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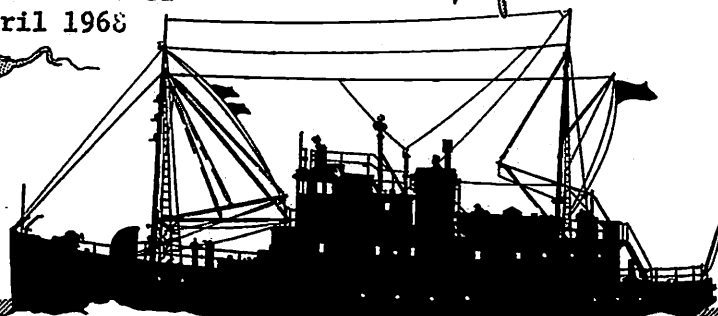
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Technical Report No. 214

SERGESTES SIMILIS HANSEN AND *S. CONSOBRINUS* N. SP. (DECAPODA) FROM THE
NORTHEASTERN PACIFIC, by Darrelyn S. Milne. *Crustaceana* 14(1):21-34. 1968.

Technical Report No. 215

SONAR REFLECTION PROFILING ON THE COLUMBIA RIVER AND IN LAKE WASHINGTON,
by C. R. B. Lister, John T. Whetten, and Bates McKee. *Northwest Science*
41(4):152-154. 1967.

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DISTRIBUTION AND MOVEMENT OF RADIOACTIVE CONTINENTAL SHELF SEDIMENT,
NORTHWESTERN UNITED STATES, by M. Grant Gross. *Collected Preprints of*
the International Sedimentological Congress. 4 p. 1967.

Technical Report No. 217

CONTINENTAL SHELF SEDIMENT, NORTHWESTERN UNITED STATES, by M. G. Gross,
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790-795. 1967.

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MAZAMA ASH FROM THE CONTINENTAL SLOPE OFF WASHINGTON, by Chester F. Royce,
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Technical Report No. 219

A DEVICE FOR RELEASING A PISTON CORER AND DEACTIVATING THE PISTON, by James
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Technical Report No. 220

SINKING RATES OF RADIOACTIVE FALLOUT PARTICLES IN THE NORTH EAST PACIFIC
OCEAN, 1961-62, by M. Grant Gross. *Nature* 216(5116):670-672. 1967.

**SERGESTES SIMILIS HANSEN AND S. CONSOBRINUS N. SP.
(DECAPODA) FROM THE NORTHEASTERN PACIFIC**

BY

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DEPARTMENT OF OCEANOGRAPHY
TECHNICAL REPORT NO 214

LEIDEN
E. J. BRILL

SERGESTES SIMILIS HANSEN AND *S. CONSOBRINUS* N. SP.
(DECAPODA) FROM THE NORTHEASTERN PACIFIC ¹⁾

BY

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INTRODUCTION

Midwater trawl samples from the eastern North Pacific Ocean collected on "Brown Bear" cruises during 1957 and 1958 by the Department of Oceanography, University of Washington, under the direction of Dr. W. I. Aron, contained large numbers of natant decapod crustaceans of the penaeid family Sergestidae. The shrimps were recorded from 564 hauls during cruises 176, 199, and 202. Cruise 176 extended across the Gulf of Alaska, along the Aleutian Island Chain, and into the Bering Sea, cruise 199 went south from the Strait of Juan de Fuca to off the coast of southern California, and cruise 202 extended to about 650 miles west of the Washington coast (Aron, 1962).

Little is known about the sergestids from the northeastern Pacific Ocean. Rathbun (1904) reported only *Sergestes atlanticus* H. Milne Edwards and a single mutilated *Sergestes* which could not be identified to species in "Albatross" samples from the western American coast. Schmitt (1921) reported *S. similis* Hansen from San Francisco Bay. Aron (1962) mentioned that sergestids from the midwater trawl collections of the Department are important contributors to the nekton of the area. LeBrasseur (1964) included a *Sergestes* sp. in his checklist of marine plankton from the North Pacific. Dr. J. C. Yaldwyn (personal communication) found several *Sergestes* species in Southern California waters.

Only *Sergestes similis* was recorded from midwater trawl samples taken during "Brown Bear" cruises 176 and 202. Both *S. similis* and a new *Sergestes* species are well represented in samples from cruise 199. In addition, less numerous adults and juveniles of 11 other *Sergestes* species, as well as one adult female and five juveniles that could be associated only with Yaldwyn's (1957) species groups, were identified. These species will not be treated here, but *Sergestes similis* will

¹⁾ Contribution No. 378, Department of Oceanography, University of Washington. The material was collected under Grant No. G-6168 of the National Science Foundation. The preparation of the paper was supported by Grant No. G-14732 of the National Science Foundation, Contract Nonr-477(10), and Contract Nonr-477(37), Project NR 083 012, with the Office of Naval Research, and Contract No. AT(45-1)-1725 with the U.S. Atomic Energy Commission.

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be redescribed, the male in particular being poorly known, and the new species will be presented.

I wish to thank the supporting agencies who made this study possible, Dr. Fenner A. Chace, Jr. of the U.S. National Museum for the loan of specimens of *Sergestes arcticus* Krøyer, Dr. Torben Wolff of Universitetets Zoologiske Museum, Copenhagen, for the loan of material of *S. edwardsi* and *S. orientalis*, and Dr. Karl Banse, Dr. Dora Henry, Miss Janet Griffin, and my colleagues in the Department for their suggestions and helpful criticisms.

Sergestes H. Milne Edwards, 1830

Yaldwyn (1957) has divided the genus *Sergestes* into the subgenera *Sergestes* and *Sergia*, separating them by the presence or absence of luminescent modifications of the gastrohepatic gland or organs of Pesta. Yaldwyn defined the subgenus *Sergestes* H. Milne Edwards, 1830, as follows:

"Species of *Sergestes* s.l. with specialised luminescent modifications of the gastrohepatic gland (organs of Pesta) but without dermal photophores. Supra-orbital and hepatic spines may be present or absent in adult. Ovary confined to cephalothorax. Colour in life due to red subcuticular chromatophores mainly concentrated on the anterior part of the body".

Sergestes (*Sergestes*) *similis* Hansen, 1903 (figs. 1-4)

Sergestes atlanticus - Bate (in part), 1888: 390.

S. similis Hansen, 1903: 60, pl. 11 figs. 6a-6d; Schmitt, 1921: 19, text fig. 8, pl. 12 fig. 7:

Illig, 1927: 310, figs. 66, 67; Burkenroad, 1937a: 321.

S. atlanticus - Rathbun (in part), 1904: 145.

S. arcticus - Cecchini, 1928: 33.

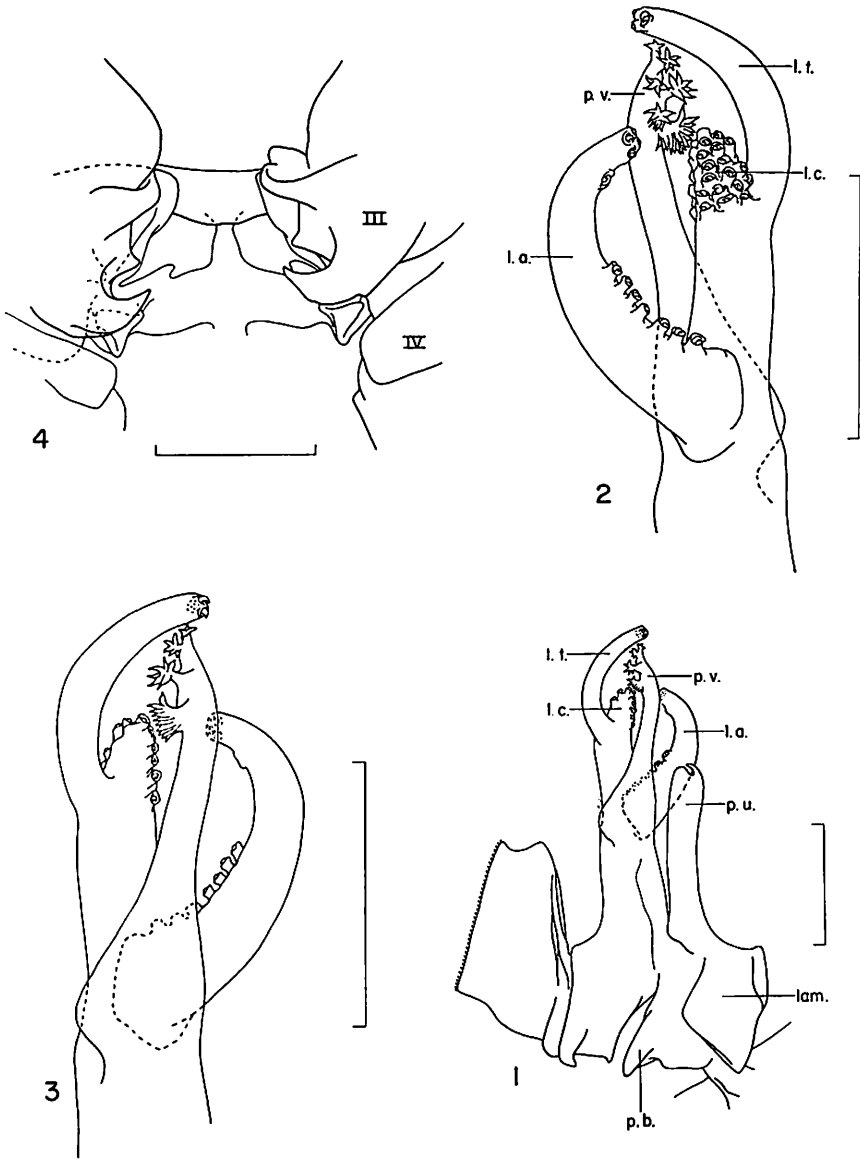
Type. — Hansen's (1903) type specimen of *S. similis* was collected off Japan, 35° 11' N 139° 28' E, and is deposited in the British Museum (Natural History).

Diagnosis. — Organs of Pesta present. First segment of antennular peduncle longer than third. Third maxillipeds subequal to third pereopods. Two distal segments of fifth pereopods setose on only one margin. Outer margin of exopod of uropod ciliated for distal one-third to one-fourth. Posterior arthrobranch above third pereopod less developed and about half as large as that above fourth pereopod. Petasma with lobus terminalis longer than processus ventralis.

Description. — The following is based on new material of *S. similis* from the northeastern Pacific Ocean, deposited in the U.S. National Museum, Washington D.C., Catalog Nos. 112973-112976.

Male. Rostrum slender, tapered, directed slightly upwards, reaching end of first segment of ocular peduncle. Ventral margin just below tip concave. Rostral shape variable. Some specimens with small dorsal tooth near tip. Anterior margin of scutum below rostrum nearly vertical.

Carapace without dorsal carina. Cervical groove distinct laterally, fading dor-



Figs. 1-4. *Sergestes (Sergestes) similis* Hansen. 1, left petasma, posterior view (carapace length 11.5 mm); 2, distal portion of left petasma, anterior view (carapace length 11.5 mm); 3, distal portion of left petasma, posterior view (carapace length 11.5 mm); 4, thelycum (carapace length 13.9 mm). III and IV indicate bases of third and fourth pereopods. Coxa of pereopod III (at right) shown in normal position. Scale = 1 mm. lam. = lamina externa, l.a. = lobus armatus, l.c. = lobus connectens, l.t. = lobus terminalis, p.b. = processus basalis, p.u. = processus uncifer, p.v. = processus ventralis.

sally. Supra-branchial groove and carina weakly developed. Supra-orbital and hepatic spines well developed.

First segment of abdomen with pronounced median ventral protuberance. Sixth

segment strongly laterally compressed, slightly longer than fourth and fifth segments combined.

Organs of Pesta opaque and whitish in formalin preserved material. Most prominent pair, clearly seen through carapace, situated above branchial chamber, dorsal to base of mandibles.

Telson rounded distally, without terminal spines, extending to distal two-thirds of rhipidura. Outer uropod slender, a little over five times as long as wide. External border with small tooth; distal one-third to one-fourth ciliated. Rhipidura extending to distal two-thirds of outer uropod.

Eyes laterally directed, tapered proximally. Cornea wider than stalk, dark brown or black in color, except in very young specimens. No ocular tubercle.

Antennular peduncle slender. First segment nearly three times longer than wide, with distal half of inner margin somewhat concave. Second and third segments very slender, about one-third width of first segment. Outer margin of first segment longer than that of the third; third segment a little longer than second.

Antennal scale four times longer than wide at its greatest breadth, tapered distally with both margins convex and extending to one-half of distal segment of antennular peduncle. Outer tooth projecting beyond terminal margin.

Second maxilliped heavily bristled. Propodus equaling carpus in length; merus and ischium a little longer than carpus. Dactylus with many closely packed bristles along one margin, orange to dark reddish-brown in formalin preserved material. Color appears to become darker in mature animals.

Third maxilliped long, slender, subequal to third pereopod. Propodus equals merus in length; carpus slightly longer, ischium slightly shorter than merus.

Third pereopod with carpus three-fourths to four-fifths as long as propodus. Merus with distal protuberance, equalling propodus in length.

Fifth pereopod with two distal segments setose on only one margin.

First maxilliped with one epipodite and one exopodite without branchia; second maxilliped with one rudimentary arthrobranch, one podobranch, and one epipodite; third maxilliped with two arthrobranches, one of which is rudimentary. First and second pereopods each with one well-developed and one rudimentary arthrobranch. Third and fourth pereopods each with two arthrobranches of which the posterior arthrobranch above third pereopod is much less developed and about half as large as the posterior arthrobranch above the fourth pereopod. Branchiae absent from fifth pereopods.

First pleopod slender, as long as third pereopod.

Second pleopod with short, somewhat triangular appendix masculina, that has five long and numerous short spines along distal margins.

The nomenclature for describing the petasma is taken from Hansen (1919). In adult (figs. 1-3), petasma with pars astringens a flat, rectangular, folded plate, joining the two halves medially by row of tiny cincinnuli. Lamina externa of pars externa a large, flat, leaf-like blade. Processus basalis a long, posteriorly

directed, terminally rather blunt tooth. Processus uncifer long, terminally hooked, not reaching to base of lobus terminalis, but extending a little past base of lobus armatus. Pars media long, narrow. Processus ventralis long, narrow, shorter than lobus terminalis, armed medially and anteriorly with six or seven spiniform projections for distal one-fourth.

Lobus terminalis long, extending past processus ventralis, terminally armed with several small "crochets" (retractible hooks).

Lobus connectens triangular, anteriorly covered with many large crochets, one-third to one-half length of lobus terminalis, extending to where spiniform projections begin on processus ventralis.

Lobus armatus long, rather thick, curved medially towards lobus terminalis, reaching to distal margin of lobus connectens. Armed for about proximal two-thirds of inner (median) margin with one row of seven to ten large crochets; four or five of them closely gathered near base, the others spaced further apart, with one low, large crochet on inner margin about one-fourth from the distal end and with several small terminal crochets. Arrangement of crochets variable, but median margin never completely armed as in *S. arcticus* Krøyer.

Lobus inermis lacking.

Female. Females consistently larger than males taken in same haul. In adult (fig. 4), thelycum with coxa of third pereopod with two pronounced, curved teeth on postero-median margin. Proximal tooth shorter, less pointed than anteriorly directed distal tooth. Longitudinal hollow with concave margin between teeth. In the normal position, distal tooth of coxa lies in another hollow formed between anteriorly directed small lobe on ridge posterior to operculum and posteriorly directed, well-defined, triangular projection, part of a short transverse ridge between bases of third and fourth pereopod.

Size. — Carapace lengths (measured from tip of rostrum to posterior margin) for young stages range from 3.0 mm to about 9.5 mm; for adults, from 9.5 mm to 19.2 mm. The largest specimen in the collection is a female of carapace length 18.3 mm (edge of scutum to posterior margin) or 19.2 mm (tip of rostrum to posterior margin), taken on "Brown Bear" cruise 176, haul 133, 47° 58' N 139° 21' W, about 225 meters nominal sample depth.

Remarks. — *S. similis* is readily located in the *S. arcticus* group as defined by Yaldwyn (1957), which includes only the two species, *S. arcticus* Krøyer and *S. similis*. *S. similis* is distinguished from the predominantly Atlantic *S. arcticus* by a clearly more slender and fragile body and antennular peduncle, a longer and more upwardly directed rostrum, and a smaller and less developed posterior arthrobranch above the third pereopod along with a larger posterior arthrobranch above the fourth pereopod.

Petasmata of adult male and thelyca of adult female *S. similis* (figs. 1-4) were

compared with the corresponding structures of *S. arcticus*, U.S. National Museum specimens No. 7102 (see also the excellent figures of the petasma by Hansen, 1922, and Yaldwyn, 1957).

The petasma of *S. similis* is more slender and elongate than that of *S. arcticus*, its lobus terminalis is longer than the processus ventralis and not armed distomedially, the lobus connectens is longer and narrower, and the lobus armatus is not armed with crochets along entire length of median margin as in *S. arcticus*.

The appendix masculina of *S. similis* has four or five long spines along distal margin, that of *S. arcticus* has only three. The thelycum of *S. similis* with two coxal teeth, is more pronounced than in *S. arcticus*, though the proximal tooth is less pointed and distal tooth more so. The posteriorly directed projections are larger in *S. similis*. Small, raised, anteriorly directed lobes posterior to operculum are absent in *S. arcticus*.

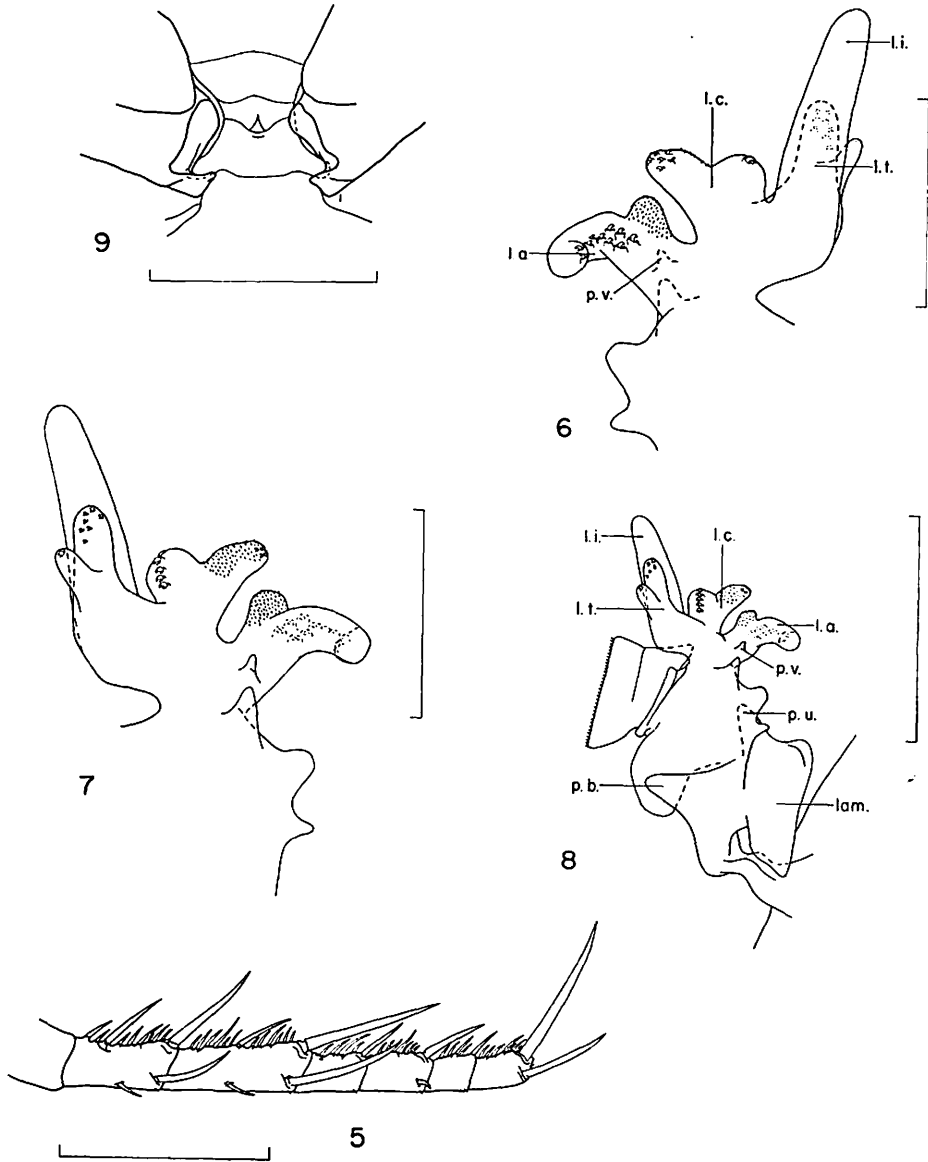
Distribution. — Western Pacific Ocean off Japan, eastern Pacific Ocean from Gulf of California to Bering Sea, South Pacific Ocean off Chile, eastern South Atlantic Ocean in Benguela Current.

The species was collected on "Brown Bear" cruises as far south as 34° N, though below 41° N, their numbers are sparse. North of about 41° N, *S. similis* is the only oceanic sergestid species found in the samples from the Washington and Oregon coasts and the Gulf of Alaska. The largest numbers of *S. similis* were all caught in midwater trawl hauls taken at 60 meters or shallower (see table II). 300-1000 or more animals per sample were found in many hauls within the area bounded by latitudes 49° 57' N and 42° 56' N, and longitudes 142° 13' W and 127° 37' W. The greatest numbers of *S. similis* were taken at 48° 23' N 131° 41' W. The area of large catches falls in the eastern Subarctic Pacific region, where the Subarctic Current and West Wind Drift branch into the northward flowing, counterclockwise gyral in the Gulf of Alaska and the southward flowing California Current (Dodimead, Favorite & Hirano, 1963). The species is most abundant in the Transitional Domain, generally characterized by warm surface temperatures and salinities greater than 33.20/00, north of the Subarctic boundary (Dodimead et al., 1963).

***Sergestes (Sergestes) consobrinus* n. sp. (figs. 5-9)**

Types. — U.S. National Museum, Washington D.C., Catalog Nos. 112948-112950. Holotype: adult male, carapace length 6.5 mm, total length, without antennae, about 23.9 mm. Taken at lat. 33° 44' N, long. 124° 53' W, "Brown Bear" cruise 199, haul 227, 3 August 1958, 0009-0050 PST about 120 meters sample depth, about 4,100 m bottom depth. Paratypes: See table II. samples marked by asterisk.

Diagnosis. — Organs of Pesta present. First segment of antennular peduncle slightly shorter than third. Third maxillipeds much enlarged and longer than third pereopods. Dactylus of third maxilliped with six subsegments and two terminal spines of unequal length. Two distal segments of fifth pereopods setose



Figs. 5-9. *Sergestes (Sergestes) consobrinus* n. sp. 5, dactylus of left third maxilliped (adult male, carapace length 6.3 mm) (small right distal spine shown on fourth subsegment sometimes absent); 6, distal portion of left petasma, anterior view (carapace length 6.5 mm); 7, distal portion of left petasma, posterior view (carapace length 6.5 mm); 8, left petasma, posterior view (carapace length 6.5 mm); 9, thelycum, showing coxae of third pereopods (carapace length 7.2 mm). Scale for figs. 6, 7 = 0.5 mm; for figs. 5, 8, 9 = 1 mm. lam. = lamina externa, l.a. = lobus armatus, l.c. = lobus connectens, l.i. = lobus inermis, l.t. = lobus terminalis, p.b. = processus basalis, p.u. = processus uncifer, p.v. = processus ventralis.

on only one margin. Outer margin of exopod of uropod entirely ciliated. Petasma with large and strongly bilobed lobus connectens and anteriorly coiled lobus armatus.

Description. — Male. Rostrum rather short and triangular with small tip anteriorly directed. Distal margins concave; proximal margins convex.

Carapace without dorsal carina. Cervical and supra-branchial grooves and carinae often difficult to see clearly.

Supra-orbital and hepatic spines small, but distinct.

Body long, slender, fragile with a rather wide abdomen. Sixth segment strongly laterally compressed, nearly twice as long as wide.

Organs of Pesta with both paired anterior and large posterior tubules visible through carapace, appearing milk-white in formalin preserved material.

Telson rounded distally, without terminal spines. Outer uropod narrow, about six and one-half times as long as wide, with entire outer margin ciliated.

Eyes laterally directed, with a brown (but not black) cornea wider than stalk. Ocular tubercle lacking.

Antennular peduncle in second and third segments slender, median margin of first segment about equal in length to second, slightly shorter than third.

Antennal scale narrow, tapering distally, a little over four times as long as wide at its greatest breadth. Outer tooth slender, greatly exceeding tip.

Second maxilliped heavily bristled. Carpus subequal to propodus. Dactylus very small.

Third maxilliped much enlarged, longer than third pereopod. Dactylus with six subsegments and two terminal spines of unequal length. First subsegment a little shorter than second; the two combined about as long as distal four. Total number of spines, closely arranged along inner margin of six subsegments, variable. Fig. 5 shows 48, excluding the two terminal spines. Though the number of small spines varies, the arrangement of certain large spines is constant in the adult (table I).

First and second pereopods with a curved tooth on ischium, more developed on second pereopod, and with smaller tooth on proximal end of merus.

Second and third pereopods long, slender, chelate, but shorter than third maxilliped.

Fourth and fifth pereopods with the two distal segments setose only on one margin.

Branchial formula simple. Of the paired branchia above the second and third maxillipeds and first four pereopods, only the dorsal posterior arthrobranch above fourth pereopod well developed, a little over half the length of anterior arthrobranch. Other pairs with an anterior arthrobranch and dorsal posterior lamella. It is extremely difficult to see the posterior lamellae, but all arthrobranches are large, leaf-like, plumose.

Second pleopod with two distinct protuberances on protopodite; distal protuberance slightly curved. Appendix masculina a single, bulbous lobe with spines of varying lengths along distal margin.

TABLE I

Arrangement of large spines on the dactylus of the third maxilliped of
Sergestes consobrinus n. sp.

Subsegment	Internal margin	External margin
1	1 very long distal, 1 shorter median	1 distal (about same length as median internal), 1 short median
2	1 very long distal, 1 rather short median	1 long distal 1 short median
3	1 long distal	None
4	1 long distal	1 very short distal (sometimes absent)
5	1 long distal	None
6	None 2 terminal (1 very long, 1 short and thinner)	None

In adult (figs. 6-8), petasma with lamina externa of pars externa flat and rectangular. Processus basalis large, triangular, distally bluntly rounded. Processus uncifer short, almost rudimentary. Pars media very short, wide. Processus ventralis rudimentary, very small, conical, with distal portion not very narrow. The middle of three projections along lateral margin of pars media proximal to processus ventralis about same height or higher than other two, often nearly twice as wide, with blunt or squared distal edge.

Lobus terminalis strongly bilobed. Anterior lobe large, directed distally, armed both anteriorly and posteriorly with crochets. Posterior lobe considerably smaller, directed more medially than anterior lobe, with one large terminal hook.

Lobus connectens large, wide, strongly bilobed, with rather long, laterally directed outer lobe with large and small crochets on distal and postero-median portions. Median lobe with several large crochets in posterior longitudinal row.

Lobus armatus bilobed, with tiny crochets covering inner lobe. Outer lobe not directed distally, but anteriorly coiled, with large hooks on terminal and antero-median portions.

Lobus inermis very long, slender, directed distally and somewhat medially, extending beyond other lobes. Proximo-median projection "heel-like", but often not more clearly defined than in *S. edwardsi* and *S. orientalis*.

Female. Females consistently larger than males in same haul. Rostrum often much larger, with longer tip than that of male. In adult (fig. 9), thelycum simple, much like that of *S. edwardsi*. Coxa of third pereopod with two wide, blunt teeth on postero-median margin, greatly hollowed anterior to these teeth, with

two tiny, anteriorly directed protuberances on a small transverse ridge posterior to operculum and beneath coxal teeth.

Size. — Largest males with carapace lengths of 6.8 mm, measured from tip of rostrum to posterior margin of carapace (total length, without antennae, about 24 mm). Largest female, 8.0 mm (total length about 26 mm). Average carapace length for males 6.4 mm, with range of 4.8-6.8 mm; for females, 7.4 mm, range of 6.0-8.0 mm.

Larvae. — Juvenile and mastigopus specimens in the present material identified as belonging to Yaldwyn's "*S. edwardsi*" group by possession of an entirely ciliated outer margin of the exopod of the uropod are probably young *Sergestes consobrinus*. Juvenile specimens small (carapace lengths ranging from about 3.5 mm to 5.0 mm), clear and transparent in formalin, with a golden to light brown cornea. Tip of rostrum longer, more slender than in adult. Third maxilliped with two subequal terminal spines, an external spine on fourth subsegment, as in *S. edwardsi*, and two small spines at middle of external margin of first and second subsegments, as in adult *S. consobrinus*. Middle of three protuberances along outer margin of undeveloped petasma more pronounced and pointed than in adult, lobus connectens thicker, less bilobed, and lobus armatus just beginning to coil anteriorly. Petasma very much like Hansen's (1922, pl. 11 fig. 1d-1f) figures of the petasma of *S. edwardsi*. Juvenile thelycum similar to adult form, with smaller coxal tooth on third pereopod.

Mastigopus shaped like juvenile, with longer rostrum, very long, laterally directed eyestalks, very wide cornea, and three long spines at tip of dactylus of third maxilliped. Viewed dorsally. anterior portion of the mastigopus very similar to *S. edwardsi* as figured by Hansen (1922, pl. 11 fig. 2a).

Name. — The specific name is from the Latin "*consobrinus*", cousin.

Remarks. — *Sergestes* (*Sergestes*) *consobrinus* belongs in Yaldwyn's (1957) "*S. edwardsi*" group, which comprises *S. edwardsi* Krøyer, *S. orientalis* Hansen, *S. tantillus* Burkenroad, and *S. semissis* Burkenroad. It differs from these species principally by the larger size, the shape of the third maxilliped, and the shape and armature of the lobes of the petasma. *S. consobrinus* specimens were compared with the types of *S. edwardsi* Krøyer and *S. orientalis* Hansen from Universitetets Zoologiske Museum, Copenhagen.

The carapace of the male *S. edwardsi* from Copenhagen measured 4.4 mm (total length about 17.8 mm without antennae); juvenile females measured 3.2 and 3.3 mm (total about 11.8 and 12.2 mm, respectively). Males of *S. consobrinus* are larger by one-third or more.

Hansen (1919, pl. 2 fig. 2a, c) counted 37 spines on the inner margin of the dactylus of the third maxilliped (excluding the two terminal spines) for adult *S. orientalis* and 39 for *S. edwardsi* (Hansen, 1922, pl. 11 fig. 1c). There are

from 47 to 50 in *S. consobrinus*. The terminal spines on the dactylus of the third maxilliped (one long, one short) of *S. consobrinus* resemble those of *S. orientalis*. Juvenile females of *S. edwardsi* had equal terminal spines on third maxilliped but differed from *S. consobrinus* in having a very long distal spine on the external margin of the fourth subsegment, and no small median spines on the first and second subsegments.

The petasma of *S. consobrinus* most closely resembles that of *S. tantillus* and *S. edwardsi* but differs from the former in having a shorter and bilobed lobus connectens, and from the latter in having a larger, longer, more strongly bilobed lobus connectens, a shorter and wider processus ventralis, and a coiled and anteriorly directed lobus armatus with many large crochets. The fully developed petasma of the male *S. edwardsi* differs from that of *S. consobrinus* by a more triangular lamina externa; the middle of the three projections along lateral margin of the pars media proximal to the processus ventralis is more strongly conical and pointed and the lobus inermis is longer and directed more distally.

The petasma of *S. consobrinus* is quite different from that of *S. orientalis* in that the middle of the three projections along the lateral margin of the pars media proximal to the processus ventralis, is not low and rounded; the lobus connectens is much longer and bilobed; the anterior lobe of the lobus terminalis is longer and armed with many crochets, and the lobus inermis is very much longer and more slender.

S. consobrinus differs from *S. semissis* in having a conspicuous middle projection along the lateral margin of the pars media proximal to the processus ventralis; a bilobed lobus connectens; a longer, more slender lobus terminalis with unequal lobes; and a longer, narrower lobus inermis.

S. consobrinus differs from the *S. edwardsi* as described by Faxon (1895) in that the third segment of the antennular peduncle is not more than one half of the length of the first or second, the cornea is wider than the stalk, and the propodus of the third maxilliped is only one and a half times longer than the dactylus, instead of four times.

Adult specimens of species related to *S. consobrinus* have been recorded as follows:

S. edwardsi — Atlantic Ocean: Krøyer (1855, 1859), Bate (1888), Hansen (1896, 1922), Kemp (1913), Borradaile (1916), Illig (1913, 1927), Sund (1920). Indian Ocean: Illig (1927), in my opinion probably *S. orientalis* because of the character of the third maxilliped. Pacific Ocean: Bate (1888), Hansen (1903), Rathbun (1906, probably *S. orientalis*), Faxon (1895, in my opinion perhaps *S. tantillus*, see also Hansen, 1922, and Burkenroad, 1937a).

S. orientalis — China Sea and southeast of South Africa: Hansen (1919).

S. tantillus — Pacific Ocean, between the Galapagos and Cocos Islands: Burkenroad (1940).

S. semissis — Indian Ocean, between Ceylon and Sumatra: Burkenroad (1940).

TABLE II
Material of *Sergestes consobrinus* n. sp. examined

Lengths indicated are carapace measurements. Dates are all in 1958. Times are Pacific Standard Time, and are given because the depth distribution of this large species may change with the time of day. An asterisk indicates samples regarded as type material and deposited in the U.S. National Museum. Specimens from haul 265 are deposited in Universitetets Zoologiske Museum, Copenhagen.

Both three-foot and six-foot modified Isaacs-Kidd midwater trawls were used for collection. The amount of cable necessary to reach a desired depth was estimated on the basis of previous measurements of maximum depth attained at a given ship speed and wire length, by attaching a bathythermograph to the net. Routinely, the nets were lowered open, with the ship proceeding at about six knots, towed for about thirty minutes to one hour after the wire had been paid out, and retrieved open, with the ship running at reduced speed. The behavior of the trawl under these circumstances may be seen from observations by Aron, Raxter, Noel & Andrews (1964).

Lat. (N)	Long. (W)	Haul	Date	Time	Depth (m)	Specimen(s)	Length(s) (mm)
41° 10'	133° 07'	273	10 Aug	0124-0158	20	1 female	7.8
41° 08'	133° 05'	272	10 Aug	0047-0123	30	1 male	6.7
39° 47'	134° 48'	159	19 Jul	0359-0452	225	2 males	6.3, 6.5
						1 female	7.4
39° 41'	135° 09'	156	19 Jul	0038-0210	20	2 males	both 6.3
						1 female	7.2
*39° 41'	131° 57'	268	9 Aug	0318-0433	400	1 female	7.8
39° 39'	135° 15'	155	19 Jul	0049-0124	30	2 females	6.3, 6.8
39° 32'	131° 53'	266	9 Aug	0159-0233	30	2 females	7.2, 7.4
39° 29'	131° 52'	265	9 Aug	0118-0156	60	1 male	6.8
						1 female	7.4
*39° 20'	131° 49'	263	8-9 Aug	2309-0021	400	1 male	6.7
36° 45'	130° 51'	256	7-8 Aug	2310-0008	225	1 female	7.6
36° 27'	130° 44'	255	7 Aug	1902-2031	400	1 female	7.4
35° 10'	130° 12'	252	7 Aug	0128-0204	30	1 female	7.2
35° 05'	130° 10'	250	7 Aug	0011-0050	60	1 male	6.3
						1 female	7.4
*33° 46'	125° 12'	230	3 Aug	0220-0307	180	1 male	6.5
						3 females	7.2, 7.6, 8.0
*33° 44'	124° 53'	227	3 Aug	0009-0050	120	1 holotypic male	6.5
						8 male paratypes	5.2, 6.1, 6.3, 6.5, 6.5, 6.5, 6.7, 6.7
						4 female paratypes	7.4, 7.4, 7.6, 7.8
33° 43'	124° 48'	226	2-3 Aug	2314-0007	225	1 young male	4.8
*33° 42'	126° 23'	232	3-4 Aug	2312-0006	225	1 female	7.8
33° 37'	126° 46'	237	4 Aug	0255-0413	400	2 females	7.2, 7.4
*33° 20'	122° 10'	221	2 Aug	0325-0442	400	1 male	6.3
33° 19'	122° 03'	220	2 Aug	0240-0321	120	4 males	6.5, 6.5, 6.5, 6.7
						3 females	7.4, 7.6, 7.8
*33° 16'	121° 42'	215	1-2 Aug	2314-0008	225	1 male	6.8
						2 females	both 7.2
33° 00'	129° 21'	246	5-6 Aug	2312-0007	225	1 female	7.6
32° 16'	128° 33'	241	4 Aug	2254-2350	225	1 female	7.6
32° 08'	128° 47'	244	5 Aug	0132-0209	30	1 male	6.1
						1 young female	6.0
32° 06'	128° 51'	245	5 Aug	0210-0321	400	1 male	6.5

Material examined. — *S. consobrinus* was taken by the six-foot midwater trawl in 27 hauls during "Brown Bear" cruise 199, summer 1958 (see table II). 27 adult males and 21 adult females were examined.

Distribution. — *S. consobrinus* is recorded from off the coast of California south of 41° 10' N, about 385 miles west of Cape Mendocino, to 32° 06' N 128° 51' W, the southern extent of "Brown Bear" cruise 199, west of the California-Mexico border. No other member of the "*S. edwardsi*" group has been reported from the same area. The species was taken from depths of 20 meters to about 400 meters, with the greatest numbers caught at about 120 meters.

ZUSAMMENFASSUNG

Isaacs-Kidd Trawl Fänge aus dem nordöstlichen Pazifik enthalten viele dekapode Krebse der Familie Sergestidae, vor allen Dingen *Sergestes (Sergestes) similis* Hansen und *Sergestes (Sergestes) consobrinus* n. sp. Die erstgenannte Art, die in grosser Anzahl bis zu 60 m Tiefe vor Kalifornien und im ganzen Golf von Alaska gefangen wurde, wird mit besonderer Berücksichtigung der äusseren Geschlechtsorgane nachbeschrieben. *S. consobrinus*, vor Kalifornien in Tiefen bis zu 400 m gefangen, ist mit *S. edwardsi* Kröyer eng verwandt. *S. consobrinus* unterscheidet sich von letzterer Art durch grössere Länge, Form des dritten Maxillipeds und Form und Bewaffnung der Arme des Petasmas.

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