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LES SERGESTIDES DES EXPÉDITIONS DU TRAVAILLEUR ET DU TALISMAN,

PAR M. H. J. HANSEN.

(Gjæstøfte, près Copenhague.)

The study of the *Crustacea Decapoda* of the family *Sergestidae* captured by the *Travailleur* and the *Talisman* during their well-known expeditions has been given in charge to me by Professor E. L. Bouvier. The family comprises in all five genera belonging to two subfamilies, *Sergestinae* and *Luciferinae*, but two of the genera, *Sicyonella* Borrad. and *Acetes* H. M.-Edw., have never been found in the Atlantic north of lat. 10° N., and may perhaps never be found there. Of the three other genera two are represented in the collection. Of *Sergestes* H. M.-Edw. six species are present, and one among them, an interesting form with numerous highly developed luminous organs, is new to science; of the other genus, *Petalidium* Bate, the single species found north of equator is represented.

At present, I work out the splendid material of *Sergestidae* collected by the Prince of Monaco. As his material comprises every species hitherto taken by any other Zoologist or expedition north of lat. 10° N., and not only the adult or subadult specimens but besides larval stages of the great majority, the paper in preparation shall be a kind of monograph of the North Atlantic fauna (the Mediterranean included) of that family, containing somewhat detailed descriptions of all species and the larvæ together with numerous figures. This is stated here, because every species from the *Travailleur* and the *Talisman* has also been gathered by the Prince of Monaco, so that they will all be described and figured in the future paper. But of the single new species collected by the *Talisman* a preliminary description is given in this little treatise, and the type belongs to the Muséum d'Histoire naturelle.

SERGESTES ARCTICUS Krøyer (1855).

S. arcticus KRØYER, *Kgl. D. Vid. Selsk. Skrifter*, 5. Række, Naturv. og math. Afdeling, Bd. 4, 1859, p. 210, Tab. III, Figs 7a-g, Tab. V, Fig. 16.

S. arcticus STANLEY KEMP, *Fisheries Ireland Sci. Invest.* 1908, I (1910), p. 30, pl. III, figs. 13-19.

HABITAT :

Travailleur, 1882, 25 juillet, n° 32, 440 mètres, au large de Cadiz; 36° 36' lat. N., 9° 46' long. O. Sable. — Un exemplaire immature.

Talisman, 1883 : 14 juin, n° 18, 550 mètres; côte du Maroc, devant Mazaghan : 33° 33' lat. N., 11° 19' long. O. Vase et coraux. — Trois exemplaires adultes.

Talisman, 1883 : 30 août, n° 140, 2,285 mètres; golfe de Gascogne : 46° 4' lat. N., 6° 46' long. O. Vase argile. — Un exemplaire adulte.

SERGESTES MOLLIS Smith (1882).

S. mollis S. J. SMITH, *Rep. Comm. Fish and Fisheries for 1885* (1886), pt. XIII, p. 697, pl. XX, fig. 3, 3a, 4, 5.

HABITAT :

Talisman, 1883 : 13 juin, n° 15, 1,425 mètres; côte du Maroc : 33° 57' lat. N., 10° 47' long. O. Vase. — Un mâle adulte.

Talisman, 1883 : 10 juillet, n° 77, 2,713 mètres; côte du Soudan : 25° lat. N., 19° 20' long. O. Vase jaune. — Un petit spécimen.

Talisman, 1883 : 19 juillet, n° 102, 3,655 mètres; entre Dakar et le Praya : 15° 48' lat. N., 22° 43' long. O. Vase grise. — Une femelle adulte.

SERGESTES TENUIREMIS Krøyer (1855).

S. tenuiremis KRØYER, *Kgl. D. Vid. Selsk. Skrifter*, 5. Række, Naturv. og math. Afdeling, Bd. 4, 1859, p. 255, Tab. IV, Fig. 11, a-b [*Mastigopus*-stade].

S. Krøyeri BATE, *Challenger Exp., Zool.*, vol. XXIV, 1888, p. 388, pl. XI, fig. 5a-5b.

S. tropicus O. SUND, *Peneides and Stenopides : Rep. Sci. Results of the "Michael Sars" North Atl. Deep Sea Exp. 1910*, *Zool.*, vol. III, pt. 2, 1920, p. 18, figs. 27-28, figs. 30-32.

HABITAT :

Talisman, 1883 : 7 juillet, n° 60, 1,975 mètres; au sud de Fuerteventura : 27° 31' lat. N., 16° 28' long. O. Vase jaune. Une femelle adulte.

Adults of both sexes have been sufficiently characterised by Oscar Sund (*op. cit.*). Krøyer established *S. tenuiremis* on two somewhat young *Mastigopus* taken in the Atlantic a few degrees north of equator, and hitherto it has been impossible to refer this larval stage or somewhat larger specimens to any adult *Sergestes*. But in the Monaco collection I have found nearly every stage from the *Acanthosoma* to the largest *Mastigopus* and further to

the subadult and adult *Sergestes*, so that the name given by Kröyer ought to be used not only for the larvæ but besides for the adults. Whether it is identical with *S. Kröyeri* Bate is still uncertain; the single difference known (vid. Sund, *op. cit.*) is the shape of the rostrum, which is rather feebly developed and besides, as in some other forms of the genus, somewhat varying in shape in adult specimens of *S. tenuiremis*, so that in the present case the difference is perhaps of no value. But Bate's type of *S. Kröyeri* was captured at 29° 55' lat. S., 178° 14' long. W., thus rather far north-east of New Zealand, and according to my observations at least four species of *Sergestes* living in the North Atlantic are represented in the Indian Ocean or the Pacific by forms extremely similar to those in the Atlantic, but differing sharply in structural features in the male petasma. Therefore it is at present advisable to keep *S. Kröyeri* as a separate species, until the petasma in a specimen taken in the Southern Pacific has been carefully studied and compared with that organ in the North Atlantic *S. tenuiremis*.

SERGESTES ROBUSTUS Smith (1882).

- S. robustus* S. J. Smith, *Bull. Mus. Comp. Zool.*, vol. X, n° I, 1882, p. 97, pl. XVI, figs. 5-8b.
- S. robustus* STANLEY KEMP, *Fisheries Ireland Sci. Invest.* 1908, I (1910), p. 25, pl. III, figs. 1-12.
- S. robustus* O. SUND, *Rep. Sci. Results of the «Michael Sars» North Atl. Deep Sea Exp. 1910*, *Zool.*, vol. III, pt. 2, 1920, p. 11, text figs. 11-15; pl. I, figs. 2-3.

HABITAT :

Travailleur, 1881 : 16 août, n° 42, 896 mètres; au sudo-uest de l'Oporto: 41° 1' 20" lat. N., 9° 25' long. O. Vase et coraux. — Un mâle jeune.

Travailleur, 1882 : 12 juillet, n° 6, 745 mètres; au nord-ouest de La Coruña : 44° 7' lat. N., 9° 31' 30" long. O. Sable vaseux. — Un mâle adulte.

Travailleur, 1882 : 23 juillet, n° 24, 1,560 mètres; au large de Bahia de Setúbal : 38° 19' lat. N., 11° 49' long. O. Vase molle. — Un exemplaire jeune.

Travailleur, 1882 : 31 juillet, n° 40, 1,900 mètres; au large de Cap Blanco, Maroc : 33° 9' lat. N., 11° 58' long. O. Vase. — Un petit mâle.

Talisman, 1883 : 11 juin, n° 13 bis, 1,216 mètres; côte du Maroc, au large de Elarish : 35° 7' lat. N., 9° 38' long. O. Vase et coraux. — Un mâle adulte.

Talisman, 1883 : 17 juin, n° 32, 1,590 mètres; côte du Maroc, au

large de Cap Cantin : 32° 34' lat. N., 12° 9' long. O. Vase grise. — Trois exemplaires adultes.

Talisman, 1883 : 17 juin, n° 33, 1,350 mètres; côte du Maroc, au large de cap Cantin : 32° 31' lat. N., 12° 8' long. O. Vase rougâtre. — Une femelle adulte.

Talisman, 1883 : 17 juin, n° 34, 1,123 mètres; côte du Maroc, au large de cap Cantin : 32° 27' lat. N., 12° 15' long. O. Vase rouge. — Trois exemplaires adultes.

Talisman, 1883 : 27 juin, n° 51, 1,238 mètres; parages des Canaries : 28° 35' lat. N., 15° 36' long. O. Vase jaune. — Un mâle adulte.

Talisman, 1883 : 10 juillet, n° 77, 2,713 mètres; côte du Soudan : 25° lat. N., 19° 20' long. O. Vase jaune. — Une femelle immature.

Talisman, 1883 : 12 juillet, n° 85, 830 mètres; côte du Soudan : 22° 49' lat. N., 19° 41' long. O. Sable vasard vert. — Deux femelles adultes.

Talissun, 1883 : 18 juillet, n° 101, 3,200 mètres; entre Dakar et le Praya : 16° 38' lat. N., 20° 44' long. O. Vase grise. — Un exemplaire jeune.

SERGESTES SPLENDENS H. J. H. (1919).

S. splendens H. J. HANSEN, *Siboga-Expeditie*: XXXVIII, *Sergestidae*, 1919, p. 13-18. [Named, with some remarks, but without description.]

HABITAT :

Talisman, 1883 : 30 juillet, n° 113, 550-760 mètres; canal de Saint-Vincent : 16° 52' lat. N., 27° 30'-27° 32' long. O. Sable; gravier. — Environ cinquante exemplaires.

This species is founded exclusively on the *Talisman* material, but as two species with similar luminous organs were described in the «Siboga» paper, some remarks on differences between the two Indian species and the new form from the North Atlantic have been given there.

The group of forms of the genus *Sergestes* with numerous compound luminous organs comprises at present 4 species : *S. Challengeri* H. J. H. (1903) from the Indian Ocean and off the Fiji Islands, *S. gloriosus* Stebbing (1905) from off South Africa, *S. fulgens* H. J. H. (1919) from 8° 19' lat. S., 117° 41' long. E., and *S. splendens*. The luminous organs are characteristic; each resembles a very convex, vitreous and somewhat yellowish, circular lens: they differ considerably in size and many among them are easily observed. They are placed on the lower surface and near it on the margin or the side of the body from the head to sixth abdominal segment,

furthermore on all appendages, eye-stalks included, and finally at least 4-6 organs in a horizontal line on the inner surface of the carapace above the upper end of the branchiæ, but visible on the outer surface. In *S. Challengeri* about 160 organs are found (Kemp, 1913; Hansen in 1903 and 1919); in *S. fulgens* and *S. splendens* slightly more, but in *S. gloriosus* a much higher number; an excellent character is that the antennal squama has on its lower side 11 organs in *S. gloriosus*, but in the three other species only 4 organs, all very easily seen. *S. gloriosus*, *S. fulgens* and *S. splendens* are nearly equal in size, measuring about 50 mm. from apex of rostrum to tip of telson, while *S. Challengeri* is very considerably smaller.

Rostrum is conspicuously longer than deep, directed forwards and somewhat upwards, distally very tapering in the main because its lower margin turns much upwards, but the end is produced into a minute triangle. The supra-ocular spine is wanting; the hepatic spine well developed; the gastro-hepatic groove distinct on the sides, indistinct above; the cervical groove is generally very conspicuous; 5-6 luminous organs in the horizontal line on the side. Third and fourth abdominal segments, frequently also first and second segments, longitudinally somewhat excavated in the median line. The eyes are large, considerably depressed, seen from above longer than broad, and nearly longer than the inner margin of their stalks; no tubercle or process above on the stalk close behind the inner distal end.

The peduncles of the antennulæ somewhat long; first joint broad with its outer margin only a little shorter than the outer margin of the two other joints together; second joint rather thick; third joint about as long as the second and distinctly less thick, seen from the side conspicuously deeper in the male than in female; in the male the whole lower margin of this joint is nearly horizontal as in the female, because the distal third of the joint is not expanded downwards in a large triangle as in *S. Challengeri* or in a large plate with two long processes as in *S. fulgens*, but the terminal lower angle of the joint is produced forwards into a small or rudimentary tooth, wanting in the female. In the male the lower flagellum of the antennulæ differs much from that in any of the three other species, at its clasping organ is rudimentary; the proximal joints are much less thickened than in the other forms and the upper process, which in the two Indian species is very sinuate and longer than the joint below it, is in *S. splendens* half or only one-third as long as that joint, simple and feebly curved.

The antennal squama has the outer distal tooth well developed and generally reaching a little beyond the flatly convex terminal margin. Fourth thoracic legs reach about to the front margin of the eyes; fifth legs somewhat more than half as long as fourth pair, moderately broad, with the terminal joint only a little shorter than the preceding one. Exopod of uro-

pedes about four and a half times as long as broad, with the glabrous part of its outer margin terminating in a tooth and about two and a half times as long as the ciliated portion. — The petasma in the main as in *S. Challengeri* and *S. fulgens*, differing especially from both in having a somewhat short but very conspicuous «lobus inermis» at the inner base of «lobus terminalis».

In 1920, Oscar Sund described a fine Atlantic species without compound luminous organs as *S. splendens*, but as this name had been used by me in 1919 for the *Talisman* species and differences between it and allied forms pointed out, the species established by Sund must have a new name, and *S. Richardi* nom. nov. is proposed for it.

SERGESTES CORNICULUM Krøyer (1855).

S. corniculum KRØYER, *Kgl. D. Vid. Selsk. Skrifter*, 5 Række, Naturv. og math. Afdeling, Bd. 4, 1859, p. 252, Tab III, Fig. 4a-e. [*Mastigopus*-stade].

S. corniculum H. J. HANSEN, *Proc. Zool. Soc. London*, Dec. 1. 1896, p. 957.

S. corniculum O. SUND, *Rep. Sci. Results of the «Michael Sars» North Atl. Deep Sea Exp. 1910*, Zool., vol. III, pt. 2, 1920, p. 9, figs. 6-10.

HABITAT :

Talisman, 1883 : 10 juin, n° 11, 1,084 mètres; au large de cap Spardel : 35° 21' lat. N., 9° 25' long. O. Vase, coraux. — Un mâle mutilé.

Talisman, 1883 : 16 juin, n° 28, 2,600 mètres; côte du Maroc, au large de cap Cantin; 32° 46' lat. N., 12° 16' long. O. Sable, vase ordinaire. — Une femelle.

Talisman, 1883 : 16 août, n° 129, 2,220-2,155 mètres; de Fayal à Saint-Michel : 38° lat. N., 29° 23'-29° 25' long. O. Vase grise molle. — Un mâle.

S. corniculum Kr. is very closely allied to *S. seminudus* H. J. H. (1919) from the Indian Ocean, but the male petasma affords excellent specific characters, pointed out in my report on the «Siboga» *Sergestidæ* (1919) on pag. 21.

PETALIDIUM OBESUM Krøyer (1855).

Sergestes obesus KRØYER, *Kgl. D. Vid. Selsk. Skrifter*, 5. Række, Naturv. og math. Afdeling, Bd. 4, 1859, p. 257, Tab. IV, Fig. 10 a-f. [*Mastigopus*-stade].

S. sanguineus C. CHEN, *Sitzungsber. K. Preuss. Akad. Wiss. Berlin*, 1889, p. 538, Taf. III, Fig. 1 [*Mastigopus*].

Petalidium obesum H. J. HANSEN, *Proc. Zool. Soc. London*, Jan. 20, 1903, p. 56.