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A new species of *Stenetrium* Haswell, 1881 (Crustacea: Peracarida: Isopoda: Asellota), from Navassa Island, Northern Caribbean Sea

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Abstract.—A new species of the isopod genus *Stenetrium* Haswell, 1881, is described from Navassa Island, Caribbean Sea. The new species, *S. kensleyi,* is compared to *S. serratum* Hansen, 1905, the only congener known from the western Atlantic following recent revisions of the Stenetriidae (Serov and Wilson, 1995, 1999; Bolstad and Kensley, 1999), and to some members of the recently proposed genus *Hansenium,* with which it shares several characters. The new species differs from *S. serratum* (and from other members of the genus) in its possession of an unusual male first pereopod, which has a greatly inflated dactylus, broadly triangular propodus, and a medial sharply triangular shark-fin-shaped tooth on the propodal cutting border.

In their comprehensive guide to isopods of the Caribbean Sea and adjacent regions of the northwestern Atlantic (Gulf of Mexico, Bahamas, and Bermuda), Kensley and Schotte (1989) reported two genera of the family Stenetriidae Hansen: *Stenetrium* Haswell, 1881, and *Stenobermuda* Schultz, 1979. The authors presented diagnoses, illustrations, and keys to these two genera and to the six species of *Stenetrium* (*S. bowmani* Kensley, 1984; *S. minocule* Menzies and Glynn, 1968; *S. patulipalma* Kensley, 1984; *S. serratum* Hansen, 1905; *S. spathulicarpus* Kensley, 1984; and *S. stebbingi* Richardson, 1902 [= *S. antillense* Hansen, 1905]) known at that time from the northwestern Atlantic. Since then, a seventh northwestern Atlantic species of *Stenetrium, S. caicosensis* Kensley and Heard, 1991, was described from the Turks and Caicos Islands. Additionally, Kensley (1994) designated a second northwestern Atlantic species of *Stenobermuda, S. iliffei,* a cave dwelling form that, like the type species *Stenobermuda acutirostrata* Schultz, 1979, came from Bermuda.

Serov and Wilson (1995) reviewed the taxonomic status of the more than 60 nominal species comprising the family Stenetriidae Hansen, 1905. As part of their study, they redescribed the type species, *Stenetrium armatum* Haswell, 1881, described the new species *S. adrianae,* and created four new genera to accommodate 23 species previously assigned to *Stenetrium.* Of the seven northwestern Atlantic species formerly assigned to *Stenetrium,* only *S. serratum* was recognized as a true member of that genus by Serov and Wilson (1995). The remaining stenetriid species from the northwestern Atlantic have been transferred to new genera (see Table 1) (and see Bolstad and Kensley, 1999, for a rediagnosis of Serov and Wilson's 1995 genus *Hansenium*). Thus, as currently understood (i.e., following Kensley and Schotte 1989; Kensley 1994; Serov and Wilson 1995, 1999; Bolstad and Kensley 1999) the family Stenetriidae contains 9 genera and approximately 67 species, 11 of which (in 6 genera) are currently known from the western Atlantic (Table 1).

Table 1.—Northwestern Atlantic species of the isopod family Stenetriidae and their current status following Serov and Wilson (1995, 1999) and Kensley and Bolstad (1999), listed in alphabetical order.

Former name	New name	Reference
Lexcenium poorei	Unchanged since description	Serov and Wilson, 1999
*Stenetrium antillense**	Transferred to *Hansenium*	Serov and Wilson, 1995
Stenetrium bowmani	Transferred to *Hansenium*	Serov and Wilson, 1995
Stenetrium caicoensis	Transferred to *Hansenium*	Serov and Wilson, 1995
Stenetrium kensleyi	Newly described, this study	
Stenetrium minocule	Transferred to *Liocoryphe*	Serov and Wilson, 1995
Stenetrium patulipalma	Transferred to *Mizothenar*	Serov and Wilson, 1995
Stenetrium serratum	Unchanged since description	Haswell, 1881
Stenetrium spathulicarpus	Transferred to *Hansenium*	Serov and Wilson, 1995
Stenetrium stebbingi	Transferred to *Hansenium*	Serov and Wilson, 1995
Stenobermuda acutirostrata	Unchanged since description	Schultz, 1979
Stenobermuda iliffei	Unchanged since description	Kensley, 1994

* Considered a junior synonym of *Stenetrium stebbingi* by Kensley (1982) but listed as a valid member of *Hansenium* by Serov and Wilson (1995).

As part of an ongoing biotic survey of the cryptic marine invertebrates of certain islands in the Caribbean (led by T. L. Zimmerman and J. W. Martin), we obtained numerous specimens, including adult males, of an undescribed asellote isopod referable to the genus *Stenetrium* Haswell, 1881, but also sharing some characters with the genus *Hansenium* as described by Serov and Wilson (1995) and Bolstad and Kensley (1999). The specimens came from waters surrounding Navassa Island, a United States Territory just off the southeastern coast of Cuba. Of the 18 species of *Stenetrium* recognized by Serov and Wilson (1995), the new species appears to have its closest affinities to *S. serratum,* the only other species of Stenetrium currently recognized (by Serov and Wilson 1995, but see also Remarks below) from the northwestern Atlantic. The species is also similar in some ways to *Stenetrium caicosensis,* a species that was treated as *Hansenium* (with spelling emended to *H. caicosense*) by Serov and Wilson (1995).

The description of the new species of *Stenetrium,* which is based solely on specimens collected from Navassa Island in the tropical Northwest Atlantic (northern Caribbean Sea), is the subject of this report. Unless otherwise indicated all of the material examined during this study was collected by R. Wetzer and G. Hendler. The specimens were fixed and preserved in 95% ethanol. Total length equals the distance from the tip of the rostrum to the posteriormost margin of the pleotelson. RW numbers refer to field collection stations of the third author; LACM numbers are catalog numbers in the Natural History Museum of Los Angeles County's collection of Crustacea.

Stenetrium kensleyi, new species
Figs 1–4

Material examined.—Holotype (LACM CR 2000-017.2): 1 ovigerous female, Atlantic, Caribbean Sea, Navassa Island, Pinnacles, 18°24.463′N, 75°01.094′W, SCUBA, ~19 m, *Halimeda* washes, R/V Coral Reef II, 21 March 2000, RW00.070. Paratypes: LACM CR 2000-017.1, 2 adult males (most appendages present), 2 ovigerous females (lacking most appendages), 2 specimens (sex not determined), same collection data as holotype. LACM CR 2000-021.1, 4 females [2 females with oostegites and 2 females without oostegites; the latter 2 in poor condition]; 4 subadult males, Atlantic, Caribbean Sea, Navassa Island, NW Lulu Bay, 18°23.856′N,

75°01.220′W, SCUBA, *Halimeda* washes, R/V Coral Reef II, 19 March 2000, NIP-2000-13, RW00.049. LACM CR 2000-021.2, 1 subadult male, Atlantic, Caribbean Sea, Navassa Island NW Lulu Bay, 18°23.856′N, 75°01.220′W, SCUBA, *Halimeda* washes. R/V Coral Reef II, 19 March 2000, NIP-2000-13, RW00.049 (first left pereopod illustrated in fig. 3B). LACM CR 2000-020.1, 1 female without oostegites (most appendages intact), Atlantic, Caribbean Sea, Navassa Island, near Lulu Bay, 18°23.791′N 75°01.195′W, SCUBA, ~9 m, rock rubble wash, R/V Coral Reef II, 18 March 2000, coll. R. Wetzer and D. O'Foighel, RW00.044. LACM CR 2000-018.1, 1 adult male (most appendages missing), Atlantic, Caribbean Sea, Navassa Island, Tom's Rock, 18°23.655′N 75°01.094′W, SCUBA, rock and sponge washes, R/V Coral Reef II, 21 March 2000, RW00.074. LACM CR 2000-019.1, 4 adult males (most with appendages missing but with chelipeds intact), Atlantic, Caribbean Sea, Navassa Island, 18°23.655′N, 75°01.094′W, RW00.074 and RW00.051 (combined).

Diagnosis.—*Stenetrium* with short, wide, distally truncate rostrum. Cephalon with well developed and acute anterolateral and antennal spines subequal in length; anterolateral spine not quite reaching level of rostral tip; antennal spine slightly longer and extending anteriorly slightly beyond rostral tip. Eyes well pigmented, reniform. Pereonites 1–3 with sharply angled anterolateral margins (less so on pereonite 4). Pleotelson with lateral margins appearing serrate, with four movable spiniform setae and posterolateral tooth; posterior border gently rounded. Male first pereopod with dactyl distally inflated, terminally rounded, and longer than propodal width; propodus large, subtriangular, bearing 2 triangular teeth on distal border opposite dactyl, one at anteroventral border and one close to midlength of distal border; carpus not enlarged or elongate, unserrated. Uropodal exopod approximately equal in length to peduncle and 3/4 length of endopod.

Description of male.—Body (Fig. 1A, B). Total length 3.6 mm, approximately 3.5 times width, as measured across widest (6th) pereonite. Pereonites 1–3 sharply angled forward; pereonite 4 similar but less sharply angled; pereonites 5–7 directed posteriorly. All pereonites with at least one long lateral seta extending outward.

Pigmentation (Fig. 1A). Pattern somewhat similar to that described for *S. serratum* Hansen, 1905 (see Kensley and Schotte, 1989, fig. 46F). Head with pigmentation confined mostly to anterior third and between the eyes. Pereonite 1 with pigment in two narrow lateral bands running anterior to posterior, with central region and anterolateral corners unpigmented. Pereonite 4 mostly unpigmented. Pleotelson almost entirely pigmented except for horizontal unpigmented band at about midlength and for outer posterior and posterolateral margins. Other pereonites variously covered with reticulated pigmentation broken up by open areas, as shown.

Head (Fig. 1A, B). Eyes located dorsolaterally, reniform, well pigmented, composed of some 15–18 ommatidia. Anterolateral spines (anterolateral lobes) well developed, acute, extending forward almost as far as antennal spines, separated from antennal spines by rounded gap extending backward toward eye. Antennal spine acute, extending anteriorly to level of rostrum. Rostrum broad, distally truncate. Outer (lateral) border of anterolateral lobes each with 2 long setae and scattered shorter setae as illustrated.

Pleotelson (Fig. 1A, B). Base just wider than length; width measured at level of third lateral spine equal to length. Lateral margins with 4 movable spines (each with 1 long and 1 short seta on either side) and strong posterior tooth just anterior to posterolateral notch; posterolateral notch with single short seta. Posterior border of pleotelson (between notches) smoothly rounded,

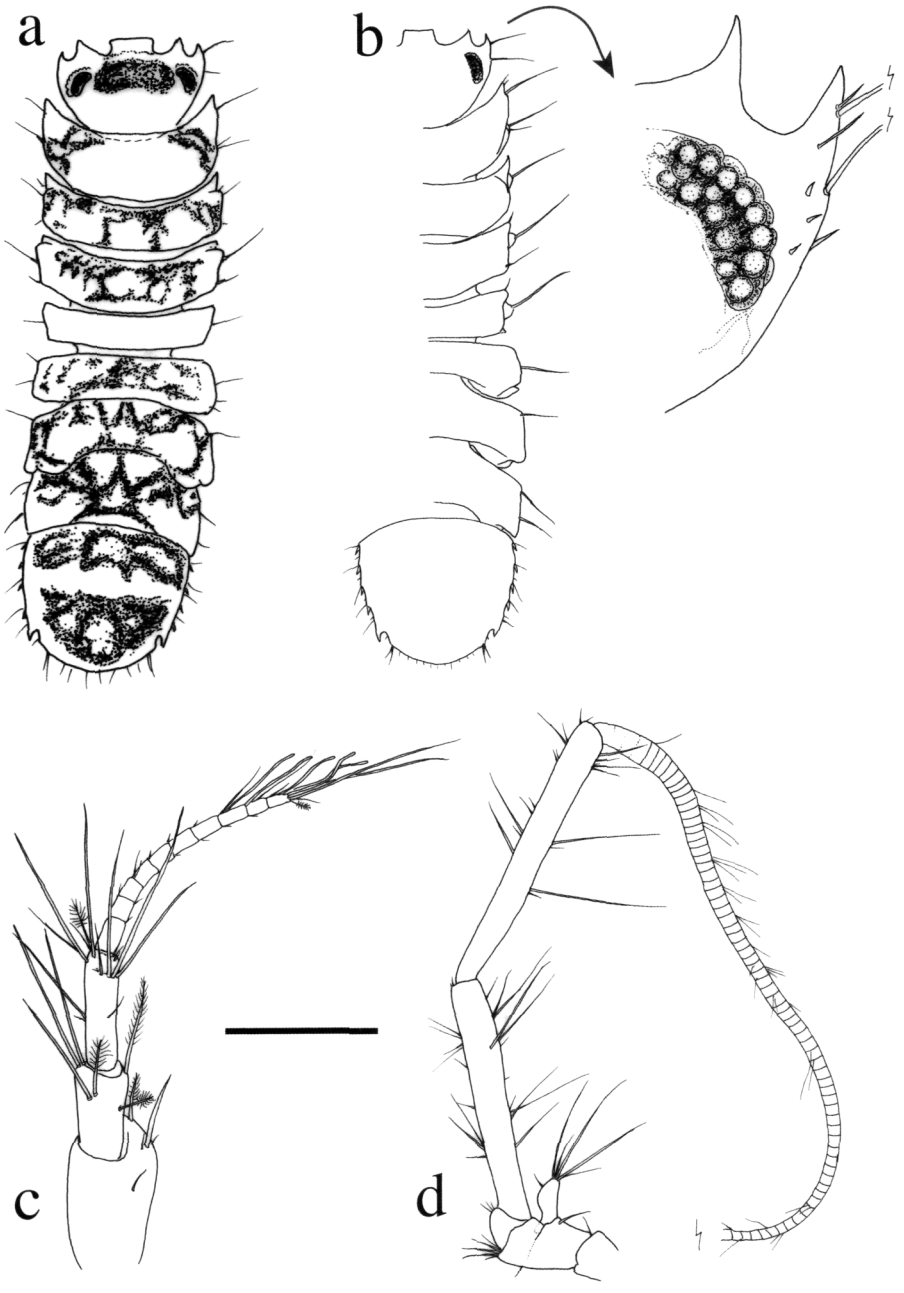

Figure 1. *Stenetrium kensleyi,* n. sp., adult male and female body from and antennae 1 and 2. A, adult female holotype (LACM CR 2000-017.2), dorsal aspect showing generalized pigmentation pattern; B, adult male (one of two male paratypes as part of LACM CR 2000-017.1), dorsal view of pleotelson, right half of pereonites and cephalon showing rostrum (chephalic appendages and uropods excluded) with enlargement showing distolateral aspect of cephalon with details of eye, anterior spines, and setation; C, antenna 1 of adult male (same specimen as B); D, antenna 2 of adult male (same specimen as B). Scale bar = 1 mm for A and B; 0.2 mm for C; 0.6 mm for D.

with scattered short setae flanked by pair of longer setae at either end of border.

Antenna 1 (Fig. 1C). Basal article broadest and extending anteriorly well beyond rostrum (rostrum reaching to about midlength of this article). Articles 1–3 with simple and plumose setae, with number of setae increasing from article 1 to 3. Flagellum with 10 articles, with distal 3 articles bearing 5 aesthetascs.

Antenna 2 (Fig. 1D). First article lacking lateral spine. Articles 2 and 3 side by side. Article 2 narrow. Article 3 wider distally than proximally and longer than combined articles 1 and 2, and bearing distal setose scale close to base of article; scale broadest at midlength and with 1 subterminal and 5 terminal setae. Article 4 about half length of article 3 and about 1/6 length of article 5. Articles 5 and 6 elongate, article 6 slightly longer than 5.

Mouthparts (Fig. 2A–E). Mandible (Fig. 2A, B; right mandible illustrated) with well developed molar and incisor processes; molar process with short, thick spines and curved spine-like setae; right incisor process with 4 strong distal teeth and approximately 8 stout, recurved, serrate setae. Mandibular palp (Fig. 2B) large, with 3 articles; first unarmed and slightly less than half length of second; second article longest and with 2 large, sinuous and minutely serrulate setae bordering field of 10 shorter stout setae; third article elongate, approximately two thirds as long as second, curved, thicker basally than distally, and bearing field of basal setae, row of short setae along ventral border, and gradually lengthening distal setae, as illustrated. Maxilla 1 (Fig. 2C) lateral lobe with 10 heavy serrate spines distally and scattered simple setae as shown, 2 aspects shown; medial lobe with 3 stout plumose setae and distal simple setae. Maxilla 2 (Fig. 2D) with lateral and middle lobes slender and subequal in length; medial lobe shorter and thicker, with stout, serrate setae on distal border and plumose and simple setae along medial border as shown; lateral and middle lobes each with 5 stout setae distally and row of 6–7 shorter, thinner setae just proximal to tip. Maxilliped (Fig. 2E) with long, straight-sided basis, 5-articulate palp, and elongate and distally tapering epipod with 6 short setae. Palp article 1 by far the shortest; articles 2 and 3 longer and wider than articles 4 and 5. Maxillipedal endite with 3 coupling hooks on mesial margin and 5 fan setae on distal margin.

Pereopod 1 (gnathopod) of terminal 3.6 mm male (Fig. 3A) extremely large, wide, subchelate. Dactyl distally swollen, widest at midlength, extending past anterolateral border of propodus and terminating in unequal pair of stout spines; setation as shown. Propodus broad, widest distally, subtriangular, with sharp anterolateral tooth and wide, triangular "sharkfin-shaped" tooth just proximal to midlength of distal border. Carpus and merus approximately equal in length; carpus lacking any extensions or projections and not serrate along distal border. Other articles and setation as shown. Subadult male (TL 3.2 mm) (Fig. 3B) with propodus subquadrate, dactyl acute distally. Propodus of female (Fig. 3C) lacking spines on anterolateral border.

Pereopods 2–7 (Fig. 4A–F) similar to each other. Dactylus with 2 stout, corneous distal "spines" (or heavily modified setae) giving the appearance of a "biunguiculate" tip, and 1 strong subterminal "accessory spine" on posterior margin. Propodus with large, blunt, distal "spine" nearly half as long as, and wider than, dactylus. Propodus and carpus elongate, each with 4 or 5 stout spines evenly spaced along ventral border; each with at least 1 plumose seta arising from distodorsal angle. Merus subtriangular, with long simple seta arising from distodorsal angle. Ischium with 1 to several plumose setae. Basis widest at midlength, with long seta arising from midlength projection.

Pleopods (Fig. 5A–C). Pleopod 1 (Fig. 5A) reduced, subrectangular, rami similar, with 2 small spines on medial border and with few setae on outer distal border. Ple-

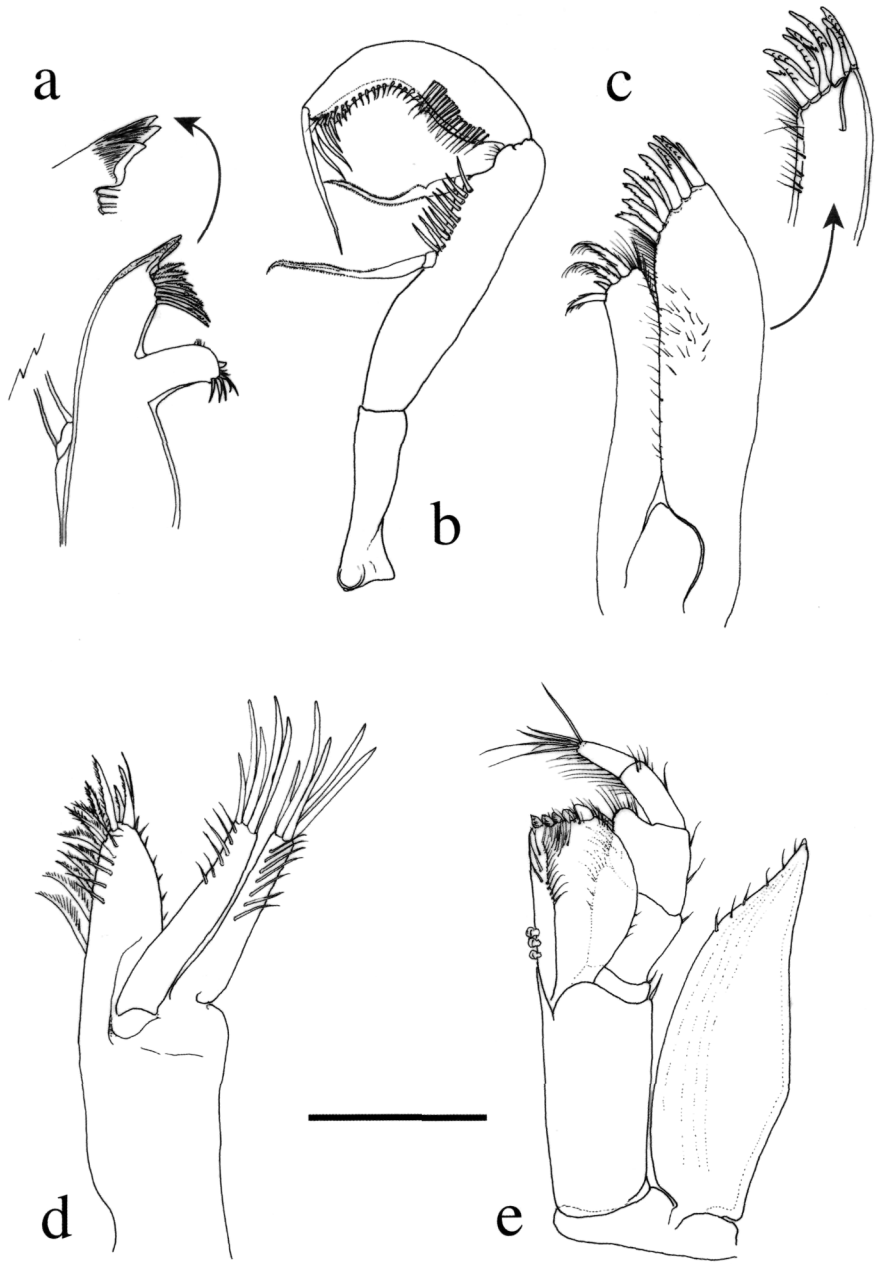

Figure 2. *Stenetrium kensleyi,* n. sp., mouthparts, adult male. All figures from a dissected male, one of four in LACM CR 2000-019.1). A, right mandible with enlargement of incisor process; B, mandibular palp; C, maxilla 1, outer aspect of lateral and medial lobes of adult male, and another aspect of lateral lobe; D, maxilla 2; E, inner face of maxilliped. Scale bar = 0.2 mm for A, E; 0.1 mm for B–D.

opod 2 (Fig. 5B) protopod subtriangular, widest at base, length 1.5 midpoint width. Exopod uniarticulate, blunt, length 1.6 width, positioned nearly apically on protopod, without setae. Endopod inserting 0.6 protopod length on medial margin; length 0.4 protopod length; proximal article groove length 0.4 article length. Appendix

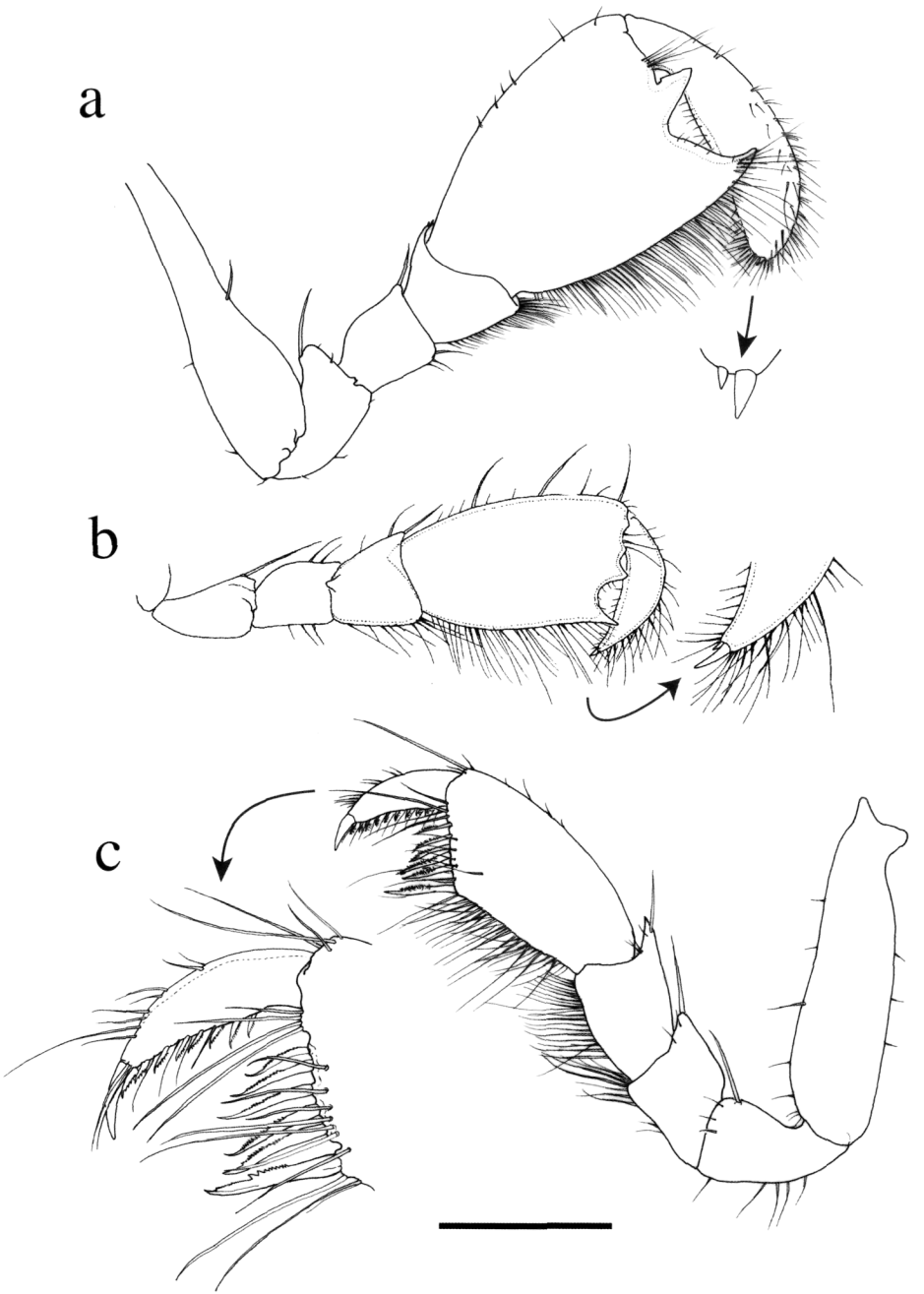

Figure 3. *Stenetrium kensleyi,* n. sp., male and female first pereopods. A, inner (mesial) surface of left pereopod 1 (gnathopod) of adult male paratype (from LACM CR 2000-017.1), TL 3.6 mm, inner aspect with enlarged view of dactylar tip; B, left pereopod 1, mesial aspect, of immature male paratype (LACM CR 2000-021.2), TL 3.2 mm, showing developing male gnathopod (with enlarged view of dactylar tip); C, inner (mesial) surface of left pereopod 1 (gnathopod) of adult female (paratype LACM CR 2000-020.1), TL 3.4 mm, inner aspect (with enlarged view of dactyl and distal part of propodus). Scale bar = 0.3 mm for A and C (excluding enlargements); 0.5 mm for B.

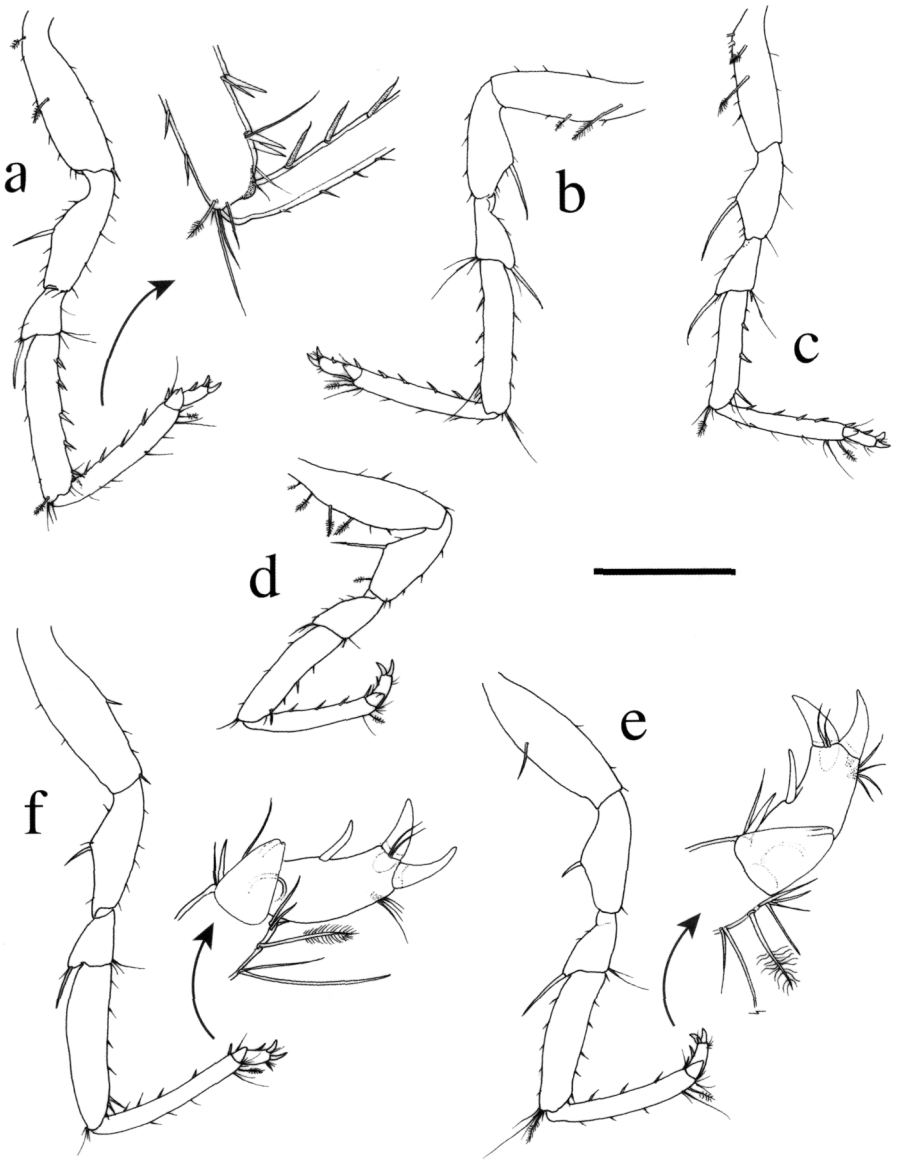

Figure 4. *Stenetrium kensleyi,* n. sp., pereopods of male (from LACM CR 2000-017.1). A–F, pereopods 2–7. Scale bar = 0.3 mm for all figures (excluding enlargements).

masculina length 1.5 endopod length, lacking setae, with 3 small recurved (dorsally-directed) barbs subapically and with sinuous groove on anterior surface; otherwise unornamented. Male pleopod 3 exopod length 1.1 width. Endopod length 2.0 width; length 0.7 exopod length; posteriorly subacute with 1 simple seta and 3 plumose setae on apex.

Uropod (Fig. 5D) with basis widest distally, with 1 long, slender seta on outer margin and 2 long setae along medial margin, plus 2 long setae on distal inner corner and scattered short setae. Inner ramus longer than outer, with 2 clusters of long, simple setae on medial border, 7 long terminal setae, and scattered plumose and simple setae along outer margin. Outer ramus approxi-

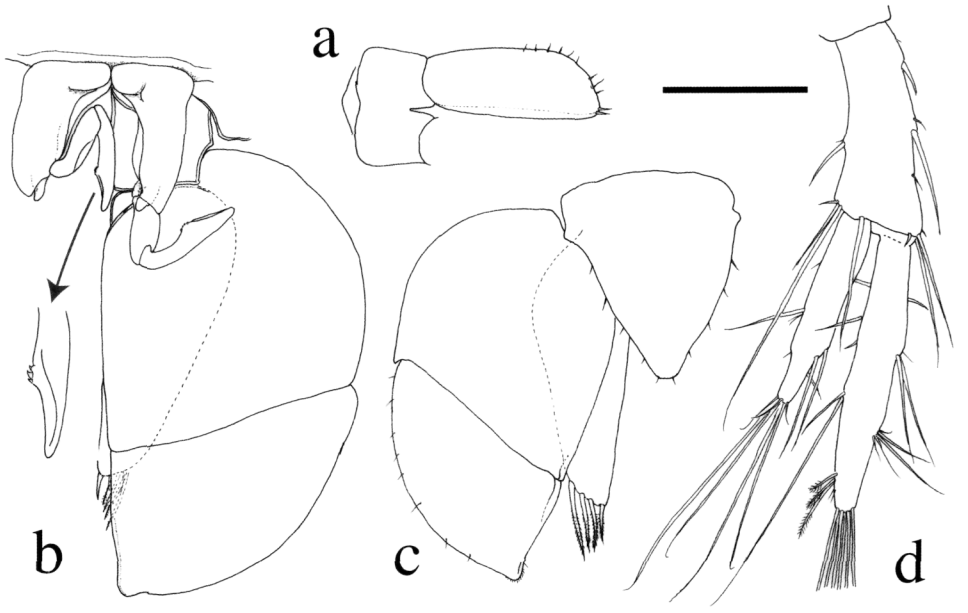

Figure 5. *Stenetrium kensleyi,* n. sp., pleopods and uropod. A, male first pleopod. B, male second pleopod; C, female second pleopod; D, uropod. A, B, and D from LACM CR 2000-017.1; C from LACM CR 2000-21.1. Scale bar = 0.3 mm.

mately 3/4 length of inner ramus and with long simple setae and scattered short setae as illustrated.

Adult female (Fig. 1A) with pigmentation and body similar to male, except for sexual dimorphism exhibited by smaller antenna 2, slightly different setation of uropods, and distinct differences in pereopod 1 (compare male in Fig. 3A to female in Fig. 3C) and in pleopods 1 and 2.

Pereopod 1 (Fig. 3C) with dactyl terminating in stout, sclerified spine, and with 8 serrate spines evenly spaced along ventral border; propodus approximately twice length of dactyl with 6 stout, serrate spines projecting from distal border opposite those of dactyl; ventral angle of propodus sharply angled at 2/3 length, marking change from stout serrate spines anteriorly to simple and plumose setae proximally; carpus heavily setose; other articles as illustrated.

Pleopod 2 (Fig. 5B) subtriangular, length 1.2 width. Distal tip blunt; 10 fine simple setae spaced evenly around lateral margins. Pleopod 3 exopod very broad, biarticulate; endopod length 0.7 exopod length, with 4 distal plumose setae.

Etymology. We take great pleasure in naming this species after Dr. Brian Kensley of the U.S. National Museum of Natural History for his numerous and significant contributions to our knowledge of Caribbean isopod crustaceans.

Remarks.—Stenetrium kensleyi appears most similar to *S. serratum* (see Kensley and Schotte, 1989:103, fig. 46), the only other species of the genus recognized by Serov and Wilson (1995) from the northwestern Atlantic. Both species share a similar pigmentation pattern, a distally truncate rostrum, and serrate-appearing lateral margins of the pleotelson. Additionally, eye morphology is similar (reniform and well pigmented) in both *S. kensleyi* and *S. serratum,* and also in *Stenetrium caicosensis* (now *Hansenium caicosense*; see Bolstad and Kensley, 1999). All three of these species also possess well-developed anterolateral and antennal spines on the head that are acute and anteriorly-directed, with a

narrow and rounded gap separating them and extending backward almost to the eye. The species are readily distinguished by the male pereopod 1. The male pereopod 1 of *S. kensleyi* is marked by a dactyl that is distally inflated and wider at midlength than it is proximally or distally (somewhat true of *H. caicosense*, but different from the dactyl of *S. serratum*). The propodal cutting surface of this pereopod in *S. kensleyi* bears a single, medially positioned, widely triangular tooth that is notched at the base, in addition to having an acute and spine-like anterolateral border; it is also distally wide, giving the article a broadly triangular shape, unlike what is seen in mature male pereopods of other species of *Stenetrium* or species of *Hansenium*.

Concerning species of *Stenetrium* outside of the western Atlantic, the new species appears similar in some characters (the inflated dactylus of the first pereopod) to Barnard's (1940) brief description of *S. bartholomei* from the littoral of South Africa. However, as specimens of *S. kensleyi* were collected at a depth of approximately 20 meters in an area of high currents in which there are no ports (the Pinnacles off Navassa Island), the likelihood of these specimens belonging to some introduced species is essentially nonexistent.

The new species is in some ways intermediate between the currently accepted definitions of *Stenetrium* and *Hansenium* (following Serov and Wilson, 1995, and Bolstad and Kensley, 1999). Serov and Wilson (1995) defined *Hansenium* as having (in addition to other characters) the following features, all of which are found also in *S. kensleyi*: a rostrum that is "broad and apically flattened" and is "slightly longer than antennal spines," an antennular flagellum with 8–14 articles (*S. kensleyi* has 10), a reduced spine on antennal article 1 (this spine is lacking in *S. kensleyi*), pereonites 1–4 with angular margins (a character that is not mentioned in their diagnosis of *Stenetrium*, but which seems to be true of both genera and is true of *S. kensleyi*), and a pleotelson that bears prominent posterolateral spines and that has a smoothly rounded postanal region (characters that are true for several other former members of *Stenetrium*). These characters, taken alone, could be used to argue for placement of the new species within *Hansenium*. However, some of the characters that Serov and Wilson (1995) used to define *Hansenium* are not found in our new species (and also do not hold for some of the other species included by them in *Hansenium*, such as their *Hansenium caicosensis* and *H. bowmani*, both formerly treated as *Stenetrium*). These characters include a "head with reduced lateral and antennal spines," an elongated pleotelson, and, what is perhaps the most salient difference, a male first gnathopod with a carpus having the "lateral margin extended and serrate." This last character clearly is not the case in *S. kensleyi*, where the male first pereopod carpus is relatively simple and does not have an extended or serrate lateral margin. Bolstad and Kensley (1999) revised the diagnosis of *Hansenium* and maintained that the primary character separating the two genera was the expanded carpal lobe on the male first pereopod in *Hansenium*, leading us to place our new species firmly in *Stenetrium*. Yet such characters as the rectangular rostrum mentioned above are considered by Bolstad and Kensley (1999; table 1) to be characteristic of *Hansenium*. The finding of species such as *S. kensleyi* with characters that bridge the definitions of *Stenetrium* and *Hansenium* (other species with characters that do not fit well within *Hansenium* as currently defined are *Stenetrium bowmani* as described by Kensley (1984) and *Stenetrium caicosensis* described by Kensley and Heard (1991); in fact *S. caicosensis* is in some ways closer to *S. kensleyi* than is *S. serratum*) may be reason to reconsider the generic status of *Hansenium*. Clearly, in addition to the ever-present need for systematic work at the species level, additional studies clarifying the morphological characters that define and distinguish stenetriid genera are needed.

Acknowledgments

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