extending beyond dactylus teeth. Dactylus with 3 teeth, central one shortest.

Maxilliped 3 (Fig. 6.E): basis 1.9 as long as remaining articles together, with 2 setose setae on outer distal margin, teeth on inner margin. Ischium with 2 teeth on inner margin. Merus with 5 simple or barely setose setae on inner margin, 1 large setose seta on distal outer angle, and teeth on both margins. Carpus 0.3 merus length, with 6 simple or barely setose setae on inner margin and 1 large setose setae on other distal angle, teeth on both margins; propodus 1.2 as long as carpus, with 3 setose setae and teeth on both margins. Dactylus 0.3 propodus length, with 3 simple setae distally. Exopod, basis without setae, flagellum of 4 articles (setae not drawn).

Pereopod 1 (Fig. 7.A): Basis 1.1 as long as remaining articles together, with 5 simple and 3 plumose setae, teeth on both margins; Ischium 0.1 basis length, with 1 setose setae. Merus with 5 simple, 1 barely setose and 1 setose setae, both margins with teeth; Carpus 0.7 as long as merus, with 8 barely setose or simple setae, both margins with teeth; Propodus 0.8 as long as carpus, with 3 setose and 2 simple setae; Dactylus

0.5 propodus length, with 10 simple setae; Exopod, basis with few teeth, flagellum of 5 articles (setae not drawn).

Pereopod 2 (Fig. 7.B): Basis 0.6 as long as remaining articles together, with 2 setose setae; Basis, merus and carpus with strong serrations; Merus 0.8 as long as carpus with 4 setae (1 barely setose, 3 simple); Carpus with 1 barely setose, 1 simple and 1 robust setae on outer distal angle, and 3 simple setae laterally. Propodus glabrous. Dactylus (including distal process) 2.3 as long as carpus, laterally with simple setae, distally with 4 setae distally (1 minute, 3 large; largest seta with setules) and a terminal digitiform process extending beyond setae insertion (see detail). Exopod, flagellum of 5 articles (setae omitted).

Pereopod 3 (Fig. 7.D): Basis 1.2 as long as remaining articles together, with 4 simple and 2 broom setae. Ischium 0.1 basis length with 2 simple setae on inner distal angle; Merus 1.3 as long as ischium with 2 simple and bristles on outer distal angle; Carpus 1.4 as long as merus, with 3 setose and 2 simple setae (3 laterally, 2 on outer distal angle); Propodus 0.5 as long as carpus, with 1 simple seta distally. Dactylus 0.7 as long as propodus, with 3 simple setae (stronger one 1.5 times as long as article); Exopod, basis and first article with teeth. Basis with 2 simple setae. Flagellum of 5 articles.

Pereopod 4 (Fig. 7.E): Basis 0.8 as long as remaining articles together, with teeth on outer margin, 2 simple and 2 broom setae. Ischium 0.1 basis length with 2 simple setae on outer distal angle. Merus 1.5 as long as ischium with 2 unequal simple setae on outer distal angle. Carpus 1.3 as long as merus with 3 simple and 3 setose setae (4 at mid- of article, 2 unequals on distal outer angle); Propodus 0.5 as long as carpus, with 1 simple seta on outer distal angle. Dactylus 0.6 as long as propodus, with 3 simple setae (stronger one 1.3 times as long as article); Exopod, basis and first article of flagellum with teeth. Flagellum of 4 articles.

Pereopod 5 (Fig. 7.F): Basis 0.5 as long as remaining articles together, with 2 simple and 3 broom setae. Ischium 0.2 as long as basis, without setae; Merus 1.8 as long as ischium, with 2 simple setae and 3 teeth distally; Carpus 1.3 as long as merus, with 4 setae on outer margin, and teeth on both margins; Propodus 0.4 as long as the carpus, without setae; Dactylus 0.9 as long as the propodus, with 3 simple setae (stronger one 1.3 times as long as article)

Uropod (Fig. 6.F): peduncle 2. 2 times last pleonite length, with strong serration on both margins. Endopod 0.9 exopod length, 0.4 peduncle length, inner margin with 4

robust setae (3 lateral, 1 subterminal), distal end with 2 robust setae (1 large, 1 small), outer margin with strong serration. Exopod second article, outer margin with 3 simple setae, distal end with 3 serrulate setae (2 subterminal and 1 terminal slightly longer than article).

Distribution: Known only from the type locality: Campos Basin, off Rio de Janeiro State, Brazil, 21º4'59.884"S 40º11'29.965"W, 703 m depth.

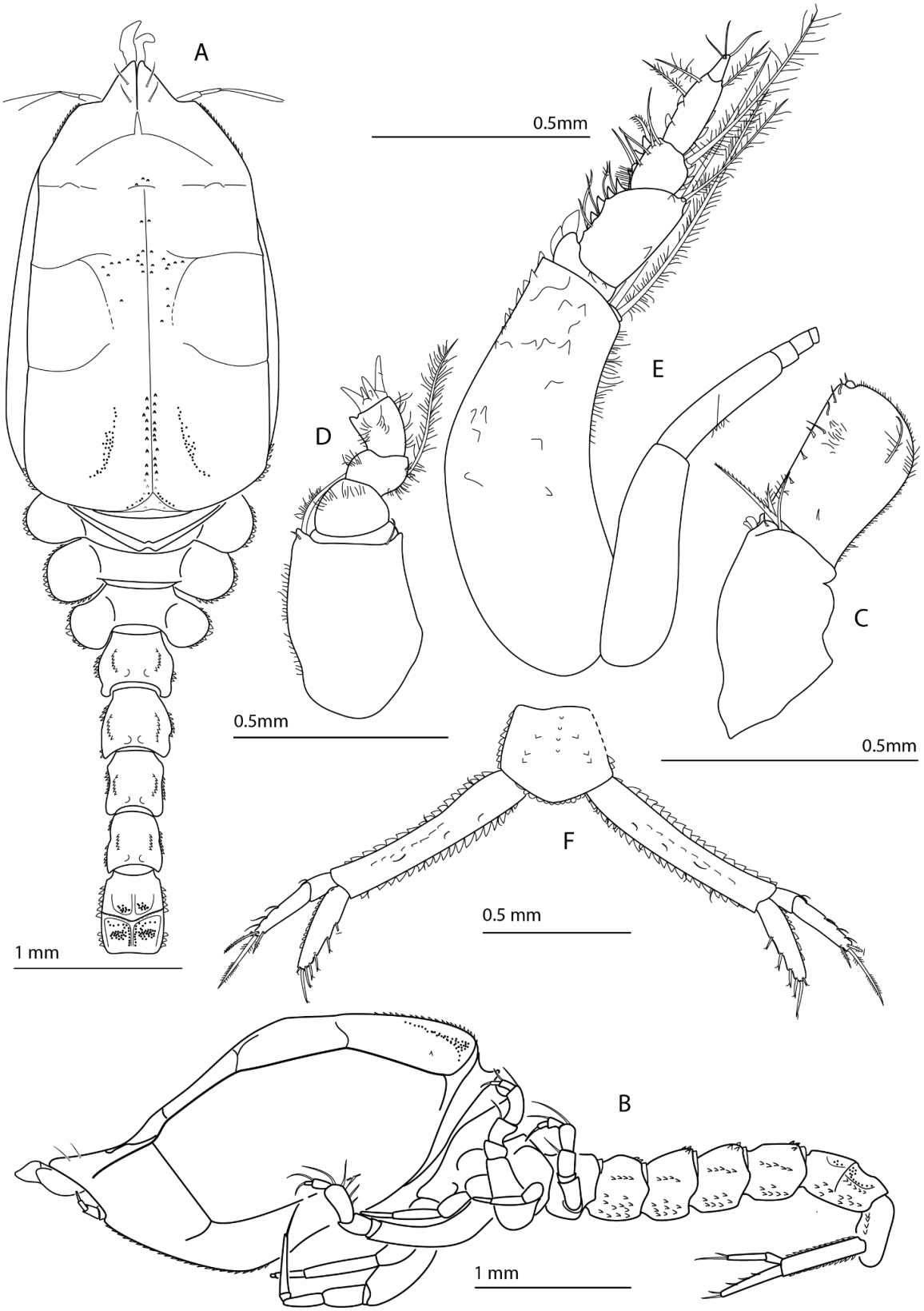
Remarks: *Campylaspis* n. sp.16 is closely related to *C. valida* Jones, 1984, both have the upper margin running backwards until the posterior edge, and also two horizontal ridges forming two areas with a shallow depression dorsally. *C. valida* has two more posterior areas forming shallow depressions that resemble *Campylaspis* n. sp.16 from *C. valida* as follows (characters for *C. valida* between parentheses): carapace dorsal with one pair of low tubercles (with two pairs of tubercles); pseudorostrum not upturned and a fourth of the total carapace length (pseudorostrum slightly upturned and a fifth of the total carapace length); dactylus of pereopod 2 a digital process (without digital process on pereopod 2). *Campylaspis* n. sp.16 also resembles *C. alisae* Corbera, 2008, *C. bulbosa* Jones, 1974, *C. johnstoni* Hale, 1937, *C. ledoyeri* Petrescu & Wittmann, 2003, *C. microsulcata* Gerken, 2012, *C. nowrae* Petrescu, 2006, *C. vitrea* Calman, 1906. Dorsal and lateral view from the specimens were schematized on Figure 9 and described in Table 2 to comparison.

Table 2 – Morphological characters of *Campylaspis* n. sp.16 and closely related species.

Species	Distribution	Depth (m)	Pseudorostrum (size and position)	Transverse lateral ridges	Transverse dorsal ridges	P2, dactylus digitiform process
Campylaspis n. sp.16	Brazil	393–732	Short, upturned	One anterior	Two dorsal, one medial and one posterior	Present
C. bulbosa	South West Africa	2117–2154	Short, straight	One posterior	Two dorsal, one anterior and one posterior	Absent
C. microsulcata	New Zealand	424–1239	Short, upturned	One posterior	One dorsal posterior	Absent
C. vítrea	Italy	950–1100	Long, upturned	One anterior and one posterior	One dorsal posterior	Absent
C. nowrae	Australia	770	Short, upturned	One posterior	Two dorsal medial	Present
C. ledoyeri	Antarctic	440–630	Short, upturned	Three oblique	Three dorsal, one anterior, one medial and one posterior	Absent
C. valida	Suriname	500	Short, upturned	None. Only oblique.	Two oblique ridges	Absent
C. alisae	Solomon Islands	367–533	Short, upturned	One anterior and one posterior	Two dorsal, one anterior and one medial	Present
C. jonhstoni	Antarctic	150–437	Short, upturned	One posterior	One anterior	Absent

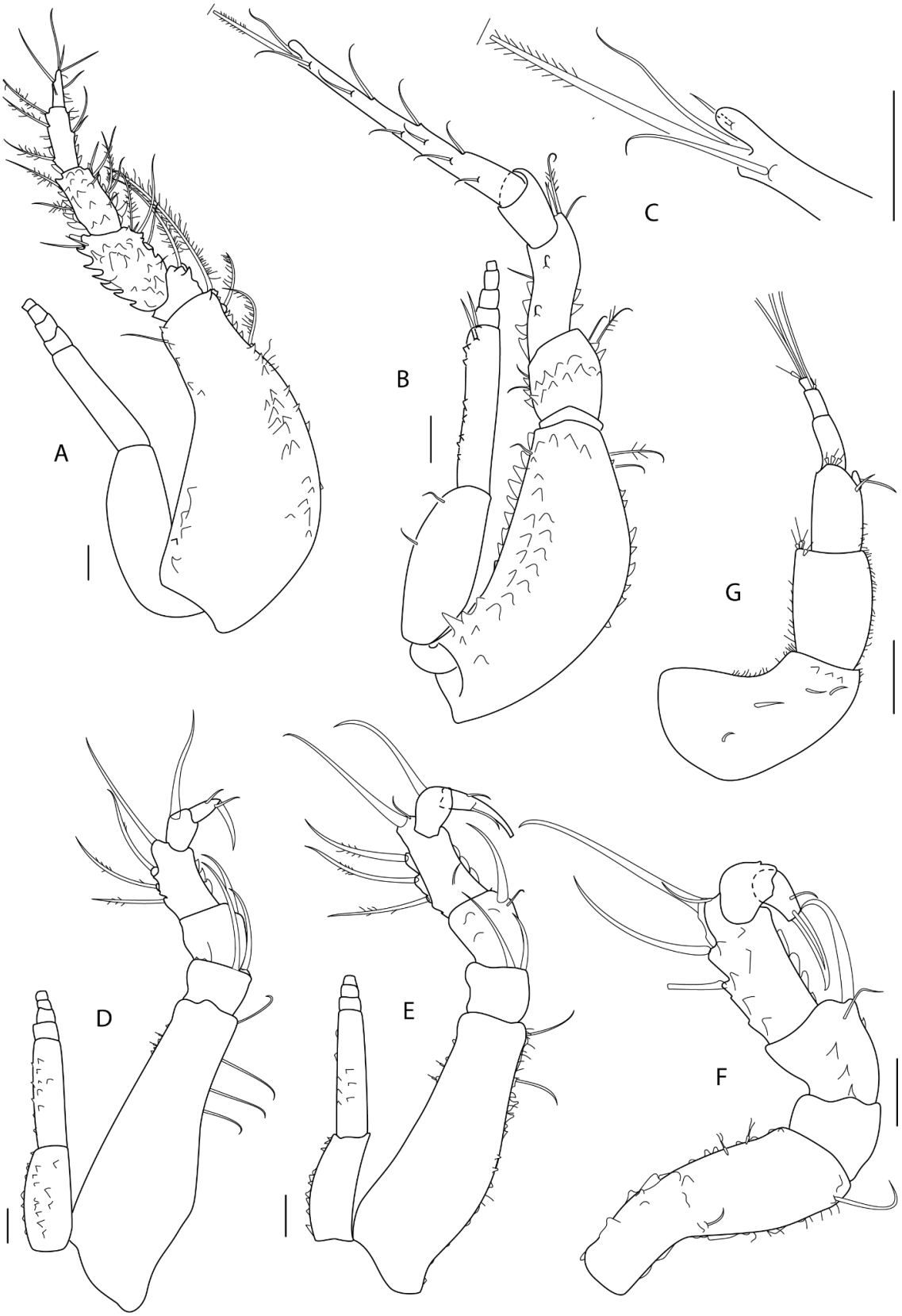
Fonte: A autora (ano).

Figure 6 – *Campylaspis* n. sp. 16 A, B. Subadult male (Holotype T700N 4#23 – MOUFPE 21052): A. Habitus, dorsal view. B. Carapace lateral view; C-F. Subadult male (Paratype T700N 4#15 - MOUFPE 21051): C. Maxilliped 1; D. Maxilliped 2; E. Maxilliped 3; F. Uropods.



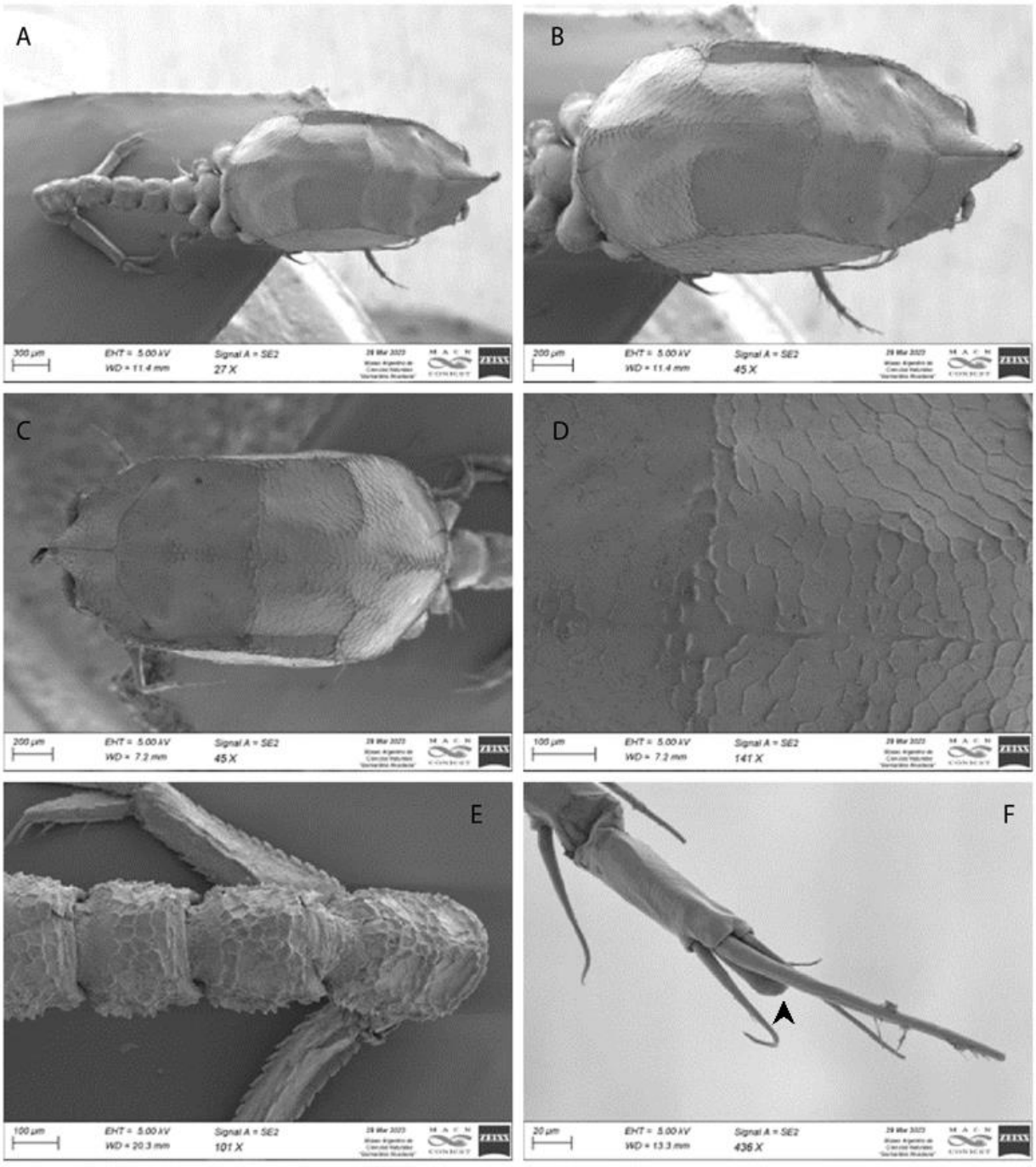
Fonte: A autora (ano).

Figure 714 – *Campylaspis* n. sp. 16 Subadult male (Paratype T700N 4#15 - MOUFPE 21051). A. Pereopod 1; B. Pereopod 2; C. Dactylus of Pereopod 2 magnified; D. Pereopod 3; E. Pereopod 4; F. Pereopod 5; G. Antenna 1; Scale bars 0.1 mm.



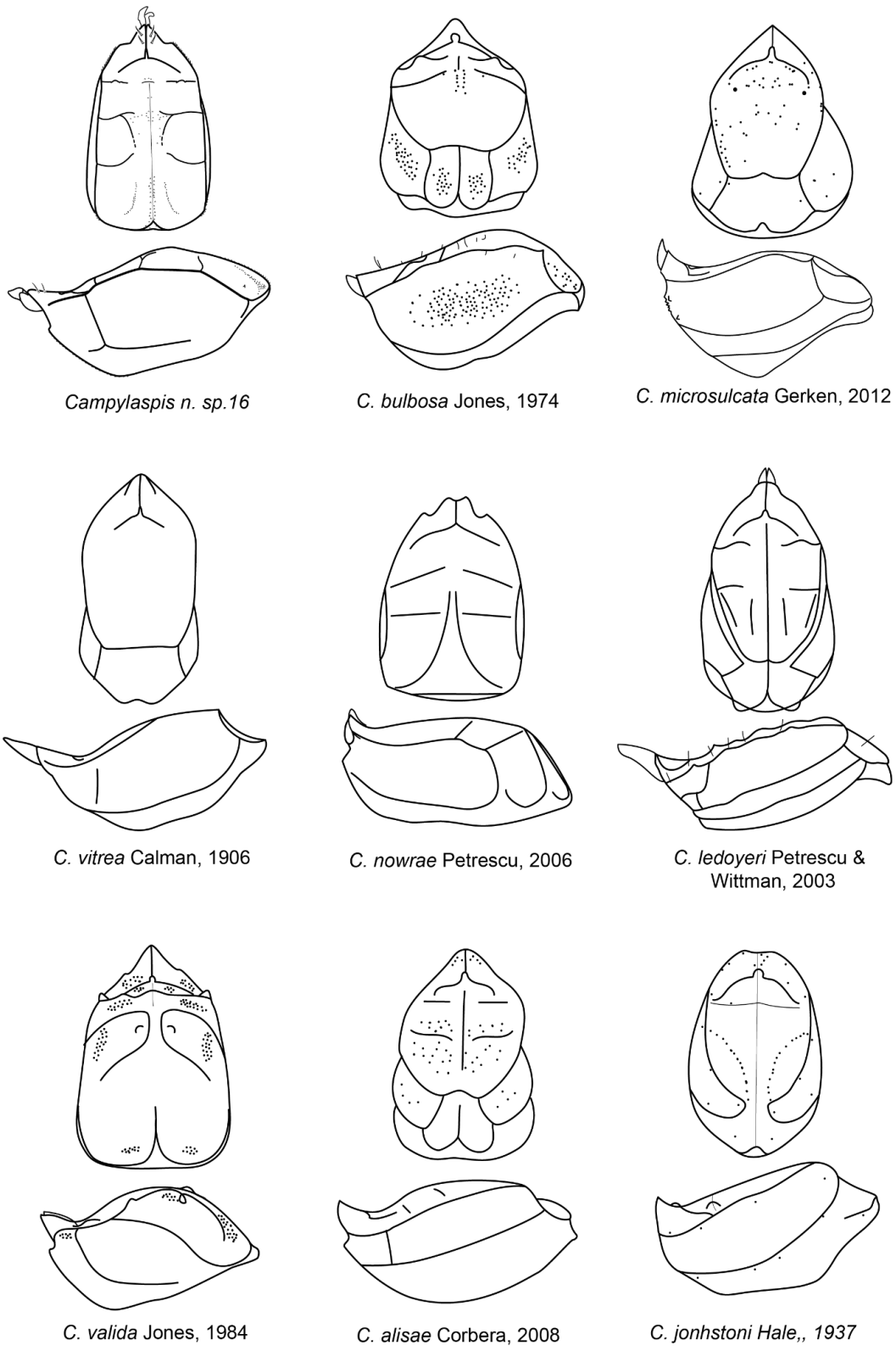
Fonte: A autora (ano).

Figure 815 – *Campylaspis* n. sp.16. SEM photos, subadult male (Paratype T700N 4#15 - MOUFPE 21051). A. Habitus, dorsal view; B, C. Carapace, dorsal view; D. Integument of carapace; E. Last four pleonites; F. Pereopod 2, head arrow points digitiform process.



Fonte: A autora (ano).

Figure 916 – Carapace in lateral and dorsal views of the species closely related to *Campylaspis* n. sp. 16, *C. bulbosa* (redrawn from Jones, 1974), *C. microsulcata* (redrawn from Gerken 2012), *C. vitrea* (redrawn from Calman, 1906), *C. nowrae* (redrawn from Petrescu 2006), *C. ledoyeri* (redrawn from Petrescu & Wittman 2003), *C. valida* (redrawn from Jones 1984), *C. alisae* (redrawn from Corbera 2008) and *C. johnstoni* (redrawn from Hale 1937).



Fonte: A autora (ano).

***Campylaspis* n. sp.17**

(Fig. 10,11)

Material examined. Holotype: 1 subadult female (3.3 mm), C700S 5#12, 23º27'55.336"S 41º6'42.484"W, 663m depth, Petrobras, MOUFPE 21053. **Paratypes:** 1 subadult female (3.6 mm), C700S 5#07, 23º27'41.414"S 41º7'4.062"W, 737m depth, Petrobras, MOUFPE 21055; 1 juvenile female (2.1 mm), C700S 5#14, 23º27'16.646"S 41º5'30.037"W, 847m depth, Petrobras, MOUFPE 21054;

Diagnosis. Carapace with at least 19 strong spines on two rows and fully covered by tiny spines. Shallow sulcus on anterior lateral region. Second pereopod, basis with a prominent tooth and dactylus with distal process. Peduncles of uropod serrated.

Description of the subadult male (based on the HOLOTYPE C700S 5#12).

Integument, with an ill-defined hexagonal pattern (Fig. 11 B).

Carapace (Fig. 10.A) 0.6 times longer than wide, with small spines covering the whole carapace and two rows of prominent spines. Row of spines starting beyond the ocular lobe until the posterior portion of carapace. Left row with 10 and right row with 9 spines. Uncountable bristles on carapace surface. At least 5 pairs of spines on dorsal midline. Carapace with a lateral shallow sulcus not bordered by ridges. Eyelobe longer than wide, no lenses. Pseudorostrum upturned almost 90° to dorsum of carapace, 0.1 carapace total length. Siphonal tubes are short. Carapace inferior margin with some small spines.

Thorax, carapace projection backwards over the first one pereonite. All segments with lateral serrated projections and one spine on each side. All pereonites with a pair of broken spines dorsally.

Pleon, all segments with one pair of spines.

Pereopod 2 (Fig. 10): Basis 0.4 as long as remaining articles together, with 2 simple setae and 1 prominent tooth. Ischium very small. Merus with 2 simple setae. Carpus 1.5 as long as merus, distally with 2 simple and 3 apícal setae (2 simple and 1 setose). Propodus 0.4 as long as carpus. Dactylus 3.0 as long as carpus, with 9 simply setose setae laterally, and 3 apical setae (2 simple and 1 setulate); distal end with a digitiform process extending beyond setae insertion. Exopod, flagellum of 5 articles with large setae (not drawn).

Uropod (Fig. 10): Peduncle 1.3 times last pleonite length, with serrations on both margins. Endopod 0.8 exopod length, 0.5 peduncle length, inner margin with 2 robust lateral setae, distal end with 3 robust setae (2 large, 1 small). Exopod second article,

outer margin with 3 simple setae, inner margin with 1 simple setae and distal end with 2 serrulate setae (1 subterminal and 1 terminal).

Distribution: Known only from the type locality: Campos Basin, off Rio de Janeiro State, Brazil (23º27'55.336"S 41º6'42.484"W), 663 m depth.

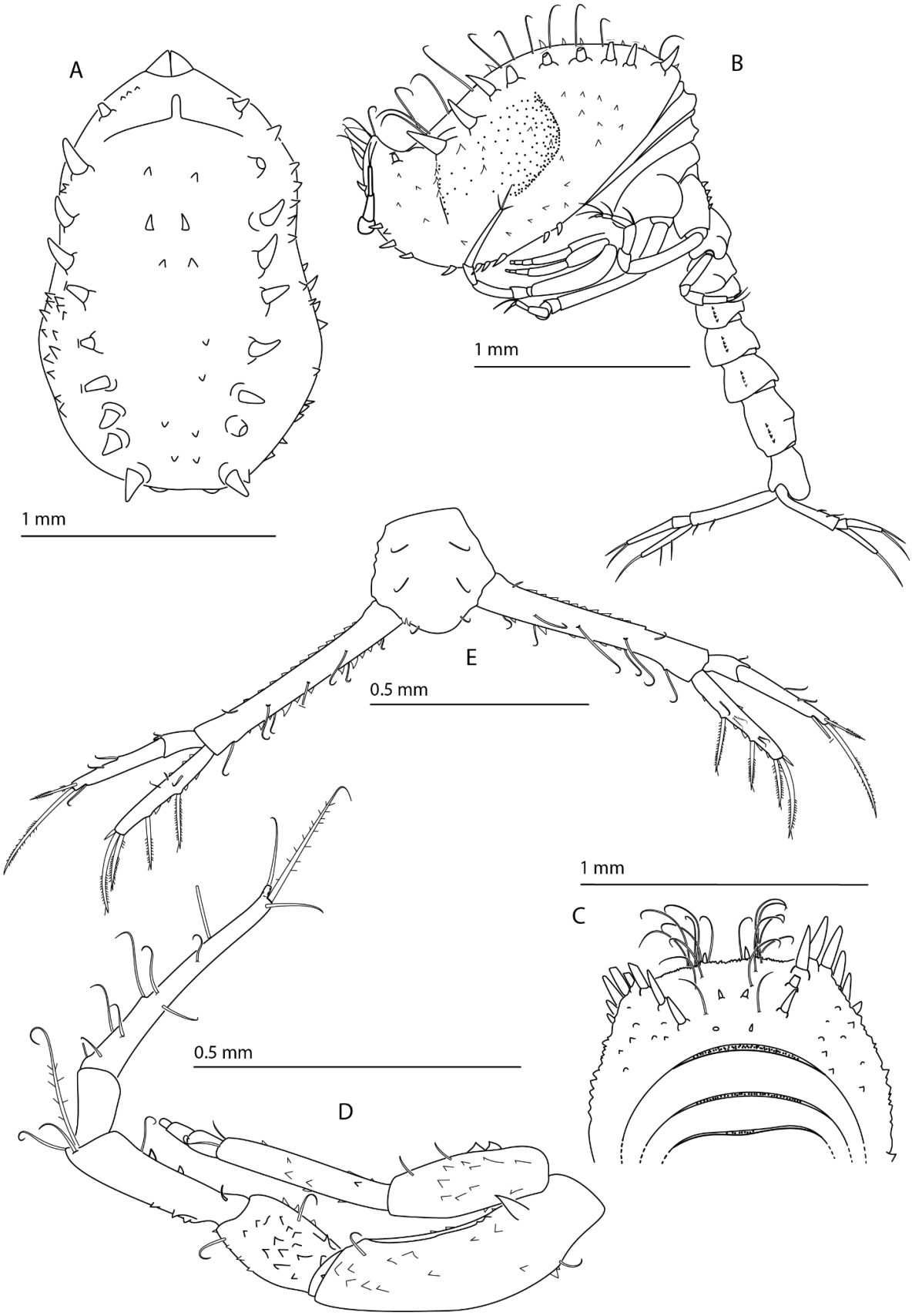
Remarks: The material examined is closely related to *C. spinosa* Calman, 1906 and *C. rex* Gerken & Rider, 2002. *Campylaspis* n. sp.17 and *C. spinosa* have the same disposition of spines, in rows and small spines covering the whole carapace. The *Campylaspis* n. sp.17 differs from *C. spinosa* as follows (characters for *C. spinosa* in parenthesis): two rows of 10 and 9 spines (with two rows of 8 spines); uncountable setae on carapace surface (with 6 setae on carapace surface); pseudorostrum short and upturned with a pair of small spines near the basis (pseudorostrum with a prominent spine near the basis extending above de carapace); prominent tooth on basis of pereopod 2 (without prominent tooth); dactylus of pereopod 2 with more than 11 distal and 1 apical setae and a digital process (without digital process and 4 distal and 1 apical setae). *Campylaspis* n. sp.17 also resembles *C. rex* which has 11 spines, called stout tubercles by Gerken and Rider (2002), forming a semicircle starting from the pseudorostrum. Both have prominent tooth on the basis of pereopod 2. *Campylaspis. rex* has no drawing for the dorsal part of the carapace, but the lateral view is schematized on Figure 12. *C. panai* Petrescu, 2018 is also closed related to *Campylaspis* n. sp.17 in having two longitudinal rows of large spines on dorsal surface of carapace and small spines near the midline. The pseudorostrum is also similar, being short and upturned. These characteristics are being compared in Table 3.

Table 3 – Morphological characters of *Campylaspis* n. sp.17 and closely related species.

Species	Distribution	Depth (m)	Spines pattern on carapace	Lateral sulcus presence	Pleon dorsal spines presence	P2, basis tooth presence	P2, dactylus digitiform process
Campylaspis n. sp.17	Brazil	663–847	Two rows of 9 and 10 spines	Shallow lateral sulcus present	Pair of spines present	Present	Present
C. spinosa	Italy	950–1100	Two rows of 8 spines each	Absent	Pair of spines present	Absent	Absent
C. rex	New Zealand	244–750	Semicircle with 11 spines	Absent	Absent	Absent	Absent
C. panai	Australia	960–1050	Longitudinal rows of small spines	Absent	Absent	Present	Present

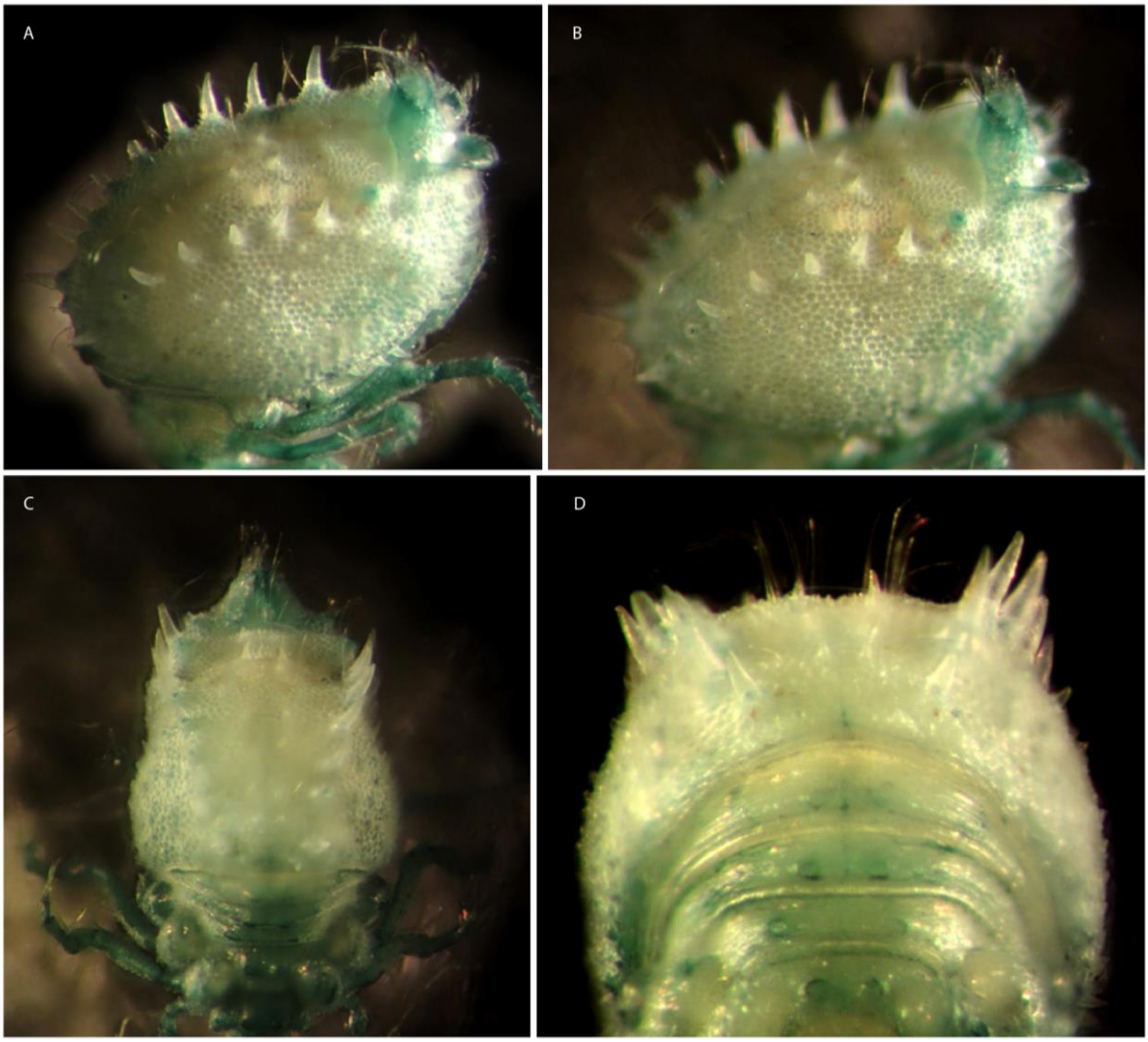
Fonte: A autora (ano).

Figure 10 – *Campylaspis* n. sp. 17 Subadult female (Holotype C700S 5#12 – MOUFPE 21053). A. Dorsal view; B. Lateral view; C. Posterior portion; D. Pereopod 2; E. Uropod.



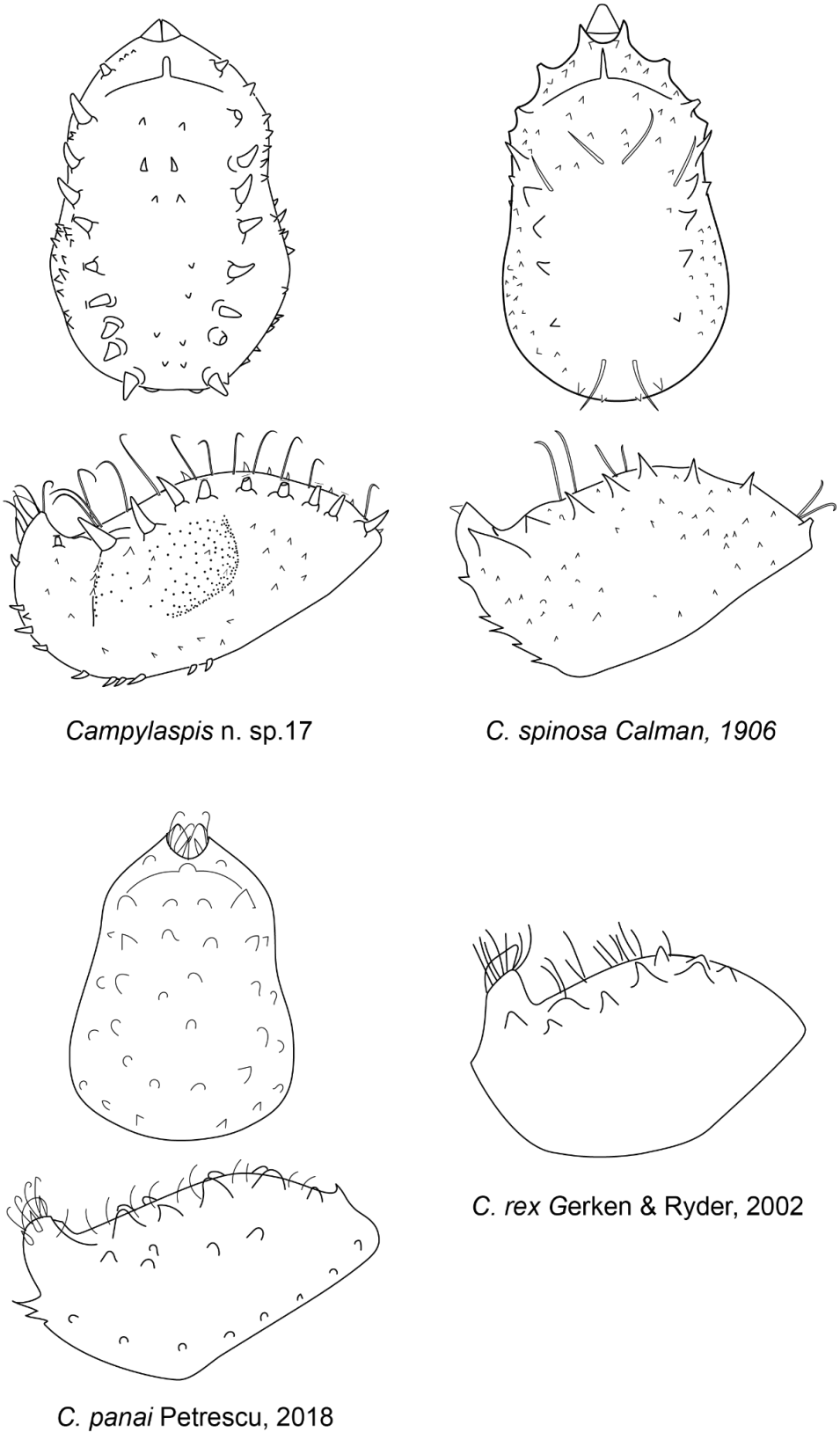
Fonte: A autora (ano).

Figure 11 – *Campylaspis* n. sp. 17 light microscope photos (Holotype C700S 5#12 - MOUFPE 21053). A-B. Carapace lateral view; C. Carapace dorsal view; D. Posterior portion of carapace with the first 4 pereonites.



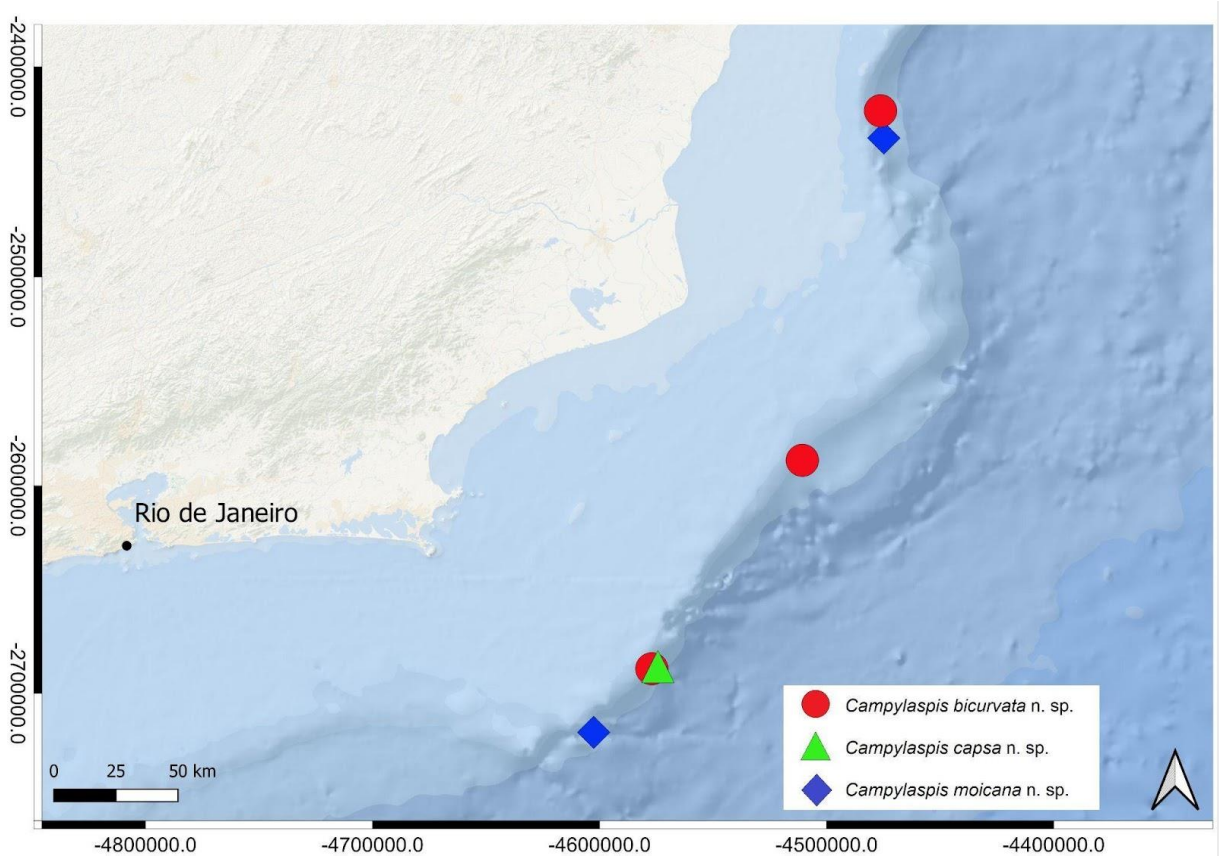
Fonte: A autora (ano).

Figure 12 – Carapaces in lateral and dorsal views of the species closely related to *Campylaspis* n. sp. 17, *C. spinosa* (redrawn from Calman, 1906), *C. rex* (redrawn from Gerken & Rider, 2002), and *C. panai* (redrawn from Petrescu, 2018).



Fonte: A autora (ano).

Figure 13 – Distribution of *Campylaspis* new species in Campos Basin, Rio de Janeiro (Brazil).



Fonte: A autora (ano).

Key to species of Campylaspis from Southwestern Atlantic Ocean

1. Carapace smooth, ornamentations absent……..……2
   Carapace ornamented 4
2. Eyelobe with lenses.....***Campylaspis laevigata* Jones, 1974**
   Eyelobe without lenses 3
3. Dactylus of pereopod 2 digitiform, distally broad..***Campylaspis nitens* Bonnier, 1896**
   Dactylus of pereopod 2 not digitiform…….....……***Campylaspis nuda* Jones, 1974**
4. Carapace without lateral sulcus …….....5
   Carapace with lateral sulcus or ridge.....7
5. Carapace covered by spines 6
   Carapace with tubercles or other protuberances……..
   ……***Campylaspis nodulosa* Sars, 1886**
6. Pseudorostrum long, carapace with short spines present…….....
   ...……..……..….***Campylaspis aculeata* Jones, 19**
   Pseudorostrum short and upturned, carapace with long spine rows…..……
   ..…….....***Campylaspis spinosa* Calman, 1906**
7. Carapace lateral sulcus presente.....8
   Carapace lateral sulcus absent and lateral ridges present.….....25
8. Carapace lateral ridges present 9
   Carapace lateral ridges absent 18

9. Carapace with dorsal cavities.....***Campylaspis redacta* Jones, 1974**
Carapace without dorsal cavities.....10
10. Carapace upper lateral ridge curved dorsally 11
Carapace upper lateral ridge not curved dorsally 19
11. Carapace lateral transverse ridge present.....12
Carapace lateral transverse ridge absent 13
12. Pseudorostrum long and upturned.....***Campylaspis* n. sp.15** (Fig. 1-4)
Pseudorostrum short and upturned.....***Campylaspis johnstoni* Hale, 1937**
13. Carapace encircling lateral sulcus present.....14
Carapace lateral sulcus limited posteriorly.....***Campylaspis exarata* Jones, 1974**
14. Eyelobe normal size or long.....15
Eyelobe short. Lenses absent 16
15. Pseudorostrum shorter than 1/6 of carapace length.....
.....***Campylaspis bacescui* Muradian, 1976**
Pseudorostrum 1/5-1/6 of carapace length.....
.....***Campylaspis alveolata* Muradian, 1976**
16. Carapace lateral sulcus reaching anterior and posterior margin of carapace (encircling).....***Campylaspis bicarinata* Jones, 1974**
Carapace lateral sulcus not meeting both anterior and posterior limits of carapace…
.....17
17. Carapace lateral ridge with two spines.....***Campylaspis cognata* Jones, 1974**
Carapace lateral ridge serrated.....***Campylaspis* n. sp. 16** (Fig. 6-8)
18. Eyelobe short. Pseudorostrum long.....19
Carapace without large and round prominences.....20
19. Carapace with dorsal transverse ridges.....***Campylaspis glebulosa* Jones, 1974**
Carapace without dorsal transverse ridges....***Campylaspis submersa* Jones, 1974**
20. Carapace with spines in horizontal rows over the dorsal part.....
.....***Campylaspis* n. sp.17** (Fig. 10, 11)
Carapace without spines 21
21. Carapace surface with scattered bristles.....***Campylaspis pilosa* Jones, 1974**
Carapace surface without bristles..... 22
22. Dactylus of pereopod 2 with a digitiform process 23
Dactylus of pereopod 2 with digitiform appearance.....24
23. Endopod of uropod with 8 robust setae on inner margin and 3 apical robust setae….
.....***Campylaspis holthuisi* Bacescu & Petrescu, 1989**
Endopod of uropod with 5 robust setae on inner margin and 2 apical robust setae….
.....***Campylaspis antipai* Bacescu & Petrescu, 1989**
24. Eyelobe with 4 lenses.....***Campylaspis tuberculata* Muradian, 1976**
Eyelobe with 3 lenses.....***Campylaspis brasilianus* Bacescu & Petrescu, 1989**
25. Carapace with 2 lateral ridges bifurcating in two more ridges; 4 lateral ridges.....
.....***Campylaspis quadriplicata* Lomakina, 1968**
Carapace with 2 lateral ridges, the upper one bifurcated; 3 lateral ridges.....
.....***Campylaspis plicata* Jones, 1974**

6. DISCUSSION

The Descartes oceanographic campaign, conducted in the Sergipe Sub-Basin, involved a total of 69 stations along the continental shelf. However, out of the designated sampling points, cumaceans belonging to the Nannastacidae family were only recorded at 7 of them, which accounts for approximately 10.14% of the total samples collected.

In the case of the Campos Basin, collections were made at 321 stations, resulting in the detection of the *Campylaspis* genus in 125 of them. Among the 7 specimens found in Sergipe, 5 potentially represent undescribed species, as *Campylaspis* sp.10, sp.11 and sp.17, while the other two, *Campylaspis* cf. *nitens* and *Campylaspis* cd. *nuda* constitute new records for the study areas. Similarly, in the Campos Basin, all *Campylaspis* specimens have the potential to be described as new species, with three of them being officially described in this study. These numbers highlight the high richness of *Campylaspis* in the Southwestern Atlantic region.

According to the Brazilian Taxonomic Catalogue (2023) the Brazilian coast is represented by three states in the occurrence of *Campylaspis* species, Pernambuco, São Paulo and Rio de Janeiro. All the species are described or have their first record in Jones 1974, Bacescu & Petrescu 1989 and most recently in this work with the geographic distribution encompassing the Sergipe state, in the Sergipe Sub-Basin. This work has the first taxonomic and bathymetric data for the *Campylaspis* genus in the Sergipe state.

For the Rio de Janeiro state, the bathymetric data recorded until the present moment is from 40 to 60 meters of depth for the *C. antipai*, *C. brasilianus* and *C. holthuisi*. Now this data encompasses not only de continental shelf but also the talude going from 78 until 801 meters of depth. The species described in this study which have the medium depth more related to the pre-existent bathymetrical data for Rio de Janeiro, are: *Campylaspis* sp.3, *Campylaspis* sp.8, *Campylaspis* sp.9, *Campylaspis* sp.11 and *Campylaspis* sp.13

However, it is important to mention that the collection and analysis of these organisms are challenging, which limits the expansion of taxonomic knowledge of the group. The use of the box corer as a collection method for both basins may have influenced the quantity of specimens sampled, as this equipment is not the most suitable for Cumacea collection. Cumaceans tend to have a scattered distribution,

making it difficult to obtain a wide diversity of species using this sampling method (Gerken, 2016), and not only the diversity but the low number of specimens collected don’t detect intraspecific variability.

Currently, there are 205 described species within the *Campylaspis* genus, with 48 of them added in just the last decade (WoRMS, 2023). A noteworthy contribution comes from Petrescu (2018), who significantly enriched the group by describing 31 new species through the analysis of specimens preserved in Australian Museum. This underscores the critical importance of maintaining and making such specimens available for future research. Furthermore, in a prior study conducted by Jones (1984), more than 50% of the Nannastacidae samples, being the most of them *Campylaspis* specimens, deposited in the carcinological collection from British Natural History Museum could be considered as new to Atlantic Ocean and to science. For the specimens deposited in the carcinological collection at MOUFPE, the scenario is very similar once the number of potential new species corresponds to almost 80% from the number of specimens registered and to be registered in the collection. These numbers underscore the paramount importance of analyzing collection samples for further scientific understanding.

7. FINAL CONSIDERATIONS

This work aimed to conduct a taxonomic study of the genus *Campylaspis* in the Sergipe sub-basin and the Campos Basin, Rio de Janeiro. To achieve this goal, 234 specimens were analyzed, resulting in 17 morphotypes, including the description of three new species. Following this study, the diversity of the genus increased from 14 to 17 from Brazil and 208 species described worldwide.

The first article focused on the diversity of the analyzed material, comprising 17 *Campylaspis* morphotypes (potential new species) and also the species *Campylaspis* cf. *nitens* and *Campylaspis* cf. *nuda*, all with descriptions and illustrations of their habitus. Additionally, a bathymetric distribution study was conducted based on the depth of all collected specimens.

In the second article, three of the 14 morphotypes present in the first article were described as new species: *Campylaspis* n. sp.15, *Campylaspis* n. sp.16, and *Campylaspis* n. sp.17. These species were described in detail, including their habitus and appendages (maxillipeds, pereopods, and uropod).

The proposed key on Nannastacidae genera and the development of a key for southwestern Atlantic described species of *Campylaspis*, will contribute significantly to a more accurate identification of cumaceans in Atlantic waters.

Further on, many more studies should be carried out along the Brazilian coast to increase our understanding on the diversity within the genus *Campylaspis*

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APPENDIX A – SAMPLE RECORDS

Numero de tombo	Gênero	Espécie	Campanha (Código)	Bacia	Estado	Isobata	Profundidade	Substrato	Latitude	Longitude	Campanha
21706	*Campylaspis*	*Campylaspis cf. nitens*	D3 R2	Sergipe	SE		1021		11°10'16,91''	036°47'7,37''	Descartes
21704	*Campylaspis*	*Campylaspis cf. nuda*	H2 R2	Sergipe	SE		1014		11°10'32,90''	036°47'40,11''	PMAR-BC
21037	*Campylaspis*	*Campylaspis sp. 1*	PA 100 S 1#09	Campos	RJ	100	102.06	Lama	23°9'14.231"S	41°11'15.662"W	PMAR-BC
21038	*Campylaspis*	*Campylaspis sp. 1*	T 700 C 4#20	Campos	RJ	700	686	Lama	22°32'13.679"S	40°18'15.494"W	PMAR-BC
21043	*Campylaspis*	*Campylaspis sp. 2*	T 700 N 3#01	Campos	RJ	700	690	Lama	21°21'53.24"S	40°11'35.095"W	PMAR-BC
21044	*Campylaspis*	*Campylaspis sp. 2*	T 700 N 5#06	Campos	RJ	700	721	Lama	21°18'31.658"S	40°12'32.854"W	PMAR-BC
21045	*Campylaspis*	*Campylaspis sp. 3*	PL 100 S 1#14	Campos	RJ	100	119.61	Lama	23°13'11.51"S	41°43'50.999"W	PMAR-BC
21046	*Campylaspis*	*Campylaspis sp. 3*	PC 100 C 2#15	Campos	RJ	100	98	Lama	22°20'39.336"S	40°32'54.906"W	PMAR-BC
21047	*Campylaspis*	*Campylaspis sp. 3*	PA 100 N 8#04	Campos	RJ	100	99	Lama	21°8'27.744"S	40°15'56.563"W	PMAR-BC
21048	*Campylaspis*	*Campylaspis sp. 3*	PL 100 S 1#16	Campos	RJ	100	113.43	Lama	23°12'8.672"S	41°41'28.576"W	PMAR-BC
21700	*Campylaspis*	*Campylaspis sp. 3*	PL 100 S 1#19	Campos	RJ	100	117.61	Lama	23°9'48.884"S	41°50'48.044"W	PMAR-BC
21701	*Campylaspis*	*Campylaspis sp. 3*	T 400 C 4#02	Campos	RJ	400	388	Lama	22°39'14.353"S	40°32'15.997"W	PMAR-BC
21702	*Campylaspis*	*Campylaspis sp. 3*	PL100S 1#18	Campos	RJ	100	128.42	Lama	23°11'0.449"S	41°44'58.502"W	PMAR-BC
21703	*Campylaspis*	*Campylaspis sp. 3*	PC100S 5#5-0	Campos	RJ	100	97	Lama	23°2'13.06"S	41°7'55.031"W	PMAR-BC
21049	*Campylaspis*	*Campylaspis sp. 4*	T 700 N 4#18	Campos	RJ	700	741	Lama	21°6'51.775"S	40°11'35.196"W	PMAR-BC
21636	*Campylaspis*	*Campylaspis sp. 4*	T700N 4 #11	Campos	RJ	700	721	Lama	21°11'59.15"S	40°12'30.323"W	PMAR-BC
21637	*Campylaspis*	*Campylaspis sp. 4*	T700N 4 #11	Campos	RJ	700	721	Lama	21°11'59.15"S	40°12'30.323"W	PMAR-BC
21638	*Campylaspis*	*Campylaspis sp. 4*	T700N 4 #11	Campos	RJ	700	721	Lama	21°11'59.15"S	40°12'30.323"W	PMAR-BC
21563	*Campylaspis*	*Campylaspis sp. 6*	PC100C 12 2 #09	Campos	RJ	100	101	Lama	22°23'19.734"S	40°35'34.249"W	PMAR-BC
21564	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #05	Campos	RJ	100	122.62	Lama	23°21'59.958"S	41°34'37.769"W	PMAR-BC
21565	*Campylaspis*	*Campylaspis sp. 6*	PL100S17 1 #12	Campos	RJ	100	119.61	Lama	23°14'17.585"S	41°42'41.94"W	PMAR-BC
21566	*Campylaspis*	*Campylaspis sp. 6*	PL100S17 1 #11	Campos	RJ	100	125.62	Lama	23°16'24.74"S	41°45'5.404"W	PMAR-BC
21567	*Campylaspis*	*Campylaspis sp. 6*	PL100S17 1 #14	Campos	RJ	100	119.61	Lama	23°13'11.51"S	41°43'50.999"W	PMAR-BC
21568	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #08	Campos	RJ	100	125.43	Lama	23°19'43.5"S	41°41'37.738"W	PMAR-BC
21569	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #10	Campos	RJ	100	124.75	Lama	23°16'26.08"S	41°43'55.43"W	PMAR-BC
21570	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #02	Campos	RJ	100	132.4	Lama	23°25'8.314"S	41°41'44.56"W	PMAR-BC
21571	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #06	Campos	RJ	100	132.82	Lama	23°21'48.298"S	41°46'21.99"W	PMAR-BC
21572	*Campylaspis*	*Campylaspis sp. 6*	PC 100 C 12 2 #09	Campos	RJ	100	101	Lama	22°23'19.734"S	40°35'34.249"W	PMAR-BC
21573	*Campylaspis*	*Campylaspis sp. 6*	PC 100 C 12 2 #09	Campos	RJ	100	101	Lama	22°23'19.734"S	40°35'34.249"W	PMAR-BC
21574	*Campylaspis*	*Campylaspis sp. 6*	PC 100 C 12 2 #09	Campos	RJ	100	101	Lama	22°23'19.734"S	40°35'34.249"W	PMAR-BC
21575	*Campylaspis*	*Campylaspis sp. 6*	PC 100 C 12 2 #09	Campos	RJ	100	101	Lama	22°23'19.734"S	40°35'34.249"W	PMAR-BC
21576	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #05	Campos	RJ	100	122.62	Lama	23°21'59.958"S	41°34'37.769"W	PMAR-BC
21577	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #05	Campos	RJ	100	122.62	Lama	23°21'59.958"S	41°34'37.769"W	PMAR-BC
21578	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #12	Campos	RJ	100	119.61	Lama	23°14'17.585"S	41°42'41.94"W	PMAR-BC
21579	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #19	Campos	RJ	100	117.61	Lama	23°9'48.884"S	41°50'48.044"W	PMAR-BC
21580	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #19	Campos	RJ	100	117.61	Lama	23°9'48.884"S	41°50'48.044"W	PMAR-BC
21581	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #19	Campos	RJ	100	117.61	Lama	23°9'48.884"S	41°50'48.044"W	PMAR-BC
21582	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #14	Campos	RJ	100	119.61	Lama	23°13'11.51"S	41°43'50.999"W	PMAR-BC
21583	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #14	Campos	RJ	100	119.61	Lama	23°13'11.51"S	41°43'50.999"W	PMAR-BC
21584	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #14	Campos	RJ	100	119.61	Lama	23°13'11.51"S	41°43'50.999"W	PMAR-BC
21585	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #14	Campos	RJ	100	119.61	Lama	23°13'11.51"S	41°43'50.999"W	PMAR-BC
21586	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #14	Campos	RJ	100	119.61	Lama	23°13'11.51"S	41°43'50.999"W	PMAR-BC
21587	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #14	Campos	RJ	100	119.61	Lama	23°13'11.51"S	41°43'50.999"W	PMAR-BC
21588	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #14	Campos	RJ	100	119.61	Lama	23°13'11.51"S	41°43'50.999"W	PMAR-BC
21589	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #14	Campos	RJ	100	119.61	Lama	23°13'11.51"S	41°43'50.999"W	PMAR-BC
21590	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #08	Campos	RJ	100	125.43	Lama	23°19'43.5"S	41°41'37.738"W	PMAR-BC
21591	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #08	Campos	RJ	100	125.43	Lama	23°19'43.5"S	41°41'37.738"W	PMAR-BC
21592	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #08	Campos	RJ	100	125.43	Lama	23°19'43.5"S	41°41'37.738"W	PMAR-BC
21593	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #08	Campos	RJ	100	125.43	Lama	23°19'43.5"S	41°41'37.738"W	PMAR-BC
21594	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #08	Campos	RJ	100	125.43	Lama	23°19'43.5"S	41°41'37.738"W	PMAR-BC
21595	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #08	Campos	RJ	100	125.43	Lama	23°19'43.5"S	41°41'37.738"W	PMAR-BC
21596	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #08	Campos	RJ	100	125.43	Lama	23°19'43.5"S	41°41'37.738"W	PMAR-BC
21597	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #10	Campos	RJ	100	124.75	Lama	23°16'26.08"S	41°43'55.43"W	PMAR-BC
21598	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #02	Campos	RJ	100	132.4	Lama	23°25'8.314"S	41°41'44.56"W	PMAR-BC
21599	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #02	Campos	RJ	100	132.4	Lama	23°25'8.314"S	41°41'44.56"W	PMAR-BC
21600	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #02	Campos	RJ	100	132.4	Lama	23°25'8.314"S	41°41'44.56"W	PMAR-BC
21601	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #02	Campos	RJ	100	132.4	Lama	23°25'8.314"S	41°41'44.56"W	PMAR-BC
21602	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #06	Campos	RJ	100	132.82	Lama	23°21'48.298"S	41°46'21.99"W	PMAR-BC
21603	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #06	Campos	RJ	100	132.82	Lama	23°21'48.298"S	41°46'21.99"W	PMAR-BC
21604	*Campylaspis*	*Campylaspis sp. 6*	PC 100 C 12 2 #09	Campos	RJ	100	101	Lama	22°23'19.734"S	40°35'34.249"W	PMAR-BC
21605	*Campylaspis*	*Campylaspis sp. 6*	PC 100 C 12 2 #09	Campos	RJ	100	101	Lama	22°23'19.734"S	40°35'34.249"W	PMAR-BC
21606	*Campylaspis*	*Campylaspis sp. 6*	PC 100 C 12 2 #09	Campos	RJ	100	101	Lama	22°23'19.734"S	40°35'34.249"W	PMAR-BC
21607	*Campylaspis*	*Campylaspis sp. 6*	PC 100 C 12 2 #09	Campos	RJ	100	101	Lama	22°23'19.734"S	40°35'34.249"W	PMAR-BC
21608	*Campylaspis*	*Campylaspis sp. 6*	PC 100 C 12 2 #09	Campos	RJ	100	101	Lama	22°23'19.734"S	40°35'34.249"W	PMAR-BC
21609	*Campylaspis*	*Campylaspis sp. 6*	PC 100 C 12 2 #09	Campos	RJ	100	101	Lama	22°23'19.734"S	40°35'34.249"W	PMAR-BC
21610	*Campylaspis*	*Campylaspis sp. 6*	PC 100 C 12 2 #09	Campos	RJ	100	101	Lama	22°23'19.734"S	40°35'34.249"W	PMAR-BC
21614	*Campylaspis*	*Campylaspis sp. 6*	PL 100 S 17 1 #05	Campos	RJ	100	122.62	Lama	23°21'59.958"S	41°34'37.769"W	PMAR-BC
21705	*Campylaspis*	*Campylaspis sp.10*	G1 R3	Sergipe	SE		984		11°10'26,41''	036°47'34,81''	Descartes
21699	*Campylaspis*	*Campylaspis sp.11*	PC100C 1#16	Campos	RJ	100	100	Lama	22°26'59.701"S	40°38'38.944"W	PMAR-BC
21615	*Campylaspis*	*Campylaspis sp.12*	T400C 18 4 #07	Campos	RJ	400	390	Lama	22°36'49.295"S	40°30'3.002"W	PMAR-BC
21616	*Campylaspis*	*Campylaspis sp.12*	T400C 18 4 #07	Campos	RJ	400	390	Lama	22°36'49.295"S	40°30'3.002"W	PMAR-BC
21617	*Campylaspis*	*Campylaspis sp.12*	T400C 18 4 #07	Campos	RJ	400	390	Lama	22°36'49.295"S	40°30'3.002"W	PMAR-BC
21621	*Campylaspis*	*Campylaspis sp.12*	T400C 18 4 #06	Campos	RJ	400	393	Lama	22°37'37.117"S	40°30'46.012"W	PMAR-BC
21695	*Campylaspis*	*Campylaspis sp.12*	PL100S 1#10	Campos	RJ	100	124.75	Lama	23°16'26.08"S	41°43'55.43"W	PMAR-BC
21509	*Campylaspis*	*Campylaspis sp.13*	PA100S 1 #04	Campos	RJ	100	104.64	Lama	23°12'13.608"S	41°12'27.227"W	PMAR-BC
21510	*Campylaspis*	*Campylaspis sp.13*	PA100C 2 #14	Campos	RJ	100	79.83	Lama	22°14'45.143"S	40°29'19.568"W	PMAR-BC
21511	*Campylaspis*	*Campylaspis sp.13*	PA 100 C 2 #12	Campos	RJ	100	78	Lama	22°16'5.102"S	40°32'32.51"W	PMAR-BC
21512	*Campylaspis*	*Campylaspis sp.13*	PA 100 N 12 8 #2	Campos	RJ	100	106	Lama	21°9'27.5"S	40°16'2.136"W	PMAR-BC
21513	*Campylaspis*	*Campylaspis sp.13*	PA 100 N 12 8 #1	Campos	RJ	100	100	Lama	21°10'16.496"S	40°16'23.383"W	PMAR-BC

21514	*Campylaspis*	*Campylaspis sp.13*	PC100C 2 #14	Campos	RJ	100	99	Lama	22°23'36.416"S	40°35'33.922"W	PMAR-BC
21515	*Campylaspis*	*Campylaspis sp.13*	PC100C 2 #14	Campos	RJ	100	99	Lama	22°23'36.416"S	40°35'33.922"W	PMAR-BC
21516	*Campylaspis*	*Campylaspis sp.13*	PC100N 10 8 #11	Campos	RJ	100	99	Lama	21°23'22.913"S	40°15'26.071"W	PMAR-BC
21517	*Campylaspis*	*Campylaspis sp.13*	PC 100N 10 8 #5	Campos	RJ	100	100	Lama	21°26'42.346"S	40°14'45.114"W	PMAR-BC
21518	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10 8#09	Campos	RJ	100	112	Lama	21°24'35.953"S	40°14'53.61"W	PMAR-BC
21519	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10 8#09	Campos	RJ	100	112	Lama	21°24'35.953"S	40°14'53.61"W	PMAR-BC
21520	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10 8#12	Campos	RJ	100	111	Lama	21°22'55.369"S	40°15'32.789"W	PMAR-BC
21521	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10 8#12	Campos	RJ	100	111	Lama	21°22'55.369"S	40°15'32.789"W	PMAR-BC
21522	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10 8#06	Campos	RJ	100	118	Lama	21°26'6.284"S	40°14'37.352"W	PMAR-BC
21523	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10 8#06	Campos	RJ	100	118	Lama	21°26'6.284"S	40°14'37.352"W	PMAR-BC
21524	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10 8#10	Campos	RJ	100	95	Lama	21°24'3.035"S	40°15'18.4"W	PMAR-BC
21525	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10 8#10	Campos	RJ	100	95	Lama	21°24'3.035"S	40°15'18.4"W	PMAR-BC
21526	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10 8#14	Campos	RJ	100	107	Lama	21°22'12.209"S	40°15'40.45"W	PMAR-BC
21527	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10 8#14	Campos	RJ	100	107	Lama	21°22'12.209"S	40°15'40.45"W	PMAR-BC
21528	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10	Campos	RJ	100	95	Lama	21°24'3.035"S	40°15'18.4"W	PMAR-BC
21529	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10 8#13	Campos	RJ	100	99	Lama	21°21'2.257"S	40°16'6.19"W	PMAR-BC
21530	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10 8#13	Campos	RJ	100	99	Lama	21°21'2.257"S	40°16'6.19"W	PMAR-BC
21531	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 10 8#13	Campos	RJ	100	99	Lama	21°21'2.257"S	40°16'6.19"W	PMAR-BC
21532	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8 #03	Campos	RJ	100	97	Lama	21°28'10.243"S	40°14'35.639"W	PMAR-BC
21533	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#02	Campos	RJ	100	105	Lama	21°28'46.668"S	40°14'19.54"W	PMAR-BC
21534	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#02	Campos	RJ	100	105	Lama	21°28'46.668"S	40°14'19.54"W	PMAR-BC
21535	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#02	Campos	RJ	100	105	Lama	21°28'46.668"S	40°14'19.54"W	PMAR-BC
21536	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#02	Campos	RJ	100	105	Lama	21°28'46.668"S	40°14'19.54"W	PMAR-BC
21537	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#02	Campos	RJ	100	105	Lama	21°28'46.668"S	40°14'19.54"W	PMAR-BC
21538	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#02	Campos	RJ	100	105	Lama	21°28'46.668"S	40°14'19.54"W	PMAR-BC
21539	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#02	Campos	RJ	100	105	Lama	21°28'46.668"S	40°14'19.54"W	PMAR-BC
21540	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#02	Campos	RJ	100	105	Lama	21°28'46.668"S	40°14'19.54"W	PMAR-BC
21541	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#04	Campos	RJ	100	97	Lama	21°27'27.122"S	40°14'45.301"W	PMAR-BC
21542	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#04	Campos	RJ	100	97	Lama	21°27'27.122"S	40°14'45.301"W	PMAR-BC
21543	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#04	Campos	RJ	100	97	Lama	21°27'27.122"S	40°14'45.301"W	PMAR-BC
21544	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#04	Campos	RJ	100	97	Lama	21°27'27.122"S	40°14'45.301"W	PMAR-BC
21545	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#04	Campos	RJ	100	97	Lama	21°27'27.122"S	40°14'45.301"W	PMAR-BC
21546	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#04	Campos	RJ	100	97	Lama	21°27'27.122"S	40°14'45.301"W	PMAR-BC
21547	*Campylaspis*	*Campylaspis sp.13*	PC 100 N 8#04	Campos	RJ	100	97	Lama	21°27'27.122"S	40°14'45.301"W	PMAR-BC
21548	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17	Campos	RJ	100	111.78	Lama	23°11'2.774"S	41°42'38.153"W	PMAR-BC
21549	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17 1#02	Campos	RJ	100	132.4	Lama	23°25'8.314"S	41°41'44.56"W	PMAR-BC
21550	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17 1#02	Campos	RJ	100	132.4	Lama	23°25'8.314"S	41°41'44.56"W	PMAR-BC
21551	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17 1#02	Campos	RJ	100	132.4	Lama	23°25'8.314"S	41°41'44.56"W	PMAR-BC
21552	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17 1#02	Campos	RJ	100	132.4	Lama	23°25'8.314"S	41°41'44.56"W	PMAR-BC
21553	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17 1#13	Campos	RJ	100	124.2	Lama	23°14'12.808"S	41°47'22.974"W	PMAR-BC
21554	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17 1#13	Campos	RJ	100	124.2	Lama	23°14'12.808"S	41°47'22.974"W	PMAR-BC
21555	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17 1#06	Campos	RJ	100	132.82	Lama	23°21'48.298"S	41°46'21.99"W	PMAR-BC
21556	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17 1#06	Campos	RJ	100	132.82	Lama	23°21'48.298"S	41°46'21.99"W	PMAR-BC
21557	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17 1#06	Campos	RJ	100	132.82	Lama	23°21'48.298"S	41°46'21.99"W	PMAR-BC
21558	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17 1#06	Campos	RJ	100	132.82	Lama	23°21'48.298"S	41°46'21.99"W	PMAR-BC
21559	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17 1#06	Campos	RJ	100	132.82	Lama	23°21'48.298"S	41°46'21.99"W	PMAR-BC
21560	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17 1#03	Campos	RJ	100	133.12	Lama	23°25'6.946"S	41°42'55.184"W	PMAR-BC
21561	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17 1#03	Campos	RJ	100	133.12	Lama	23°25'6.946"S	41°42'55.184"W	PMAR-BC
21562	*Campylaspis*	*Campylaspis sp.13*	PL 100 S 17	Campos	RJ	100	111.78	Lama	23°11'2.774"S	41°42'38.153"W	PMAR-BC
21681	*Campylaspis*	*Campylaspis sp.13*	PC100N 10 8 #11	Campos	RJ	100	99	Lama	21°23'22.913"S	40°15'26.071"W	PMAR-BC
21682	*Campylaspis*	*Campylaspis sp.13*	PC100N 10 8 #11	Campos	RJ	100	99	Lama	21°23'22.913"S	40°15'26.071"W	PMAR-BC
21683	*Campylaspis*	*Campylaspis sp.13*	PC 100N 10 8 #5	Campos	RJ	100	100	Lama	21°26'42.346"S	40°14'45.114"W	PMAR-BC
21684	*Campylaspis*	*Campylaspis sp.13*	PC 100N 10 8 #5	Campos	RJ	100	100	Lama	21°26'42.346"S	40°14'45.114"W	PMAR-BC
21618	*Campylaspis*	*Campylaspis sp.14*	T400C 18 4 #13	Campos	RJ	400	397	Lama	22°33'44.964"S	40°26'48.149"W	PMAR-BC
21619	*Campylaspis*	*Campylaspis sp.14*	T400C 18 4 #05	Campos	RJ	400	393	Lama	22°38'1.37"S	40°31'13.163"W	PMAR-BC
21620	*Campylaspis*	*Campylaspis sp.14*	T400C 18 4 #10	Campos	RJ	400	389	Lama	22°34'31.973"S	40°27'49.723"W	PMAR-BC
21622	*Campylaspis*	*Campylaspis sp.14*	T400C 18 4 #13	Campos	RJ	400	397	Lama	22°33'44.964"S	40°26'48.149"W	PMAR-BC
21623	*Campylaspis*	*Campylaspis sp.14*	T400C 18 4 #13	Campos	RJ	400	397	Lama	22°33'44.964"S	40°26'48.149"W	PMAR-BC
21624	*Campylaspis*	*Campylaspis sp.14*	T400C 18 4 #13	Campos	RJ	400	397	Lama	22°33'44.964"S	40°26'48.149"W	PMAR-BC
21625	*Campylaspis*	*Campylaspis sp.14*	T400C 18 5# 14	Campos	RJ	400	386	Lama	22°32'15.565"S	40°25'19.405"W	PMAR-BC
21626	*Campylaspis*	*Campylaspis sp.14*	T400C 18 5# 25	Campos	RJ	400	395	Lama	22°26'40.387"S	40°18'20.3"W	PMAR-BC
21627	*Campylaspis*	*Campylaspis sp.14*	T400C 18 5# 23	Campos	RJ	400	387	Lama	22°27'42.415"S	40°19'52.064"W	PMAR-BC
21628	*Campylaspis*	*Campylaspis sp.14*	T400C 18 5# 23	Campos	RJ	400	387	Lama	22°27'42.415"S	40°19'52.064"W	PMAR-BC
21629	*Campylaspis*	*Campylaspis sp.14*	T400C 18 5# 23	Campos	RJ	400	387	Lama	22°27'42.415"S	40°19'52.064"W	PMAR-BC
21630	*Campylaspis*	*Campylaspis sp.14*	T400C 18 5# 24	Campos	RJ	400	384	Lama	22°27'2.563"S	40°18'59.17"W	PMAR-BC
21631	*Campylaspis*	*Campylaspis sp.14*	T400C 18 5#18	Campos	RJ	400	440	Lama	22°29'40.499"S	40°21'12.521"W	PMAR-BC
21632	*Campylaspis*	*Campylaspis sp.14*	T400S 5 #21	Campos	RJ	400	399	Lama	22°28'21.882"S	40°20'46.162"W	PMAR-BC
21633	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #12	Campos	RJ	700	733	Lama	21°11'42.702"S	40°12'30.265"W	PMAR-BC
21634	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #12	Campos	RJ	700	733	Lama	21°11'42.702"S	40°12'30.265"W	PMAR-BC
21635	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #12	Campos	RJ	700	733	Lama	21°11'42.702"S	40°12'30.265"W	PMAR-BC
21639	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #11	Campos	RJ	700	721	Lama	21°11'59.15"S	40°12'30.323"W	PMAR-BC
21640	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #11	Campos	RJ	700	721	Lama	21°11'59.15"S	40°12'30.323"W	PMAR-BC
21641	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #11	Campos	RJ	700	721	Lama	21°11'59.15"S	40°12'30.323"W	PMAR-BC
21642	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #19	Campos	RJ	700	702	Lama	21°6'34.517"S	40°11'52.285"W	PMAR-BC
21643	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #19	Campos	RJ	700	702	Lama	21°6'34.517"S	40°11'52.285"W	PMAR-BC
21644	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #20	Campos	RJ	700	688	Lama	21°6'15.966"S	40°11'54.089"W	PMAR-BC
21645	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #20	Campos	RJ	700	688	Lama	21°6'15.966"S	40°11'54.089"W	PMAR-BC
21646	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #18	Campos	RJ	700	741	Lama	21°6'51.775"S	40°11'35.196"W	PMAR-BC
21647	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #06	Campos	RJ	700	721	Lama	21°18'31.658"S	40°12'32.854"W	PMAR-BC
21648	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #06	Campos	RJ	700	721	Lama	21°18'31.658"S	40°12'32.854"W	PMAR-BC

21649	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #22	Campos	RJ	700	723	Lama	21°5'41.539"S	40°11'34.951"W	PMAR-BC
21650	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #22	Campos	RJ	700	723	Lama	21°5'41.539"S	40°11'34.951"W	PMAR-BC
21651	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #16	Campos	RJ	700	700	Lama	21°9'0.709"S	40°12'29.57"W	PMAR-BC
21652	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #16	Campos	RJ	700	700	Lama	21°9'0.709"S	40°12'29.57"W	PMAR-BC
21653	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #16	Campos	RJ	700	700	Lama	21°9'0.709"S	40°12'29.57"W	PMAR-BC
21654	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #16	Campos	RJ	700	700	Lama	21°9'0.709"S	40°12'29.57"W	PMAR-BC
21655	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #05	Campos	RJ	700	721	Lama	21°18'55.764"S	40°12'32.616"W	PMAR-BC
21656	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #10	Campos	RJ	700	727	Lama	21°14'34.508"S	40°12'39.398"W	PMAR-BC
21657	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #03	Campos	RJ	700	695	Lama	21°20'15.846"S	40°12'17.089"W	PMAR-BC
21658	*Campylaspis*	*Campylaspis sp.14*	T700N 4 #01	Campos	RJ	700	690	Lama	21°21'53.24"S	40°11'35.095"W	PMAR-BC
21659	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #07	Campos	RJ	700	678	Lama	23°44'10.327"S	41°22'5.862"W	PMAR-BC
21660	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #07	Campos	RJ	700	678	Lama	23°44'10.327"S	41°22'5.862"W	PMAR-BC
21661	*Campylaspis*	*Campylaspis sp.14*	T700S 18 3 #01	Campos	RJ	700	684	Lama	23°46'50.297"S	41°25'49.03"W	PMAR-BC
21662	*Campylaspis*	*Campylaspis sp.14*	T700S 18 3 #01	Campos	RJ	700	684	Lama	23°46'50.297"S	41°25'49.03"W	PMAR-BC
21663	*Campylaspis*	*Campylaspis sp.14*	T700S 18 3 #01	Campos	RJ	700	684	Lama	23°46'50.297"S	41°25'49.03"W	PMAR-BC
21664	*Campylaspis*	*Campylaspis sp.14*	T700S 18 3 #01	Campos	RJ	700	684	Lama	23°46'50.297"S	41°25'49.03"W	PMAR-BC
21665	*Campylaspis*	*Campylaspis sp.14*	T700S 18 3 #01	Campos	RJ	700	684	Lama	23°46'50.297"S	41°25'49.03"W	PMAR-BC
21666	*Campylaspis*	*Campylaspis sp.14*	T700S 18 3 #01	Campos	RJ	700	684	Lama	23°46'50.297"S	41°25'49.03"W	PMAR-BC
21667	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #22	Campos	RJ	700	709	Lama	23°34'9.43"S	41°12'31.784"W	PMAR-BC
21668	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #11	Campos	RJ	700	682	Lama	23°42'18.04"S	41°20'18.722"W	PMAR-BC
21669	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #11	Campos	RJ	700	682	Lama	23°42'18.04"S	41°20'18.722"W	PMAR-BC
21670	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #11	Campos	RJ	700	682	Lama	23°42'18.04"S	41°20'18.722"W	PMAR-BC
21671	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #12	Campos	RJ	700	682	Lama	23°41'37.514"S	41°19'50.3"W	PMAR-BC
21672	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #12	Campos	RJ	700	682	Lama	23°41'37.514"S	41°19'50.3"W	PMAR-BC
21673	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #12	Campos	RJ	700	682	Lama	23°41'37.514"S	41°19'50.3"W	PMAR-BC
21674	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #02	Campos	RJ	700	688	Lama	23°46'42.258"S	41°25'32.225"W	PMAR-BC
21675	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #14	Campos	RJ	700	682	Lama	23°40'50.102"S	41°19'23.783"W	PMAR-BC
21676	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #03	Campos	RJ	700	702	Lama	23°46'10.783"S	41°24'38.426"W	PMAR-BC
21677	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #03	Campos	RJ	700	702	Lama	23°46'10.783"S	41°24'38.426"W	PMAR-BC
21678	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #09	Campos	RJ	700	683	Lama	23°43'30.601"S	41°21'21.449"W	PMAR-BC
21679	*Campylaspis*	*Campylaspis sp.14*	T700S 18 5 #19	Campos	RJ	700	687	Lama	23°34'41.527"S	41°13'24.654"W	PMAR-BC
21681	*Campylaspis*	*Campylaspis sp.14*	T700S 5#10	Campos	RJ	700	679	Lama	23°42'57.884"S	41°20'44.801"W	PMAR-BC
21682	*Campylaspis*	*Campylaspis sp.14*	T700C 4 #08	Campos	RJ	700	687	Lama	22°38'24.058"S	40°25'18.498"W	PMAR-BC
21683	*Campylaspis*	*Campylaspis sp.14*	T700C 5#12	Campos	RJ	700	693	Lama	22°36'25.15"S	40°22'39.835"W	PMAR-BC
21684	*Campylaspis*	*Campylaspis sp.14*	T700S 18	Campos	RJ	700	690	Lama	23°35'35.588"S	41°15'46.469"W	PMAR-BC
21685	*Campylaspis*	*Campylaspis sp.14*	T700S 5 #06	Campos	RJ	700	686	Lama	23°45'22.198"S	41°23'26.538"W	PMAR-BC
21686	*Campylaspis*	*Campylaspis sp.14*	T700S 5 #06	Campos	RJ	700	686	Lama	23°45'22.198"S	41°23'26.538"W	PMAR-BC
21687	*Campylaspis*	*Campylaspis sp.14*	T700S 5 #06	Campos	RJ	700	686	Lama	23°45'22.198"S	41°23'26.538"W	PMAR-BC
21688	*Campylaspis*	*Campylaspis sp.14*	T700S 5 #06	Campos	RJ	700	686	Lama	23°45'22.198"S	41°23'26.538"W	PMAR-BC
21689	*Campylaspis*	*Campylaspis sp.14*	C 700 S 5#01	Campos	RJ	700	801	Lama	23°28'21.673"S	41°6'21.125"W	PMAR-BC
21690	*Campylaspis*	*Campylaspis sp.14*	C 700 S 3#12	Campos	RJ	700	663	Lama	23°27'41.414"S	41°7'4.062"W	PMAR-BC
21691	*Campylaspis*	*Campylaspis sp.14*	C 700 S 3#12	Campos	RJ	700	663	Lama	23°27'41.414"S	41°7'4.062"W	PMAR-BC
21692	*Campylaspis*	*Campylaspis sp.14*	C 700 S 3#12	Campos	RJ	700	663	Lama	23°27'41.414"S	41°7'4.062"W	PMAR-BC
21693	*Campylaspis*	*Campylaspis sp.14*	C700S 5#11	Campos	RJ	700	660	Lama	23°27'39.449"S	41°6'56.203"W	PMAR-BC
21694	*Campylaspis*	*Campylaspis sp.14*	C700S 5#10	Campos	RJ	700	680	Lama	23°27'46.746"S	41°6'57.208"W	PMAR-BC
21039	*Campylaspis*	*Campylaspis sp.15*	T 700 N 4#20	Campos	RJ	700	688	Lama	21°6'15.966"S	40°11'54.089"W	PMAR-BC
21040	*Campylaspis*	*Campylaspis sp.15*	T 700 N 4#17	Campos	RJ	700	726	Lama	21°8'20.076"S	40°12'20.329"W	PMAR-BC
21041	*Campylaspis*	*Campylaspis sp.15*	T 700 N 4#19	Campos	RJ	700	702	Lama	21°6'34.517"S	40°11'52.285"W	PMAR-BC
21042	*Campylaspis*	*Campylaspis sp.15*	T 700 N 4#04	Campos	RJ	700	700	Lama	21°19'43.262"S	40°12'25.232"W	PMAR-BC
21685	*Campylaspis*	*Campylaspis sp.15*	T700N 4#10	Campos	RJ	700	700	Lama	21°14'34.508"S	40°12'39.398"W	PMAR-BC
21686	*Campylaspis*	*Campylaspis sp.15*	T700S 5#10	Campos	RJ	700	686	Lama	23°42'57.884"S	41°20'44.801"W	PMAR-BC
21687	*Campylaspis*	*Campylaspis sp.15*	T700N 4#12	Campos	RJ	700	733	Lama	21°11'42.702"S	40°12'30.265"W	PMAR-BC
21688	*Campylaspis*	*Campylaspis sp.15*	T700N 4#02	Campos	RJ	700	705	Lama	21°21'4.849"S	40°11'51.918"W	PMAR-BC
21050	*Campylaspis*	*Campylaspis sp.16*	T 700 N 4#10	Campos	RJ	700	727	Lama	21°19'43.262"S	40°12'25.232"W	PMAR-BC
21051	*Campylaspis*	*Campylaspis sp.16*	T 700 C 4#15	Campos	RJ	700	692	Lama	22°34'15.47"S	40°19'51.64"W	PMAR-BC
21052	*Campylaspis*	*Campylaspis sp.16*	T 700 N 4#23	Campos	RJ	700	703	Lama	21°4'59.884"S	40°11'29.965"W	PMAR-BC
21058	*Campylaspis*	*Campylaspis sp.16*	C700S 5#10	Campos	RJ	700	680	Lama	23°27'46.746"S	41°6'57.208"W	PMAR-BC
21680	*Campylaspis*	*Campylaspis sp.16*	T700S 5#20	Campos	RJ	700	695	Lama	23°34'18.275"S	41°12'39.838"W	PMAR-BC
21689	*Campylaspis*	*Campylaspis sp.16*	T400C 4#05	Campos	RJ	400	393	Lama	22°38'1.37"S	40°31'13.163"W	PMAR-BC
21053	*Campylaspis*	*Campylaspis sp.17*	T 700 S 5#12	Campos	RJ	700	663	Lama	23°27'55.336"S	41°6'42.484"W	PMAR-BC
21054	*Campylaspis*	*Campylaspis sp.17*	C 700 S 5#14	Campos	RJ	700	847	Lama	23°27'16.646"S	41°5'30.037"W	PMAR-BC
21055	*Campylaspis*	*Campylaspis sp.17*	C 700 S 5#07	Campos	RJ	700	737	Lama	23°27'41.414"S	41°7'4.062"W	PMAR-BC
21708	*Campylaspis*	*Campylaspis sp.17*	C3 R1	Sergipe	SE		1060		11°10'3,56''	036°46'57,16''	Descartes
21709	*Campylaspis*	*Campylaspis sp.17*	A1 R3	Sergipe	SE		1004		11°8'51,49''	036°46'43,52''	Descartes
21710	*Campylaspis*	*Campylaspis sp.17*	D3 R3	Sergipe	SE		1020		11°10'16,93''	036°47'7,39''	Descartes
21711	*Campylaspis*	*Campylaspis sp.17*	A2 R3	Sergipe	SE		1041		11°9'10,74''	036°46'18,10''	Descartes
21500	*Campylaspis*	*Campylaspis sp.5*	PL100S 1#18	Campos	RJ	100	128.42	Lama	23°11'0.449"S	41°44'58.502"W	PMAR-BC
21501	*Campylaspis*	*Campylaspis sp.5*	T400S 5#21	Campos	RJ	400	399	Lama	23°33'28.75"S	41°15'6.296"W	PMAR-BC
21502	*Campylaspis*	*Campylaspis sp.5*	T400C 4#11	Campos	RJ	400	368	Lama	23°39'26.298"S	41°21'28.692"W	PMAR-BC
21611	*Campylaspis*	*Campylaspis sp.5*	PC 100 N 8# 05	Campos	RJ	100	100	Lama	21°26'42.346"S	40°14'45.114"W	PMAR-BC
21612	*Campylaspis*	*Campylaspis sp.5*	PC 100 N 8# 05	Campos	RJ	100	100	Lama	21°26'42.346"S	40°14'45.114"W	PMAR-BC
21613	*Campylaspis*	*Campylaspis sp.5*	PC 100 N 8# 05	Campos	RJ	100	100	Lama	21°26'42.346"S	40°14'45.114"W	PMAR-BC
21503	*Campylaspis*	*Campylaspis sp.7*	T700C 4#21	Campos	RJ	700	693	Lama	22°31'26.681"S	40°16'48.101"W	PMAR-BC
21504	*Campylaspis*	*Campylaspis sp.8*	PA100C 2#12	Campos	RJ	100	78	Lama	22°16'5.102"S	40°32'32.51"W	PMAR-BC
21696	*Campylaspis*	*Campylaspis sp.8*	PL100S 1#12	Campos	RJ	100	119.61	Lama	23°14'17.585"S	41°42'41.94"W	PMAR-BC
21505	*Campylaspis*	*Campylaspis sp.9*	PC100S 2#14	Campos	RJ	100	98.26	Lama	22°59'0.499"S	41°5'14.525"W	PMAR-BC
21506	*Campylaspis*	*Campylaspis sp.9*	PC100S 2#05	Campos	RJ	100	97	Lama	23°0'37.775"S	41°4'41.531"W	PMAR-BC
21507	*Campylaspis*	*Campylaspis sp.9*	PC100S 2#08	Campos	RJ	100	97	Lama	23°0'51.336"S	41°3'53.32"W	PMAR-BC
21508	*Campylaspis*	*Campylaspis sp.9*	PC100S 2#04	Campos	RJ	100	97	Lama	23°0'22.46"S	41°4'23.747"W	PMAR-BC