

Gnathiid isopods (Crustacea: Isopoda: Gnathiidae), mostly new, from the Indian Ocean

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Abstract.—Twelve new species from three genera of Gnathiidae are described: *Caecognathia rhektos*, *Elaphognathia aldabrae*, *E. gladia*, *E. ramosa*, *Gnathia antonbruunae*, *G. eumeces*, *G. glauca*, *G. luxata*, *G. serrula*, *G. somalia*, *G. stoddarti*, and *G. zanzibarensis*. Most are from the western Indian Ocean, with one from Thailand. *Gnathia nkulu* Smit & Van As, 2000, is newly recorded from Madagascar. Keys to the six species of *Elaphognathia* and 20 species of *Gnathia* from the Indian Ocean are presented.

The marine isopod fauna of the Indian Ocean has been reviewed by Bruce (1997) and Kensley (2001). This paper on the family Gnathiidae continues a series by the late Brian Kensley and Marilyn Schotte, documenting the marine isopod diversity of the Indian Ocean (see Kensley & Schotte 2000, 2002; Schotte & Kensley 2005, Kensley et al. 2007).

Fewer than 20 species of gnathiids have been recorded from the Indian Ocean. The material for this contribution adds another twelve. It comes mainly from the western Indian Ocean (Aldabra Atoll, the granitic Seychelles, Zanzibar Island), from Phuket, Thailand, and a few samples from the International Indian Ocean Expedition (mid-1960s) collected off the east African coast and Madagascar. This paper does not repeat diagnoses of higher level taxa; revisionary works are referred to in the generic synonymies. The diagnoses of new taxa (males only) were generated from a DELTA database prepared by GCBP initially for the identifi-

cation of world genera and Australian species, based on a manuscript prepared by BK. They follow the brief style preferred by him. Illustrations were completed by MS.

Keys are provided to Indian Ocean species wherein distribution information is provided as a further aid to separation.

Abbreviations.—F – Kristian Fauchald field stations; JR – Jack Rudloe field stations; K – Brian Kensley field stations; IIOE – International Indian Ocean Expedition; USNM – National Museum of Natural History, Smithsonian Institution; ZMUC – Zoological Museum, University of Copenhagen

Family Gnathiidae

Remarks.—See Cohen & Poore (1994) for a comprehensive review of this family and diagnoses of all genera then known. They diagnosed and provided keys to ten genera, but two more, *Tenerognathia* Tanaka, 2005 and *Afrignathia* Hadfield & Smit, 2008 have been added since. The latter and its only species, *A. multicavea* Hadfield & Smit, 2008, are from South

[†] Deceased 19 January 2004.

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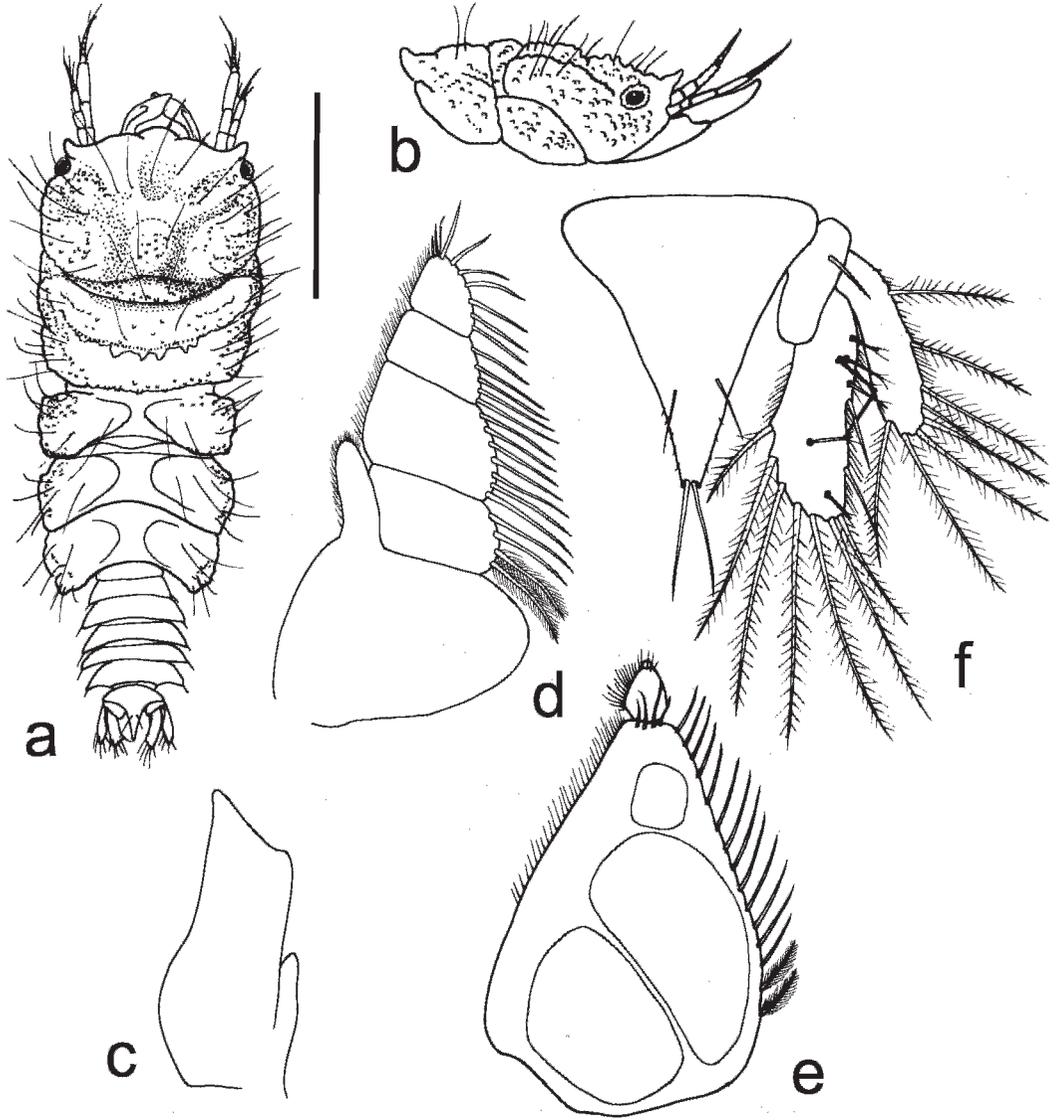


Fig. 1. *Caecognathia rhextos*. a, dorsal view, scale = 0.5 mm; b, cephalon in lateral view; c, mandible; d, maxilliped; e, pylopod; f, pleotelson and right uropod.

Africa, the western edge of the Indian Ocean.

Caecognathia Dollfus, 1901

Remarks.—Cohen & Poore (1994) diagnosed the genus. *Caecognathia andamanensis* Svavarsson, 2002 is a recently described species from the Andaman Sea, part of the Indian Ocean.

Caecognathia rhextos, new species

Fig. 1

Type material.—HOLOTYPE: USNM 280364, male, 2.1 mm, E of Mauritius, 20°23'N, 70°00'E, 43 m, 15 Nov 1963 (IIOE stn 206-A). PARATYPES: USNM 280365, 30 males, same data as holotype.

Diagnosis of male.—Cephalosome 0.8 times as long as wide, covered with

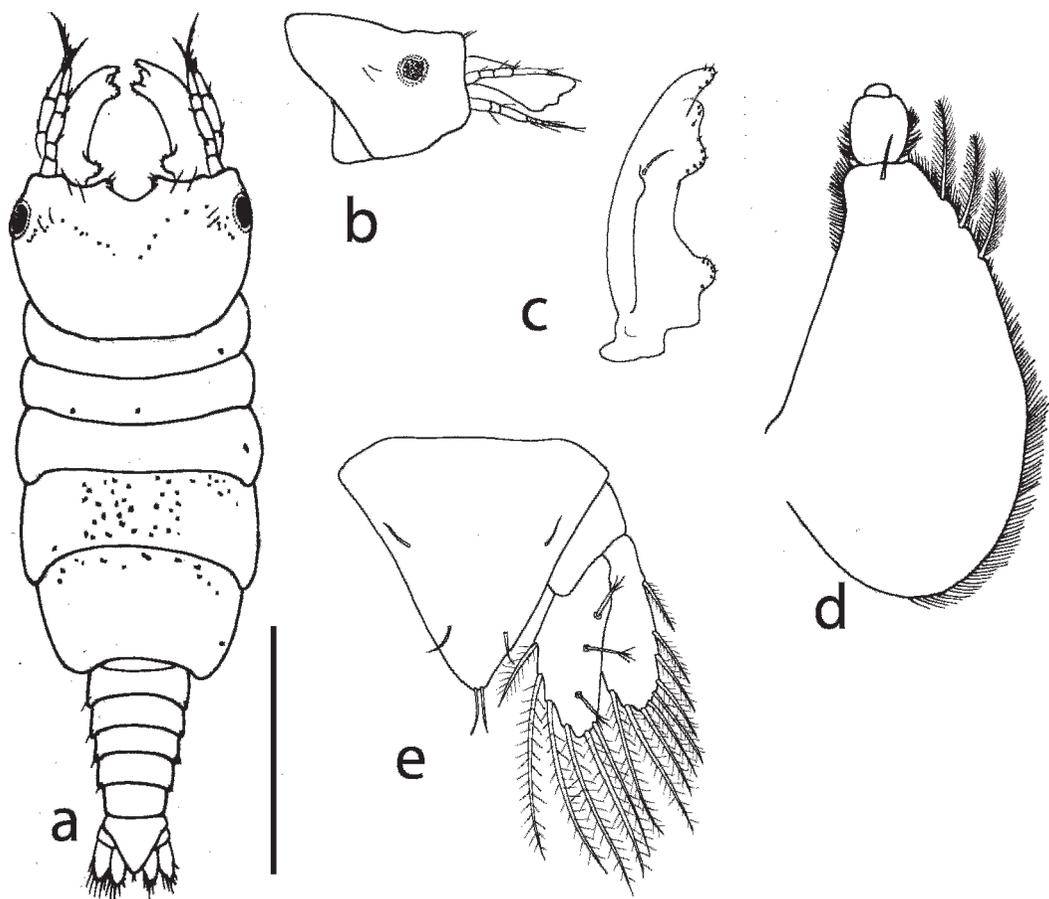


Fig. 2. *Elaphognathia aldabrae*. a, dorsal view, scale = 0.5 mm; b, cephalon in lateral view; c, mandible; d, pylopod; e, pleotelson and right uropod.

numerous granules; frontal border slightly produced. Mandibular blade smooth; mandible with carina with distally produced tooth. Pylopod 3-articled (article 3 minute), operculate. Pleotelson subtriangular (lateral margins concave), 1.1 times as long as wide. Uropodal endopod 4 times as long as wide, with 9 marginal setae; exopod 3.5 times as long as wide, with 8 marginal setae.

Remarks.—In its relatively broad head and featureless mandibles, this species resembles its congeners from Australia, *C. agwillisi* (Seed, 1979) and *C. pustulosa* (Hale, 1924) but does not have the truncate pleotelson of *C. agwillisi* or dorsal pereonal armature of *G. pustulosa*.

It differs from *Caecognathia andamenesis* Svavarsson, 2002 from the eastern Indian Ocean in a much broader cephalosome (narrow and tapering in *C. andamenesis*).

Etymology.—The specific name, derived from the Greek, describes the nature of the integument, viz. brittle and easily broken.

Elaphognathia Monod, 1926

Elaphognathia aldabrae, new species

Fig. 2

Type material.—HOLOTYPE: USNM 280366, male, 1.9 mm, clumps of *Halimeda* in seagrass bed, mid-reef flat, Picard Island, Aldabra, 0.2 m, 12 Apr 1983 (stn K-AL-40). PARATYPES:

USNM 280367, 8 males, 2 pranizae, from 4 stations, coralline algae and algal turf-encrusted rubble, Aldabra, 0–6 m.

Other material examined.—USNM 280368, 2 males, 1 praniza, encrusting algae, Anse Royale, Mahé, Seychelles, 1–2 m, 15 Aug 1992 (stn K-SEY-34).

Diagnosis of male.—Cephalosome 0.65 times as long as wide, without sculpture (scattered reddish-brown chromatophores on dorsum, especially near eye and on pereonites 5 and 6); mediofrontal process absent; superior frontolateral process conical. Mandible with bilobed pseudo-blade proximal to mandibular apex; with semicircular internal lobe at base of mandible. Pylopod 3-articled (article 3 minute), operculate. Penes a small fused papilla directed anteriorly. Pleotelson subtriangular (with straight margins), as long as wide. Uropodal endopod 2.8 times as long as wide, with 9 marginal setae; exopod 2.4 times as long as wide, with 6 marginal setae.

Remarks.—There is some variation in the shape of the cephalosome, specifically the length to width ratio, in different specimens from the same station. The new species is similar to *Elaphognathia wolffi* (Müller, 1989) from Kenya, and a new species of *Elaphognathia* described herein from Somalia. *Elaphognathia aldabrae* can be separated from Müller's species by the lack of projections on the frontal margin, which is also much narrower, and by the presence of short bristle-like setae on the mandible apically and on the internal lobes, which are not bifurcate as in the new species of *Elaphognathia* from Somalia. Schoenichen (1908) published a description of a new gnathiid from Aldabra, *Gnathia aldabrensis*, but based it on a praniza. We are not confident of the characters of pranizae that would enable us to identify our species with the pranizae associated with *E. aldabrae*.

Etymology.—The species is named for Aldabra Stoddart, daughter of Professor David R. Stoddart, foremost biogeogra-

pher of the Seychelles and especially Aldabra Atoll.

Elaphognathia gladia, new species

Fig. 3

Type material.—HOLOTYPE: USNM 280379, male, 2.1 mm, off Somalia, 10°03'N, 51°15'E, 31–39 m, 16 Dec 1964 (IIOE stn 449). PARATYPE: USNM 280380, 1 male, same data as holotype.

Diagnosis of male.—Cephalosome 1.3 times as long as wide; mediofrontal process absent; superior frontolateral process conical. Mandible without pseudo-blade, mandibular apex acute; with 2 conical lobes at base of mandible. Pylopod 3-articled (article 3 minute), operculate. Penes fused, small papilla directed anteriorly. Pleotelson subtriangular (lateral margins with denticles near concave distal third), 1 times as long as wide. Uropodal endopod 2.7 times as long as wide, with 9 marginal setae; exopod 3.8 times as long as wide, with 11 marginal setae.

Remarks.—The new species can be immediately recognized by the long, thin saber-like mandible with two conical lobes at its base. *Elaphognathia froygattella* Cohen & Poore, 1994 has similar narrow mandibles but has a well-defined medial projection absent in this species.

Etymology.—The specific name, from the Latin for saber, used as a noun in apposition, describes the shape of the mandible.

Elaphognathia ramosa, new species

Fig. 4

Type material.—HOLOTYPE: USNM 280369, male, 2.0 mm, off Somalia, 11°14'N, 51°08'E, 27–31 m, 17 Dec 1964 (IIOE stn 456). PARATYPES: USNM 280370, 2 males, same data as holotype.

Other material examined.—USNM 280371, 1 male, off Somalia, 9°25'N, 50°54'E, 90 m, 16 Dec 1964 (IIOE stn 437). USNM 280372, 1 male, off Somalia,

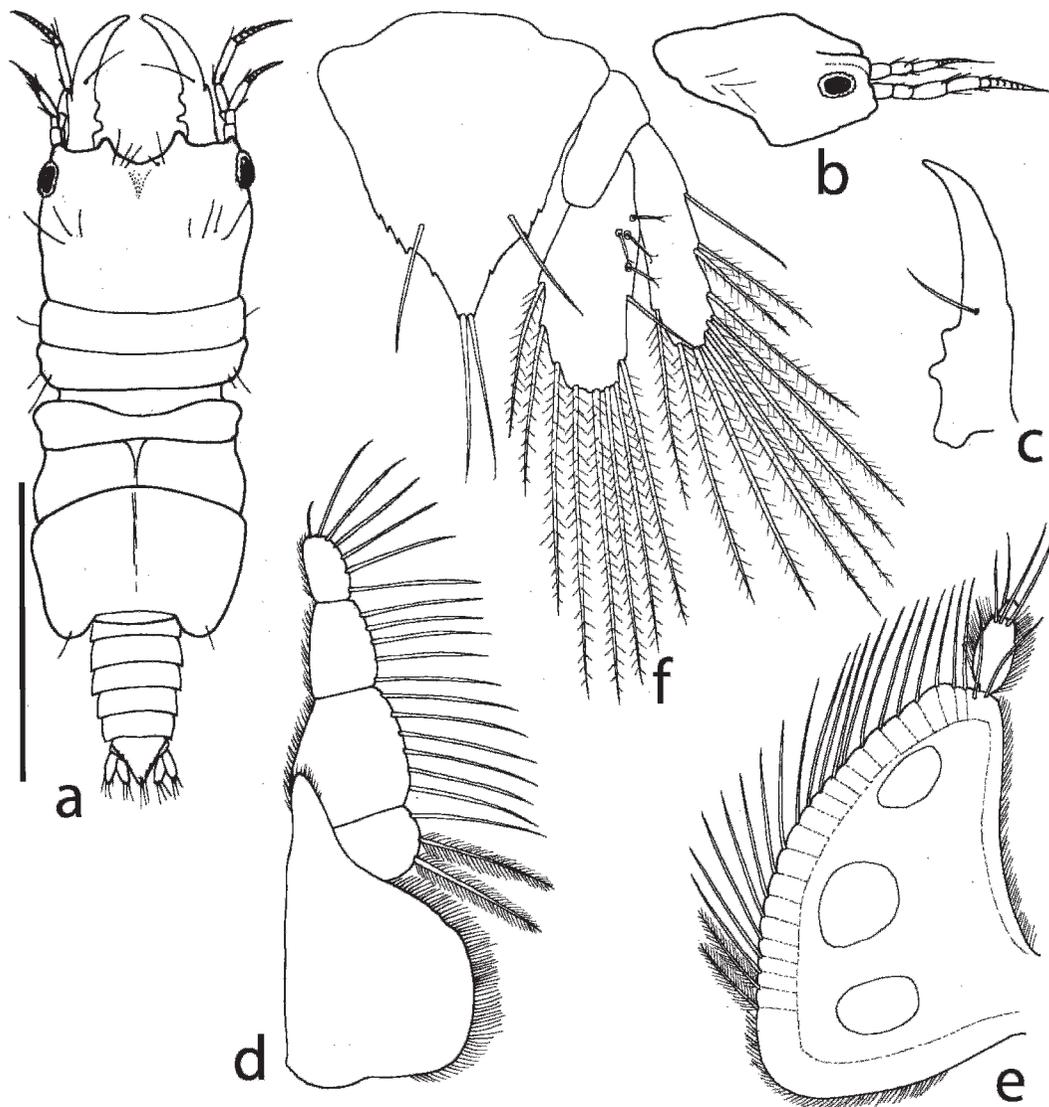


Fig. 3. *Elaphognathia gladia*. a, dorsal view, scale = 1 mm; b, cephalon in lateral view; c, mandible; d, maxilliped; e, pylopod; f, pleotelson and right uropod.

9°36'N, 51°01'E, 80 m, Dec 1964 (IIOE stn 444). USNM 280373, 2 males, off Somalia, 11°37'N, 51°27'E, 18 Dec 1964 (IIOE stn 465). USNM 280374, 1 male, off Mozambique, 24°35'S, 34°56'E, 55 m, 19 Aug 1964 (IIOE stn 372-G).

Diagnosis of male.—Cephalosome 0.7 times as long as wide, with middorsal dome posteriorly and paired elevations anteromedial to eyes; medifrontal process absent. Pereonite 2 with medial hump. Mandible with tooth-like pseudo-

blade directed ventrally and exceeding mesially mandible apex; with splayed bilobed internal lobe at base of mandible. Pylopod 2-articled, operculate. Penes 2 small contiguous papillae. Pleotelson subtriangular (with straight margins), 0.9 times as long as wide. Uropodal endopod 2.6 times as long as wide, with 10 marginal setae; exopod 2.4 times as long as wide, with 7 marginal setae.

Remarks.—*Elaphognathia ramosa* is similar to its West Indian Ocean congener

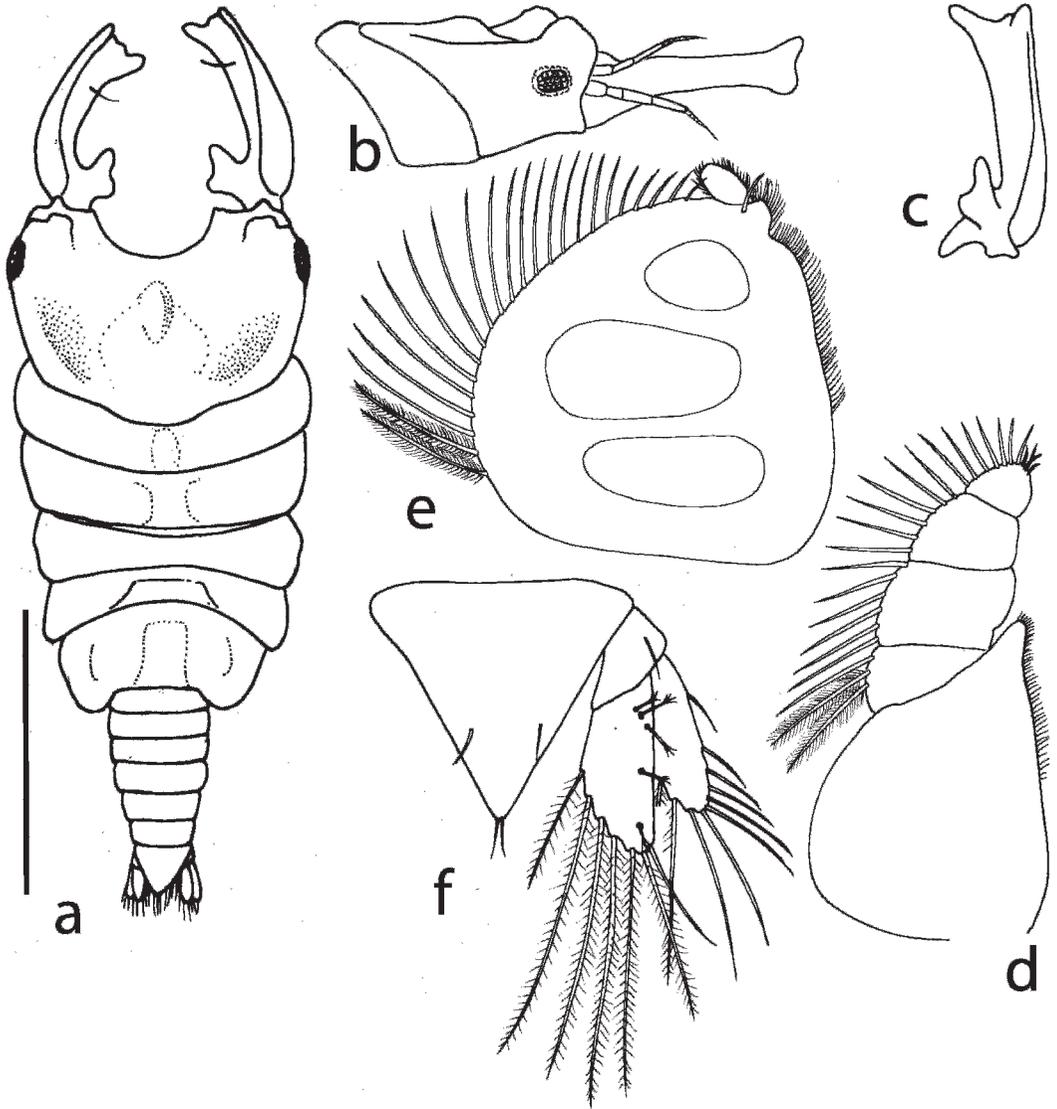


Fig. 4. *Elaphognathia ramosa*. a, dorsal view, scale = 0.5 mm; b, cephalon on lateral view; c, mandible; d, maxilliped; e, pylopod; f, pleotelson and right uropod.

E. wolffi (Müller, 1989), whose frontal margin, in contrast, exhibits small processes and whose similar mandible lacks the large splayed internal lobe. The type species, *E. ferox* (Haswell, 1885) from eastern Australia, is also similar in the complex apical tip of the mandible, but the internal lobe is more simple and the cephalosome excavation narrower and with a medial projection.

Etymology.—The specific name, from the Latin for branching, refers to the

branching antler-like mandibles of the male.

Key to Indian Ocean species of *Elaphognathia* (males only)

- 1. Mediofrontal process present 2
- Mediofrontal process absent 4
- 2. Surface of cephalon granular; front deeply excavated 3
- Surface of cephalon smooth; front slightly excavated

- *E. insolita* (Stebbing, 1905) [tl. "barely 2 mm," Gulf of Manaar, Sri Lanka]
3. Frontolateral process strongly elevated over eye; internal lobe on mandible simple *E. wolffi* (Müller, 1989) [tl. 1.6 mm, Mombasa, Kenya]
- Frontolateral process barely or not elevated over eye; internal lobe on mandible with accessory blunt tooth
- *E. korachaensis* Svavarsson & Gísladóttir, 2002 [tl. 1.4 mm, Andaman Sea]
4. Mandible with simple acute tip ...
- *E. gladia* [tl. 2.1 mm, Off Somalia]
- Mandible with bifid or complex tip 5
5. Mandible with conical internal lobe; frontal excavation flanked by short setose process
- *E. aldabrae* [tl. 1.9 mm, Aldabra Atoll and Mahé, Seychelles]
- Mandible with splayed bilobed internal lobe; frontal excavation flanked by tiny bifid process
- *E. ramosa* sp. nov. [tl. 2.0 mm, Off Somalia; off Mozambique]

Gnathia Leach, 1814

Gnathia antonbruunae, new species

Fig. 5

Type material.—HOLOTYPE: USNM 280375, male, 2.5 mm, off Inhambane, Mozambique, 24°42'S, 35°23'E, 190 m, 18 Aug 1964 (IIOE stn 371-G). PARATYPES: USNM 280376, 17 males, 1 female, 11 pranizae, same data as holotype.

Diagnosis of male.—Cephalosome 0.7 times as long as wide, without sculpture; dorsal sulcus shallow, obscure; mediofrontal process broad with deep wide notch; frontal border transverse; superior frontolateral process conical; paraocular ornamentation absent; supraocular lobe simple, rounded, or obsolete. Mandible 2.6 times as long as greatest width of blade; blade crenulate; without seta; without internal lobe. Pylopod 3-articled (article 3 minute), operculate. Pereon even-sided. Penes 2 small contiguous papillae. Pleotelson subtriangular (with sinuous margins), 1 times as long as wide. Uropodal endopod 2.5 times as long as wide, with 7 marginal setae; exopod 3.8

times as long as wide, with 8 marginal setae.

Remarks.—The new species resembles its Indian Ocean neighbor, *G. africana* but lacks the two diverging ridges extending from the eyes to the middle of posterior margin. The broad, near-truncate rostrum is distinctive in this species. This rostrum is similar to that of *G. nkulu* but broader; *G. nkulu* has a tubercular cephalosome, whereas *G. antonbruunae* is smooth.

Etymology.—The species is named for the research vessel *Anton Bruun*, the primary U.S. ship of the International Indian Ocean Expedition during the years 1963–1964.

Gnathia eumeces, new species

Fig. 6

Type material.—HOLOTYPE: USNM 280377, male, 3.0 mm, Red Sea, 27°16'38"N, 33°47'01"E, 0.5–3 m, 12 Jan 1965 (IIOE stn HA-39). PARATYPES: USNM 280378, 13 males, 1 praniza, same data as holotype.

Diagnosis of male.—Cephalosome 1.25 times as long as wide, without sculpture; dorsal sulcus shallow, obscure; mediofrontal process absent; frontal border transverse; superior frontolateral process conical, bearing few setae; supraocular lobe absent. Mandible 2.2 times as long as greatest width of blade; incisor absent; blade crenulate; with seta; without internal lobe. Pylopod 2-articled, operculate. Penes fused, small papilla directed anteriorly. Pleotelson subtriangular (with sinuous margins), 1.2 times as long as wide. Uropodal endopod 3 times as long as wide, with 9 marginal setae; exopod 4.4 times as long as wide, with 12 marginal setae.

Remarks.—*Gnathia eumeces* can readily be identified by the elongate head and body generally and the small size of the mandible relative to the cephalon, i.e., less than half its length.

Etymology.—The species name derives from Greek, meaning 'elongate', and refers to body shape.

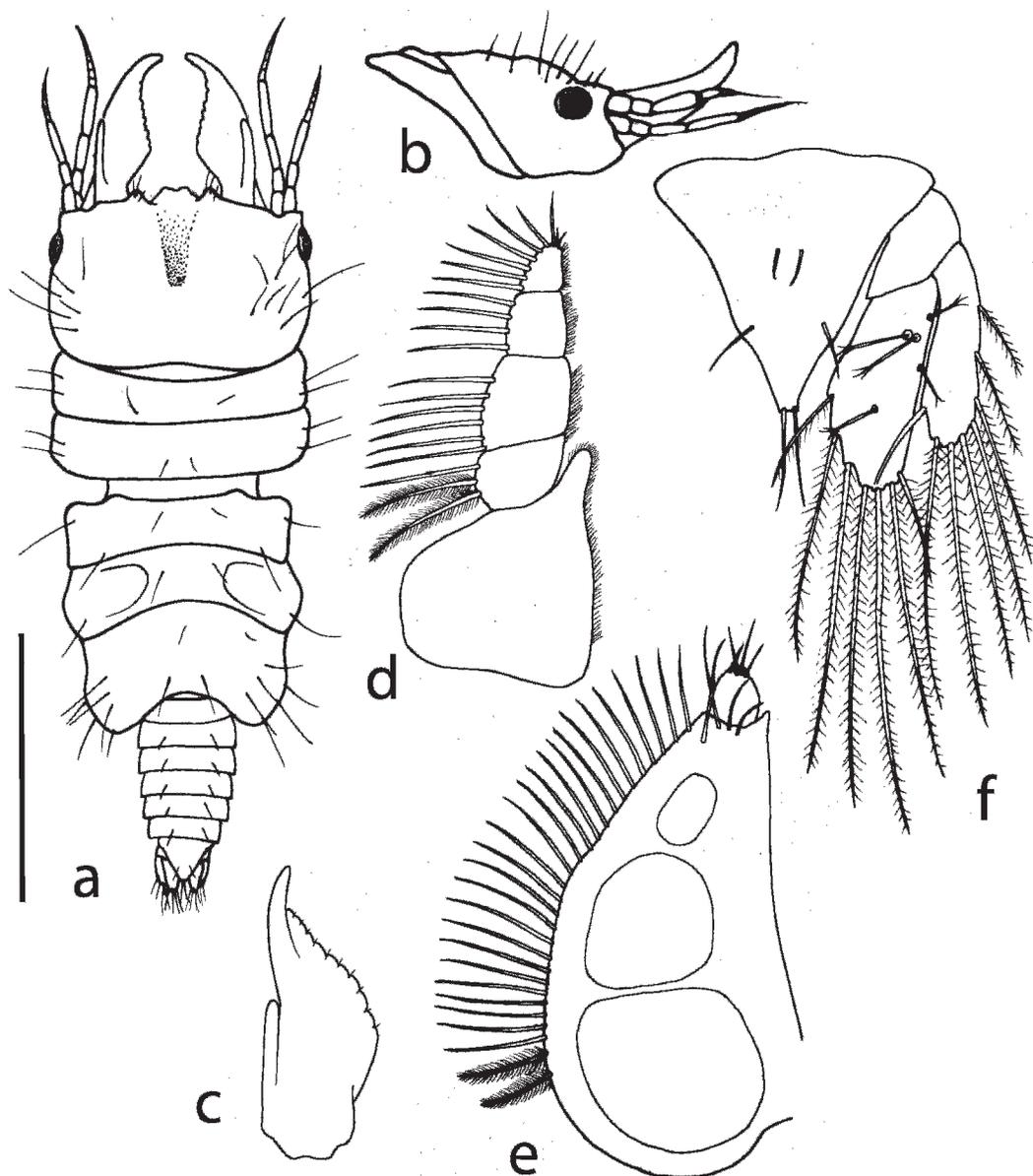


Fig. 5. *Gnathia antonbruunae*. a, dorsal view, scale = 1.0 mm; b, cephalon in lateral view; c, mandible; d, maxilliped; e, pylopod, f, pleotelson and right uropod.

Gnathia glauca, new species

Fig. 7

Type material.—HOLOTYPE: USNM 280381, male, 3.2 mm, rubble from reef crest, Aldabra, 1 m, 13 Apr 1987 (stn F-11-87). PARATYPES: USNM 280382, 5 males from 3 stations, reef rubble, Aldabra, 1 m.

Diagnosis of male.—Cephalosome 0.7 times as long as wide, with a low, posterior median tubercle (elongate; dorsum with sparse dots of red-brown pigment.); dorsal sulcus shallow, obscure; mediofrontal process triangular, with median notch; frontal border transverse; superior frontolateral process conical; paraocular or-

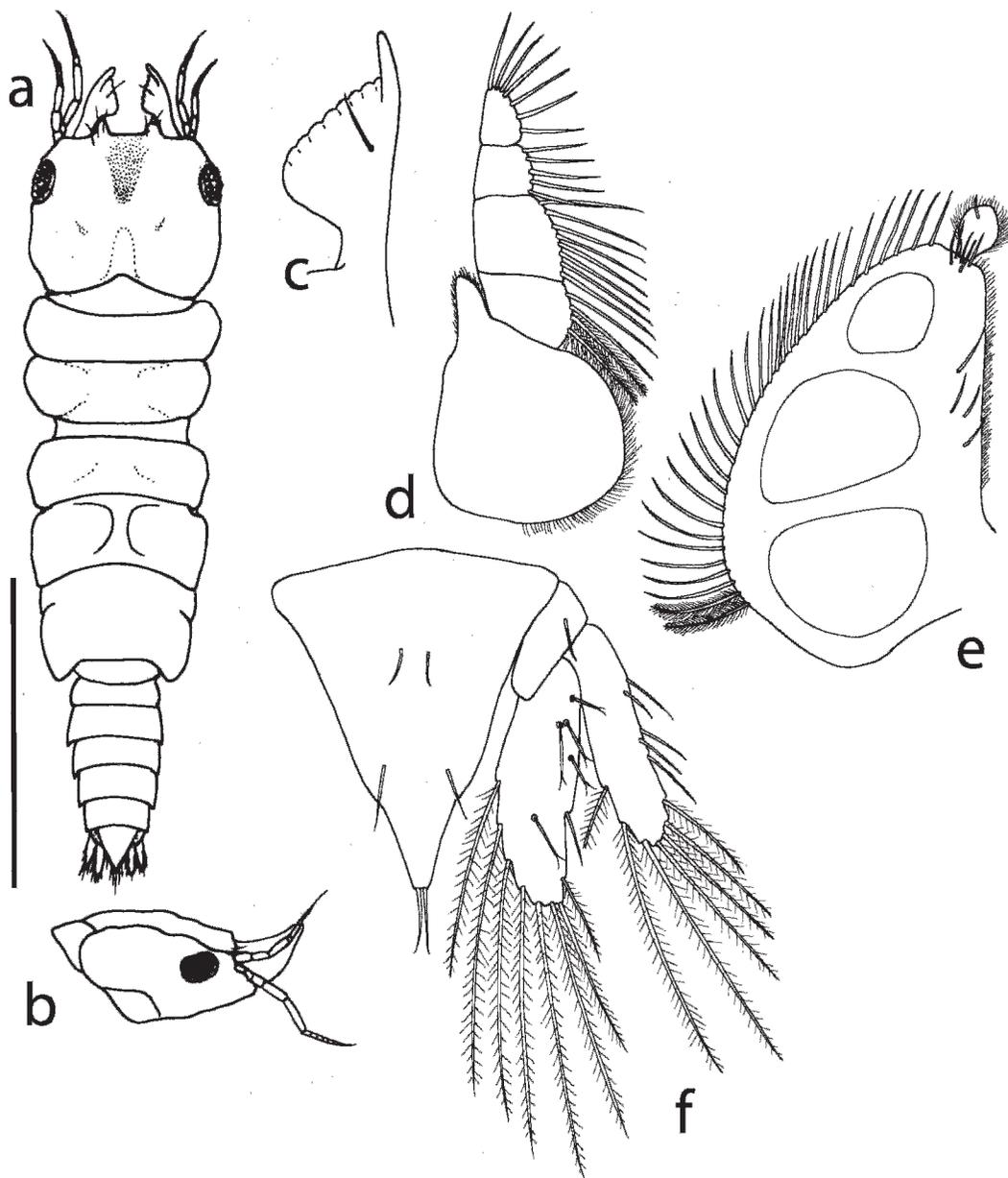


Fig. 6. *Gnathia eumeces*. a, dorsal view, scale = 1.0 mm; b, cephalon in lateral view; c, mandible; d, maxilliped; e, pylopod; f, pleotelson and right uropod.

namentation granules medial to eyes; supraocular lobe simple, rounded. Mandible 2.4 times as long as greatest width of blade; incisor pronounced; blade crenulate, with distinct proximal oblique lobe; with seta; without internal lobe. Pylopod 3-articled (article 3 minute), operculate.

Pereon widest posteriorly. Penes fused, elongate, blunt. Pleotelson subtriangular (lateral margins concave over proximal half), 1 times as long as wide. Uropodal endopod 2.3 times as long as wide, with 9 marginal setae; exopod 3.2 times as long as wide, with 16 marginal setae.

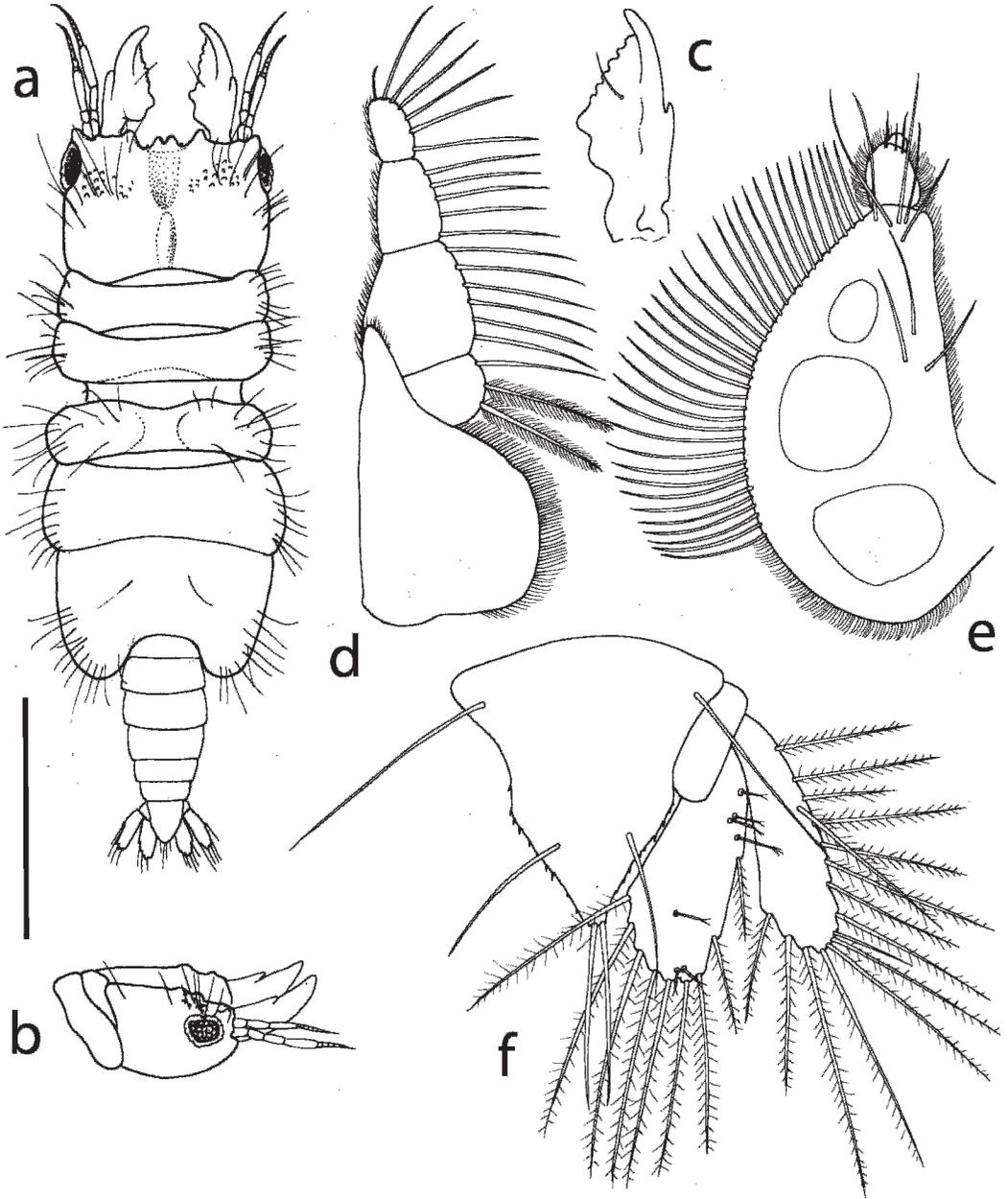


Fig. 7. *Gnathia glauca*. a, dorsal view, scale = 1 mm; b, cephalon in lateral view; c, mandible; d, maxilliped; e, pylopod; f, pleotelson and right uropod.

Remarks.—The new species resembles *G. africana* but differs in the shape of the mandible, and in characters of the cephalosome, e.g., tuberculate areas near the eyes instead of ridges. It is one of the few gnathiids with fused enlarged penes. In this it differs from *G. nkulu* which it

somewhat resembles in the general shape of the cephalosome.

Etymology.—The specific name, from the Latin for ‘sea green’, refers to the type locality, Aldabra, which name derives from an Arabic word meaning green.

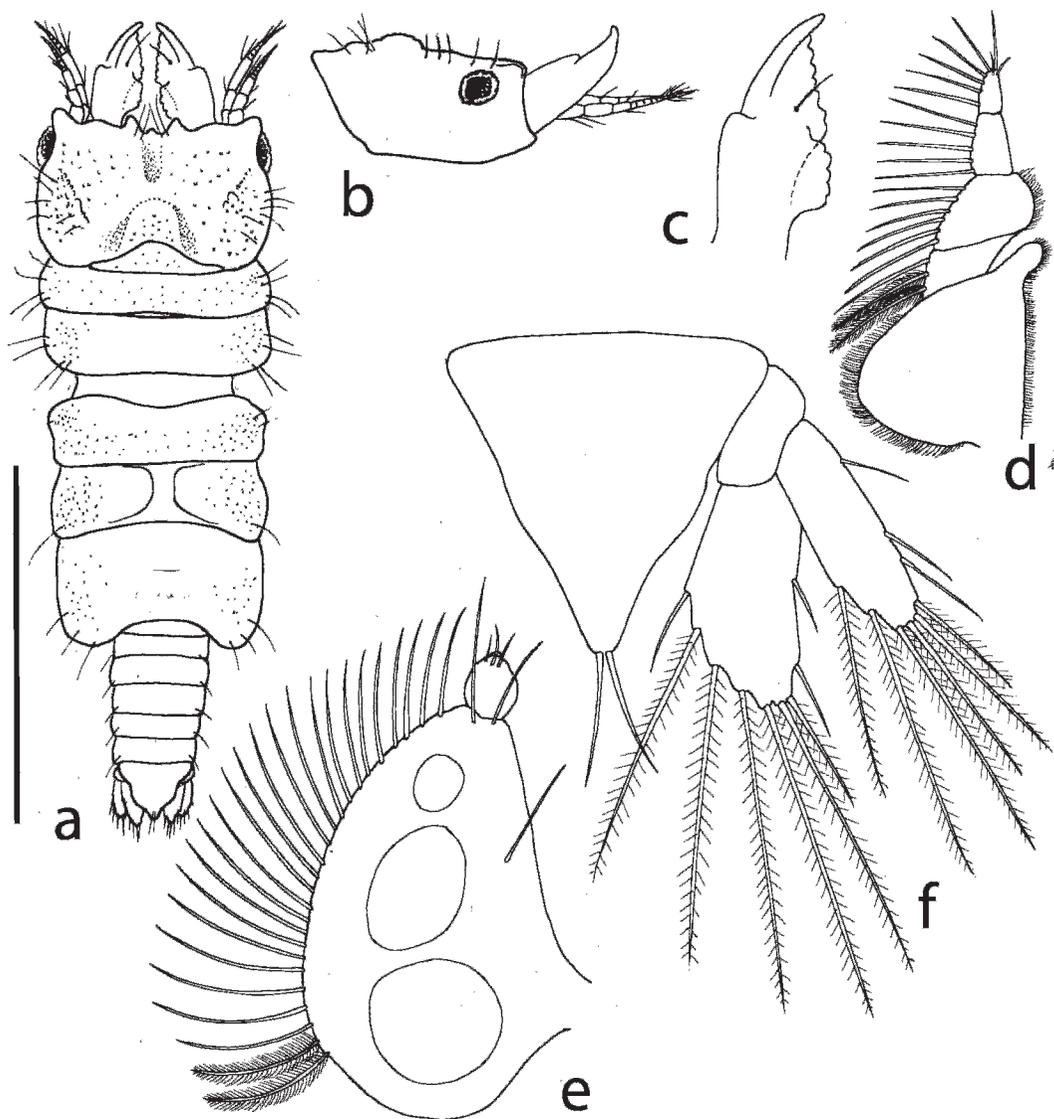


Fig. 8. *Gnathia luxata*. a, dorsal view, scale = 1.0 mm; b, cephalon in lateral view; c, mandible; d, maxilliped; e, pylopod; f, pleotelson and right uropod.

Gnathia luxata, new species

Fig. 8

Type material.—HOLOTYPE: USNM 280383, male, 2.3 mm, seagrass beds near Khawr Musharraba, Persian Gulf, 1 m, coll. J. McCain, Mar 1982 (stn 3GS). PARATYPE: USNM 280384, 1 male, seagrass beds near Safaniya Pier, Persian Gulf, 2.5 m, coll. J. McCain, Sep 1981 (stn 7G1).

Diagnosis of male.—Cephalosome 0.6 times as long as wide, with a low, posterior median tubercle; dorsal sulcus shallow, obscure; medifrontal process small, rounded; frontal border transverse; superior frontolateral process conical; paraocular ornamentation a series of tubercles running obliquely posteriorly from eyes; supraocular lobe simple, rounded. Mandible 2 times as long as

greatest width of blade; incisor pronounced; blade crenulate; without seta; with a broad crenulate internal lobe. Pylopod 3-articled (article 3 minute), operculate. Pereon even-sided. Penes 2 small contiguous papillae. Pleotelson subtriangular (lateral margins almost straight), 1 times as long as wide. Uropodal endopod 2.2 times as long as wide, with 9 marginal setae; exopod 3.1 times as long as wide, with 9 marginal setae.

Remarks.—The morphology of the frontal margin in combination with the shape of the mandible serve to distinguish this species.

Etymology.—The specific name derives from the Latin, meaning disjointed or dislocated, and refers to the disjointed mesial margin of the mandible.

Gnathia nkulu Smit & Van As, 2000

Gnathia nkulu Smit & Van As, 2000:235–240, figs 1–15.

Material examined.—USNM 280385, male, 4.0 mm, sand and coral bottom, Nosy-Be, Madagascar, 13°23'S, 48°13'E, 1.5 m, 11 Jan 1964 (stn JR-29). USNM 280386, 4 males, 1 female, 3 pranizae, same data.

Remarks.—The new material extends the distribution of this species from the south-eastern African coast to Madagascar.

Gnathia serrula, new species

Fig. 9

Type material.—HOLOTYPE: ZMUC CRU-2005, male, 3.0 mm, Ko Hi, Phuket Island, Thailand, 7°44'N, 98°22'E, in dead *Porites* coral, 5.4 m, coll. N. L. Bruce, 20 Nov 1995 (stn 69). PARATYPES: ZMUC CRU-20153, 5 males, 2 ovigerous females, Ko Racha Yai, Phuket Island, Thailand, mixed coral rubble, 5 m, coll. N. L. Bruce, 5 Dec 1995 (stn 202); USNM 280387, 47 males, 5 ovigerous females, 4 pranizae, Ko Racha Yai, Phuket Island, Thailand, mixed coral

rubble, 5 m, coll. N. L. Bruce, 5 Dec 1995 (stn 202).

Diagnosis of male.—Cephalosome 0.75 times as long as wide, with a low, posterior median tubercle; dorsal sulcus deep, narrow; medifrontal process conical; frontal border slightly produced; superior frontolateral process broadly triangular; paraocular ornamentation granules medial to eyes; supraocular lobe simple, rounded. Mandible 2.8 times as long as greatest width of blade; incisor pronounced; blade crenulate; with seta; with a broad crenulate internal lobe (overlapping blade). Pylopod 3-articled (article 3 minute), operculate. Pereon widest anteriorly. Penes 2 small contiguous papillae. Pleotelson subtriangular, distal quarter exceptionally narrow, 1.1 times as long as wide. Uropodal endopod 3 times as long as wide, with 6 marginal setae; exopod 3.3 times as long as wide, with 10 marginal setae.

Remarks.—The new species is distinct from all congeners, except *Gnathia luxata*, described above, in having a longitudinal, dentate mandibular internal lobe in the male plus a deeply excavate frontal margin with median point. *Gnathia johanna* Müller, 1988 and *G. mortenseni* Monod, 1926 have disjunct cutting edges which appear to include a dentate internal lobe but different morphology of the frontal margins separates them. *Gnathia serrula* differs from *G. luxata* from the Persian Gulf in being smaller, in the shape of the male mandible, and in having a longer cutting blade and a more recurved tip.

Etymology.—The specific name is a diminutive of 'serra', Latin for saw, of which the internal lobe on the mandible is reminiscent.

Gnathia somalia, new species

Fig. 10

Type material.—HOLOTYPE: USNM 280388, male, 4.0 mm, off Somalia, 11°14'N, 51°08'E, 27–31 m, 17 Dec 1964 (IIOE stn 456). PARATYPES: USNM

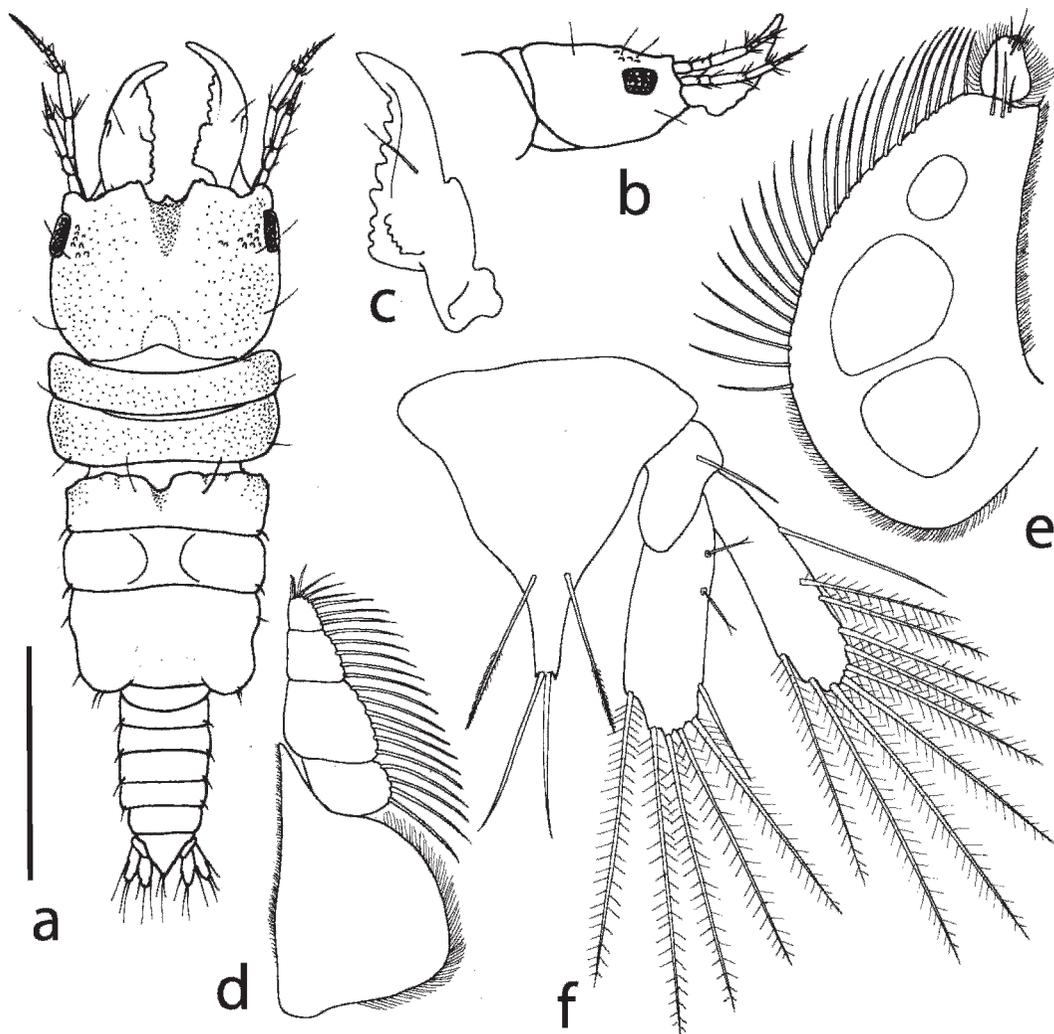


Fig. 9. *Gnathia serrula*. a, dorsal view, scale = 1.0 mm; b, cephalon in lateral view; c, mandible; d, maxilliped; e, pylopod; f, pleotelson and right uropod.

280389, 3 males, 4 ovigerous females, 17 pranziae, same data as holotype.

Other material examined.—ZMUC CRU-1902, male, Zanzibar, Mnemba Island, Zanzibar, reef flat, coll. N. L. Bruce, 25 Sep 1995 (stn 10/D6-1); ZMUC CRU-3153, male, Zanzibar, Bawe Island, reef flat, intertidal, N. L. Bruce, 26 Sep 1995 (stn 11/I2-1).

Diagnosis of male.—Cephalosome 0.65 times as long as wide, without sculpture; dorsal sulcus shallow, obscure; medio-frontal process triangular, with median

notch; frontal border transverse; superior frontolateral process bifid; paraocular ornamentation granules medial to eyes; supraocular lobe bifid. Mandible 2.4 times as long as greatest width of blade; incisor pronounced; blade dentate; without seta; with semicircular internal lobe at base of mandible. Pylopod 3-articled (article 3 minute), operculate. Pereon widest anteriorly. Penes fused, bulbous apex covered with tiny scales. Pleotelson subtriangular (tapering gradually then strongly over distal quarter), 1.2 times as

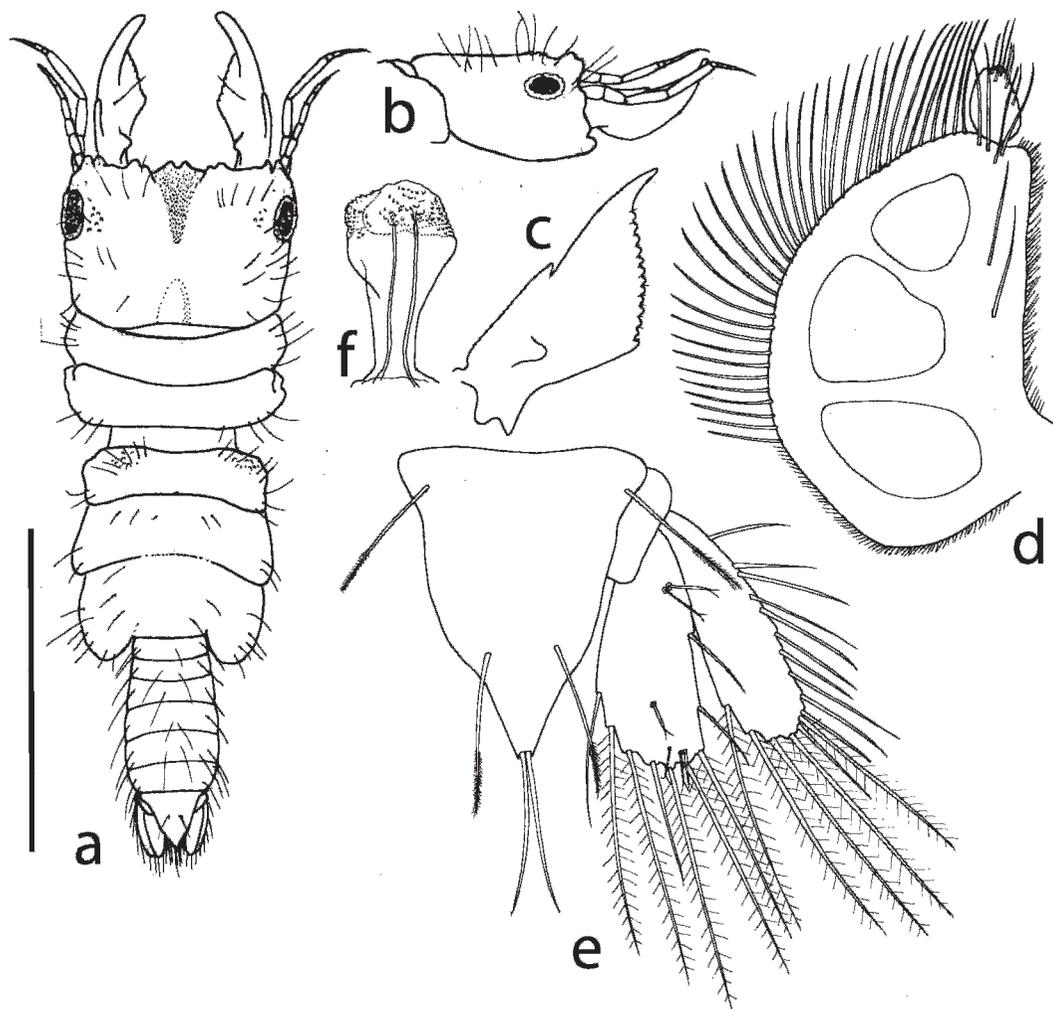


Fig. 10. *Gnathia somalia*. a, dorsal view, scale = 1.0 mm; b, cephalon in lateral view; c, mandible; d, pylopod; e, pleotelson and right uropod; f, penis.

long as wide. Uropodal endopod 2.3 times as long as wide, with 9 marginal setae; exopod 3.2 times as long as wide, with 16 marginal setae.

Remarks.—While appearing similar to *G. africana* and other new species described herein, *G. somalia* has distinctive triangular mandibles and bifid inferior frontal process. None of the species described herein possesses the enlarged penial structure.

Etymology.—The specific name refers to the type locality, the coast of Somalia, a noun in apposition

Gnathia stoddarti, new species

Fig. 11

Type material.—HOLOTYPE: USNM 280390, male, 2.0 mm, Aldabra Atoll, coral rubble between coral heads on reef slope, Picard Island, Aldabra, 20 m, 13 Apr 1987 (stn K-AL-124). PARATYPES: USNM 280391, 30 males, 9 pranziae, from 6 stations, coral rubble, coralline algae, and algal turf in sinkhole, Aldabra, Intertidal–16 m.

Diagnosis of male.—Cephalosome 0.9 times as long as wide, without sculpture; dorsal sulcus shallow, obscure; medio-

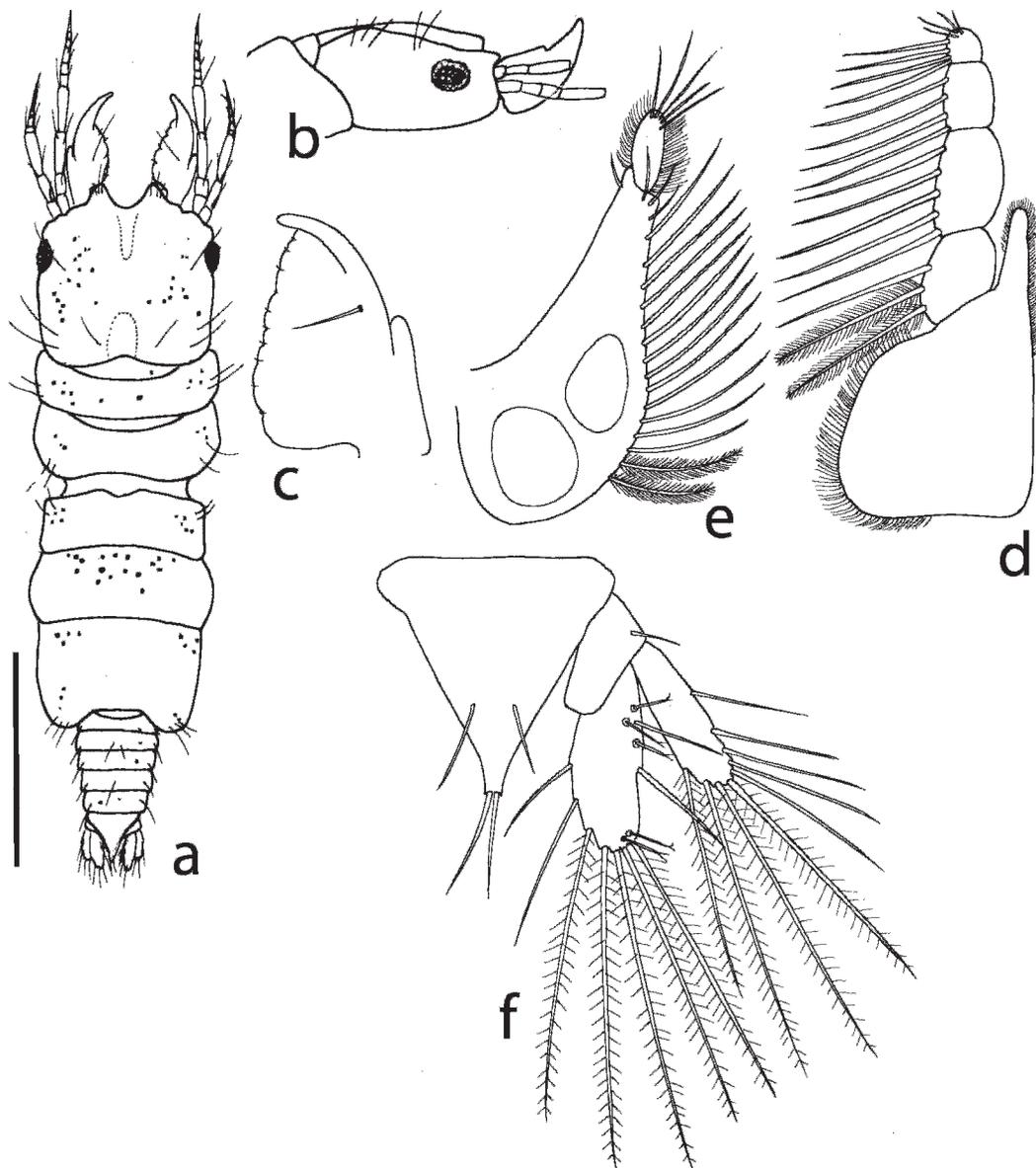


Fig. 11. *Gnathia stoddarti*. a, dorsal view, scale = 0.5 mm; b, cephalon in lateral view; c, mandible; d, maxilliped; e, pylopod; f, pleotelson and right uropod.

frontal process absent; frontal border slightly produced; superior frontolateral process conical (prominent); paraocular ornamentation absent; supraocular lobe absent. Mandible 1.7 times as long as greatest width of blade; incisor pronounced; blade crenulate; with seta; without internal lobe. Pylopod 2-articled, operculate. Pereon even-sided. Penes 2 small contiguous papillae. Pleotelson sub-

triangular, 1 times as long as wide. Uropodal endopod 2.6 times as long as wide, with 8 marginal setae; exopod 3.2 times as long as wide, with 9 marginal setae.

Remarks.—*Gnathia stoddarti* resembles *G. eumeces* described herein in the squarish head but can be distinguished by the produced frontal border with deep median excavation, and broader mandible.

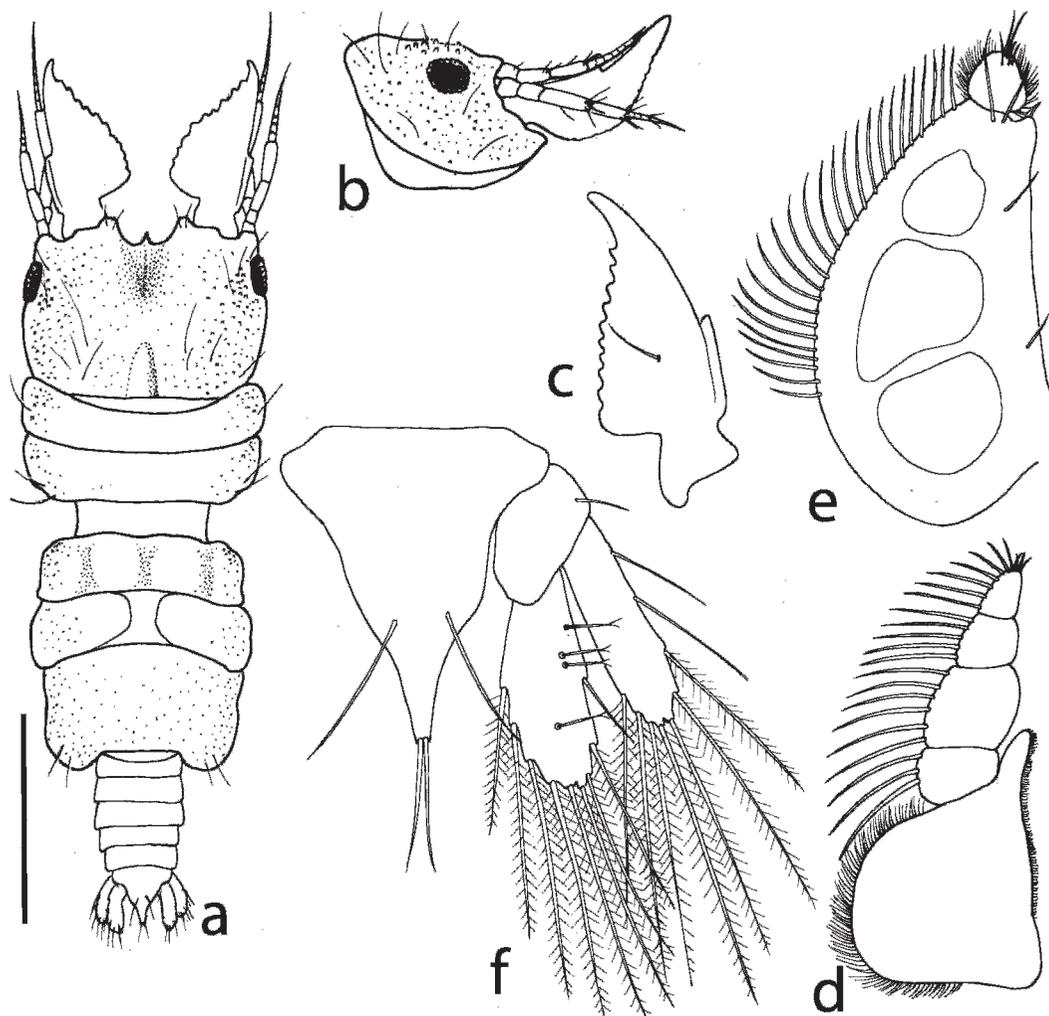


Fig. 12. *Gnathia zanzibarensis*. a, dorsal view, scale = 0.5 mm; b, cephalon in lateral view; c, mandible; d, maxilliped; e, pylopod; f, pleotelson and right uropod.

Individuals are colored by sparsely scattered reddish-brown pigment on the dorsum of the pereon and pleonites, especially pereonite 5.

Etymology.—The species is named for biogeographer David R. Stoddart, whose conservation efforts promoted the designation of Aldabra, the type locality, as a UNESCO World Heritage Site.

Gnathia zanzibarensis, new species

Fig. 12

Type material.—HOLOTYPE: ZMUC CRU-3117, male, 2.1 mm, Bawe Island,

Zanzibar, SW side of reef, 6°09'42"S, 39°07'49"E, 12–14 m, 21 Sep 1995 (stn 5/D4-1). PARATYPES: ZMUC CRU-1889, 11 males, 1 ovigerous female, Changuu Island, Zanzibar, 6°06'54"S, 39°09'48"E, large coral heads, 7 m, coll. N. L. Bruce, 19 Sep 1995 (stn 2/D1-1); ZMUC CRU-3122, 1 male, 1 praniza, Mnemba Island, Zanzibar, 5°50'00"S, 39°23'30"E, 25 m, coll. N. L. Bruce, 25 Sep 1995 (stn N10/D6-1); ZMUC CRU-3115, 10 males, Matemwe, Zanzibar, reef flat, intertidal, N. L. Bruce 25 Sep 1995 (stn 9I1-1); USNM 280392, 2 males, 1

ovigerous female, 1 praniza, Bawe Island, Zanzibar, 6°09'42"S, 39°07'42"E, sand, 10 m, coll. N. L. Bruce, 21 Sep 1995 (stn 5/D4-3).

Diagnosis of male.—Cephalosome 0.75 times as long as wide, with a low, posterior median tubercle; dorsal sulcus shallow, obscure; mediofrontal process conical; frontal border transverse; superior frontolateral process rounded; paraocular ornamentation granules medial to eyes; supraocular lobe simple, rounded. Mandible 1.6 times as long as greatest width of blade; incisor absent; blade crenulate; with seta; without internal lobe. Pylopod 2-articled, operculate. Pereon widest anteriorly. Penes 2 small contiguous papillae. Pleotelson subtriangular, distal quarter exceptionally narrow, 1.2 times as long as wide. Uropodal endopod 2.5 times as long as wide, with 9 marginal setae; exopod 3.3 times as long as wide, with 9 marginal setae.

Remarks.—*Gnathia zanzibarensis* can be distinguished from the other Indian Ocean gnathiids by the shape of the frontal margin including the small medial projection in the central concavity, and the elongate pleotelson.

Etymology.—The specific name derives from the type locality.

Key to Indian Ocean species of *Gnathia* (males only)

Note: *Gnathia piscivora* Paperna & Por, 1977 from Elat, Gulf of Aqaba, was poorly described and is not included in the key.

- 1. Cephalosome dorsally granular 2
 - Cephalosome not granular 13
- 2. Frontal margin having mediofrontal process 3
 - Frontal margin lacking mediofrontal process 6
- 3. Mediofrontal process broadly rounded *G. mortenseni* Monod, 1926 [tl. 2.7–3.0 mm, Gulf of Thailand, Andaman Sea (Svavarsson 2002)]
 - Mediofrontal process acute 4
- 4. Superior frontolateral process faintly bilobed
 - G. serrula* [tl. 3.0 mm, Phuket, Thailand]
 - Superior frontolateral process rounded or subacute, not bilobed 5
- 5. Superior frontolateral process faintly denticulate
 - G. zanzibarensis* [tl. 2.1 mm, Zanzibar Is.]
 - Superior frontolateral process rounded, not denticulate
 - *G. luxata* [tl. 2.3 mm, Persian Gulf]
- 6. Frontal margin deeply emarginate at midpoint 7
 - Frontal margin not emarginate 8
- 7. Cephalosome about as wide as long, with few dorsolateral tubercles, medial notch rounded
 - *G. stoddarti* [tl. 2.0 mm, Aldabra Atoll]
 - Cephalosome wider than long, with oblique lateral row of tubercles, medial notch angular
 - *G. pantherina* Smit & Basson, 2002 [tl. 4.9–6.1 mm, SE coast of South Africa]
- 8. Cephalosome granulate only near eyes 9
 - Cephalosome granulate overall 12
- 9. Submedian paired processes as long as and weakly differentiated from frontolateral margin of head
 - *G. somalia* [tl. 4.0 mm, Off Somalia]
 - Submedian paired processes set and distinct from frontolateral margin of head 10
- 10. Margins of pleotelson minutely serrate
 - *G. glauca* [tl. 3.2 mm, Aldabra Atoll]
 - Margins of pleotelson entire 11
- 11. Submedian paired processes half as long as superior frontolateral processes; telson with excavate lateral margins
 - *G. nkulu* Smit & Van As, 2000 [tl. 3.7–4.9 mm, South Africa, Madagascar]
 - Submedian paired processes obscure, quarter length of superior frontolateral processes; telson triangular, with straight lateral margins
 - *G. indoinsularis* Svavarsson & Jörundsdóttir, 2004 [tl. 2.7 mm, Rodrigues]
- 12. Frontal margin with distinct pair of inferior and superior frontolateral processes *G. firin-gae* Müller, 1991 [tl. 2.1 mm, Réunion Is.]

- Frontal margin lacking clear inferior and superior frontolateral processes *G. arabica* Schotte, 1995 [tl. 2.2 mm, Arabian Sea]
- 13. Frontal margin with mediofrontal process, sometimes obscure 14
- Frontal margin lacking mediofrontal process 16
- 14. Mediofrontal process almost indistinct from submedian processes *G. alces* Monod, 1926 [tl. 2.2–2.8 mm, Gulf of Thailand, Andaman Sea (Svavarsson 2002)]
- Mediofrontal process distinct 15
- 15. Mediofrontal process low, sited in shallow emargination *G. rhinobatis* (Kossmann, 1880) [Gulf of Suez]
- Mediofrontal process somewhat conical, not in emargination *G. taprobanensis* Monod, 1926 [tl. 2.0 mm, Sri Lanka]
- 16. Cephalosome bearing 2 pairs of conical processes posteriorly *G. disjuncta* Barnard, 1920 [tl. 3.5 mm, SE coast of South Africa]
- Cephalosome lacking conical processes 17
- 17. Frontal margin with pair of superior frontolateral processes only 18
- Frontal margin with pair of inferior and superior frontolateral processes 19
- 18. Cephalosome wider than long, frontolateral processes obscure *G. bengalensis* Kumari, Rao & Shyamasundari [tl. 0.8 mm, E coast of India]
- Cephalosome almost square, frontolateral processes prominent *G. eumeces* [tl. 3.0 mm, Red Sea]
- 19. Cephalosome with low crenulations or tubercles mesial to eyes *G. africana* Barnard, 1914 [tl. 4.0 mm, SE coast of South Africa]
- Cephalosome lacking crenulations or tubercles *G. antonbruunae* [tl. 2.5 mm, Off Mozambique]

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