

A NEW SPECIES OF *TORTANUS* (CRUSTACEA, COPEPODA) FROM SOUTH AFRICA

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(With 4 figures and 3 tables)

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ABSTRACT

A new species of Copepoda *Tortanus capensis* (Calanoida, Tortanidae) is described from lagoons and estuaries on the west and south coasts of South Africa. This species appears to be most closely related to *Tortanus recticauda* Giesbrecht from the Red Sea and must be placed in the subgenus *Atortus*.

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Tortanus capensis sp. nov.

(Figs 1-4)

Occurrence

Numerous specimens, comprising adult males and females and copepodite stages of both males and females from estuaries and lagoons on the west and south coasts of South Africa, in salinities between 34,5‰ and 40,0‰.

Types

Type specimens from Langebaan Lagoon, 100 km north of Cape Town have been deposited in the South African Museum, Cape Town. Holotype, male, SAM-A12227, allotype, female, SAM-A12228, 15 paratypes, male, female and juvenile, SAM-A12229, with dissected appendages mounted on slides. Further paratypes also from Langebaan Lagoon have been deposited in the British Museum (Natural History) and the United States National Museum.

Description

Female

Length 2,20-2,40 mm.

Prosome (Fig. 1B-C) slender, viewed dorsally three times as long as wide, characteristically shaped with a cervical groove prominent in lateral view.

Forehead shallowly sloped. Rostral projections without filaments. Eyes prominent and reddish. All five pedigerous segments distinct but fourth and fifth partly fused. Posterior angles of metasome produced but rounded.

Urosome (Fig. 1B–C) two-segmented, last segment partly fused with the caudal rami. The genital segment is swollen.

Caudal rami (Fig. 1B–C) asymmetrical, right ramus slightly wider and longer, about four and a half times as long as wide distally but narrowed proximally, furnished with fine hairs on the distal part of their medial margins. Five plumose and one non-plumose caudal setae on each ramus, of which the second inner plumose seta is twice as long as the neighbouring setae.

Antenna 1 (Fig. 1A) of fifteen separate segments, almost reaching the end of the caudal rami when extended. Apparently segments 1–6, 8–12 and 24–25 are fused, but the segmentation of the proximal part of the antenna is somewhat obscure. Some further fusions are apparent in immature stages in the proximal segments and segments 23–25 are still fused in Stage IV. Aesthetascs appear on a number of segments particularly on the proximal part of the antenna. Four long setae are present on proximal segments and on segments 14, 16, 18 and 21 while six terminal setae arising from an expanded end give the antennae a characteristic appearance. The terminal setae are all plumose and the four long ones are asymmetrically constricted near their bases. Some specimens have one or two small terminal non-plumose setae.

The second antenna and mouthparts appear to be identical in the female and male except for the mandibular palp and are figured for the female (Fig. 3D–H).

Antenna 2 (Fig. 3D) with basipod, bearing one lateral and one sub-terminal seta and a medial fringe of fine hairs. Exopod one-segmented, bearing six setae and a small sub-terminal fringe of bristles. Endopod two-segmented, bearing four terminal setae and a small sub-terminal seta.

Mandible (Fig. 3E) with gnathal lobe heavily chitinized, bearing one large and four smaller teeth. Each of the smaller teeth has a supporting rib bearing a longitudinal row of short bristles on tiny transverse striations. Basipod of mandibular palp unarmed. Exopod and endopod each one-segmented in the male and bearing four and five terminal setae respectively. In the female the exopod and endopod are each two-segmented and bear five and six setae respectively.

Maxilla (Fig. 3F) with gnathobase, bearing seven serrated and plumose spines, three plumose setae and three small non-plumose setae. Endopod one-segmented, bearing three barbed terminal setae, one of which has widely spaced plumules.

Maxilla 2 (Fig. 3G) stout, with three endites, and indistinct indications of segmentation. Two of the three small lateral setae bear bristles. The three different setae on the medial endite bear a variety of bristles. The remaining six long terminal setae are flattened and bear lateral rows of spinules all medially orientated (see enlarged figure of tip). Small subsidiary setae are situated at the

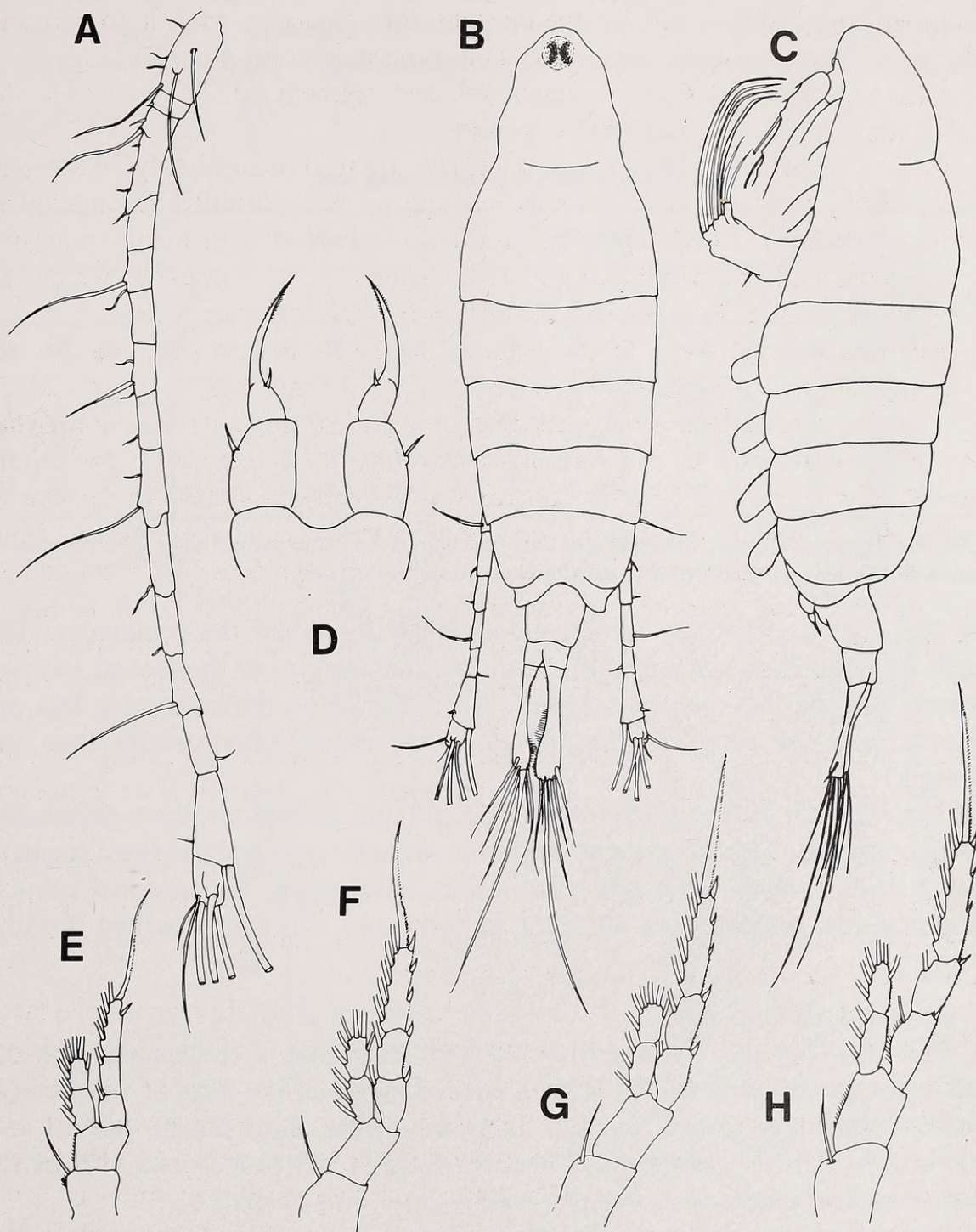


Fig. 1. *Tortanus capensis* sp. nov. Female.

A. Antenna 1. B. Dorsal view. C. Lateral view. D. Fifth legs. E. First swimming leg. F. Second swimming leg. G. Third swimming leg. H. Fourth swimming leg.

bases of the second and sixth long setae and the two barbed lateral setae.

Maxilliped (Fig. 3H) small and three-segmented, the basal segment bearing two long, curvaceous setae ornamented with diverging pairs of bristles, and the third segment bearing a small lateral seta and three strongly curved barbed terminal setae.

Swimming legs 1–4 (Fig 1E–H) biramous with two-segmented basipodite, two-segmented endopodite and three-segmented exopodite. They are similar in both sexes. The ornamentation of the swimming legs is represented in Table 1.

TABLE 1
Ornamentation of swimming legs.

Leg	Protopod				Endopod					Exopod						
	1		2		1		2			1		2		3		
	Si	Se	Si	Se	Si	Se	Si	St	Se	Si	Se	Si	Se	Si	St	Se
P ₁ . .	1	0	0	0	3	0	3	2	1	1	0	1	0	4	I	I
P ₂ . .	1	0	0	0	3	0	3	2	1	1	I	1	I	5	II	II
P ₃ . .	1	0	0	0	3	0	3	2	1	1	I	1	I	5	II	II
P ₄ . .	1	0	0	0	3	0	3	2	1	1	I	1	I	5	II	II

Si, Se, St represent internal, external and terminal spines, or setae respectively. The number of setae is shown in arabic numerals and spines in roman numerals.

The first leg has four less spines and one less seta than the remainder. The fourth leg has a fringe of fine hairs on the medial margins of the second basipod segment and the first exopod segment. All the setae on the swimming legs are plumose, and the setae on the endopods are much more slender than the remainder.

The fifth pair of legs of the female (Fig. 1D) are uniramous, three-segmented and symmetrical. The second segment bears an outer seta and the third segment bears a stout terminal spine and a subsidiary basal spine. The terminal spine is not articulated but fused to the third segment and it is finely barbed distally.

Male

Length 1,80–1,85 mm.

Prosoma (Fig. 2C, F) somewhat different from that of the female, with the head more evenly tapered but with a cervical groove like that of the female. Forehead shallowly sloped. Rostral filaments absent. Eyes not prominent and dark brown. All five pedigerous segments distinct but fourth and fifth partly fused. Posterior angles of metasoma rounded and not produced.

Urosome five-segmented of which the first is largest. Caudal rami (Fig. 2E) symmetrical and about five times as long as wide. The urosomes of several males were characteristically twisted to the right.

Left antenna 1 (Fig 2A–B) fifteen-segmented and similar to that of the female.

Right antenna 1 (Fig. 2D) geniculate, with fifteen separate segments, two of which are beyond the articulation. Segments 1–6, 19–21 and 22–25 fused. Prominent setae appear on proximal segments and on segments 14, 16, 18 and 21. The development of the specialization of the geniculate antenna may be observed in the right antenna 1 of a stage V male copepodite (Fig. 4H).

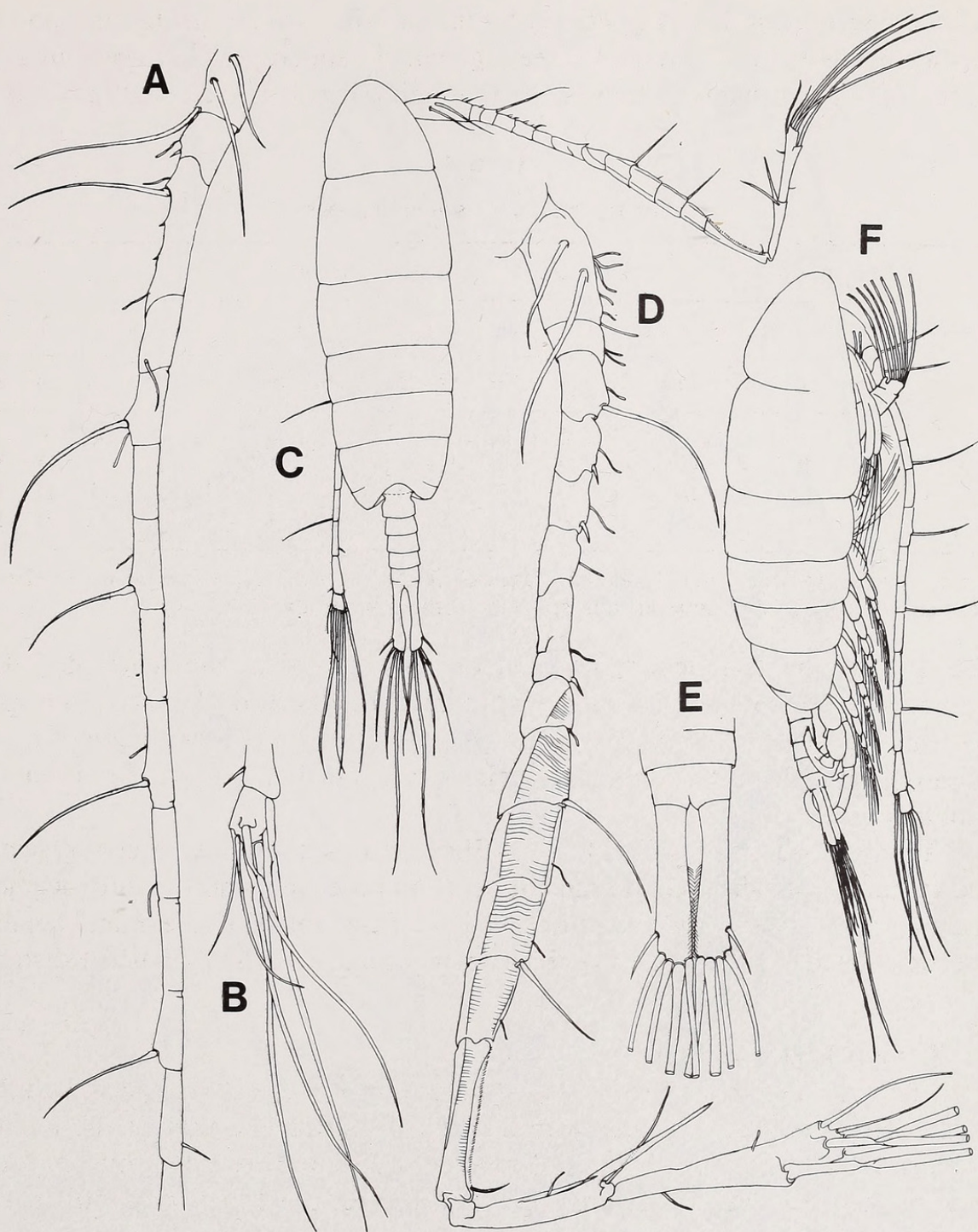


Fig. 2. *Tortanus capensis* sp. nov. Male.

A-B. Left antenna. C. Dorsal view. D. Right antenna. E. Caudal rami. F. Lateral view.

Segments 11-12 and 23-25 are fused at that stage, but segments 18 to 22 are free and there are prominent spines on segments 18 and 20. It would appear that the spine on segment 18 forms the serrated lamella on that segment of the geniculate antenna of the adult male.

Male fifth legs (Fig 3A-C) uniramous and asymmetrical with the right leg three-segmented and the left leg four-segmented. The first segment of the right leg is swollen and produced into a rounded projection at its medial distal corner.

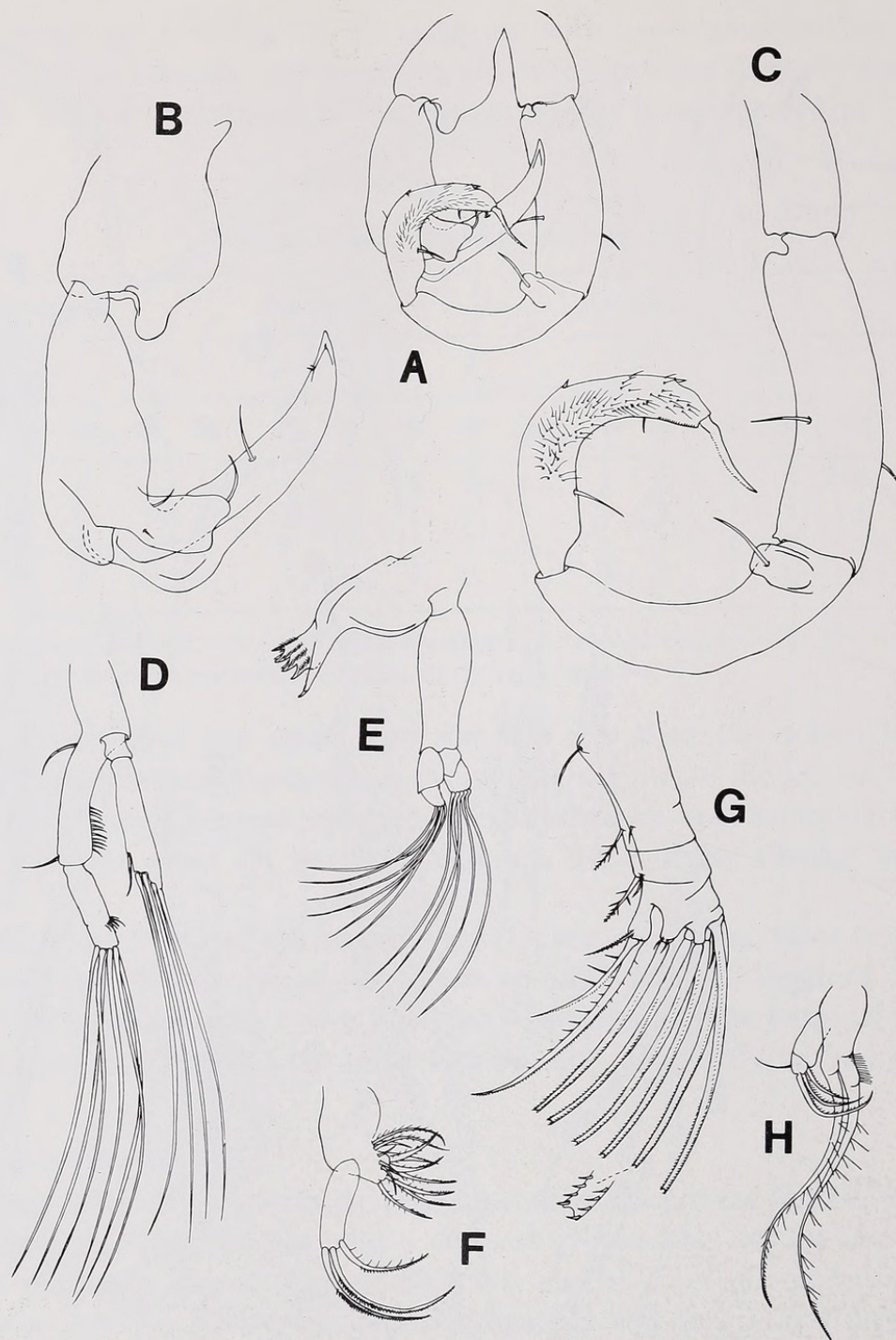


Fig. 3. *Tortanus capensis* sp. nov.

Male. A. Fifth legs. B. Right fifth leg. C. Left fifth leg. Female. D. Antenna. E. Mandible and palp. F. First maxillary. G. Second maxilla (end of one seta enlarged). H. Maxilliped.

The second segment bears a large bilobed medial projection near its distal end, which bears two setae. The terminal segment is in the form of a sub-chelate claw, strongly chitinized near the tip and bearing two medial setae, and two tiny bristles near its tip.

The first segment of the left leg is short. The second segment is longer and curved and bears a medial and an outer seta. The third segment is strongly curved tapers distally, and has an angular swelling proximally bearing a medial

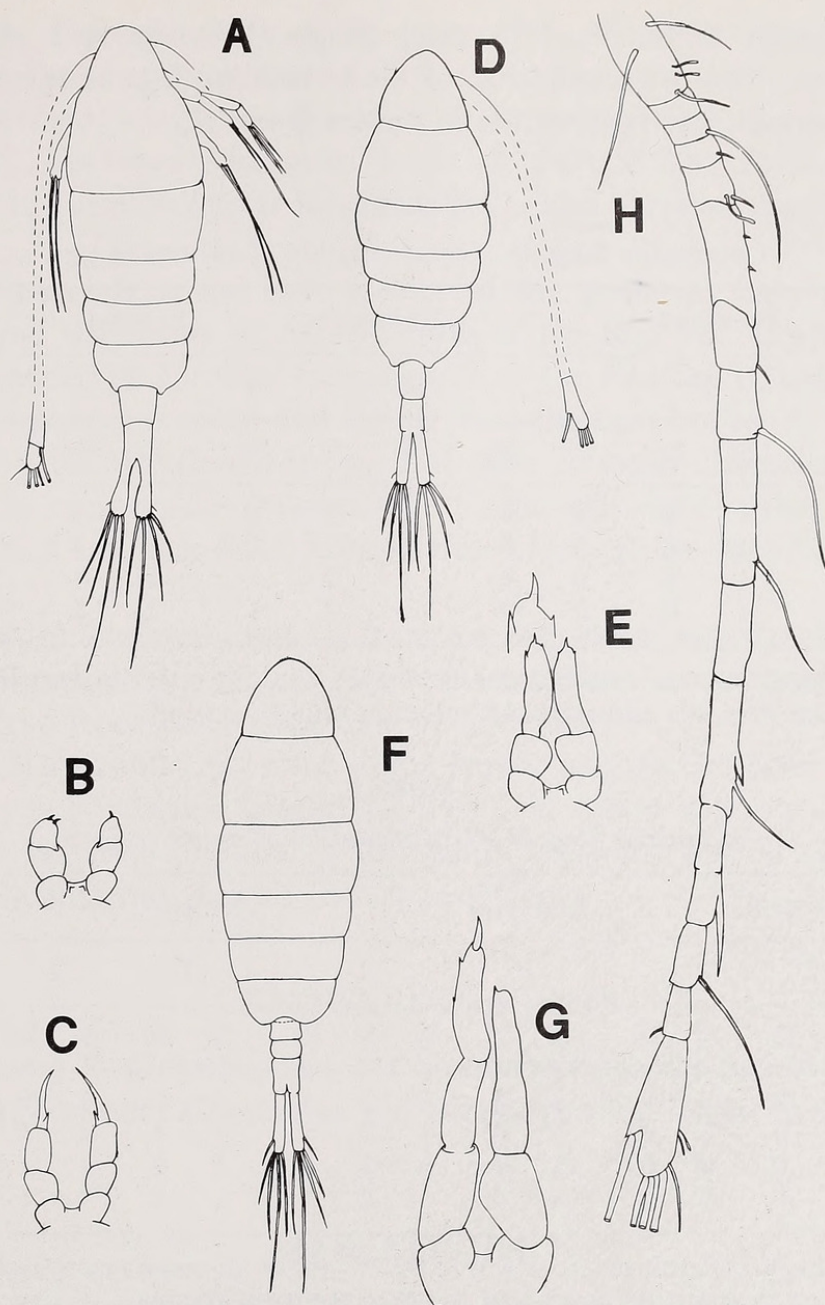


Fig. 4. *Tortanus capensis* sp. nov. Juveniles.

A. Stage IV female, dorsal view. B. Fifth legs, stage IV female. C. Fifth legs stage V female. D. Stage IV male, dorsal view. E. Fifth legs, stage IV male, tip enlarged. F. Stage V male, dorsal view. G. Fifth legs, stage V male. H. Right antenna 1, stage V male.

seta. The terminal segment is even more strongly curved and bears a finely serrate terminal spine, two outer marginal spinules, two inner marginal setae, and a large number of tiny bristles.

Spermatophore 300–380 μm long.

Juvenile stages (Fig. 4A–H)

Copepodite stages including stages four and five of both males and females were obtained. The changes that occur in the development of the urosome and the fifth legs particularly are apparent in the figures. Lengths: Stage IV female

1,45 mm, Stage V female 1,75 mm, Stage IV male 1,12 mm, Stage V male 1,50 mm. The ornamentation of the swimming legs of the Stage IV and Stage V copepodites is represented in Tables 2 and 3.

TABLE 2
Copepodite Stage IV. Ornamentation of swimming legs.

					Protopod				Endopod				Exopod				
					1		2		1		+	2	1		2	+	3
					Si	Se	Si	Se	Si	St	Se	Si	Se	Si	St	Se	
P ₁	.	.	.	.	1	0	0	0	6	2	1	1	0	5	I	I
P ₂	.	.	.	.	1	0	0	0	6	2	1	1	I	6	II	II
P ₃	.	.	.	.	1	0	0	0	5	2	1	1	I	5	II	II
P ₄	.	.	.	.	1	0	0	0	4	2	1	1	I	5	II	II

Si, Se, St represent internal, external and terminal spines, or setae respectively. The number of setae is shown in arabic numerals and spines in roman numerals.

TABLE 3
Copepodite Stage V. Ornamentation of swimming legs.

		Protopod				Endopod					Exopod						
		1		2		1		2			1		2		3		
		Si	Se	Si	Se	Si	Se	Si	St	Se	Si	Se	Si	Se	Si	St	Se
P ₁	.	1	0	0	0	3	0	3	2	1	1	0	1	0	4	I	I
P ₂	.	1	0	0	0	3	0	3	2	1	1	I	1	I	5	II	II
P ₃	.	1	0	0	0	3	0	3	2	1	1	I	1	I	5	II	II
P ₄	.	1	0	0	0	3	0	3	2	1	1	I	1	I	5	II	II

Si, Se, St represent internal, external and terminal spines, or setae respectively. The number of setae is shown in arabic numerals and spines in roman numerals.

Remarks

Tortanus capensis is apparently the twenty-first species of this peculiar genus of copepods to have been described. The genus *Corynura* was established by Brady (1883) for two species obtained by the *Challenger* expedition in the Philippine islands. This generic name which was preoccupied was replaced by the name *Tortanus* (from *tortus* and *anus*) by Giesbrecht & Schmeil (1898). The following species are now included in this genus: *Tortanus barbatus* (Brady), 1883 (= *denticulatus* Giesbrecht); *Tortanus gracilis* (Brady), 1883; *Tortanus forcipatus* (Giesbrecht), 1889; *Tortanus recticauda* Giesbrecht, 1889; *Tortanus discaudatus* (Thompson & A. Scott), 1897; *Tortanus setacaudatus* Williams, 1906; *Tortanus murrayi* A. Scott, 1909; *Tortanus brevipes* A. Scott, 1909; *Tortanus* (*Atortus* sub. gen. nov.) *tropicus* Sewell, 1932; *Tortanus derjugini* Smirnov, 1935 (see Brodsky 1950); '*Tortanus sp.*' Colefax, 1940 (*In* Dakin &

Colefax 1940); *Tortanus longipes* Brodsky, 1948; *Tortanus vermiculus* Shen, 1955; *Tortanus spinicaudatus* Shen & Bai, 1956; *Tortanus denticulatus* Shen & Lee, 1963; *Tortanus compernis* Gonzales & Bowman, 1965; *Tortanus rubidus* Tanaka, 1965; *Tortanus giesbrechti* Jones & Park, 1968; *Tortanus scaphus* Bowman, 1971; *Tortanus lophus* Bowman, 1971; and *Tortanus capensis* sp. nov. (1977).

Tortanus capensis is the first species of the genus to have been found anywhere round the coasts of Africa, south of the Red Sea. It appears to be most closely related to *Tortanus recticauda* from the Red Sea (Giesbrecht 1889) and *Tortanus murrayi*, *scaphus* and *lophus* from the East Indies (A. Scott 1909; Bowman 1971), but it differs from each of them in many characters. *Tortanus capensis* may be most readily distinguished by the fifth legs of either the male or the female, which are quite distinct from those of any of the described species of *Tortanus*.

Specimens of *Tortanus capensis* from the Swartkops estuary on the south-east coast of South Africa showed a few minor differences in comparison with the type material from Langebaan Lagoon.

In the two-segmented urosome of the female and the character of the male fifth legs *Tortanus capensis* might be placed in Steuer's group 3 which he established in his 1926 revision of the genus *Tortanus*. This is equivalent to Sewell's (1932) subgenus *Atortus* (Bowman 1971).

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REFERENCES

- BOWMAN, T. E. 1971. *Tortanus scaphus* and *Tortanus lophus*, new Pacific planktonic copepods, with notes on *Tortanus murrayi* (Calanoida, Tortanidae). *Pacif. Sci.* **25** (4): 521-528.
- BRADY, G. S. 1883. Report on the Copepoda collected by H.M.S. *Challenger* during the years 1873 to 1876. *Challenger Rep.* 1873-76 **8**: 1-142.
- BRODSKY, K. A. 1948. *T. longipes* sp. nov. from the Sea of Japan. *Proc. Pacif. Sci. Res. Inst. Fish Oceanogr.* **26**: 80. (In Russian.)
- BRODSKY, K. A. 1950. Calanoida of the far eastern and polar seas of the U.S.S.R. *Tabl. anal. faune U.R.S.S. Zool. Inst. Acad. Sci.* **35**: 1-442. (In Russian.)
- DAKIN, W. J. & COLEFAX, A. N. 1940. The plankton of the Australian coastal waters of New South Wales. *Publ. Univ. Sydney (Zool.)* **1** (1): 1-215.
- GIESBRECHT, W. 1889. Elenco dei Copepodi pelagici. *Atti. R. Ac. Lincei* (4) **5**: 24-29.
- GIESBRECHT, W. & SCHMEIL, O. 1898. Copepoda. 1. Gymnoplea. *Tierreich* **6**: 1-169.
- GONZALES, J. G. & BOWMAN, T. E. 1965. Planktonic copepods from Bahia Fosforescente, Puerto Rico, and adjacent waters. *Proc. U.S. nat. Mus.* **117**: 241-303.
- JONES, E. C. & PARK, T. S. 1968. A new species of *Tortanus* (Calanoida) from Pago Pago Harbour, American Samoa. *Crustaceana* (Suppl. I): 152-158.
- SCOTT, A. 1909. The Copepoda of the Siboga expedition. *Siboga Exped. Monogr.* **29** (A): 1-323.
- SEWELL, R. B. S. 1932. The Copepoda of Indian seas. Calanoida. *Mem. Indian Mus.* **10**: 400-402.

- SHEN, C. J. 1955. On some marine crustaceans from the coastal water of Fenghsien, Kiangsu Province. *Acta. zool. Sin.* **7**: 75-100. (In Chinese & English.)
- SHEN, C. & BAI, S. 1956. The marine Copepoda from the spawning ground of *Pneumatophorus japonicus* (Houttuyn) off Chefoo, China. *Acta. zool. Sin.* **8**: 177-234.
- SHEN, C. J. & LEE, F. S. 1963. The estaurine copepoda of Chiekong and Kaikong Rivers, Kwangtung Province, China. *Acta. zool. Sin.* **15**: 571-596.
- STEUEUR, A. 1926. Revision der Copepodengattung *Tortanus* Giesbr. *Boll. Soc. Adriatica Sci. Nat.* **29**: 49-69.
- TANAKA, O. 1965. The pelagic copepods of the Izu region, Middle Japan. Systematic account XIII. Parapontellidae, Acartiidae and Tortanidae. *Publ. Seto mar. biol. Lab.* **12**: 379-408.
- THOMPSON, I. C. & SCOTT, A. 1897. On the plankton collected continuously during the two traverses of the North Atlantic in the summer of 1897. *Trans. Liverpool biol. Soc.* **12**: 80.
- WILLIAMS, L. W. 1906. Notes on marine Copepoda of Rhode Island. *Amer. Nat.* **40** (447): 639-660.



Grindley, John Richard. 1978. "A new species of Tortanus (Crustacea, Copepoda) from South Africa." *Annals of the South African Museum. Annale van die Suid-Afrikaanse Museum* 74, 219–228.

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