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A NEW SPECIES OF THE GENUS *LINUPARUS* WHITE, FROM THE SOUTH CHINA SEA (CRUSTACEA DECAPODA)¹⁾

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With one text-figure and two plates

The palinurid genus *Linuparus* White, 1847, has been represented by a single recent species, *Linuparus trigonus* (Von Siebold). The trawl survey of the northern shelf region of the South China Sea at present being carried out by the R.V. "Cape St. Mary" of the Fisheries Research Station, Hong Kong, has produced numerous examples of this species. Amongst old collections of Crustacea at the Fisheries Research Station, a single example of a specimen of *Linuparus* was found early in 1963, which showed numerous differences from the specimens obtained on the trawl survey. This specimen lacked data and was badly damaged, making a full comparison with *Linuparus trigonus* impossible. In January 1964, a second specimen was obtained which confirmed the constancy of the differences previously noted when compared with specimens of *Linuparus trigonus* of the same size and sex. The second specimen, which is undamaged is considered as the holotype of the new species and the original damaged example as the paratype, the former being deposited at the British Museum (Natural History), London and the latter at the Rijksmuseum van Natuurlijke Historie, Leiden.

Linuparus sordidus sp. nov. (text-fig. 1A; pl. 1, pl. 2 fig. A, C)

Material examined. — South China Sea, 19° 40.0' N 113° 41.0' E to 19° 39.5' N 113° 36.0' E, 182-172 fms, coarse sand; Granton Trawl; 5 January 1964; "Cape St. Mary", Cr. 1/64, Stn. 16, Trawl T/125. — 1 ♀ (holotype), carapace length 70.5 mm, intact. British Museum (Nat. Hist.), Reg. no. 1965.V.21.1.

Origin uncertain, presumably northern part of South China Sea. — 1 ♂ (paratype), carapace length 68.8 mm, badly damaged and with the mouthparts and left branchiostegite removed. Rijksmuseum van Natuurlijke Historie, Reg. No. Crust. D.21213.

1) Contribution no. 11 from the Fisheries Research Station, Hong Kong.

Description of holotype ♀. — A small *Linuparus* that shows all the characteristics of the genus as described by Barnard (1950) and closely resembles *L. trigonus* (Von Siebold) in its general morphology.

The supra-orbital spines are small and triangular and situated close to the dorsal midline. They bear a small acute point anteriorly, which extends slightly beyond the level of the ophthalmic segment. The dorsal aspect of the supra-orbital spines is flattened and covered with small granules.

A well-marked groove with a smooth base extends across the carapace behind the supra-orbital spines separating them from a transverse row of three small spines situated on the anterior gastric region. A similar small spine is situated in the midline behind the anterior gastric spine. A pair of low submedian ridges extend longitudinally across the posterior gastric region. Each ridge is slightly interrupted near the middle of its length and there is a distinct depression between their posterior ends anterior to the cervical groove. A ridge curves along the lateral border of the gastric region towards the base of the supra-orbital spine and bears small anterior, intermediate and posterior spines, the former being separated by a smaller interval than the latter. The anterior spine is slightly larger than the intermediate and posterior spines and lies at a level anterior to that of the anterior gastric row of spines. The concave anterior margin of the carapace bears a distinct antennal spine at its lateral end and is separated from the supra-orbital spines by a groove. The medial half of the ridge along the anterior border of the carapace bears 6 or 7 small subequal spines. A ridge extends posteriorly along the lateral border of the carapace from the antennal spine ending anteriorly to the cervical groove. It bears two small spines separated by a gap less than that found between the anterior spine and the antennal spine. A groove separates the anterior lateral ridge from the posterior part of the lateral gastric ridge and extends anteriorly between the anterior marginal ridge and the anterior part of the lateral gastric ridge. It is broad in its posterior portion and narrow in its anterior part and it joins medially with the groove around the supra-orbital spines. Its floor is feebly granulated posteriorly and almost smooth anteriorly.

The cervical groove extends deeply across the dorsum of the carapace at the middle of its length. The median portion is transverse, the dorso-lateral part curves antero-laterally and is concave posteriorly. The posterior part of the hepatic groove is almost vertically disposed and is continuous with the lower end of the cervical groove. The anterior part curves forwards almost to the pterygostomial angle and is concave posteriorly. It is broad and shallow in its posterior half, but deep and narrow anteriorly. A well-marked sub-marginal groove extends across the posterior aspect of the dorsum of the

carapace and is concave anteriorly, the posterior margin of the carapace being straight.

Posterior to the cervical groove a low ridge extends backwards as far as

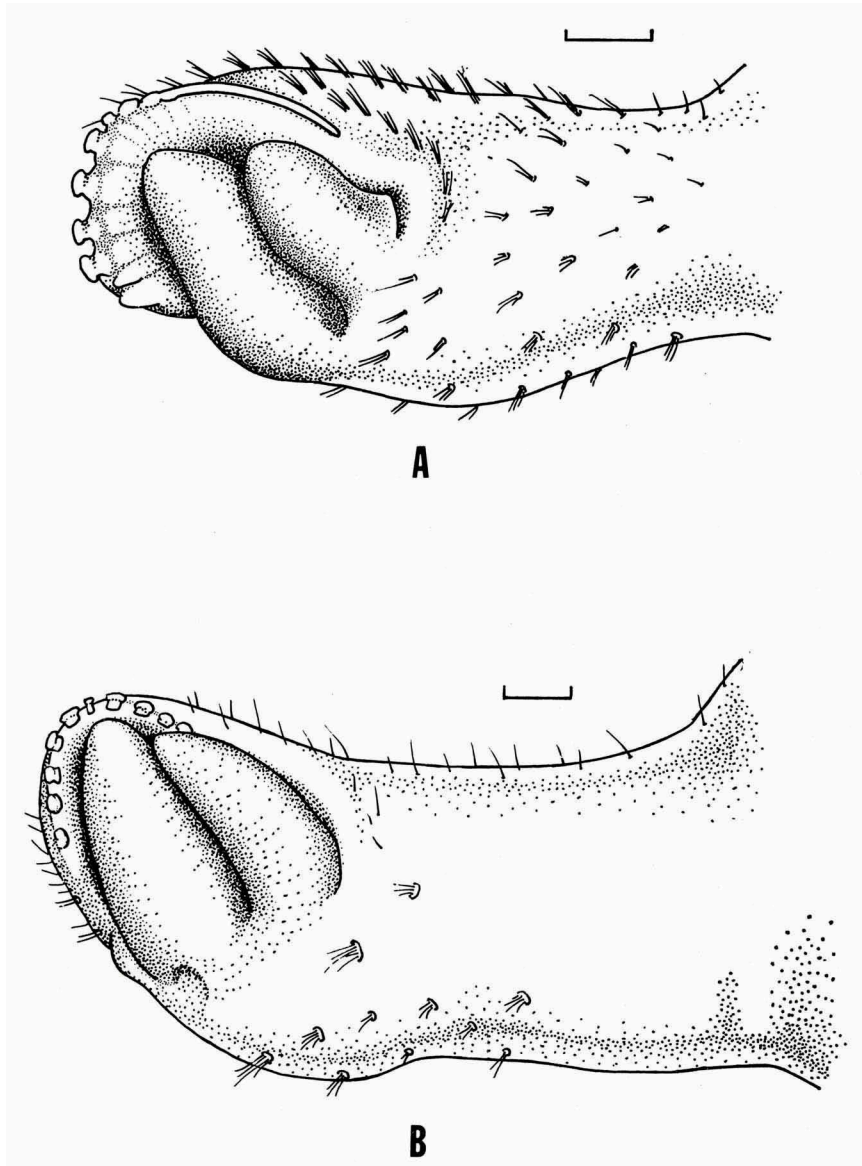


Fig. 1. Penile process of coxa of left fifth pereiopod of male. A, allotype of *Linuparus sordidus* sp. nov.; B, *Linuparus trigonus* (Von Siebold). The scales represent 1 mm.

the posterior submarginal groove. This ridge is broadest anteriorly, where it bears a very small spine, and tapers posteriorly. Another small spine is present on the median posterior margin of the carapace. A dorso-lateral ridge extends across the carapace from the postero-lateral angle to the posterior end of the lateral gastric ridge from which it is separated by the upper end of the hepatic groove. This lateral ridge is slightly concave dorsally and bears 4 or 5 very small spines along its anterior half, the most anterior lying just posterior to the cervical groove. The postero-lateral angle of the carapace is produced posteriorly beyond the level of the posterior dorsal margin. The ventral margin of the branchiostegite is thickened and bears a very fine submarginal carina from the level of the base of the fifth pereopod anteriorly to the level of the base of the third maxilliped. A deep transverse groove extends dorsally across the posterior part of the carapace between the postero-lateral angles and delimits a broad posterior marginal carina which is widest in the midline and becomes narrower laterally.

All aspects of the carapace are densely covered with fine setiferous granules with the exception of the bases of the cervical and hepatic grooves and the small depression posterior to the supra-orbital spines. The short setae arising from the granulations are directed anteriorly and are very noticeable to the touch.

The terga of the abdominal segments have smooth articular surfaces and granulated non-articular surfaces similar to that of the carapace except that the short setae are directed posteriorly. Apart from the first and sixth segments, each tergum is divided into a larger anterior and a smaller posterior part by a transverse furrow that extends across the midline. The furrow is directed postero-laterally so that the posterior division is about twice as wide in the midline as it is at the lateral termination of the furrow near the hinge of the segment. The furrows extend to the posterior margin of the tergum immediately above the hinge and are widest in their central portions. This transverse furrow is only feebly developed on the fifth abdominal segment. Traces of another furrow extend from the middle of the anterior border of the tergum obliquely postero-laterally to join the lateral end of the transverse furrow. This groove is most developed on the fourth segment and is only feebly developed on the second, third and fifth segments. The first abdominal segment has a well-developed transverse groove but only the lateral part of the anterior division of the tergum is present as the articular surface of the tergum is continuous with the median third of the groove. The antero-lateral portion of the tergum is separated by a shallow groove from the articular surface. A small median spine is present on the anterior border of the non-articular surface of the tergum of the first abdominal

segment and similar smaller spines are present on the anterior edges of both anterior and posterior divisions of the non-articular surfaces of the second segment. Feeble median granular ridges without spines extend across the third, fourth and fifth segments while the sixth segment, the tergum of which lacks grooves, bears a pair of granular submedian ridges that join anteriorly. The antero-lateral angle of the first abdominal tergum is a broad blunt rounded process that articulates with the postero-lateral extremity of the carapace. It is separated by a concavity from a single smaller more acute pleural process. The lateral margin of the second abdominal tergum is slightly thickened and separated from the pleuron by a shallow groove. The pleuron bears a broad acute antero-ventrally directed process separated by a large shallow concavity from a sharp ventral spine. A smaller concavity separates the ventral spine from a small posterior spine. The pleura of the second to fourth segments are similar except that the anterior border is slightly concave and the anterior spine is directed ventrally. It is separated by a small notch from the ventral spine which is directed slightly posteriorly. A pronounced concavity separates the ventral spine from the smaller posterior spine. On these segments the posterior border of the pleuron also bears a second small spine dorsally to the posterior spine. The pleuron of the sixth segment is triangular, the anterior border being sinuous and lacking a spine. The ventral tooth is large and curved slightly posteriorly and the posterior border bears three small subequal spines. The postero-lateral angle of the sixth segment bears a blunt tooth and the posterior margin is sinuous. The granulations on the abdominal segments are most marked along the lateral ridges of the terga and are least developed over the pleura. There are pairs of minute submedian spines on the sterna of second to fifth segments. The sternum of the sixth segments bears two pairs of submedian spines. The anterior pair are larger than the posterior pair and are twice as far apart. A pair of small intermediate spines are present on the posterior margin of the sternite.

The lateral borders of the calcified anterior two-fifths of the telson are parallel and terminate posteriorly in a pair of small spines. The non-calcified posterior part tapers slightly and has a feebly concave posterior margin. The dorsal surface of the calcified part is finely granulated and the surface of the whole telson is covered with short setae.

The lateral border of the basal segment of the uropod bears a blunt tooth and the calcified antero-lateral borders of the exopod and endopod terminate distally in a single tooth and an oblique series of four teeth respectively. The ventral aspect of the basal segment of the uropod bears a single acute tooth on its posterior medial angle.

The antennular peduncles consist of three segments. The proximal seg-

ment is rounded ventrally but carinate along its dorso-median edge. The intermediate and distal segments are subcylindrical. The ventral aspect of the proximal segment is markedly hirsute and the intermediate segment also bears numerous short setae. The distal segment is smooth. The basal segment is approximately two and a half times the length of the intermediate segment and is twice as wide proximally as in the middle of its length. The distal segment is about 1.3 times the length of the intermediate segment. The peduncle extends beyond the antennal peduncle by one-fifth of the length of the terminal segment. There are two short flagellae of which the median is longer than the lateral and subequal to the distal segment of the peduncle. The lateral flagellum is slightly shorter than the median.

The antennal peduncle is robust and its segments are covered with fine setiferous granules similar to those of the carapace. The proximal medial end of the basal segment forms a raised articulation with the articular lateral sides of the antennal plate, which are separated by a narrow groove only. The antero-medial angle of the segment bears a strong spine and the lateral border bears well-developed proximal and distal spines. Ventrally there is a small acute tooth at the proximal end of a raised granular ridge extending anteriorly and slightly laterally from the junction of the anterior and lateral edges of the epistomal region. A scale-like tooth is present at the disto-ventral extremity of the basal segment. The ventral surface is feebly granular and hirsute especially on the raised portions. The intermediate segment bears three strong lateral teeth and a single disto-medial tooth. The dorsal aspect bears two longitudinal rows of teeth. The central row bears 2 or 3 teeth and the medial row, which is curved first medially and then distally from its proximal end, bears 3 or 4 similar spines. An irregular longitudinal depression extends between the two ridges bearing these teeth. There are no teeth ventrally but there is a longitudinal depression ventro-laterally. The distal segment bears a tooth on the middle of its lateral border and also at its distal end. The medial border bears a subterminal tooth distally and also at the distal end of its proximal third. The dorsal aspect bears anterior and posterior spines on its posterior central half. The dorso-median aspect bears a longitudinal row of 2 or 3 teeth posteriorly. An oblique longitudinal depression lies between these two rows of spines. The ventro-lateral aspect bears a similar longitudinal depression. The middle of the anterior border bears a small tooth ventrally. Dorsally a similar but smaller tooth is present at the lateral end of the medial third of the anterior border. The antennal flagellum is rigid, dorso-ventrally compressed, and about 2.3 times the length of the carapace. It is grooved dorsally and ventrally throughout its length, and bears fringes of long setae along its medial and lateral borders.

The setae of the medial border are twice the length of those on the lateral border. Dorsal and ventral surfaces are covered with transverse rows of short setae.

The anterior border of the epistome is transverse and slightly produced anteriorly in the midline, where it bears four small tubercles, at its lateral angles and is concave in the intervening portions. The lateral margins are inclined posteriorly. The antero-median part bears a well-marked oblique granular ridge directed antero-laterally. There is a deep median fissure ending in a small posterior depression between the two ridges. The anterior part of the epistome is hirsute, the posterior half glabrous. The transversely oval openings of the antennal glands are raised and there is a curved depression half-way between them and the midline.

The third maxilliped extends beyond the epistome by half the length of its terminal segment. The medial border of the ischium bears 6 or 7 strong teeth which are slightly larger distally than proximally. The merus bears 6 or 7 strong teeth along the proximal three-fifths of its medial border and a strong tooth with a small subterminal tooth at the distal end of the medial border. The proximal teeth decrease in size distally. The ventral medial surfaces bear numerous tufts of long setae, the ventro-lateral aspects bears a few short setae and the dorsal aspects are smooth except for the disto-lateral end of the merus which is also hirsute. The dorsal aspects are concave and the ventral aspects convex with the lateral borders bluntly rounded and the median borders carinate. The ischium is about three-fifths of the merus in length. Dactylus and carpus are subequal in length and the propodus is slightly shorter. The dorso-medial border of the carpus is densely setose while the dorsal and dorso-lateral aspects are smooth. The propodus is similar. The ventral and ventro-lateral aspects are feebly setose. The dactylus is sub-cylindrical and setose with the dorso-median aspect flattened and glabrous. The basis bears a well developed exopod which reaches to four-fifths of the length of the merus. The flagellum is about one and a half times the length of the ramus. The ventro-medial aspect of the basis bears long setae and lacks teeth.

The first pair of pereopods are well-developed and reach beyond the distal border of the intermediate segment of the antennal peduncle by the length of the dactylus. All segments are bilaterally compressed and bear a fringe of long setae along their dorsal margins. The dactylus is as long as the dorsal margin of the propodus and has sharp setose upper and lower margins with a smooth convex outer aspect and a carinate inner surface with row of tufts of setae immediately dorsally to the carina. The propodus has the dorsal margin 0.8 times the length of the ventral border and the segment

decreases in width distally. Its maximal width is 0.35 times its maximal length. The outer surface is concave and feebly pitted. The inner aspect is divided into upper and lower areas but lacks a distinct longitudinal carina. The lower area bears scattered setose pits. The ventral border is also strongly setose. The maximum length of the carpus is slightly less than the dorsal margin of the propodus. An indistinct groove extends obliquely longitudinally across the outer aspect. The inner surface is smooth and convex. The ventral aspect is rounded and lacks a fringe of setae. The dorsum of the merus is carinate and twice the length of that of the propodus. Inner and outer aspects are convex. The ventral aspect is rounded and finely granulated. Distally it bears two rows of larger acute granules, a longer outer row of 9 or 10 and a shorter inner row of 4 or 5. The ischium is short and bears a few small granules ventrally. The ventral aspect of the coxa is setose and has a few small granules along its medial edge. The second to fifth pereopods are similar to the first except that they are progressively more slender posteriorly. The inner ventral row of granules on the merus is lacking and the lateral ridge is progressively less conspicuous on each limb posteriorly until absent on the fifth. The longitudinal oblique grooves on the outer aspects of the carpi are also reduced posteriorly and are absent on the fifth pereopod. The dorsal fringe of propodus and carpus is lacking on the three posterior pereopods and the ventral fringe is greatly reduced or absent. The meri are increasingly covered with short setae posteriorly. The inner ridge on the dactylus of the second pereopod is reduced and absent on the third and fourth. A lateral row of short setae is present on the dactyli of third and fourth pereopods. The dactylus of the fifth pereopod is very short and forms a small chela with a ventral process of the propodus. It is 0.13 times the length of the propodus and it bears medial and lateral sub-dorsal rows of setae. The distal end of the propodus is also setose. The posterior medial end of the third pereopod bears a small subcircular sexual aperture. The sternum is narrow anteriorly, bearing a small pair of hirsute submedian processes between the bases of the second maxillipeds and a single oral process between the third maxillipeds. Posteriorly the sternum progressively widens between the coxae of the pereopods. There is a raised granulated hump medial to the coxae of the first four pereopods and a deep pit posterior to each hump. The raised humps are most conspicuous opposite the coxae of the second and third pereopods. The midline of the sternum is smooth and unarmed but a medial pit is present at the level of the fourth pereopod and a small granulated elevation is present between it and the lateral elevation. The posterior margin of the sternum is slightly swollen in the midline and bears a few granules.

The first abdominal segment lacks pleopods. The second to fifth segments bear well developed biramous pleopods. The external ramus is large and foliaceous while the internal ramus is small and rod-like and bears a large appendix interna. The endopod of the second segment is distinctly smaller than the appendix interna, on the third segment they are subequal, on the fourth the endopod is distinctly larger and on the fifth it is again slightly larger.

Description of paratype ♂. — The specimen is of similar size to the holotype and it shows no significant differences from that specimen except as noted below. However, because of its badly damaged condition full comparison cannot be made.

The mandible has only a well-developed molar process which has no distinct teeth. Its main surface is hollowed and its medial margins are sharp edged. A palp is present and consists of two segments. The proximal segment, which is twice the length of the distal segment, is densely covered with plumose setae. The terminal segment, which is flattened, bears plumose setae only distally and along the posterior margin. The ventral surface of the mandible posteriorly and lateral to the attachment of the palp is also covered with dense plumose setae.

The maxillula has the proximal and distal endites articulated. The proximal endite is short and strongly curved medially. Its rounded distal end bears numerous strong spines and bristles. The medial half of the anterior border bears a row of fine setae while the posterior border bears only two. The distal endite is larger and longer than the proximal and its medial border is straighter than that of the proximal endite. The medial border bears a row of strong spines along its border with a parallel row of setae submarginally ventrally and rows of smaller spines dorsally. The anterior border is setose. On the anterior border of the distal endite, at a level with its union with the proximal endite, there is a small rod-like palp. The palp bears a few setae along its medial border and one distal seta. Its lateral border bears numerous short densely plumose setae.

The maxilla has a reduced proximal endite consisting of a small blunt proximal rounded lobe and a small more acute lobe. Both bear a few short setae. The distal endite is well-developed and bifid for three-quarters of its length. The two processes are very long and narrow and almost uniform in width. The distal process is longer than the proximal and both terminate in rounded ends bearing long setae. All other margins bear scattered short setae. An acute palp is present, equal to about half the distal endite in length. It bears a few short setae along its medial side and a dense mass of plumose

setae along its lateral border. A large epipod is present, acute anteriorly and broadly rounded posteriorly. Its borders are fringed with short dense plumose setae except at the posterior border where they are long and filiform. The first maxilliped has proximal and distal endites fused along their contiguous borders. The distal endite is subrectangular, about as broad as long, with a dense brush of setae along its medial border. The proximal endite is tapering and about three times as long as its central width. Distally it bears a brush of setae similar to those of the distal endite. Viewed dorsally the proximal endite appears much broader and bears a longitudinal ridge which ends distally in a dense tuft of strong setae. The endopod is a slender tapering process that lies closely adpressed to the medial side of the peduncle of the exopod for half its length. It is setose around the borders of its expanded base but devoid of setae distally. The exopod has a well-developed and slightly tapering peduncle that is deeply channeled dorsally for the distal two-thirds of its length, widening out basally. Its distal end is rounded and the flagellum arises from the median side. The flagellum is about one-third of the length of the peduncle and is subcircular in section proximally. The distal half is in the form of a flattened spatulate process densely fringed with plumose setae. The ventral surface of the peduncle bears an oblique longitudinal setose carina and the lateral border is fringed with short setae.

The second maxilliped has a short dactylus, almost twice as wide as long, with a rounded distal end bearing ten stout spines. The propodus is about two-thirds as long as its maximum width and its width is about twice that of the dactylus. It is strongly compressed and its dorsal and ventral borders are strongly rounded and fringed with long setae. The carpus is triquetral and bears a few long setae on its dorso-distal angle. The merus is simple and fringed with short setae along its medial border. The medial borders of the ischium and basis are smoothly rounded and bear tufts of plumose setae. A well developed exopod is present, the peduncle extending to the level of the distal end of the merus and the flagellum reaching to the middle of the dorsal edge of the propodus. The coxa is expanded laterally as an anteriorly angled flattened plate and its postero-lateral extremity bears a long epipod with a mastigobranch of half its length.

The third maxilliped is as described for the holotype. The exopod has a peduncle that extends to the level of the distal end of the ischium. The flagellum is of similar length and is densely fringed with plumose setae along its borders. The coxa is expanded as a broad plate laterally and bears an epipod and a mastigobranch of four fifths of its length.

The coxae of the fifth pereopod bear a cylindrical penile process projecting medially from the medial side. The distal end of this process is swollen

and bears the opening of the vas deferens on its ventral aspect. This opening is surrounded anteriorly by a semicircular chitinous ridge. The lateral half of this ridge is entire but the medial half bears six blunt teeth. The aperture is occluded by two soft, finger-like folds that project anteriorly from the posterior border. The surfaces of this process are, apart from the ventral aspect, covered with numerous tufts of short setae.

The sternum is similar to that of the female except that granulation is generally more marked and intermediate groups of tubercles are present on the sternites of the second and third pereopods. The branchial formula is as follows:

	Maxillipeds			Pereopods				
	1	2	3	1	2	3	4	5
pleurobranchiae	—	—	—	—	1	1	1	1
arthrobranchiae	—	—	2	2	2	2	2	—
podobranchiae	—	1	1	1	1	1	1	—
epipods	1	1	1	1	1	1	1	—
exopods	1	1	1	—	—	—	—	—

There are no pleopods on the first abdominal segment but the second to fifth each bear a uniramous pleopod with a foliaceous ramus. The paired submedian spines are similar to those of the female but larger and more acute.

Measurements. — The main measurements (in mm) of the holotype and (in parentheses) those of the paratype are as follows: total length, 381.0 (—); carapace length, 70.5 (68.8); carapace width at antero-lateral angles, 44.0 (41.0); carapace width across branchiostegite, 39.0 (37.6); body length, i.e., the length from the anterior dorsal margin of the carapace to the posterior dorsal median point of the sixth abdominal segment with the abdomen fully extended, 141.0 (136.0); proximal antennular segment, 23.0 (23.0); intermediate antennular segment, 9.0 (9.5); distal antennular segment, 13.0 (13.0); antenna, 208.0 (—); antennal flagellum, 160.5 (—). The measurements (in mm) of the various segments of the third maxilliped and the five legs are given in the following table:

	holotype ♀						paratype ♂					
	mxp	pereopods					mxp	pereopods				
		3	1	2	3	4		5	3	1	2	3
dactylus	6.6	13.5	15.0	7.6	7.5	3.0	5.8	—	—	9.2	11.2	—
propodus	5.8	17.4	20.4	22.2	22.4	22.8	4.5	—	—	20.5	21.7	—
carpus	6.0	14.9	15.8	14.8	15.0	15.4	6.0	—	—	15.3	14.5	—
merus	13.6	28.9	31.0	29.5	28.4	25.1	13.0	—	—	29.5	28.8	25.0
ischium	9.5	10.5	10.5	9.5	9.2	8.4	9.4	10.0	10.0	9.0	8.5	8.0

Colouration. — When freshly caught, the holotype showed a general pale yellowish brown colouration except for the distal two-thirds of the antennal flagellum which was red and faded out proximally. The cornea was dark brown.

Ecological data. — Data are only available for the holotype, which was caught by Granton Trawl between 172 and 182 fms. The bottom consisted of coarse sand and the bottom water temperature was 12.89° C, with a salinity of 34.52 ‰ and an oxygen concentration of 3.48 cc/litre (60 % saturated).

It is interesting to note that the holotype of *Linuparus sordidus* was collected together with seven specimens of *L. trigonus*. Other decapod crustacea that were associated in the catch were *Penaeopsis rectacutus* (Bate), *Plesionika longipes* var. *indica* De Man, *Heterocarpus sibogae* De Man, *Ibacus ciliatus* (Von Siebold), *Munida incerta* Henderson, *Munida* sp., and *Platymaia alcocki* Rathbun.

No other invertebrates were recorded but the ichthyofauna included the following: *Eridacnis radcliffei* Smith, *Myctophum* sp., *Parazen pacificus* Kamohora, *Cubiceps gracilis* (Lowe), *Lirus* sp., *Satyrichthys amiscus* (Jordan & Starks), *Tydemania navigatoris* Weber and two species of *Macrorhamphodes*.

DISCUSSION

Although numerous fossil species of *Linuparus* White, 1847, have been described, only a single recent species, *Linuparus trigonus* (Von Siebold), has been previously recorded. The fossil species are known from such incomplete specimens that it is not possible to recognize the most important characters (Holthuis, in litt.) and the present species is therefore described as new, full comparison being impossible. Numerous specimens of *Linuparus trigonus* from the northern part of the South China Sea have been available for comparison. These have shown very little variation in their main characters and no overlap with those used in the separation of *Linuparus sordidus*. Although only two specimens of *L. sordidus* are so far available for study, each shows the same characteristic differences from *L. trigonus*. No specimens of *L. trigonus* have been found to lack the red markings on the body although these do decrease in intensity on preservation. The lectotype of *L. trigonus* is preserved in the Rijksmuseum van Natuurlijke Historie, Leiden (Reg. No. Crust. D. 5611, Japan, 1823-1824, P. F. von Siebold), and the differences between *L. sordidus* and the lectotype specimen and other specimens of *L. trigonus* from Japan and the Philippines have been confirmed by Dr. L. B. Holthuis.

Although closely similar in its general morphology to the well known species *Linuparus trigonus*, *Linuparus sordidus* may be separated easily by a number of distinctive characters, of which the more conspicuous are listed below.

Linuparus sordidus sp. nov.*Linuparus trigonus* (Von Siebold)

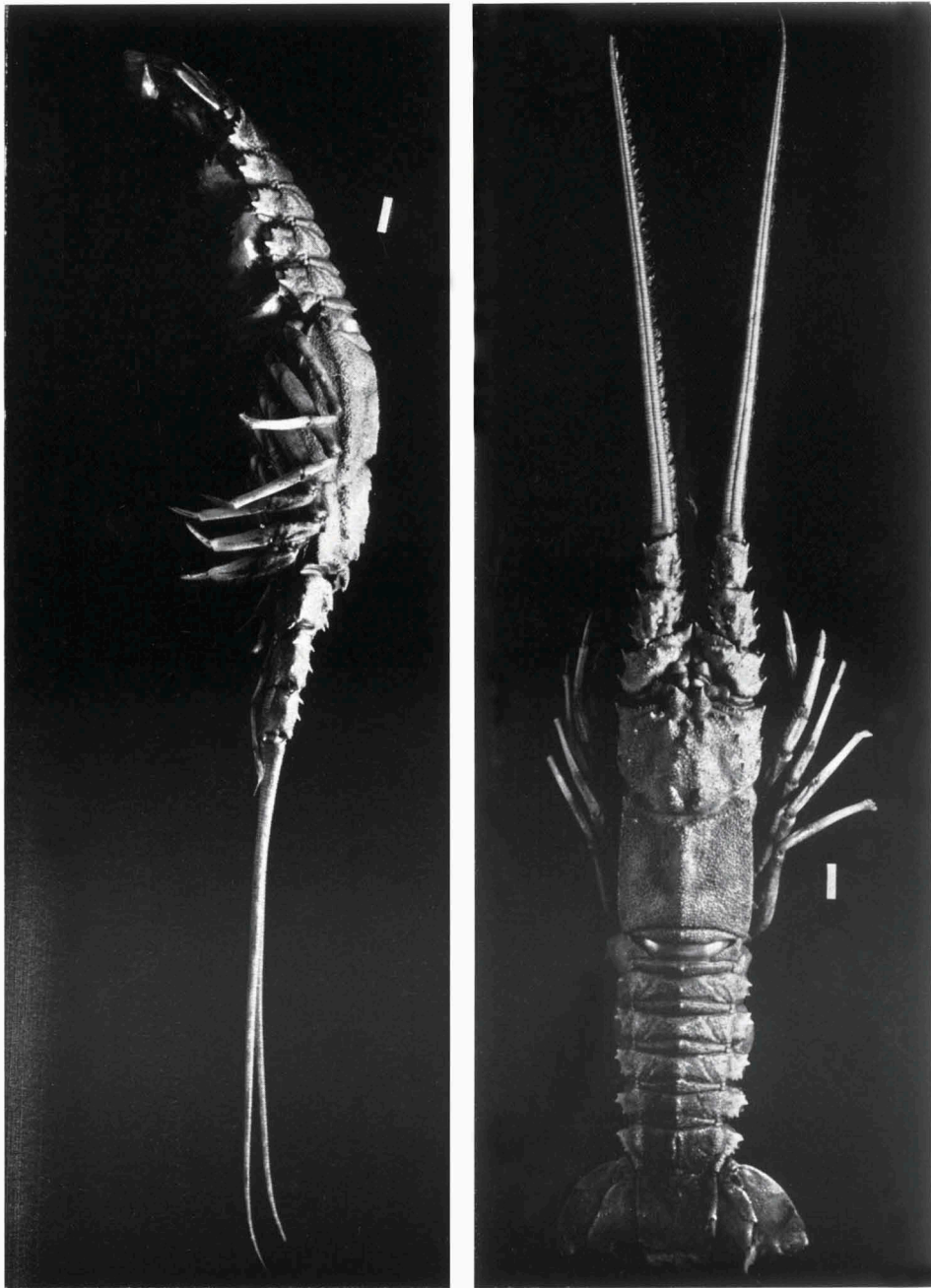
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|---|---|
| 1. Dorsal surfaces coarsely granulated and setose. | Dorsal surface feebly granulated or smooth and pitted. Feebly setose. |
| 2. Supra-orbital spines with single distinct anterior acute point. | Supra-orbital processes broader anteriorly with a large lateral tooth and 1-2 medial smaller teeth. |
| 3. Epistomal ridge coarsely granulated and lacking an acute anterior tooth. | Epistomal ridges feebly granulated and with a well-developed acute anterior tooth. |
| 4. Median anterior margin of epistome with a transverse row of small tubercles. | No small tubercles on anterior median border of epistome. |
| 5. Antennular peduncle distinctly longer than antennal peduncle. | Antennular peduncle not longer than antennal peduncle. |
| 6. Chitinous anterior margin of male genital aperture with toothed medial border and entire lateral border. | Chitinous anterior margin of male genital aperture toothed throughout its length. |
| 7. Dull yellow-brown in colour with distal two-thirds of antennal flagella red. | Body mainly bright red with yellow-brown patches. |

ACKNOWLEDGMENTS

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Limparus sordidus sp. nov., holotype in lateral and dorsal views. The white scale represents 1 cm.



A



B



C



D

A, C, *Linuparus sordidus* sp. nov., holotype; B, D, *Linuparus trigonus* (Von Siebold).
 A, B, dorsal view of frontal region; C, D, ventral view of epistomal region. The white
 scale represents 1 cm.