

Three new occurrences of Sergestidae (Dendrobranchiata) for the Southwestern Atlantic slope (13°-22°S)

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Abstract

The Family Sergestidae includes 97 species and six genera. *Sergestes* H. Milne Edwards, 1830, and *Sergia* Stimpson, 1860, occur only in the deep sea. The genus *Sergestes* is represented in Brazilian waters by four species: *Sergestes armatus* Kroyer, 1855; *S. atlanticus* H. Milne Edwards, 1830; *S. arachnipodus* (Cocco, 1832); and *S. edwardsii* Kroyer, 1855. The genus *Sergia* is represented by two species: *Sergia prebensilis* (Bate, 1888) and *S. regalis* (Gordon, 1839). Three new occurrences of *Sergestidae* were recorded: *Sergestes paraseminudus* Crosnier and Forest, 1973; *Sergia burukovskii* Vereshchaka, 2000; and *S. tenuiremis* (Kroyer, 1855). The material examined was collected by the REVIZEE Program from the central Brazilian coast in depths from 200 to 2200 m. This paper presents the redescription of these species and figure them.

Key words: *Sergestes*, *Sergia*, Taxonomy, Brazil.

Introduction

The family Sergestidae comprises 97 species distributed in six genera. Until 2002 the Sergestidae were known in Brazilian waters by: *Acetes americanus americanus* Ortmann, 1893; *Acetes marinus* Omori, 1975; *Acetes paraguayensis* Hansen, 1919; *Peisos petrunkevitchi* Burkenroad, 1945; *Sergestes atlanticus* H. Milne Edwards, 1830; and *Sergestes edwardsii* Kroyer, 1855, as mentioned by Omori (1975) and (D'Incao, 1998).

Recently, Cardoso and Serejo (2003) published a redescription of four new occurrences of Sergestidae to the southwestern Atlantic: *Sergestes armatus* Kroyer, 1855; *S. corniculum* Kroyer, 1855 (actually a synonymous of *S. arachnipodus* (Cocco, 1832)); *Sergia prebensilis* (Bate, 1881), and *S. regalis* (Gordon, 1939). These species were recorded for the first time from Brazilian waters by those authors.

The genus *Sergestes* was established in 1855, by Kroyer. Latter, Stimpson (1860) described the closely related genus *Sergia*, which has subsequently

been considered as a subgenus, or as a synonym of *Sergestes* (Burkenroad, 1945; Kensley, 1971).

Vereshchaka (1994) considered *Sergia* as valid, redescribing 10 species with material from the Caribbean Sea and North Atlantic. Further, Vereshchaka (2000) made a complete review of *Sergia*, redescribing the 28 known species and adding six new ones. In his work, the genus was divided into nine systematic groups adopted in the present study.

As the species of *Sergia* and *Sergestes* are very similar to each other, the petasma is one of the fundamental structures for identification within these genera. Characters of the thelycum are less informative, which makes females identification difficult. Thus, other characters of the carapace and outer antennular flagellum are important in the female identification.

The present work redescribes three species that are new records for the Southwestern Atlantic: *Sergestes paraseminudus* (Crosnier and Forest, 1973); *Sergia burukovskii* Vereshchaka, 2000; and *Sergia tenuiremis* (Kroyer, 1855).

Material and Methods

During June and July 2000 the REVIZEE (Alive Resources Survey on Brazilian Exclusive Economic Zone) Central Program, using the R/V *Thalassa*, provided the material for this study. Samples were obtained from the latitude of the central Brazilian coast (11°-22°S – from Rio Real, Bahia to Cabo de São Tomé, Rio de Janeiro) in depths ranging between 200 and 2200 m. Dredge samplings were made with two kinds of net: ARROW (47.4 m X 26.8 m) and GOV (Grat Opening Vertical). A total of 58 trawls were conducted.

The material collected was fixed in ethanol 70% and is lodged in the collection of Museu Nacional, Rio de Janeiro (MNRJ).

Systematics

Family Sergestidae Dana, 1852

Sergestidae Dana, 1852a: 18; 1852b: 123; Bate, 1888: 345; Hansen, 1922: 9; Barnard, 1950: 637; Omori, 1975: 5; Williams, 1984: 50.

Sergestinae Bate, 1888: 345; Ortmann, 1893: 29; 1898: 1121; Hansen, 1922: 10.

Genus *Sergestes* H. Milne Edwards, 1830

Sergestes H. Milne Edwards, 1830: 346; Bate, 1881: 171; Ortmann, 1893: 29; Hansen, 1896: 936 (part); 1903: 53; 1919: 2; 1922: 11; Barnard, 1950: 638; Yaldwin, 1957: 7; Kensley, 1971: 230; Burkenroad, 1983: 283.

Nika Risso, 1816: 87.

Acheles Cocco, 1832: 204; Burkenroad, 1893: 288.

Type species: *Sergestes atlanticus* H. Milne Edwards, 1830: 349, figs. 1-9.

Diagnosis: Organ of Pesta present. Pereopods 1-3 elongate and slender, pereopod 1 lacking chelae; pereopods 2-3 with minute chelae. Pereopods 4-5 reduced and without dactyls. Pereopod 5 shorter than pereopod 4 (from Pérez Farfante and Kensley, 1997).

Sergestes paraseminudus Crosnier and Forest, 1973 (Fig. 1A-E)

Sergestes paraseminudus Crosnier and Forest, 1973: 313, figs. 105e-h, 107a-b, e.

Material examined: 1 male, carapace length 13 mm, 1 female, carapace length 14.5 mm, st. E-0503, 14°37'83"S-38°52'02"W, 540 m, MNRJ 19432.

Diagnosis: Carapace with supraorbital protuberance and hepatic spine; cervical groove strongly defined. Maxilliped 3 as long as pereopod 3. Two distal articles of pereopod 5 setose in both margins. Dactyl of maxilliped 3 with seven articles. Petasma with lobus armatus elongate, armed with nine hooks; triangular lobus connectens; processus ventralis formed by ten papillae and processus uncifer hook like.

Description: Carapace, rostrum broad at base, tapering on tip; supraorbital protuberance present; cervical groove strongly defined, reaching the carapace dorsum; branchial and suprabranchial grooves well defined; hepatic spine well developed; harsh sign near distal part of cervical groove; orbito-antennal carina running from hepatic spine to level of antennae insertion (Fig. 1A). Eyestalk with medial ocular tubercle. Scaphocerite tapering to tip, that was missed (Fig. 1B). Outer antennular flagellum with five stout setae, median depression and a striate distal area on inner margin (Fig. 1C). Maxilliped 3 as long as pereopods; dactyl with seven articles, bearing many simple long setae. Pereopod 5 slender and short, two distal articles setose on both margins. Uropod exopod setose in 2/3 of outer margin (Fig. 1D). Telson broken in both examined specimens. Petasma, lobus armatus triangular, elongate, with nine strong hooks; lobus connectens triangular, short with about 11 hooks on distal and lateral margins; lobus inermis slender, elongate, unarmed; lobus terminalis rounded, armed with many hooks; processus ventralis elongate with many acute papillae on tip; processus uncifer with a hook like tip (Fig. 1E).

Distribution: Eastern Atlantic: Gabon, Congo, Angola; new record, Western Atlantic: Brazil (14°37'83"S-38°52'02"W) (Fig. 2).

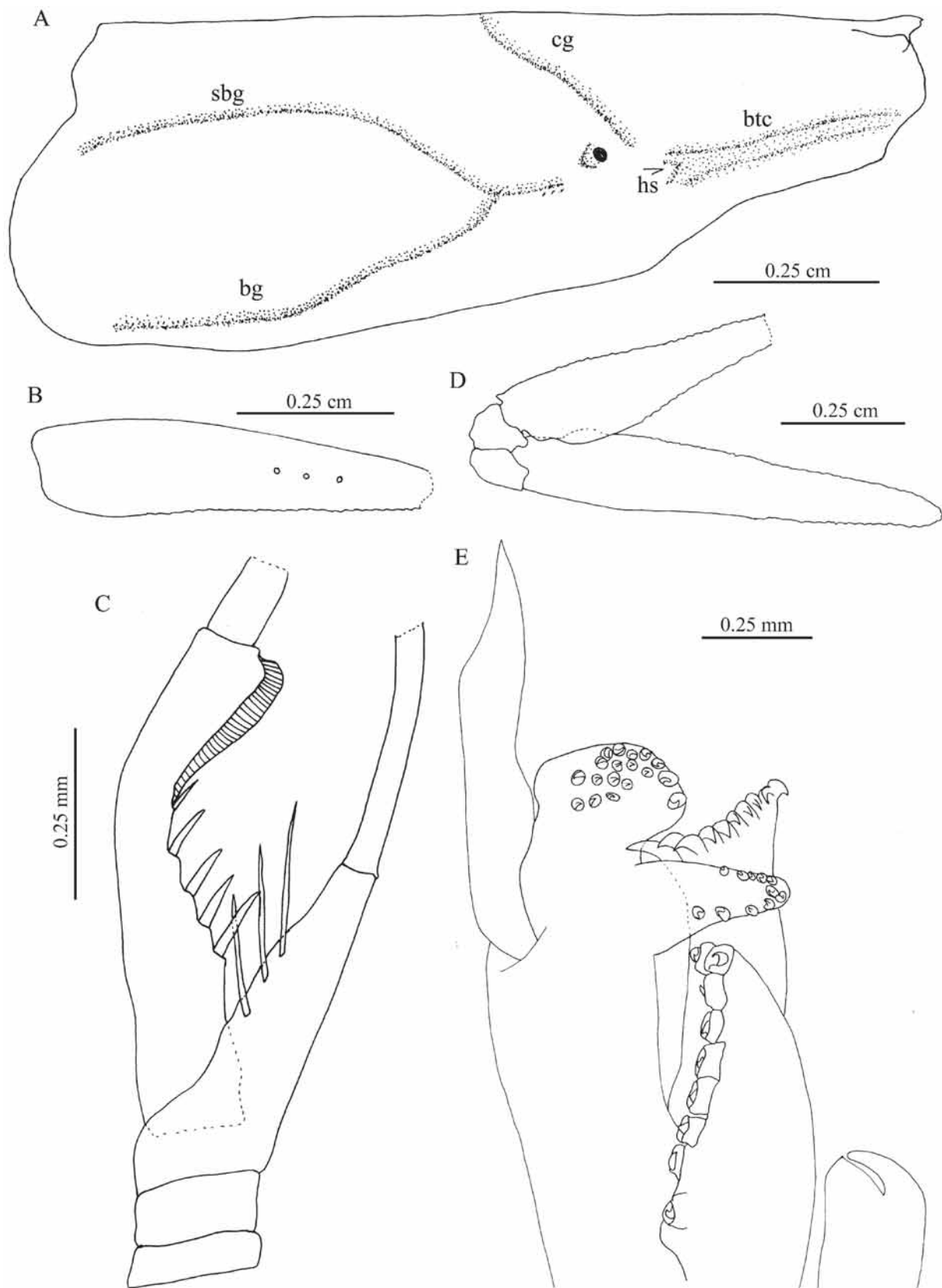


Figure 1. *Sergestes paraseminudus*, male (MNRJ 19432). A. Carapace, 13 mm length (bg- brachial groove; cg- cervical groove; oac- orbito-antennal carina; hs- hepatic spine; hs- harsh sign; sbg- supra-brachial groove; spp- supraorbital protuberance). B. Scaphocerite. C. Uropod. D. Antennule (iaf- inner antennular flagellum and oaf- outer antennular flagellum). E. Petasma (la- lobus armatus; lc- lobus connectens; li- lobus inermis; lt- lobus terminalis; pv- processus ventralis and pu- processus uncifer).

Remarks: *Sergestes paraseminudus* is included on the *S. corniculum* group (*S. rubroguttatus* Wood-Mason, 1891; *S. henseni* (Ortmann, 1893); *S. seminudus* Hansen, 1919; *S. nipponensis* Yokoya, 1933; *S. erectus* Burkenroad, 1940; *S. disjunctus* Burkenroad, 1940; and *S. coalitus* Burkenroad, 1940), that is characterized by maxilliped 3 as long as pereopod 3 and dactyl of pereopod 5 with setae in both margins.

The specimens herein examined agree with the original description of *S. paraseminudus* made by Crosnier and Forest (1973) in the rostrum shape, in the absence of supraorbital spine and in the petasma structure, with a lobus armatus smaller than the processus ventralis, bearing nine strong hooks and a lobus terminalis rounded, armed with many hooks. However, the Brazilian specimen has a su-

praorbital protuberance that is described as a short carina by Crosnier and Forest (1973).

Genus *Sergia* Stimpson, 1860

Sergia Stimpson, 1860: 46; Burkenroad, 1983: 288.
Sergestes Milne Edwards, 1830 (part); Hansen, 1896: 936 (part); 1919: 2 (part); 1922: 11 (part); Barnard, 1947: 384; 1950: 638.

Sergestes (*Sergia*) – Yaldwin, 1957: 9; Kensley, 1971: 230.

Type species: *Sergia remipes* Stimpson, 1860.

Diagnosis: Organ of Pesta absent. Pereopods 1-3 elongate, slender and without chelae; pereopods

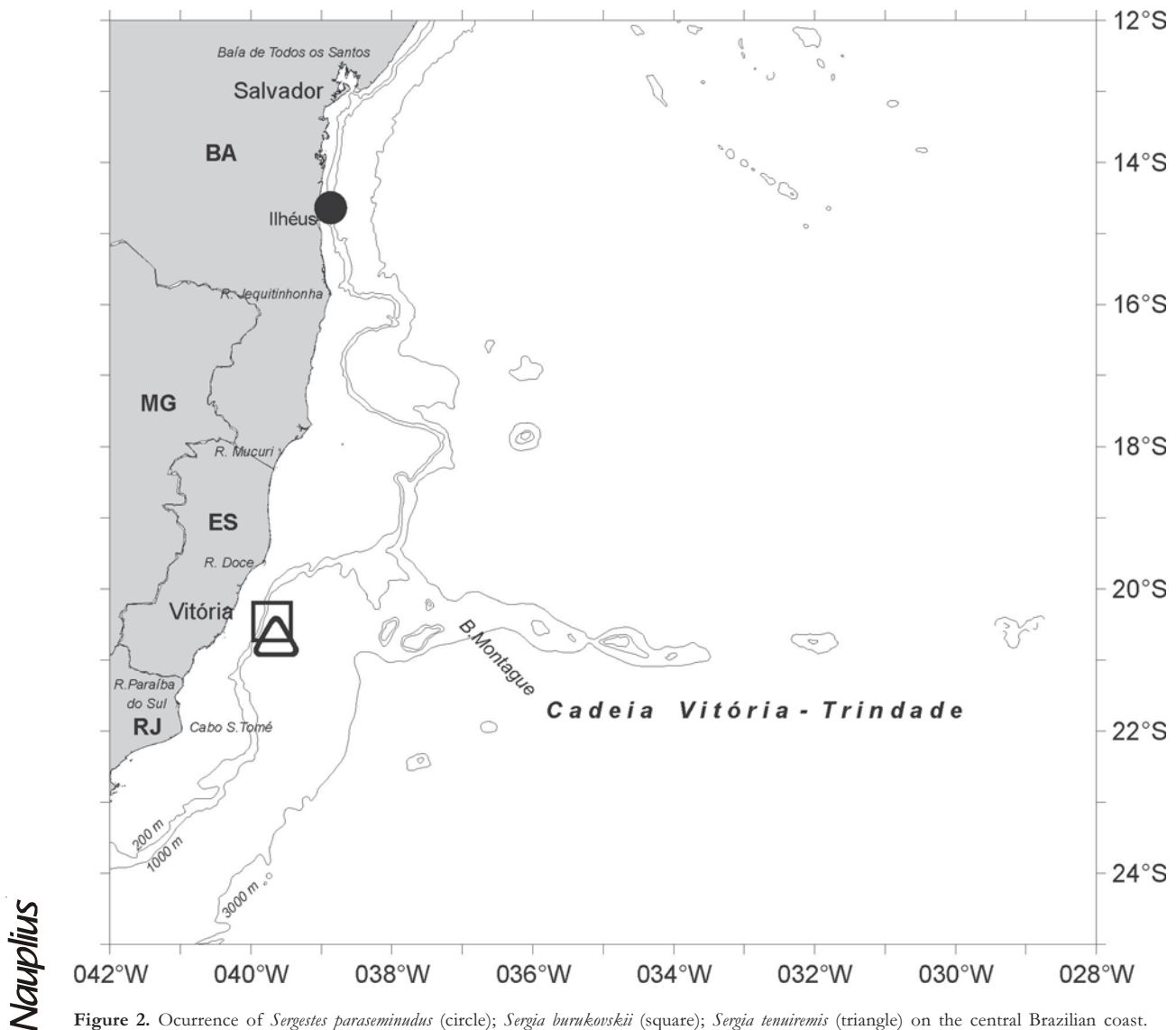


Figure 2. Occurrence of *Sergestes paraseminudus* (circle); *Sergia burukovskii* (square); *Sergia tenuiremis* (triangle) on the central Brazilian coast.

4-5 reduced, without dactyl. With or without dermal photophores. Processus ventralis not forked (from Vereshchaka, 1994).

***Sergia burukovskii* Vereshchaka, 2000
(Fig. 3A-E)**

Sergestes (Sergia) grandis – Kensley, 1971(part): 249, fig. 17; Crosnier and Forest, 1973 (part): 331, figs. 113-116.

Material examined: 1 male, carapace length 20 mm, st. E-0537, 20°26'85"S-39°41'63"W, 1545 m, MNRJ 19433.

Diagnosis: Photophore lacking lens type. Carapace, rostrum with broad base, tapering to tip; supraorbital sulcus absent; suprabranchial carina present; branchial carina not completely developed, reaching a half of branchial carina length. Petasma with lobus armatus curved, with one strong hook on tip; lobus connectens bilobed, basal lobe small, with few hooks, distal lobe elongate, curved, with about four hook steae on tip.

Description: Carapace rostrum broad at base, tapering to tip; supraorbital sulcus absent; cervical groove present, well defined dorsally; orbito-antennal carina absent; supraorbital and hepatic spines absent; rounded protuberance present near distal part of cervical groove (Fig. 3A). Eyestalk lacking tubercle. Scaphocerite with distal tooth on outer margin (Fig. 3B). Outer antennular flagellum with five stout setae on inner margin and a not well defined median depression (Fig. 3C). Pereopods 1-5 broked in the examined specimen. Uropod exopod outer margin with a tooth on distal third (Fig. 3D). Telson distally broked in the examined specimen. Petasma with lobus armatus curved, with one strong hook on tip and small hooks on concave margin; lobus connectens bilobed, basal lobe small, with two hooks on tip, distal lobe elongate, curved with about four hooks on tip; lobus inermis triangular, short, unarmed; lobus terminalis triangular, short, with a hook on tip; processus ventralis slender, elongate, unarmed; processus uncifer with a hook like tip (Fig. 3E).

Distribution: Eastern Atlantic: off South Africa; new record, Western Atlantic: Brazil (Espírito Santo, 20°26'85"S-39°41'63"W); Southwest Indian Ocean (Fig. 2).

Remarks: *Sergia burukovskii* was recently described by Vereshchaka (2000) and included in the *Sergia phorca* (Faxon, 1893) group. This group is characterized by lacking lenses photophores, blunt hepatic tubercle and a petasma with one or more lobes divided.

This species is close related to the Pacific *S. phorca* and to *S. grandis* (Sund, 1920) that was collected on Western and Eastern Atlantic. The specimen herein examined agrees with the description of *S. burukovskii* in the tip of rostrum with one point, and in the petasma structure: with a lobus armatus longer than the basal lobe of lobus conectens, a lobus terminalis with a acute tip, and a slender lobus inermis. Distinct of *S. grandis* wich has the tip of rostrum with a bifid point, and the petasma with a lobus armatus shorter than the basal lobe of lobus conectens, a lobus terminalis with a blunt tip, and a broad lobus inermis.

***Sergia tenuiremis* (Kroyer, 1855)
(Fig. 4A-E)**

Sergestes tenuiremis Kroyer, 1855: 30, 34; 1856: 39, 62, 67-70, pl. 4, fig. 11a-b.

Sergestes tenuiremis – Bate, 1888: 420; Illig, 1914: 349; 1927: 283, figs. 6-10; Hansen 1920: 478; 1922: 81, pl. 4, figs. 4-5, pl. 5, figs.1-2; 1927: 4; Sund, 1920: 7; Gurney and Lebour, 1940: 21.

Sergestes Kroyeri Bate, 1881: 193; 1888: 388, pl. 70, figs. 3-4.

Sergestes Kroyeri – Hansen, 1903: 58; 1920: 479; Illig, 1914: 354 (part); 1927: 289 (part); Burkenroad, 1940: 50; Dannel, 1955: 403; Richardson and Yaldwin, 1958: 26.

Sergestes junceus Bate, 1888: 416, pl. 76, fig. 1.

Sergestes longicollis Bate, 1888: 421, fig. 1.

Sergestes tropicus Sund, 1920: 18, figs. 27-28, 30-32.

Sergestes (Sergia) tenuiremis – Yaldwin, 1957: 9; Donaldson, 1975: 45.

Sergestes (Sergia) kroyeri – Yaldwin, 1957: 9; Crosnier and Forest, 1973: 308; Lagardère, 1978: 7.

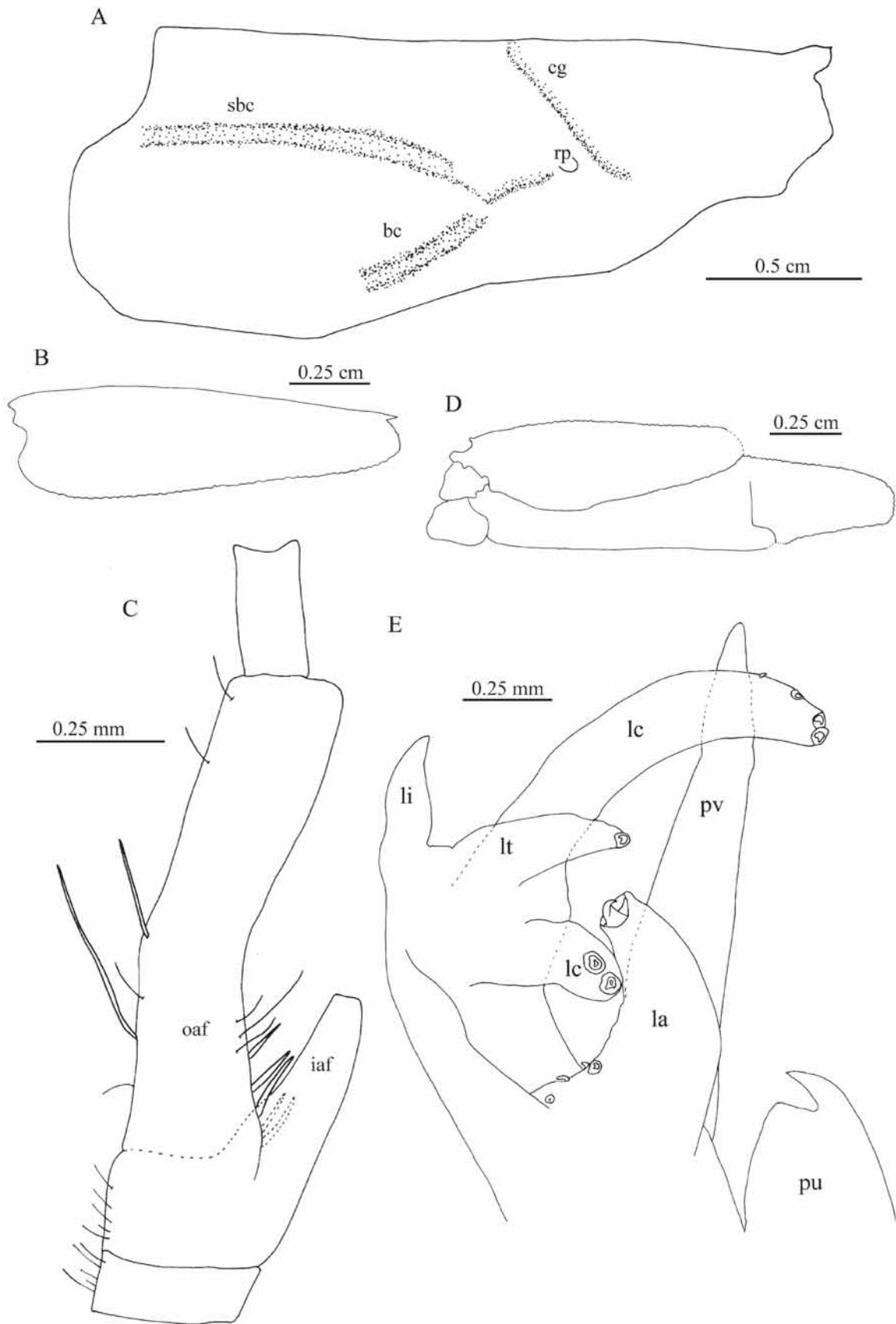


Figure 3. *Sergia burukovskii*, male (MNRJ 19433). A. Carapace, 20 mm length (bc- branchial carina; cg- cervical groove; rp- rounded protuberance; sbc- suprabranchial carina). B. Scaphocerite. C. Uropod. D. Antennule (iaf- inner antennular flagellum and oaf- outer antennular flagellum). E. Petasma (la- lobus armatus; lc- lobus connectens; li- lobus inermis; lt- lobus terminalis; pv- processus ventralis and pu- processus uncifer).

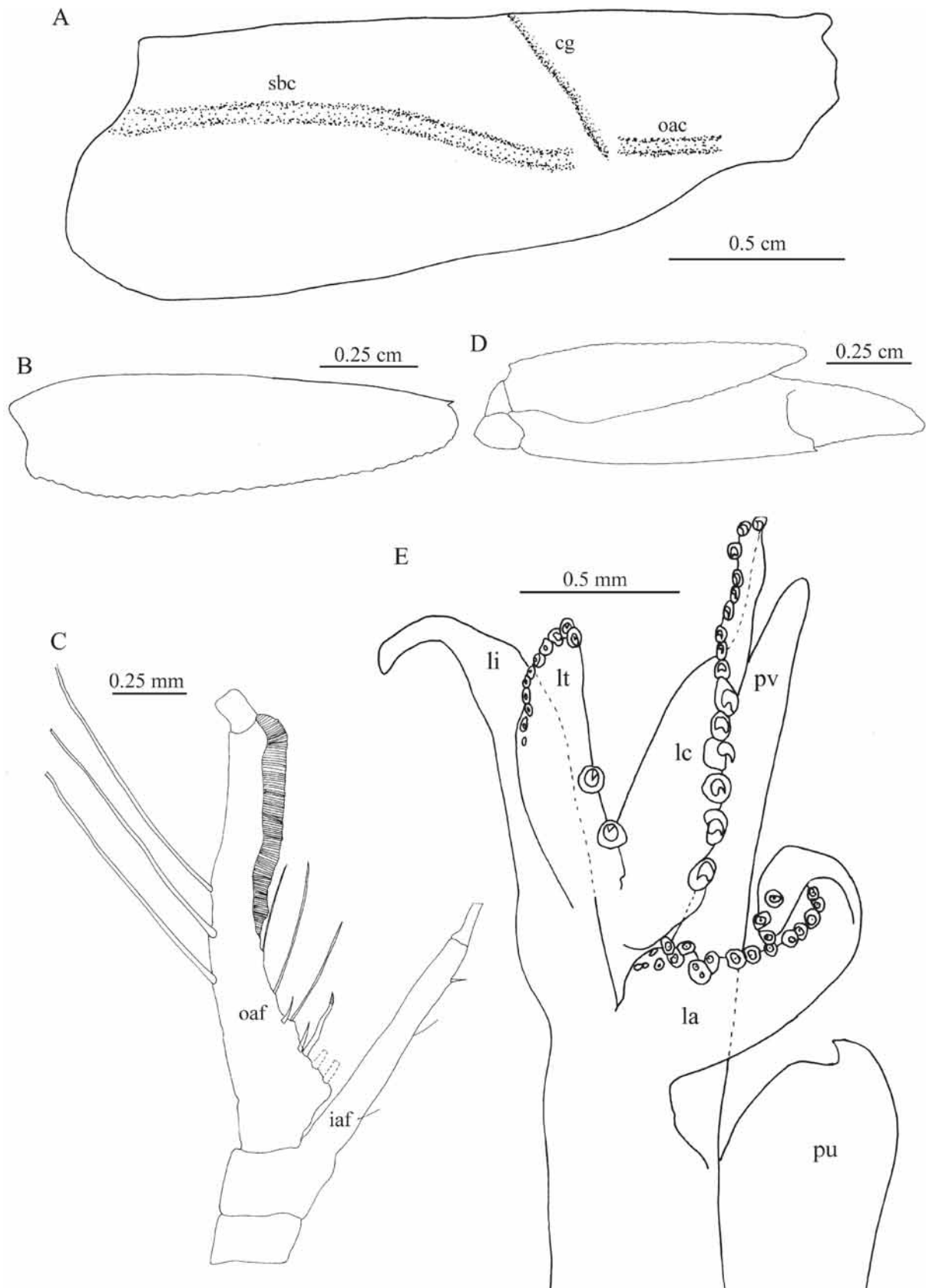


Figure 4. *Sergia tenuiremis*, male (MNRJ 19434). A. Carapace, 20.5 mm length (cg- cervical groove; oac- orbito-antennal carina; sbc- suprabranchial carina). B. Scaphocerite. C. Uropod. D. Antennule (iaf- inner antennular flagellum and oaf- outer antennular flagellum). E. Petasma (la- lobus armatus; lc- lobus connectens; li- lobus inermis; lt- lobus terminalis; pv- processus ventralis and pu- processus uncifer).

Sergia kroyeri – Krygier and Wasmer, 1988: 72.

Sergia tenuiremis – Percy and Forss, 1966: 1137; Walters, 1976: 823; Butler, 1980: 49; Krygier and Percy, 1981: 101, fig. 1; Vereshchaka, 1994: 76, figs. 1-3, 26; 2000: 84, Figs. 3-5.

Material examined: 1 male, carapace length 20.5 mm, st. E-0538, 20°27'66"S-39°38'10"W, 1680 m, MNRJ 19434.

Diagnosis: Photophore lacking lens type. Carapace, rostrum with broad base and blunt tip; supraorbital sulcus absent; suprbranchial carina present; branchial carina absent; orbito-antennal carina present. Petasma, lobus armatus with a basal rounded protuberance, armed with hooks and a part elongate, strongly curved, armed with many hooks; lobus terminalis stout, with two strong hooks on basal part and many small hooks on tip.

Description: Carapace, rostrum with broad base and blunt tip; supraorbital sulcus absent; cervical groove present, well defined dorsally; orbito-antennal carina present; suprbranchial carina present; supraorbital and hepatic spines absent (Fig. 4A). Eystalk with tubercle. Scaphocerite with small distal tooth on outer margin (Fig. 4B). Outer antennular flagellum slender, with five stout setae, three long and two short, a not well defined median depression, and a striate distal part on inner margin (Fig. 4C). Maxilliped 3 slender, as long as pereopod 2 and shorter than pereopod 3 and 4. Pereopod 5 broked in the examined specimen. Uropod exopod outer margin with a small tooth on distal third (Fig. 4D). Telson with three pairs of dorso-lateral stout setae. Petasma, lobus armatus with a basal rounded protuberance, armed with hooks and a part elongate, strongly curved, armed with many hooks; lobus connectens elongate, broad at base, tapering to tip, armed with hooks on inner margin; lobus inermis slender, elongate, directed outwards, unarmed; lobus terminalis stout, with two strong hooks at base and many small hooks at tip; processus ventralis slender, elongate, unarmed; processus uncifer with a hook like tip (Fig. 4D).

Distribution: Eastern Atlantic: Canaries, Azores, Madeira, Gul of Guinea; new record, Western Atlantic: Brazil (Espírito Santo, 20°27'66"S-

39°38'10"W); Estern Pacific: Kermadec, New Zealand; Western Pacific: Hawaii, Oregon (Fig. 2).

Remarks: *Sergia tenuiremis* is an isolated species in the genus *Sergia*. This species is characterized by absence of photophores and hepatic tubercle and by the presence of a very developed ocular tubercle.

The Brazilian material agrees with the description presented by Vereshchaka (2000) in the rostrum with a blunt tip and in the petasma structure with a long lobus armatus curved inwards, a lobus terminalis with a blunt tip and a unarmed long, slender processus ventralis.

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