

1940

F002

Preliminary Descriptions of Twenty-one new Species of Pelagic Penaeidea (Crustacea Decapoda) from the Danish Oceanographical Expeditions.

By

Martin D. Burkenroad



*Preliminary Descriptions of Twenty-one new Species
of Pelagic Penæidea (Crustacea Decapoda) from the
Danish Oceanographical Expeditions* *. By MARTIN D.
BURKENROAD, Bingham Oceanographic Laboratory,
Yale University.

THE completion of systematic, developmental and distributional study of the immense quantity of Peneid and Sergestid material contained in the 'Dana' Collections must necessarily take some time. It therefore seems desirable that as the sorting of the material progresses, preliminary notice of new species encountered should be published; especially since the proportion of unnamed forms is greater than even such extensive collections might have been expected to include in view of the wide distribution of many pelagic species of the tribe and the considerable attention which they have previously received.

It is with warmth that I express my thanks to Dr. Å. V. Tåning and to Mr. K. Stephensen for opportunity to study

* Papers from the 'Dana' Oceanographical Collections, No. 18.

the Danish collections, and to the Rask-Ørsted Fondet for a grant making possible an invaluable visit to the Marinbiologisk Laboratorium.

For details of 'Dana' stations cited below, see Dana-Report, No. 1, Copenhagen, 1934.

1. *Funchalia (Funchalia) danæ*, sp. n.

Holotype ♀, St. 4017 VII; carapace length 32 mm.

Rostrum unarmed ventrally, petasma asymmetrical; most nearly related to *F. woodwardi* Johnson.

Rostrum with 10+1 to 12+1 teeth dorsally, its lateral ridge well defined. Hepatic spine persistent even in the largest adults. Frontal margin of the carapace below the antennal projection is only moderately convex, with well-defined pterygostomian spine set well above the antero-inferior angle; more as in *F. woodwardi* than as in *F. villosa* (Bouvier). Ridge running posteriorly from the pterygostomian spine is short, only about five times as long as the spine, in contrast to more than ten times in *F. woodwardi*. Sides of sixth pleonic somite with only the faintest trace of a second longitudinal ridge between the midlateral one and the ventrolateral margin, instead of a strong second ridge as in *F. woodwardi*.

Dactyl of the fourth leg less than one-third as long as the propodus in large adults.

Petasma asymmetrical, very nearly as in *F. woodwardi*.

Thelycum differs from that of other species of the subgenus *Funchalia* and resembles that of the subgenus *Pelagopenæus* in that the lateral hoods are produced as flaps which cover over the sperm receptacle.

2. *Funchalia (Funchalia) taaningi*, sp. n.

Holotype ♀, St. 3920 III, carapace length 16.2 mm.

Rostrum unarmed ventrally, petasma asymmetrical; very nearly related to *F. villosa* (Bouvier).

Rostrum with 5+1 to 6+1 teeth dorsally, its lateral ridge poorly defined. Hepatic spine present in juveniles, absent in adults. Frontal margin of the carapace below the antennal projection slopes anteriorly to join the pterygostomian spine without a definite point of demarcation. Frontal margin ventral to pterygostomian spine slopes posteriorly, as in young juveniles of *F. villosa*,

instead of vertically or even anteriorly as in adults of *F. villosa*. Sides of sixth pleonic somite without a trace of a second longitudinal ridge between the midlateral one and the ventrolateral margin.

Dactyl of fourth leg more than two-thirds as long as propodus in large adults; relatively much shorter in juveniles. Chela of third leg from 4.3 mm. long at a carapace length of 9 mm. to 4.5 mm. long at a carapace length of 16 mm., as compared with lengths of 3 and 4 mm. at the respective sizes in *F. villosa*.

Petasma differs from that of *F. villosa* only in lacking a small projection from the middle of the lateral edge of the free, distal part of the larger endopod.

Thelycum differs from that of *F. villosa* in having a large tooth-like rather than a very small median ridge or tubercle on sternite XIV posterior to the receptacular depression; and in having the ridges, which form the posterior continuation of the lateral hoods bounding the posterior half of the receptacular depression, straight somewhat as in *F. woodwardi* instead of curved as in *F. villosa*.

3. *Bentheogennema stephenseni*, sp. n.

Holotype ♂, St. 3624 I; carapace length 11 mm.

A podobranch, extending little if at all beyond the corresponding epipodite, present on somites VIII–XII, statolith autogenous; petasma without lobus accessorius, thelycum without intermediate prominences between the scutes of sternites XII and XIII; nearly related to *B. intermedia* (Bate).

Carapace much as in *B. intermedia*, differing from that of *B. borealis* (Rathbun) and *B. pasithea* (DeMan) in having the cervical and post-cervical sulci less closely approximated dorsally, the infra-antennal angle less produced and angular, and the pterygostomial spine weaker although not so much so as in *B. intermedia*. Telson nearly as in *B. borealis*, bearing only one midlateral and one distal pair of spines, the spines of the distal pair widely separated by the straight terminal margin of the telson.

Eye nearly as in *B. intermedia*, its corneal diameter approximately three-fifths that of the stalk at the level of the tubercle.

Petasma nearly as in *B. intermedia*, differing in having the middle part of the distal margin, between the distoventral and the distomedian projections, nearly straight instead of decidedly convex.

Thelycum as in *B. intermedia*.

4. *Sergestes (Sergestes) erectus*, sp. n.

Holotype ♂, St. 3579 I, carapace length 19.2 mm.

Organs of Pesta present, both margins of the two distal segments of the fifth leg ciliated, third maxillipede not greatly enlarged; most nearly related to *S. seminudus* Hansen and to *S. henseni* Ortmann (a species to which is referable the petasma figured by Sund as of *S. "corniculum Kr."*).

Supraorbital spine lacking. Hepatic spine well-developed, its buttress separated from the longitudinal carina anterior to it by a transverse sulcus. Ocular tubercle high, much more so than in *S. henseni* and *S. seminudus*. Posterior arthrobranch of XII not one-third as long as the anterior one.

Lobus armatus of the petasma not bent over, and bearing a continuous row of hooks from base to tip, as in *S. seminudus*. Lobus connectens differs from that in *S. seminudus* and resembles that in *S. henseni* in being well separated from lobus terminalis, slender, and armed only with a single hook at the tip.

Base of third leg and genital sternites of the female much as in *S. henseni*, but the median longitudinal ridge at the posterior margin of the twelfth sternite is not as well defined; the median protuberance posteroproximal to the coxa of the third leg has a rounded median margin rather than a somewhat projecting one such as is usual in *S. henseni*; there is a large convexity distal to the proximal tooth on the median margin of the coxa, rather than a minute projection, the projection on the postero-median face of the coxa laterodistal to the large proximal tooth has a longer and straighter median edge than in *S. henseni* and has a distal angle rather than a spine or tooth.

5. *Sergestes (Sergestes) disjunctus*, sp. n.

Holotype ♂, St. 3630 IV, carapace length 16 mm.

Organs of Pesta present, both margins of the two distal segments of the fifth leg ciliated, third maxillipede not

greatly enlarged; most nearly related to *S. henseni* Ortmann and to *S. seminudus* Hansen.

Supraorbital spine well developed. Hepatic spine well developed, its buttress separated from the longitudinal carina anterior to it by a transverse sulcus. Ocular tubercle very low. Posterior arthrobranch of XII nearly half as long as the anterior one.

Lobus armatus of the petasma not bent over, its median edge with an unarmed interval between a proximal and a distal group of hooks, as in *S. henseni*. Lobus connectens stout, not far separated from lobus terminalis, armed with numerous hooks along its distal edge.

Base of third leg and genital sternites of female somewhat as in *S. henseni*, but there is no clearly defined median longitudinal ridge at the posterior end of the twelfth sternite; the median protuberance posteroproximal to the coxa of the third leg projects nearly as much as in *S. seminudus* but has a less angular median margin as in *S. henseni* rather than a sharply angular one; the projection on the posteromedian face of the coxa, laterodistal to the large proximal tooth, is a simple convexity without a tooth or spine such as it bears in *S. henseni*.

6. *Sergestes (Sergestes) coalitus*, sp. n.

Holotype ♂, St. 3737 I, carapace length 22 mm.

Organs of Pesta present, both margins of the two distal segments of the fifth leg ciliated, third maxillipede not greatly enlarged; resembling *S. rubroguttatus* Wood-Mason (*nec* Pesta) except in petasma, which is like that of *S. erectus* Burkenroad.

Supraorbital spine lacking. Hepatic spine very small, its buttress not separated from the longitudinal ridge anterior to it by a transverse sulcus such as occurs in the related species other than *S. rubroguttatus*. Ocular tubercle moderately low; eye-stalk very long, cornea of moderate size. Posterior arthrobranch of XII less than one-third as long as the anterior one.

Petasma almost indistinguishable from that of *S. erectus*, differing from that of *S. rubroguttatus* in that the lobus armatus is not bent over, reaches beyond the processus ventralis and bears a continuous row of hooks from base to tip.

Base of third leg and genital sternites of female nearly as in *S. rubroguttatus*, differing only in that the median

ridge at the posterior end of the twelfth sternite is rounded although strongly defined, instead of being a high lamellate projection. Base of third leg differs from that of related species other than *S. rubroguttatus* by the following combination of characters: Median protuberance postero-proximal to the coxa with rounded, not sharply angular or tooth-like median margin; apex of postero-lateral precoxal protuberance directed more posteriorly than laterally; middle of the median edge of the coxa, distal to the large basal tooth, convex, and distal to this convexity with a subrectangular projection; projection on the posteromedian face of the coxa laterodistal to the large proximal tooth bears a distinct but small tooth which does not project as far as to the median margin of the joint.

7. *Sergestes (Sergestes) verpus*, sp. n.

Holotype ♂, St. 3739 IX, carapace length 7.8 mm.

Organs of Pesta present, both margins of the two distal segments of the fifth leg ciliated, third maxillipede greatly enlarged and with dactyl divided into five subsegments, posterior arthrobranch of XII a lamella; very similar to *S. "sargassi" Ortmann* of Hansen, 1922, but with a petasma more like that of *S. pestifer* Burkenroad.

Supraorbital spine of carapace completely absent. Suture which runs ventrally from the middle of the cardiacobranchial sulcus is reinforced with a heavy chitinous rib.

Third maxillipede much as in *S. "sargassi."*

Lobus armatus of petasma large, nearly two-thirds as long as processus ventralis; bearing a pair of terminal hooks and a row of four hooks which occupy its median margin. Processus ventralis with a row of two or three stellate disks occupying the median third of its armed antero-distal margin; the lateral two-thirds of the antero-distal margin with a serrate edge; two or three minute spines at the tip. Lobus terminalis large, armed only at the tip, which bears two hooks or groups of hooks. Lobus inermis represented only by an undefined swelling or a very minute rudiment on the lateral edge of the capitulum at about the level of the tip of lobus armatus. Lobus connectens represented by a large hook on the median edge of the capitulum somewhat beyond the mid-

point between its base and the armed tip of lobus terminalis.

Female unknown.

8. *Sergestes (Sergestes) index*, sp. n.

Holotype ♂, Dana St. 3630 II, carapace length 6 mm.

Organs of Pesta present, both margins of the two distal segments of the fifth leg ciliated, third maxillipede greatly enlarged and with dactyl divided into five sub-segments, posterior arthrobranch of XII a lamella; very nearly related to *S. "sargassi" Ortman* of Hansen, 1922, from which it differs only in petasma.

Lobus armatus of petasma directed laterally, not distally; somewhat more than half as long as the processus ventralis; bearing a terminal group of hooks and one hook in the middle of its median margin. Processus ventralis with a series of stellate disks along its entire distal margin instead of having a serrate armature on the lateral part of its tip. Lobus terminalis and lobus inermis subequal in size, divergent; lobus terminalis armed only with a single terminal hook. The capitulum below the lobus terminalis lacks the median hook which seems to represent the lobus connectens in *S. "sargassi."*

Female unknown.

9. *Sergestes (Sergestes) stimulator*, sp. n.

Holotype ♂, St. 3656 VIII, carapace length 9.4 mm.

Organs of Pesta present, only one margin of the two distal segments of the fifth leg ciliated, third maxillipede greatly enlarged and with dactyl divided into four sub-segments; nearly related to *S. diapontius* Bate, *S. vigilax* Stimpson, and *S. incertus* Hansen.

Rostrum short and deep, with a very short tip, like that of *S. vigilax*. External edge of proximal antennular segment slightly longer than the distal segment. Third maxillipede most like that of *S. incertus*: the proximal subsegment of its dactyl with six spines along the median edge, antepenultimate subsegment with four, penultimate with two, ultimate with one in addition to the terminal spine; penultimate subsegment of dactyl slightly more than half as long as ultimate; propodus subdivided by a joint. Ciliated part of the external margin of the

exopodite of the uropod about four times as long as the unciliated part.

Petasma with rather short lobus armatus; lobus terminalis long, slender, ridged along the anterior face, the ridge twisted and with a small cusp toward its base; lobus inermis conoidal with a small projection in the middle of its proximomedian edge.

Genital area of the female much as in the related species.

10. *Sergestes (Sergestes) tantillus*, sp. n.

Holotype ♂, St. 3556 II, carapace length 5.7 mm.

Organs of Pesta present, only one margin of the two distal segments of the fifth leg ciliated, third maxillipede greatly enlarged and with dactyl divided into six subsegments; nearly related to *S. edwardsi* Krøyer.

Third maxillipede about as in *S. edwardsi*: the pair of spines at tip of the dactyl subequal, as long as or longer than the distal two subsegments of the dactyl combined; antepenultimate subsegment of the dactyl with a quite long spine on its lateral margin.

Petasma with three conspicuous projections along the lateral edge of pars media proximal to the processus ventralis, as in *S. edwardsi* (the middle one of these projections being much less developed in *S. orientalis*). Lobus connects with a long finger-like tip, not short and bilobed as in *S. edwardsi* and *S. orientalis*. Posterior lobule of lobus terminalis conspicuously longer than the short, stout, fleshy, hook-bearing anterior lobule. Lobus inermis with a well-defined heel-like proximo-medial projection.

Genital area of the female much as in the related species.

11. *Sergestes (Sergestes) semissis*, sp. n.

Holotype ♂, St. 3905 I, carapace length 4 mm.

Organs of Pesta present, only one margin of the two distal segments of the fifth leg ciliated, third maxillipede greatly enlarged and with dactyl divided into six subsegments; related to *S. orientalis* Hansen and to *S. edwardsi* Krøyer and *S. tantillus* Burkenroad.

Third maxillipede about as in *S. edwardsi* and *S. tantillus*.

Petasma with the middle of the three projections along the lateral margin of pars media proximal to the processus

ventralis low and rounded, as in *S. orientalis*. Lobus connectens large and conical, directed laterally, not bilobed. Both lobules of lobus terminalis large and fleshy, subequal in size; the posterior lobule directed medially instead of distally as in the related species. Lobus inermis conical, not much larger than the lobus connectens, with a small papilliform protuberance on its proximomedian edge.

Female unknown.

12. *Sergestes (Sergia) scintillans*, sp. n.

Holotype ♂, St. 3622 I, carapace length 7.2 mm.

Organs of Pesta absent, numerous dermal photophores with well-developed cuticular lenses; most nearly related to *S. lucens* Hansen and to *S. prehensilis* Bate.

Rostrum moderately deep, with moderately long point; no dorsal tooth. Cervical sulcus shallow dorsally, post-cervical deep. No hepatic spine or projection. Posterior arthrobranch of twelfth somite about half as long as the anterior one and slightly smaller than the posterior arthrobranch of the thirteenth somite. Cornea of eye of moderate size, its greatest length only about two-thirds the dorsomedian length of the distal segment of the stalk.

Photophore pattern unique: a row of seven in antennal scale; one at base, one at tip of eye-stalk; none on body of mandible, one in palp; one in labrum; two lateral to the base of the maxilla; two lateral to the base of the third maxillipede; none in coxa-basis of second maxillipede, one at tip of ischium, one at base of merus, one at base and one at tip of carpus, one at tip of propodus of second maxillipede; a row of twelve very minute photophores in branchiostegite (as otherwise only in *S. prehensilis*); none in area of hepatic projection; none median to the bases of the fourth and fifth pleopods; four in the midline of the sixth pleonic sternite, one at its anterolateral corner; two or three in the exopodite of the uropod; and others.

Tip of antennular peduncle of male without distal spine or enlarged setæ.

Petasma with small processus ventralis, not two-fifths as long as the short, stout lobus armatus (processus ventralis longer than lobus armatus in *S. prehensilis*, completely absent in *S. lucens*, where lobus armatus is very long). Lobus accessorius short. Lobus connectens

of moderate size, with only a short proximo-lateral protuberance. Lobus terminalis small, closely applied to anterior base of lobus connectens, much as in *S. prehensilis*. Lobus inermis large, lamellar, oblong, and widely separated from lobus connectens.

Coxa of third leg of the female somewhat as in *S. prehensilis*, but both the distal and the proximal tooth-like projections of the median margin much more elongate.

13. *Sergestes (Sergia) stellatus*, sp. n.

Holotype ♂, St. 3908 I, carapace length 7.1 mm.

Organs of Pesta absent, numerous dermal photophores with well-developed cuticular lenses; related to *S. fulgens* Hansen and *S. splendens* Hansen.

Rostrum deep, with a short point and only a very weak trace of dorsal tooth. Cervical sulcus shallow dorsally, postcervical deep. Hepatic projection well developed but not acutely pointed. Posterior arthrobranch of the twelfth somite small, less than one-third as long as the anterior gill. Cornea of eye very large, its greatest length considerably more than the dorso-median length of the distal peduncular segment.

Photophores as in the related species.

Inferior antennular flagellum of the male much as in *S. fulgens*. Distoventral margin of distal segment of antennular peduncle of male with a rounded lamellate crest but not spinose; at the proximal end of the crest originates a pair of greatly enlarged, sinuose, blunt-tipped setæ.

Petasma with lobus armatus reduced to a small papilla not one-half as long as lobus accessorius, which latter is itself small, not one-fifth as long as the processus ventralis. Lobus connectens much broadened as compared with related species; lobus terminalis (homologue of the lobe figured as anterior lobule of "lc." in *S. splendens* by Hansen, 1922) slender and not bilobed. Lobus inermis (homologue of the lobe figured as "lt." in *S. splendens* by Hansen, 1922) reduced to a small papilla.

Female genital area much as in the related species.

14. *Sergestes (Sergia) creber*, sp. n.

Holotype ♂, St. 3766 XVIII; carapace length 16 mm. Organs of Pesta absent, cornea of the eye longer and

considerably broader than the stalk, numerous lensless dermal photophores including conspicuous unpaired median ones in pereionic sternites; related to *S. robustus* Smith. Nearly related to (identical with?) *S. "bisulcatus* Wood-Mason" of Hansen, 1919 (*nec* Wood-Mason).

Rostrum elevated, moderately deep at base with a long tapering tip; no more than a trace of dorsal tooth. Cervical sulcus well-marked laterally, absent dorsally. Post-cervical sulcus very faint laterally, very deeply cut across the dorsum.

Unciliated part of the external margin of the uropodal exopod about 2.3 times the ciliated part. Posterior arthrobranch of XII little more than two-thirds as long as the anterior one, about equal to the posterior arthrobranch of XIII, about four-fifths as long as the anterior arthrobranch of XIII. Cornea of the eye large, about one-fifth longer than the distal joint of the stalk and as wide as long; hardly a trace of ocular tubercle.

Some of the photophores are as follows: Exopod of uropod, a row of 6 to 9 discrete bodies median to the central muscle, a longitudinal row of 2 to 3 distal to the muscle. Antennal scale, a row of 10 to 15 distally, one obscure photophore at base. Middle of pleonic sternites, a pair in advance of the first pair of pleopods, a single one in advance of the last four; a pair behind the first three pairs of pleopods; a single one behind the fourth and fifth; one between the last three pairs of pleopods; a median row of 6 to 8 on the sixth sternite. Pereiopods, one in the base of ischium and of merus of all five legs; a row of 2 additional in proximal part of ischium of fifth leg; 5 additional in ischium, 12 in merus, one in base of propodus of fourth leg; 9 in distal part of merus of third leg; 8 in distal part of merus of first leg.

Petasma somewhat as in *S. robustus*, differing as follows: Lobus armatus reaches as far as does lobus connectens, much beyond processus ventralis, which does not reach as far as does the lobus terminalis; lobus armatus with an unarmed interval between a large distal hook and two large hooks in the middle of its length, three small hooks between middle and base. A well-defined and heavily armed though small lobus accessorius. Heavily armed proximolateral part of lobus connectens

not so swollen and heel-like as in *S. robustus*. Lobus terminalis not reaching higher than lobus inermis, not nearly as high as lobus connectens. A well-defined blunt projection at the lateral base of the lobus armatus.

Third leg of the female differs from that of all named species of *Sergia* in having a long, acute, curved, scythe-like coxal projection which reaches nearly to the midline.

15. *Sergestes (Sergia) extenuatus*, sp. n.

Holotype ♂, St. 3999 II; carapace length 12 mm.

Organs of Pesta absent, cornea of the eye longer and considerably broader than the stalk, numerous lensless dermal photophores including an unpaired median one in pereionic sternite XI; very nearly related to *S. robustus* Smith.

Rostrum very short and deep, with a small spiniform point and a minute dorsal tooth close behind it. Cervical and post-cervical sulci both shallow but continued across the dorsum.

Unciliated part of the external margin of the uropodal exopod about 2.1 times the ciliated part. Posterior arthrobranch of XII little more than three-quarters the length of the anterior one, equal to the posterior gill of XIII, which is four-fifths as long as the anterior gill of XIII. Cornea of the eye large, about one-seventh longer than the distal joint of the stalk and wider than long; hardly a trace of ocular tubercle.

Some of the photophores are as follows: Exopod of uropod, none. Antennal scale only one, near the base. Pleonic sternites, a single obscure median photophore between each pair of pleopods; a large crescentic one near the posterior end of the sixth sternite. Pereiopods, a conspicuous photophore at the proximo-median end of the ischium of all five legs; a faint one in the basis of the fourth and fifth legs; a faint one in the proximal end of the merus of the second, third, and fourth legs. The numerous photophores present in uropodal exopod, antennal scale, and meri of first, third, and fourth legs of adults of *S. robustus* are thus lacking in *S. extenuatus*, while the conspicuous proximomedian photophore in the ischium of the first leg of *S. extenuatus* is missing in *S. robustus*, where this joint instead bears a small photophore on its lateral edge.

Petasma nearly as in *S. robustus* but lobus connectens larger, stouter than lobus terminalis instead of slenderer; lobus armatus thickened at the tip and with more than a third of its median margin unarmed between the large distal hooks and the proximal series.

Genital area of female much as in *S. robustus*, but the distal end of the median edge of the coxa of the third leg with a large triangular tooth rather than a small angle; and the crest near the median edge of the posterior face of the coxa low and straight-edged, instead of bilobed and extending to the median margin as in *S. robustus*.

16. *Sergestes (Sergia) maximus*, sp. n.

Holotype ♂, St. 3933 I; carapace length 41.5 mm., total about 136 mm.

Organs of Pesta absent; cornea of eye longer and considerably broader than the stalk, numerous lensless dermal photophores including conspicuous unpaired median ones in pereionic sternites; nearly related to *S. robustus* Smith.

Rostrum very short and deep, nearly square; with a minute tip and a minute dorsal tooth close behind it. Cervical and post-cervical sulci both moderately deep, clearly cut across the dorsum.

Unciliated part of the external margin of the uropodal exopod about 2.1 times as long as the ciliated part. Posterior arthrobranch of XII more than three-quarters as long as the anterior one, about equal to the posterior arthrobranch of XIII, six-sevenths or more as long as the anterior arthrobranch of XIII.

Cornea of the eye very large, its length slightly greater than that of the distal article of the stalk; its breadth greater than its width. Stalk of unique shape; long, very slender in the middle, expanding considerably at base and tip. Ocular tubercle minute.

Some of the photophores are as follows: Exopod of uropod, a single large crescentic transverse organ just at tip of the median muscle. Antennal scale with a long stripe of photogenic tissue, distally separated into discrete organs, down the middle of its distal half; no proximal photophore as in *S. robustus*, but a short oblique stripe on the median side of the proximal half of the scale. Middle of pleonic sternites, a single photophore in advance of each

pair of pleopods, that of the first two segments appearing to be composed of a fused pair; a single wide photophore behind each pair of pleopods, all five appearing to be composed of a fused pair; sixth sternite with a row of four organs and one between the bases of the uropods; no photophores between the pleopods. Pereiopods, one conspicuous organ in the base of the ischium of all five legs and one in the base of the merus of the first three legs, on the median side; fourth leg with one in the ischium and one in the merus on the outer side; third leg with a long stripe down the outer side of the merus; first leg with a photophore at end of carpus on outer side.

Petasma much as in *S. robustus* but lobus armatus not half as long as processus ventralis, which latter reaches well beyond lobus terminalis; lobus connectens longer, its heel-like proximal part reaching the base of lobus armatus, its tip far beyond lobus terminalis; lobus inermis more than half as large as lobus terminalis and directed medially; a small papilla in the fork between lobus terminalis and lobus inermis somewhat as in *S. phorcus* Faxon.

Twelfth sternite of the adult female differs from that of all described species in that there are a pair of protuberances with deeply hollowed faces at its posterior margin (these concavities absent in a small female). Third leg of the female with a moderately large, bluntly pointed projection from the proximomedian corner of the coxa, immediately distal to which is a smaller but conspicuous blunt tooth, somewhat as in *S. phorcus* Faxon and also as in *S. bisulcatus* Wood-Mason [*nec* Hansen].

17. *Sergestes* (*Sergia*) *potens*, sp. n.

Holotype ♂, St. 3975 VII. Carapace length 25.5 mm., total about 85 mm.

Organs of Pesta absent, cornea of the eye much longer and broader than the stalk. numerous lensless dermal photophores including conspicuous unpaired median ones in pereionic sternites; nearly related to *S. phorcus* Faxon and *S. grandis* Sund.

Rostrum moderately long, very deep, subrectangular; with a minute slender tip and a rudimentary dorsal tooth. Cervical and post-cervical sulci very shallow laterally, hardly or not at all continued across the dorsum.

Unciliated part of the external margin of the uropodal exopod twice the ciliated part. Posterior arthrobranch of XII four-fifths the length of the anterior one; about one-tenth longer than the posterior gill of XIII; about equal to the anterior gill of XIII. Cornea of the eye enormous; its length and its diameter both twice that of the short, slender distal segment of the stalk; no trace of ocular tubercle.

Some of the photophores are as follows: Uropodal exopod, a single file of three to five organs distal to the muscle, none median to it. Antennal scale, a row of nine to twelve in the distal part, a short oblique stripe in the median side of the proximal part; no photophore in the centre of the base of the scale. Middle of pleonic sternites, a single one in advance of the first four pairs of pleopods, one between the last three pairs, a pair behind the first three pairs of pleopods, one behind the fourth and fifth pairs; sixth pleonic sternite with a median row of about five photophores, and one between the uropods. Pereiopods, one in the base of the ischium of all five legs; one in the tip of the ischium of the second through fifth legs; one in the tip of the merus of the fourth and fifth legs; one in the tip of the carpus of the fifth, 2 in the fourth leg; a row of 10 to 12 in the merus of the third, of 6 in the second leg.

Petasma much as in *S. phorcus* and *S. grandis*, with lobus connectens proximolaterally produced as an armed finger-shaped protrusion. Lobus armatus large as in *S. phorcus*, but with a well-defined lobus accessorius at base larger than that in *S. grandis*. Processus ventralis expanded at base with a slender tip; relatively short, not reaching as far as does lobus terminalis. Lobus terminalis bears an armed proximolateral lobule which is much better defined than in *S. phorcus*, but is much smaller than the well-developed distomedian part of lobus terminalis instead of much larger than a rudimentary distomedian part as in *S. grandis*.

Genital sternites and base of third leg of female not greatly different from these parts in *S. phorcus*.

18. *Sergestes (Sergia) bigemmeus*, sp. n.

Holotype ♂, St. 3570 VI; carapace length 12 mm.

Organs of Pesta absent, cornea of the eye much longer and considerably broader than the stalk, numerous minute

lenseless dermal photophores including obscure paired but no median organs in pereionic sternites ; most nearly related to *S. gardineri* Kemp, *S. richardi* Hansen [of which *S. crassus* Hansen is a synonym] and *S. krøyeri* Bate [with which *S. tropicus* Sund. and *S. "tenuiremus* Krøyer" of Hansen are identical].

Rostrum very short and deep with a marked ventrodistal angle, nearly square ; with a short point and no more than a rudiment of dorsal tooth. Cervical sulcus faint laterally, hardly apparent dorsally ; post-cervical moderate laterally, deeply impressed across the dorsum, and with only a very inconspicuous inflection at the midline.

Unciliated part of external margin of uropodal exopod about two and one-half times the ciliated part. Posterior arthrobranch of XII about four-fifths as long as the anterior one, about equal to the posterior gill of XIII, about seven-eighths as long as the anterior gill of XIII. Cornea of the eye much as in *S. richardi*, large, flattened, about one and two-thirds as long as the short, wide, flattened distal joint of the stalk. Ocular tubercle large and high.

Photophore pattern much as in *S. richardi*. Uropodal exopod with a row of about 12 to 14 very minute organs placed close to the median margin along nearly the entire length of the appendage ; antennal scale with a similar row placed farther from the margin. A pair of photophores between each of the first four pairs of pleopods, a single one between the fifth ; a pair in the middle behind and an obscure single organ before the first three pairs of pleopods ; sixth pleonic sternite without median photophores but with a row of minute ones along its lateral margins. Inter-pleopodal photophores without even so slightly developed a cuticular lens as that which accompanies these organs in *S. richardi* and *S. gardineri*. A photophore mediolaterally in the basis and the ischium of all five legs.

Petasma differs from that of *S. richardi* and *S. gardineri* and resembles that of *S. krøyeri* in having well-developed lobus accessorius and lobus inermis and in lacking a clearly defined proximolateral lobule on lobus connectens. Petasma differs from that of *S. krøyeri* in that its lobus armatus is uncurved, longer than the processus ventralis, and reaches nearly as far as does the lobus connectens ;

its lobus inermis is larger and stouter, reaching as far as does the lobus connectens ; and its lobus terminalis is less than a third as long as the lobus inermis and directed laterally.

Coxa of third leg of female differs from that in *S. richardi* in that the proximomedian nib is set off from the crest which guards the opening of the oviduct posteriorly, instead of being continuous with it as in *S. richardi*. The nib is deep and subrectangular, not cut into two sharp teeth as in *S. krøyeri*, not sub-lanceolate as in *S. gardineri*.

19. *Sergestes (Sergia) inequalis*, sp. n.

Holotype ♂, St. 3768 ; carapace length 12.5 mm.

Organs of Pesta absent, cornea of the eye much longer and considerably broader than the stalk, numerous lensless dermal photophores including obscure paired but no median organs in pereonic sternites XI and XII ; most nearly related to *S. bigenmeus* Burkenroad.

Rostrum of moderate size, sub-pentagonal in shape, with a small slender terminal spine and no dorsal tooth. Cervical sulcus moderate laterally, absent dorsally. Post-cervical sulcus weak laterally but clearly cut across the dorsum ; not inflected in the midline

Unciliated part of the external margin of the uropodal exopod about 2.2 times the ciliated part. Posterior arthrobranch of XII about three-quarters as long as the anterior one, about equal to the posterior arthrobranch of XIII, slightly more than five-sixths as long as the anterior gill of XIII. Cornea of the eye large, nearly twice as long as the short, broad peduncle ; ocular tubercle well-defined but minute.

The photophores are translucent in formalin-preserved material, rather than opaque or pigmented as in other species, and are consequently difficult to discover. Uropodal exopod with a row of 12 to 14 small photophores along its median margin. Antennal scale with a row of about 12 along its midline, of which the distal 2 are fairly large and conspicuous, the proximal organs minute and obscure. Pleonic sternites appear to bear very obscure photophores at the median base of pleopods of anterior pairs, and possibly unpaired median organs anterior to the pairs of pleopods ; photophores seem to be lacking

completely from the sixth pleonic sternite. There is a fairly conspicuous photophore at the mediiodistal end of the ischium of all five legs, and a much more obscure one at the mediiodistal end of the basis.

Petasma peculiar: *Processus uncifer* with only the rudiment of a hook at its tip. *Lobus armatus* relatively very short, directed laterally; similar in size and shape to the relatively large *lobus accessorius*; both *lobus armatus* and *lobus accessorius* only lightly armed. *Processus ventralis* short, broad, and flattened. *Lobus connectens* with a short unarmed distal part, and a long, slender, distally lightly armed projection on its lateral side; the whole shaped somewhat as an inverted high-heeled boot. *Lobus inermis* directed posterodistally, of moderate size but conspicuously over-reaching the *lobus connectens*. *Lobus terminalis* unarmed, somewhat smaller than the *lobus inermis* and directed laterally.

Genital area of female distinguished by a high transverse sinuose ridge at the posterior end of sternite XII, followed by a well-defined median longitudinal crest on XIII. Coxa of third leg somewhat as in *S. bigemmus*.

20. *Sergestes (Sergia) filictum*, sp. n.

Holotype ♂, St. 3549 IV; carapace length 15.5 mm.

Organs of Pesta absent, cornea of the eye considerably shorter than the stalk although moderately broader, a few lensless dermal photophores including obscure paired but no median organs in pereionic sternites; nearly related to *S. plumbeus* Illig and less closely so to *S. bisulcatus* Wood-Mason [*nec* Hansen] and to *S. gardineri* Kemp.

Rostrum short and deep; rounded, or anterodorsally truncated with resultant definition of a short, blunt terminal point. Both cervical and post-cervical sulci deeply cut across the dorsum, shallower laterally. Habitus rather slender with sides of carapace inflated by the enormous gills; integument rather membranous.

Unciliated part of the external margin of the uropodal exopod more than two and one-half times the ciliated part, as compared with two and one-quarter times in adults of *S. plumbeus* and two times in *S. bisulcatus*. Gills extremely voluminous, their primary branches very long. Posterior arthrobranch of XII only one-third

as long as the anterior one ; not half as long as the posterior gill of XIII, which is six-sevenths of the anterior gill of XIII and about one-quarter as long as the carapace. Cornea of the eye in males about seven-eighths, in females about four-fifths as long as the distal segment of the moderately long and slender stalk ; as compared with adults of *S. plumbeus* and *S. bisulcatus* in which the cornea is considerably longer than the stalk. Ocular tubercle low but distinct.

Photophores completely absent from antennal scale and from exopod and endopod of uropod, as compared with *S. bisulcatus*, in which there is a photophore in base of antennal scale and of uropodal endopod. An obscure pair in the middle behind the anterior four pairs of pleopods, a single one behind the fifth. A photophore in the base of the ischium of the fourth and fifth legs, and one at the base of the merus of the first three legs.

Petasma quite similar to that of *S. phorceus* Faxon, but slenderer and more lightly armed, with a longer distal part of lobus connectens, and without hooks at base of lobus terminalis. Petasma very like that of *S. bisulcatus* and of *S. plumbeus* ; differing from the former in having lobus armatus shorter than processus ventralis, lobus armatus with several small hooks scattered along the proximal two-thirds of its median margin and no hooks at base of lobus terminalis ; and from the latter in having lobus armatus at least four-fifths as long as the processus ventralis ; the proximolateral projection of lobus connectens directed laterally rather than proximally, and the distal part of lobus connectens curved in its distal fifth instead of its distal half as in *S. plumbeus*.

Coxal nib of third leg of female with median margin only shallowly incised and with rounded corners, instead of being conspicuously cleft into two tooth-like projections as in *S. plumbeus* and *S. bisulcatus*.

21. *Sergestes (Sergia) laminatus*, sp. n.

Holotype ♂, St. 3933 I ; carapace length 9.5 mm.

Organs of Pesta absent, cornea of the eye not as long as the stalk and only moderately broader, no dermal photophores ; most nearly related to *S. krøyeri* Bate and to *S. japonicus* Bate [with which *S. mollis* Smith is identical].

Rostrum low and rounded. Integument membranous. Cervical sulcus deeply cut laterally and dorsally; post-cervical absent.

Unciliated part of the external margin of the uropodal exopod nearly three times the ciliated part. Posterior arthrobranch of XII a lamella unprovided with filaments or with from a rudiment up to six well-developed pairs of filaments distally; filament-bearing part at most one-quarter as long as the anterior gill of XII. Posterior gill of XIII from one-half to three-quarters the length of the anterior one; anterior gill of XIII more than five-sixths as long as the anterior one of XII. Eye strikingly variable sexually: cornea in the female not two-thirds the length of the distal segment of the peduncle and not twice as broad as the base of the latter; in the male four-fifths the length of the peduncle and twice its breadth. Peduncle shorter, broader, and distally more enlarged in male than in female. Ocular tubercle conspicuous though not as high as in *S. kröyeri*.

Lobus armatus of petasma short and curved, not reaching the middle of processus ventralis and without any well-defined lobus accessorius. Processus ventralis flattened and very broad, leaf-shaped. Lobus connectens short, not reaching nearly as far as does processus ventralis, with a short slender tip and a swollen base. Lobus terminalis very large, reaching far beyond lobus connectens and the short, slender lobus inermis.

Female genital sternites and coxa of third leg much as in *S. japonicus*.