

Anuretes grandis sp. n., a caligid copepod (Siphonostomatoida) parasitic on *Diagramma pictum* (Pisces) in Taiwan, with discussion of *Anuretes* Heller, 1865

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Abstract. A new species of caligid copepod (Siphonostomatoida), *Anuretes grandis* sp. n., parasitic on the painted sweetlips [*Diagramma pictum* (Thunberg)] in Taiwan is described. The new species is distinguished from its congeners by having: (1) free margin of cephalothorax not covering fourth pediger, (2) large genital complex longer than 2/3 of the cephalic shield, (3) no maxillary whip, (4) leg 3 with 9 setae on the terminal segment of exopod and 8 plumose setae on the terminal segment of endopod, and (5) armature of I,III on leg 4 exopod. Genus *Anuretes* Heller, 1865 is reviewed and redefined. Based on the new diagnosis three species (*A. chelatus* Prabha et Pillai, *A. feddorni* Price and *A. parvulus* Wilson) were transferred to *Pseudanuretes*, and two species (*A. furcatus* Capart and *A. renalis* Heegaard) were transferred to *Lepeophtheirus*. In addition, the following three species of caligids were transferred to *Anuretes*: *Lepeophtheirus fallolunulus* Lewis, *Heniochophilus indicus* Pillai, and *Lepeophtheirus rotundigenitalis* Prabha et Pillai. The latter is renamed *Anuretes occultus* nom. n. due to the homonym encountered through this transfer. "*Anuretes plectorhynchi* Yamaguti" reported by Prabha and Pillai (1986) is renamed *Anuretes similis* sp. n. and *Anuretes yamagutii* Prabha et Pillai is relegated to the synonym of *Anuretes anomalus* Pillai. A key to the 18 species of *Anuretes* is provided.

Although more than 200 species of marine fishes are caught for food from the waters of Taiwan, only about 15% of them have so far been examined for copepod parasites. In order to narrow this gap, we launched in 1997 a survey of commercial fishes for their copepod parasites. Up till now, we have obtained parasitic copepods from 67 of the 90 species of fishes examined. In this paper we shall report a new species of *Anuretes* recovered from the gills of painted sweetlips [*Diagramma pictum* (Thunberg)].

In their fourth part of report on the copepod parasites of the marine fishes of India, Prabha and Pillai (1986) reported seven species of *Anuretes* with four of them new to science. However, close examination of their report revealed that "*Anuretes chelatus* sp. nov." is a species of *Pseudanuretes*, "*Anuretes yamagutii* sp. nov." a misidentification for *Anuretes anomalus* Pillai, 1967, and "*Anuretes plectorhynchi* Yamaguti" a new species. Such mistakes are considered chiefly due to the ambiguity of the definition of the genus *Anuretes*. Thus, we shall take the opportunity of describing the first species of *Anuretes* from Taiwan to give a general discussion of the genus and also to provide a key to the known species.

MATERIALS AND METHODS

The fish hosts – painted sweetlips [*Diagramma pictum* (Thunberg)] – were purchased from the Mi-Tuo Fishing Port in Kaohsiung County of Taiwan and transferred in an icebox

to National Chiayi Institute of Technology where the laboratory examination for parasites was carried out. The copepod parasites removed from the fish hosts were preserved in 70% ethanol. They were later cleared in 85% lactic acid for 1 to 2 h before dissection in a drop of lactic acid on a wooden slide (Humes and Gooding 1964). The removed body parts and appendages were examined under the compound microscope with a series of magnifications up to $\times 1,500$. All drawings were made with the aid of a camera lucida.

RESULTS

Anuretes grandis sp. n.

Figs. 1-3

Female. Body (Fig. 1A) 1.72 (1.50-1.98) mm long, excluding setae on caudal rami. Cephalothoracic shield longer than wide, 0.98 (0.92-1.06) \times 0.81 (0.74-0.92) mm, excluding marginal hyaline membrane. Fourth pediger, 0.14 \times 0.18 mm, only partially covered by free margin of cephalothorax. Genital complex usually slightly longer than wide, 0.70 (0.58-0.90) \times 0.68 (0.56-0.92) mm. Abdomen (Fig. 3C) much reduced, represented by reduced, bilobate anal somite located at end of genital complex. Caudal ramus (Fig. 3C) small, longer than wide, 25 (24-28) \times 22 (16-24) μ m, carrying 3 short and 3 long plumose setae. Egg sac 1.15 (0.76-1.93) mm long, containing as many as 34 eggs.

Antennule (Fig. 1B) 2-segmented; proximal segment with 27 setae on anterodistal surface, distal segment with a subterminal seta on posterior margin and 11 setae

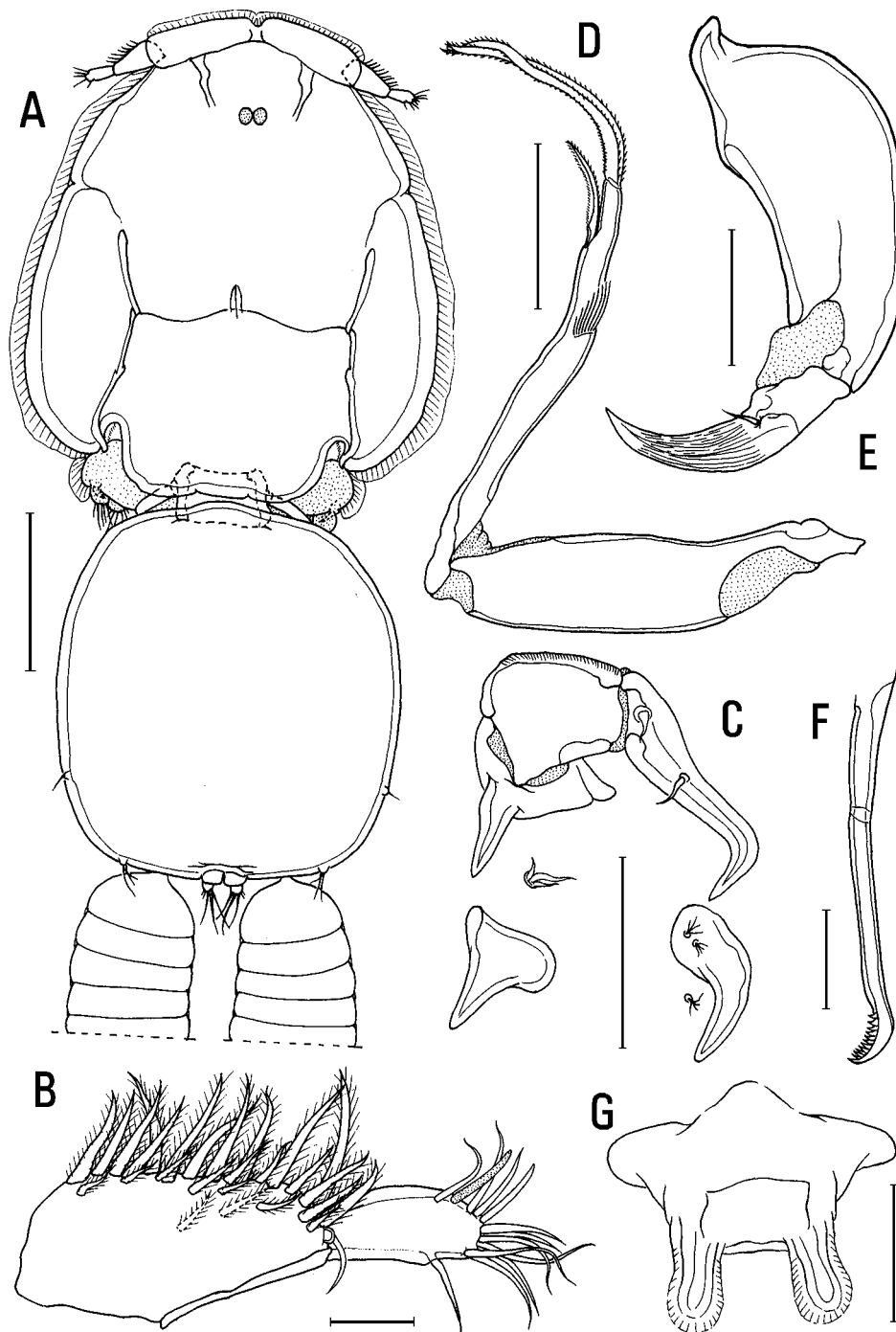


Fig. 1. *Anuretes grandis* sp. n., female. **A** – habitus, dorsal; **B** – antennule, ventral; **C** – antenna, postantennal process and maxillule, ventral; **D** – maxilla; **E** – maxilliped; **F** – mandible; **G** – sternal furca. Scale bars: A = 0.3 mm; B, F = 0.03 mm; C, E = 0.1 mm; D = 0.07 mm; G = 0.05 mm.

plus 1 aesthetasc on distal margin. Antenna (Fig. 1C) 3-segmented; proximal segment smallest, with sharply pointed posteromedial process; second segment rectangular and unarmed; distal segment a sharply pointed, bent claw bearing 1 seta in proximal region and another one in middle region. Postantennal process bluntly pointed claw, bearing 2 basal papillae with each bearing 4 setules. Another similar papilla located nearby on sternum.

Mandible (Fig. 1F) apparently 2-segmented; with 12 teeth on medial margin of distal blade. Maxillule (Fig. 1C) comprising short pointed process and papilla with 3 setae. Maxilla (Fig. 1D) 2-segmented; proximal segment (lacertus) large and unarmed, slender, distal segment (brachium) carrying a subterminal, hyaline membrane on outer edge and 2 unusual elements (calamus and canna) terminally. Maxillary whip (Figs. 3A,B) obtuse, bent process located posterolaterally to maxilla. Maxilliped (Fig. 1E) 3-segmented; proximal segment (corpus) largest but unarmed; middle and distal segments fused to form strong, sharply pointed claw carrying medial seta. Sternal furca (Fig. 1G) with short, obtuse, parallel tines.

Armature on rami of legs 1-4 as follows (Roman numeral indicating spines and Arabic numeral, setae):

	Exopod	Endopod
Leg 1	1-0; III, 1,3	(vestigial)
Leg 2	I-1; I-1; II, I, 5	0-1; 0-2; 6
Leg 3	I-0; 9	0-0; 6
Leg 4	I-0; III	(missing)

Leg 1 (Fig. 2A) protopod with long, plumose outer (anterior) seta and another small, plumose inner (posterior) seta; vestigial endopod 2-segmented and tipped with 2 setules; first segment of exopod with row of setules on posterior (inner) edge and short spiniform seta at outer (anterior) distal corner; inner 2 of 3 terminal elements on last segment of exopod (Fig. 2B) with accessory process, bipinnate setiform process originated at base of innermost terminal element. Leg 2 (Fig. 2C) coxa small, with large, plumose, inner seta on posterior edge; basis lacking outer seta; both outer and medial edges of protopod fringed with large marginal membrane. Leg 3 (Fig. 2D) protopod (apron) with large, outer marginal membrane; posterior edge with small, plumose, outer seta and large, plumose inner seta. Leg 4 (Fig. 2E) protopod with naked outer seta; pectens on exopod segments at insertion of 2 inner, terminal spines (Fig. 2F). Leg 5 (Fig. 3C) represented by a papilla bearing single, plumose seta and leg 6 (Fig. 3C) represented by a slightly larger papilla tipped with 3 plumose setae.

Type host: *Diagramma pictum* (Thunberg).

Site of infection: gills.

Type locality: Mi-Tuo, Kaohsiung County, Taiwan.

Prevalence and intensity: 33% (1 ♀ from 1 of 3 fishes) obtained on 2 April, 1999 and 50% (25 ♀♀ from 2 of 4 fishes) obtained on 14 May, 1999.

Etymology: The species name *grandis*, from Latin meaning large, great, noble, magnificent, refers to the spectacular genital complex, which is nearly as large as the cephalothorax – an unusual feature for the species of *Anuretes*.

Deposition of types: Holotype (USNM 288089) and 12 paratypes (USNM 288090) have been deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.

Remarks. The new species from Taiwan is characteristic in having a large genital complex, which is about 71 (63-85) % of the size of cephalothorax. Currently, there are 20 nominal species in the genus *Anuretes* and only one of them, *A. rotundigenitalis* Hameed, bears a large genital complex like the present species. However, the new species is distinguished from *A. rotundigenitalis* chiefly in the armature on legs 2, 3, and 4. In *A. rotundigenitalis* the first outer spine on the exopod of leg 2 does not reach the distal edge of the terminal segment, the distal segment of leg 3 exopod has 8 (instead of 9) setae, and the middle spine on the terminal segment of leg 4 exopod is about 1/2 (instead of 4/5) the length of the inner most spine. *A. rotundigenitalis* is known from a grunt, “*Diagramma crassispinum* Day”, collected in Cape Comorin, India (Hameed 1976).

It is noteworthy that in *A. grandis* the armature on the terminal region of the distal segment of antennule is 11 + 1 aesthetasc, with one less element (either seta or aesthetasc) in comparison with most species of *Caligus* and *Lepeophtheirus*. Also, the basis of leg 2 is unusual in lacking outer seta.

DISCUSSION

Genus *Anuretes* Heller, 1865

In 1863 when Henrik Krøyer described *Lepeophtheirus heckelii* found on the spadefish, “*Ephippus gigas*”, from Brazil and New Orleans, Louisiana, he noticed the copepod bearing a vestigial abdomen and commented that this unusual feature might warrant the creation of a new genus for *L. heckelii*. Krøyer’s (1863) comment was adopted by Heller (1865) who proposed a new genus *Anuretes* to accommodate *L. heckelii*. Since the establishment of *Anuretes*, 19 species of caligid copepods have been described and attributed to this genus (Table 1).

Although the distinction between members of *Anuretes* and *Lepeophtheirus* was set to be the absence or great reduction of the abdomen in the species of *Anuretes* (Heller 1865, Wilson 1905, Heegaard 1945, Capart 1953, Lewis 1964, Pillai 1985), some members

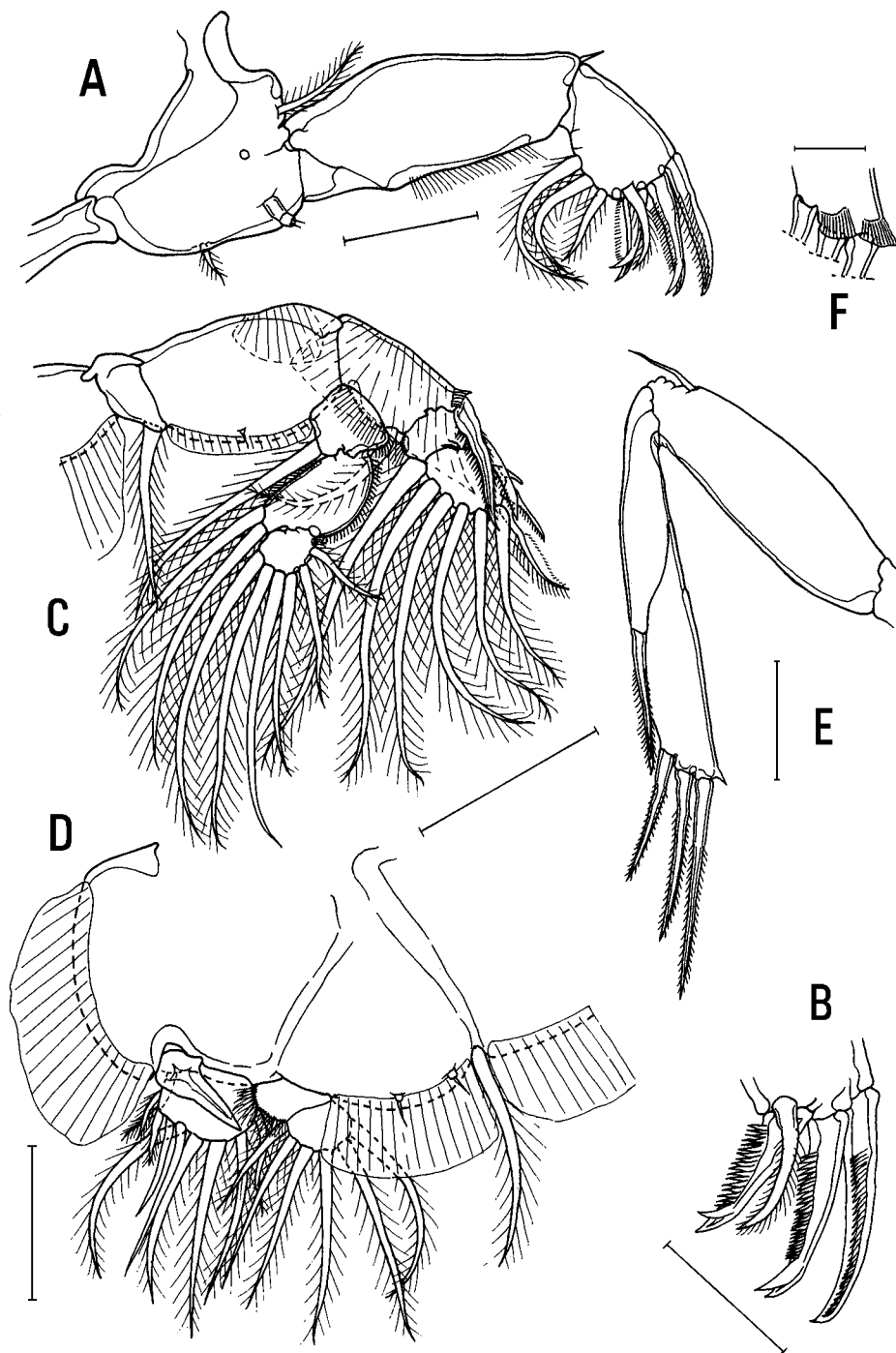


Fig. 2. *Anuretes grandis* sp. n., female. **A** – leg 1, anterior; **B** – tip of leg 1 exopod; **C** – leg 2, ventral (anterior); **D** – leg 3, ventral; **E** – leg 4, ventral (anterior); **F** – terminal portion of distal segment of leg 4 exopod. Scale bars: A, D = 0.07 mm; B, E = 0.05 mm; C = 0.15 mm; F = 0.02 mm.

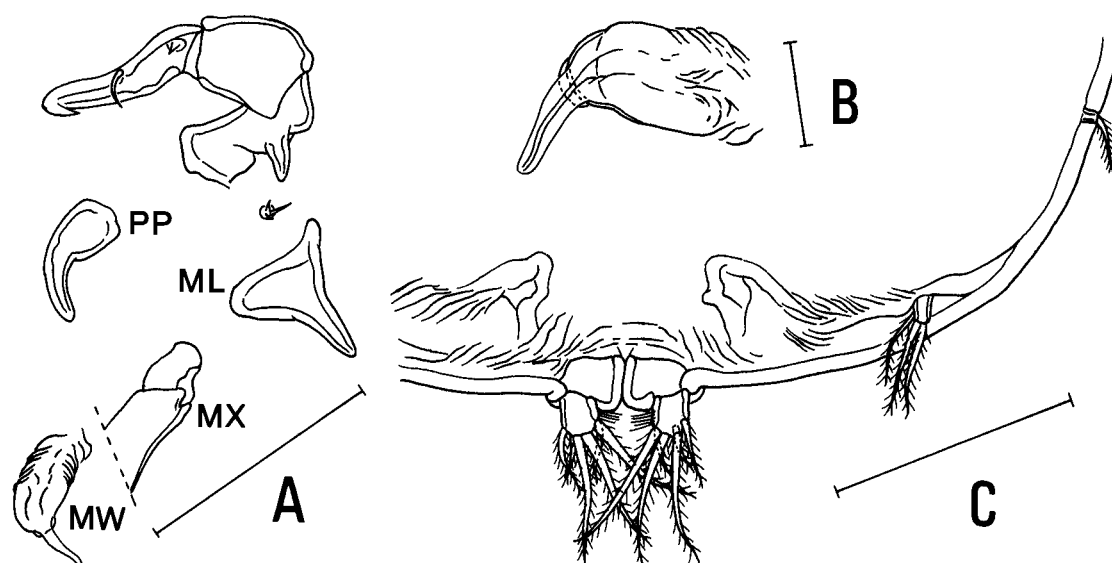


Fig. 3. *Anuretes grandis* sp. n., female. **A** – antenna, postantennal process (PP), maxillule (ML), maxillary whip (MW), basal part of maxilla (MX), ventral; **B** – maxillary whip; **C** – posterior portion of genital complex, ventral. Scale bars: A, C = 0.15 mm; B = 0.03 mm.

of this genus, like *A. furcatus*, *A. quadrilaterus*, *A. renalis*, *A. serratus*, etc., possess a small but distinct abdomen, as in some species of *Lepeophtheirus*. Thus, to distinguish between these two genera by this feature alone was questioned by Shiino (1954), Pillai (1967), and Ho and Dojiri (1977). Shiino (1954) added that *Anuretes* could be distinguished from *Lepeophtheirus* by having a 2-segmented exopod on leg 4 and Pillai (1967) claimed that the occurrence of pinnate seta 4 between spines 2 and 3 on the terminal exopodal segment of leg 1 was not found in species of *Lepeophtheirus*. However, Ho and Dojiri (1977) opted to treat the 12 species of *Anuretes* known then as *Lepeophtheirus* until the taxonomic value of these characters can be re-evaluated.

In his unpublished work on the revision of the genera of the Caligidae, Dojiri (1983) resurrected *Anuretes* and distinguished it from *Lepeophtheirus* by a combination of the following characters:

- 1) Vestigial abdomen.
- 2) Two-segmented exopod of leg 3.
- 3) Absence of basal swelling or fusion of it with basal spine on exopod of leg 3.
- 4) Absence of inner plumose seta of first endopodal segment of leg 3.
- 5) Two-segmented exopod of leg 4.

To this combination of characters we can now add one more feature to define the scope of the genus *Anuretes*:

- 6) Pinnate seta 4 located between spines 2 and 3 on the terminal segment of exopod of leg 1 (instead of on the posterior corner or inner to the base of spine 3).

Although the last character is shared with *Pseudanuretes* Yamaguti, 1936, species of the latter genus are characterised in having an accessory tine on the claw of antenna and lacking postantennal process, dentiform process of maxillule, and sternal furca.

Taking into consideration the above-mentioned diagnostic combination of six characters for the genus *Anuretes*, it was discovered that *A. furcatus* Capart, 1953 and *A. renalis* Heegaard, 1945 should be transferred to *Lepeophtheirus*, because of the possession of a small but distinct abdomen and the 3-segmented exopod of leg 4. Since neither species was well described, no further comments can be provided. We concur with Dojiri's (1983) recommendation to transfer *A. parvulus* Wilson, 1913 to *Pseudanuretes*. Additionally, *A. chelatus* Prabha et Pillai, 1986 and *A. feddorni* Price, 1968 should also be transferred to *Pseudanuretes*. These two species possess an accessory tine on the terminal claw of antenna and lack the postantennal process and the dentiform process of maxillule.

While five species are suggested to be removed from the redefined *Anuretes*, examination of literature on 109 species of *Lepeophtheirus* revealed that two of them, *L. fallolunulus* Lewis, 1967 and *L. rotundigenitalis* Prabha et Pillai, 1983, should be included in the redefined *Anuretes*. *L. fallolunulus* was recovered from the gill cavity of a surgeonfish, *Naso unicornis* (Forsskål), in Hawaii. It was placed in *Lepeophtheirus* with some reservation by Lewis (1967), but based on his description, *L. fallolunulus* possesses all of the redefined characters of *Anuretes* except for the abdomen, which is reduced but not vestigial. Prabha and

Table 1. Species of *Anuretes* nominated since the erection of the genus.

Species	Host	Locality
<i>A. anomalus</i> Pillai, 1967	<i>Platax teira</i> (Forsskål) <i>Diagramma pictum</i> (Thunberg) (= <i>Spilotichthys pictus</i>)	Trivandrum, India Heron Island, Australia
<i>A. branchialis</i> Rangnekar, 1953	<i>Eleutheronema tetradactylum</i> (Shaw) <i>Heniochus acuminatus</i> (Linnaeus) <i>Katsuwonus pelamis</i> (Linnaeus) <i>Platax teira</i>	Arabian Sea Shirahama, Japan Bombay, India Australia; Sri Lanka, Celebes; Philippines
<i>A. brevis</i> Pearse, 1951	<i>Archosargus probatocephalus</i> (Walbaum)	Bahamas
<i>A. chelatus</i> Prabha et Pillai, 1986	<i>Pomacanthodes imperator</i> (Bloch)	Trivandrum, India
<i>A. feddemi</i> Price, 1968	<i>Holacanthus ciliaris</i> (Linnaeus)	Caribbean
<i>A. furcatus</i> Capart, 1953	<i>Mobula rochebrunei</i> (Vaillant)	Senegal
<i>A. heckelii</i> (Krøyer, 1863)	<i>Caranx hippos</i> (Linnaeus) <i>Chaetodipterus faber</i> (Broussonet) “ <i>Ephippus gigas</i> ” <i>Lobotes surinamensis</i> (Bloch) <i>Scomberomorus maculatus</i> (Mitchill) <i>Vomer setapinnis</i> (Mitchill)	Tuxpan, Mexico Louisiana; Texas, Mississippi Brazil Louisiana Texas Mississippi
<i>A. hoi</i> Prabha et Pillai, 1986	<i>Diagramma pictum</i> (= <i>Spilotichthys pictus</i>)	Trivandrum, India
<i>A. menehune</i> Lewis, 1964	<i>Naso hexacanthus</i> (Bleeker)	Hawaii
<i>A. parvulus</i> Wilson, 1913	<i>Angelichthys bermudensis</i> (Jordan et Rutter) <i>Pomacanthus arcuatus</i> (Linnaeus)	Florida Dry Tortugas, Florida
<i>A. perplexus</i> Bassett-Smith, 1898	<i>Lutjanus</i> sp.	Sri Lanka
<i>A. plataxi</i> Prabha et Pillai, 1986	<i>Platax teira</i>	Trivandrum, India
<i>A. plectorhynchi</i> Yamaguti, 1936	<i>Diagramma pictum</i> (= <i>Plectorhynchus pictus</i>) (= <i>Spilotichthys pictus</i>)	Japan Trivandrum, India
<i>A. quadrilaterus</i> Shiino, 1954	<i>Zenopsis nebulosa</i> (Temminck et Schlegel)	Japan
<i>A. renalis</i> Heegaard, 1945	<i>Diodon</i> sp.	Japan
<i>A. rotundigenitalis</i> Hameed, 1976	“ <i>Diagramma crassispinum</i> Day”	Cape Comorin, India
<i>A. rotundus</i> Prabha et Pillai, 1983	<i>Pomacanthodes imperator</i>	Trivandrum, India
<i>A. serratus</i> Shiino, 1954	<i>Naso hexacanthus</i> <i>Siganus javus</i> (Linnaeus) <i>Xesurus scalprum</i> (Cuvier et Valenciennes)	Hawaii Trivandrum, India Wakayama, Japan
<i>A. shiinonii</i> Prabha et Pillai, 1986	<i>Naso</i> sp.	Trivandrum, India
<i>A. yamagutii</i> Prabha et Pillai, 1986	<i>Plectorhynchus cinctus</i> (Temminck et Schlegel) <i>Diagramma pictum</i> (= <i>Spilotichthys pictus</i>)	Kuwait Trivandrum, India

Note: Information shown in this table was compiled from the following works: Capart (1953), Causey (1953, 1955, 1960), Dojiri (1983), Hameed (1976), Heegaard (1945), Ho and Sey (1996), Kabata (1965), Krøyer (1863), Lewis (1964), Pearse (1951), Pillai and Mohan (1965), Prabha and Pillai (1983, 1986), Price (1966), Rangnekar (1953), Shiino (1954), Wilson (1913, 1935), Yamaguti (1936), and Yamaguti and Yamasu (1959).

Pillai (1983) found *L. rotundigenitalis* in the gill cavities of a somber sweetlips, *Plectorhynchus* (= *Gaterin*) *schotaf* (Forsskål), from Trivandrum, India. Although the species was placed in *Lepeophtheirus* and claimed to be unique in bridging “the gap between several genera of Lepeophtheirinae and Anuretinae”, Prabha and Pillai’s (1983) description of this species fits well to the six features given above for the species of *Anuretes*. However, it can not be transferred to *Anuretes* without a name change, because the specific name is preoccupied (see Table 1). Thus, we propose to call it “*Anuretes occultus* nom. n.” implying the fourth pediger of this species is entirely concealed underneath the free margin of the cephalothorax.

Pillai and Mohan (1965) transferred *Anuretes branchialis* Rangnekar, 1953 to *Heniochophilus*, which was established to contain one species, *H. japonicus*, by Yamaguti and Yamasu (1959). At the time of this transfer, it was also recognised by Pillai and Mohan (1965) that *H. japonicus* was conspecific with “*Heniochophilus branchialis*”. The genus *Heniochophilus* remained monotypic until Pillai (1977) described *H. indicus* from a spadefish, *Platax teira* (Forsskål), from Kerala, India. However, after re-examination of “*Heniochophilus branchialis*” recovered from the spadefishes from Sri Lanka and Southeast Asia kept in ichthyological collection at National Museum of Natural History, Dojiri (1983) proposed the synonymy

of *Heniochophilus* with *Anuretes* and returned *H. branchialis* to its original status proposed by Rangnekar (1953) and also transferred *H. indicus* to *Anuretes*.

Thus, in conclusion, with removal of five species (*A. chelatus*, *A. feddorni*, *A. furcatus*, *A. parvulus*, *A. renalis*) and addition of three species (*L. fallolunulus*, *L. rotundigenitalis*, and *H. indicus*), there are now 19 species of caligid copepods attributed to *Anuretes*, including the new species reported herein.

Key to the species of the genus *Anuretes*

In compiling morphological data for construction of a key to the species, it was discovered that *A. yamagutii* Prabha et Pillai, 1986 is synonymous with *A. anomalus* Pillai, 1967 and "*Anuretes plectorhynchi* Yamaguti" reported by Prabha and Pillai (1986) is in essence a new species. Therefore, according to Article 60 of the International Code of Zoological Nomenclature, we propose to call the latter "*Anuretes similis* nom. n." implying its close resemblance to *A. plectorhynchi*. Prabha and Pillai's (1986) description of "*Anuretes plectorhynchi* Yamaguti" shows that it differs from Yamaguti's (1936) *A. plectorhynchi* in the possession of (1) maxillary whip, (2) the fourth pediger not covered by the free margin of the cephalothorax, and (3) larger genital complex (relative to cephalothoracic shield).

As generally true for the caligid copepods, the species of *Anuretes* are mostly known from the female; thus, the key provided below is intended for the identification of female *Anuretes*. Inasmuch as *A. brevis* Pearse is known only from the male and has not been adequately described, it is excluded from the following key.

- | | | |
|----|--|---|
| 1 | Armature of leg 4 exopod I,II | 2 |
| – | Armature of leg 4 exopod I,IV | 3 |
| – | Armature of leg 4 exopod I,III | 7 |
| 2 | Length of genital complex about 1/2 that of cephalothoracic shield, 4 setae on terminal segment of leg 3 endopod | <i>A. indicus</i> (Pillai, 1977) |
| – | Length of genital complex about 1/4 that of cephalothoracic shield, 6 setae on terminal segment of leg 3 endopod | <i>A. rotundus</i> Prabha et Pillai, 1983 |
| 3 | Dentiform process of maxillule simple | 4 |
| – | Dentiform process of maxillule bifid | 5 |
| – | Dentiform process of maxillule simple but with a hooklet | <i>A. heckelii</i> (Krøyer, 1863) |
| 4 | Genital complex less than 1/2 length of cephalothoracic shield, 4 setae on terminal segment of leg 3 endopod | <i>A. plataxi</i> Prabha et Pillai, 1986 |
| – | Genital complex more than 1/2 length of cephalothoracic shield, 6 setae on terminal segment of leg 3 endopod | <i>A. shiinoii</i> Prabha et Pillai, 1983 |
| 5 | Inner surface of leg 3 protopod extended posteriorly into a large, heavily chitinised, blunt-tipped process; outer spine on first segment of leg 2 exopod simple | <i>A. menehune</i> Lewis, 1964 |
| – | Inner surface of leg 3 endopod without such process; outer spine on first segment of leg 2 exopod ramified | 6 |
| 6 | Length of genital complex greater than 1/2 of cephalothoracic shield, posterior setae of leg 1 exopod simple, reduced | <i>A. fallolunulus</i> (Lewis, 1967) |
| – | Length of genital complex shorter than 1/2 of cephalothoracic shield, posterior setae of leg 1 exopod plumose, long | <i>A. serratus</i> Shiino, 1954 |
| 7 | Fourth pediger completely covered by free margin of cephalothorax | 8 |
| – | Fourth pediger not covered by free margin of cephalothorax | 9 |
| 8 | Length of genital complex greater than 1/2 that of cephalothorax, 2 setae on terminal segment of leg 3 endopod | <i>A. branchialis</i> Rangnekar, 1953 |
| – | Length of genital complex shorter than 1/2 that of cephalothorax, 6 setae on terminal segment of leg 3 endopod | <i>A. plectorhynchi</i> Yamaguti, 1936 |
| 9 | Maxillary whip absent | 10 |
| – | Maxillary whip present | 11 |
| 10 | Maxilliped corpus with sharp, median protuberance; 7 plumose setae on terminal segment of leg 3 exopod | <i>A. perplexus</i> Bassett-Smith, 1898 |
| – | Maxilliped corpus without median protuberance, 9 (4 simple + 5 plumose) setae on terminal segment of leg 3 exopod | <i>A. quadrilaterus</i> Shiino, 1954 |
| 11 | Terminal segment of leg 3 exopod with 9 elements | 12 |
| – | Terminal segment of leg 3 exopod with 8 elements | 13 |
| – | Terminal segment of leg 3 exopod with 7 elements | 14 |
| 12 | Length of genital complex less than 1/2 that of cephalothorax; leg 6 tipped with 4 plumose setae | <i>A. anomalus</i> Pillai, 1967 |
| – | Length of genital complex greater than 1/2 that of cephalothorax, leg 6 tipped with 3 plumose setae | <i>A. grandis</i> sp. n. |
| 13 | Length of genital complex almost as long as that of cephalothorax, maxillary whip with simple, long setiform process .. | <i>A. rotundigenitalis</i> Hameed, 1976 |
| – | Length of genital complex about 1/2 that of cephalothorax; maxillary whip with a pair of short setiform processes | <i>A. similis</i> nom. n. |
| 14 | Length of genital complex greater than that of cephalothorax; maxilliped corpus without median protrusion | <i>A. occultus</i> nom. n. |
| – | Length of genital complex less than 1/2 that of cephalothorax; maxilliped corpus with sharply pointed, median protrusion | <i>A. hoi</i> Prabha et Pillai, 1986 |

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