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A New Species of *Dynoides* (Crustacea: Isopoda: Sphaeromatidae) from the Cape d'Aguilar Marine Reserve, Hong Kong

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ABSTRACT. A new species of sphaeromatid isopod, *Dynoides daguilarensis* n.sp., is described from intertidal black mussel (*Septifer virgatus*) beds in the Cape d'Aguilar Marine Reserve, Hong Kong. This species has been previously misidentified as *D. serratisinus* and *D. dentisinus*. It is characterized by a pleotelsonic apex with an open, sub-parallel slit, both edges of which are serrated from the bottom to the two sides of the apex; uropod endopods which are sub-apically notched externally; and a tubercle on the ventral side of the pleonal process. The composition of *Dynoides* and its relationships to *Clianella* are reviewed. A revised composition of *Dynoides* with a key to the species is provided.

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In this paper, *Dynoides daguilarensis* n.sp. is described from the Cape d'Aguilar Marine Reserve, Hong Kong. The new species is common in the intertidal beds of the black mussel, *Septifer virgatus*. This contribution is part of an ongoing study of the biology—including population dynamics, reproductive biology and behaviour of this species. Because of similarities with other species of *Dynoides*, this species has been wrongly identified in the past. More descriptive information on the species is needed. A key to all species in the genus is also presented.

Dynoides Barnard, 1914

Dynoides Barnard, 1914: 407; Nierstrasz, 1931: 198; Pillai, 1954: 11; Loyola e Silva, 1960: 91; Pillai, 1965: 79, 80; Bruce, 1980: 199, 208, 210; Iverson, 1982: 250; Bruce, 1982: 447; Harrison & Holdich, 1984: 370.

Paradynoides Loyola e Silva, 1960: 101.

Dynoidella Pillai, 1965: 78.

Dynoidella Nishimura, 1976: 275; Bruce, 1980: 199; Iverson, 1982: 250; Bruce, 1982: 447 (non *Dynoidella* Pillai, 1965).

Clianella Boone, 1923: 152; Menzies & Glynn, 1968: 58; Iverson, 1982: 250; Harrison & Holdich, 1984: 363.

Type species. *Dynoides serratisinus* Barnard, 1914.

Generic diagnosis. Cephalon broader than long; mandible with highly-ridged molar process, all pereopods with one strong secondary unguis on the dactyl. Clypeus in inverted V-shape; lobes of labium slightly rounded, distal portion strongly setose. Maxillipeds with 2nd, 3rd and 4th segments of palps inwardly produced. Anterior pereopods without natatory setae, ventral margins more strongly setulose. Pereopodal coxal margins with membrane-like setae. Penes fused along proximal half of length. Appendix masculina elongate, twice as long as endopod, strongly reflexed. Pleon with or without median dorsal process. Pleotelson in form of bilobed dome, convex in centre, flat near margins and apex; apex with variable slit to sinus, notch or foramen, with or without denticulate sides, with or without small inwardly directed, lobe at anterior end projecting into slit. Uropods with both rami broad and lamellar, subequal in length extending some distance beyond pleotelson; exopod folded at right angle to plane of uropod. Ovigerous female with brood pouch formed from three pairs of oostegites arising from pereonites 2, 3 and 4, overlapping well in the midline. Female with exopod of pleopod 3 segmented. Uropods lamellar, not extending beyond pleotelson. Pleotelsonic apex with posterior, simple, rounded dome.

Relationships of *Dynoides* to *Clianella*. The question of whether or not the absence of a pleonal process should be regarded as a critical feature separating *Dynoides* (Barnard, 1914) from *Clianella* (Boone, 1923) has been much discussed.

Harrison & Holdich (1984) argued that the presence or absence of pleonal processes is an important character separating *Dynoides* from *Clianella*, and should be considered a consistent generic character, thereby upholding *Clianella* Boone, with four species: *C. amblysina* (Pillai, 1954), *C. castroi* (Loyola e Silva, 1960), *C. elegans* (Boone, 1923) and *C. globicauda* (Dana, 1853). The only distinguishing character for *Clianella* is the absence of a pleonal process, an apomorphic character state which exists in varying degrees of development in mature males, from absent to elongate (Bruce, pers. comm.). In some species of *Dynoides*, e.g., *D. brevispina* Bruce, *D. brevicornis* Kussakin & Malyutina, *D. saldanai* Carvacho & Haasmann and *D. hoonsooi* Kwon, all of which have a very short, wide or blunt pleonal process or it cannot be termed a process in *D. hoonsooi*. Thus, intermediate stages exist (Bruce, pers. comm.). The ontogenic evidence also suggests that the dorsal process is absent in juvenile males and therefore immature individuals of the two "genera" cannot be differentiated (Bruce, pers. comm.). These two taxa, however, share some unique characters such as a pleotelsonic slit that may or may not have an anterior lobe and internal teeth; a penial process basally fused for half its length and an appendix masculina elongate, twice as long as the endopod and strongly reflexed. Bruce has concluded that the generic name *Clianella* should be suppressed and that *Dynoides*, a genus with an unambiguous definition, should be used for the taxon (Bruce, pers. comm.). *Dynoides* is polymorphic for the pleonal process character.

The author agrees with this interpretation and supports Bruce's conclusions. All species of *Clianella* can be placed in *Dynoides*.

Composition of *Dynoides*. Eighteen species of the sphaeromatid isopod genus *Dynoides* Barnard, 1914 are known to date. *Clianella globicauda* (Dana, 1853) has been placed variously in *Dynamenella* Hansen or *Exosphaeroma* Stebbing (Harrison & Holdich, 1984). Its identity remains unknown (Bruce, pers. comm.), and it is excluded here.

Dynoides amblysinus Pillai, 1954: 11 (**n.comb.** *Clianella amblysina*)—from India.

Dynoides artocanalis Nunomura, 1997: 73—from the intertidal zone of Tachibana Bay, Tokushima Prefecture, Japan.

Dynoides barnardi Baker, 1928: 56—from the coast of New South Wales, Australia.

Dynoides brevicornis Kussakin & Malyutina, 1987: 51—from Furugelm Island, Bochkov Cape, lower horizon of the rocky intertidal among *Laminaria* and *Costaria*; Eastern Cape of Severnaya Bay; Sivuchia Bay, Cape Ostrovok, Falshivigi, Russia.

Dynoides brevispina Bruce, 1980: 119—from Japan (Kwon, 1990: 174) and Korea.

Dynoides castroi Loyola e Silva, 1960: 91 (**n.comb.** *Clianella castroi*)—from Brazil.

Dynoides crenulatus Carvacho & Haasmann, 1984: 23—from the Pacific coast of Mexico.

Dynoides daguilarensis n.sp.—from Hong Kong.

Dynoides dentisinus Shen, 1929: 65—from Peidaiho, China, below low tide mark, Japan (Nunomura & Nishimura, 1976: 21; Bruce, 1980: 200) and Korea (Kwon, 1990: 174).

Dynoides elegans (Boone, 1923: 152) **n.comb.**, (*Clianella elegans*)—from California.

Dynoides harrisoni Kussakin & Malyutina, 1993: 1175—from the intertidal zone of Kat-Ba Island, Gulf of Tonkin, South China Sea.

Dynoides hoonsooi Kwon, 1990: 180—from Korea.

Dynoides indicus Müller, 1991: 313—from a sabellariid reef in Sri Lanka.

Dynoides longisinus Kwon, 1990: 175—from Korea.

Dynoides saldanai Carvacho & Haasmann, 1984: 27—from Puerto Escondido, Pacific coast of Mexico.

Dynoides serratisinus Barnard, 1914: 407—from Shepstone, Natal, South Africa, in the low intertidal.

Dynoides spinipodus Kwon & Kim, 1986: 43—from the south coast of Korea.

Dynoides viridis Bruce, 1982: 447—from Heron Island, Great Barrier Reef, Australia.

A key to the known species of *Dynoides*

Dynoides hoonsooi might be a junior synonym of *D. brevicornis* (Kwon, pers. comm.) and is also excluded from the key. Kwon (pers. comm.) suspects that *D. harrisoni* is a junior synonym of *D. longisinus*, so the name *D. longisinus* is used in this key because of its nomenclatorial priority. This key to species only works for adult males.

1 pleon with elongate dorsal process 2

—— pleon without elongate dorsal process 10

2 pleonal process triangular 3

—— pleonal process not triangular 9

3 pleotelsonic slit with smooth margins, lacking teeth and serrations ..... *D. spinipodus*

—— pleotelsonic slit with teeth, or serrations 4

4 pleotelsonic slit convergent posteriorly 5

—— pleotelsonic slit open to apex 6

5 pleotelson dorsal surface with two rows of distinct tubercles opposite two rows of tubercles on ventral surface of pleonal process ..... *D. barnardi*

—— without these characters ..... *D. dentisinus*

6 pleotelsonic slit anterior end without median lobe but semi-circular proximally ..... *D. longisinus*

—— pleotelsonic slit anterior end with small median lobe 7

7 pleotelsonic slit walls with 3–4 small spines projecting into slit; body bright green, suggesting a green algal habitat ..... *D. viridis*

—— pleotelsonic slit walls more markedly serrate; body not green 8

8 uropod endopod bearing truncate posterior margin ..... *D. serratisinus*

—— uropod endopod with sub-terminal marginal indentation; both edges of pleotelsonic slit with teeth from the bottom to the top ..... *D. daguilarensis*

9 pleotelson dorsal surface with 2 tubercles opposing those on pleonal process ..... *D. brevispina*

—— pleotelson not as above, short pleonal process points upward ..... *D. brevicornis*

10 pleotelson ventral surface having ventilation slit with denticulate margin ..... *D. indicus*

—— pleotelson ventral surface lacking ventilation slit with denticulate margin 11

11 pleotelson surface with two rows of 3 tubercles ..... *D. artocanalis*

—— pleotelson surface lacking such tubercles 12

12 pleotelsonic slit anterior end lacking median lobe ..... *D. crenulatus*

—— pleotelsonic slit anterior end with prominent small median lobe 13

13 body surface setose ..... *D. saldanai*

—— body surface not setose 14

14 pleotelsonic apical notch forming deep narrow slit with smooth lateral margin ..... *D. elegans*

—— pleotelsonic slit denticulate 15

15 uropodal rami margins angular and truncate ..... *D. amblysinus*

—— uropodal rami margins more rounded ..... *D. castroi*

Dynoides daguilarensis n.sp.

Figs. 1–6

Dynoides serratisinus.–Ong Che & Morton, 1992: 220; Kussakin & Malyutina, 1993: 1173 (misidentifications, not *D. serratisinus* Barnard, 1914).

Dynoides dentisinus.–Ong Che & Morton, 1992: 220; Kussakin & Malyutina, 1993: 1173 (misidentifications, not *C. dentisinus* Shen, 1929).

Material examined. Type specimens of *Dynoides daguilarensis* were collected on 7 January 1999, from the black mussel (*Septifer virgatus*) bed which forms a conspicuous mid-littoral, 0.5–1.0 m wide band at approximately mean high water neap tide, i.e., +1.3 m chart datum (Ong Che & Morton, 1992) on the southern shore of the Cape d'Aguilar Marine Reserve, Hong Kong, 22°12.48'N 114°15.67'E. Clumps of *S. virgatus* were removed with a hammer and chisel from the shore, transferred to the laboratory and separated a mussel by washing them with running seawater through a 500 mm diameter mesh-size, metal sieve. The isopods were then separated from other organisms, preserved in 5% neutral formaldehyde, and transferred to 80% alcohol.

Type specimens are deposited in the Australian Museum, Sydney. HOLOTYPE, AM P55943, adult male, bl (body length) 6.5 mm. PARATYPES: AM P55944, adult male, bl 6.2 mm; AM P55945, adult male, bl 5.8 mm; AM P55946, adult male, bl 7.4 mm; AM P55947, adult male, bl 5.6 mm; AM P55948, sub-adult male, bl 4.5 mm; AM P55949, adult male, bl 6.5 mm; AM P55950; ovigerous female, bl 4.8 mm; AM P55951, ovigerous female, bl 4.3 mm; AM P55952, ovigerous female, bl 4.5 mm; AM P55953, sub-adult female, bl 4.1 mm; AM P55954, juvenile, bl 1.8 mm.

Other PARATYPE specimens not dissected: AM P55955, adult male, 1 specimen; AM P55956, sub-adult males, 8 specimens; AM P55957, ovigerous females, 3 specimens; AM P55958, sub-adult females, 6 specimens; AM P55959, juveniles, 58 specimens. The following specimens were collected in 18 April 1999 from the type locality: AM P55960, adult males, 16 specimens; AM P55961, sub-adult males, 12 specimens; AM P55962, ovigerous females, 9 specimens; AM P55963, sub-adult females, 4 specimens; AM P55964, juveniles, 48 specimens.

Other material examined. SWIMS [Swire Institute of Marine Science] CRU-XX171, formerly identified as *Dynoides serratisinus*, 2 adult males, bl 4.7 mm and 4.3 mm, respectively. SWIMS CRU-XX172, formerly identified as *Dynoides dentisinus*, 1 sub-adult male, bl 3.4 mm; 1 ovigerous female, bl 3.5 mm; 1 sub-adult female, bl 3.6 mm; 6 juveniles. These SWIMS specimens collected by Ong Che and Morton in 1992, from the Cape d'Aguilar Marine Reserve, Hong Kong.

Diagnosis. One tubercle produced in ventral side of pleonal process. Antennulae reaching to about eighth joint of flagellum of antenna, to middle of 1st peraeon; flagellum shorter than peduncle. Mandible with highly-ridged molar process, robust and brownish incisor, lacinia mobilis with six spines. Maxillule exopod bearing terminally six spines larger and dark brown, four inner ones slender and serrated; all pereopods with strong secondary unguis on dactyl. Penes distal exterior margin with minute spinules. Pleotelsonic apex with an open, sub-parallel slit and serrated at both edges, extending to bottom of two sides of apex. Endopods of uropods sub-apically notched externally.

Description. Adult male (Fig. 1A,B). Body greatest breadth about half length of body, dorsal surface with dark dendritic chromatophores, but smooth; one orange (freshly collected specimen) curved line in front of and between eyes, anterolateral margins of cephalon produced slightly over narrow transverse furrow when seen from front and with anteromedian portion extended into small process (Fig. 1E). Margin of coxae with setae appearing membranous. Coxae of pereonite 6 reaching not as far back as to overlap lateral parts of pereonite 7. Pleon with posterior margin produced into prominent, triangular, posteriorly pointed, conical process not exceeding beyond anterior end of pleotelsonic slit; sutures of fused pleon not visible. In lateral view, one tubercle produced in ventral side of pleotelsonic process (Fig. 1C).

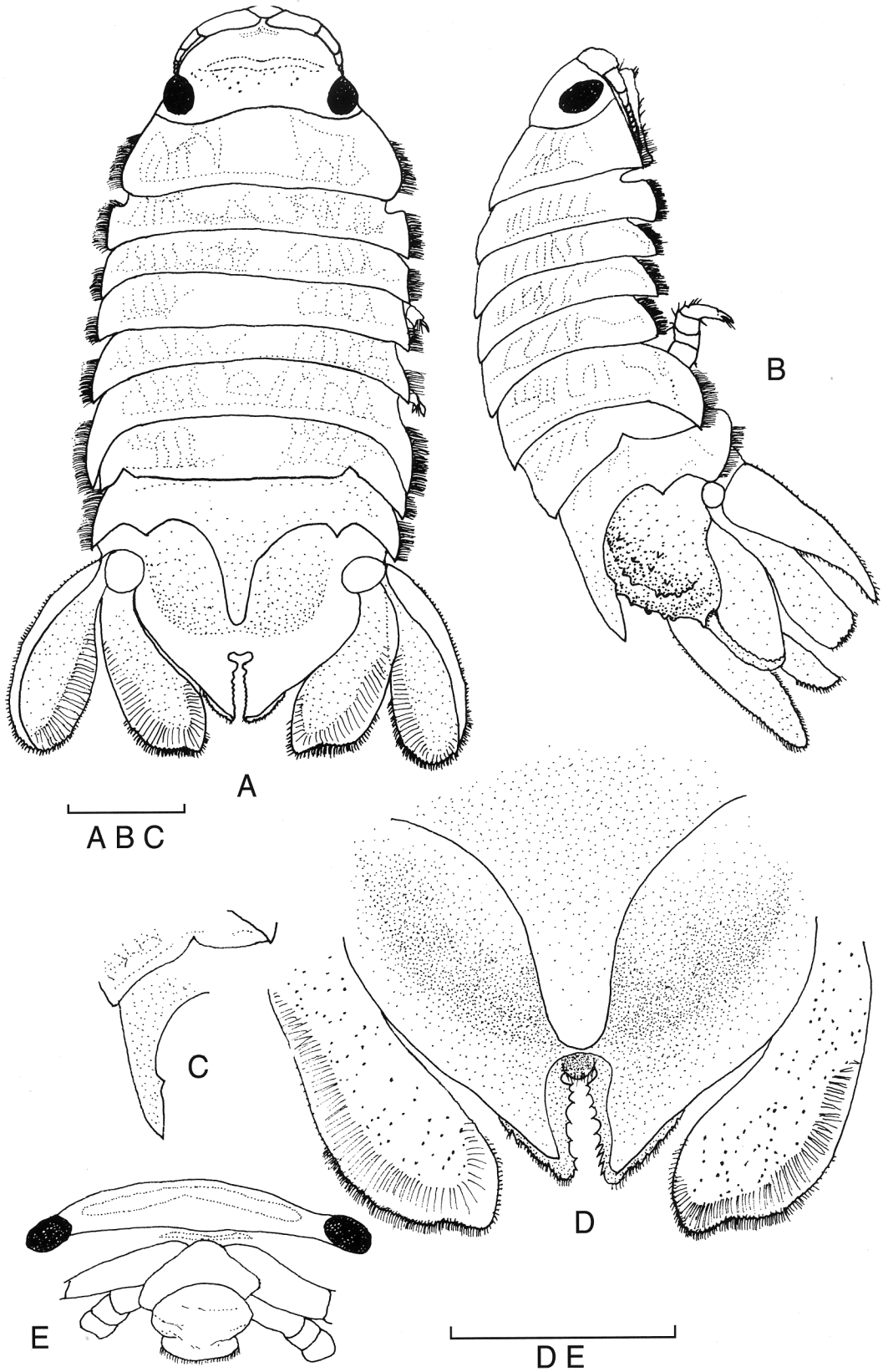

Figure 1. *Dynoides daguilarensis* n.sp. AM P55943, adult male, holotype, bl 6.5 mm. A, dorsal view; B, lateral view; C, pleotelsonic process, lateral view; D, pleotelson, dorsal view; E, head, anterior view including epistome and labrum. Scale bar 1 mm.

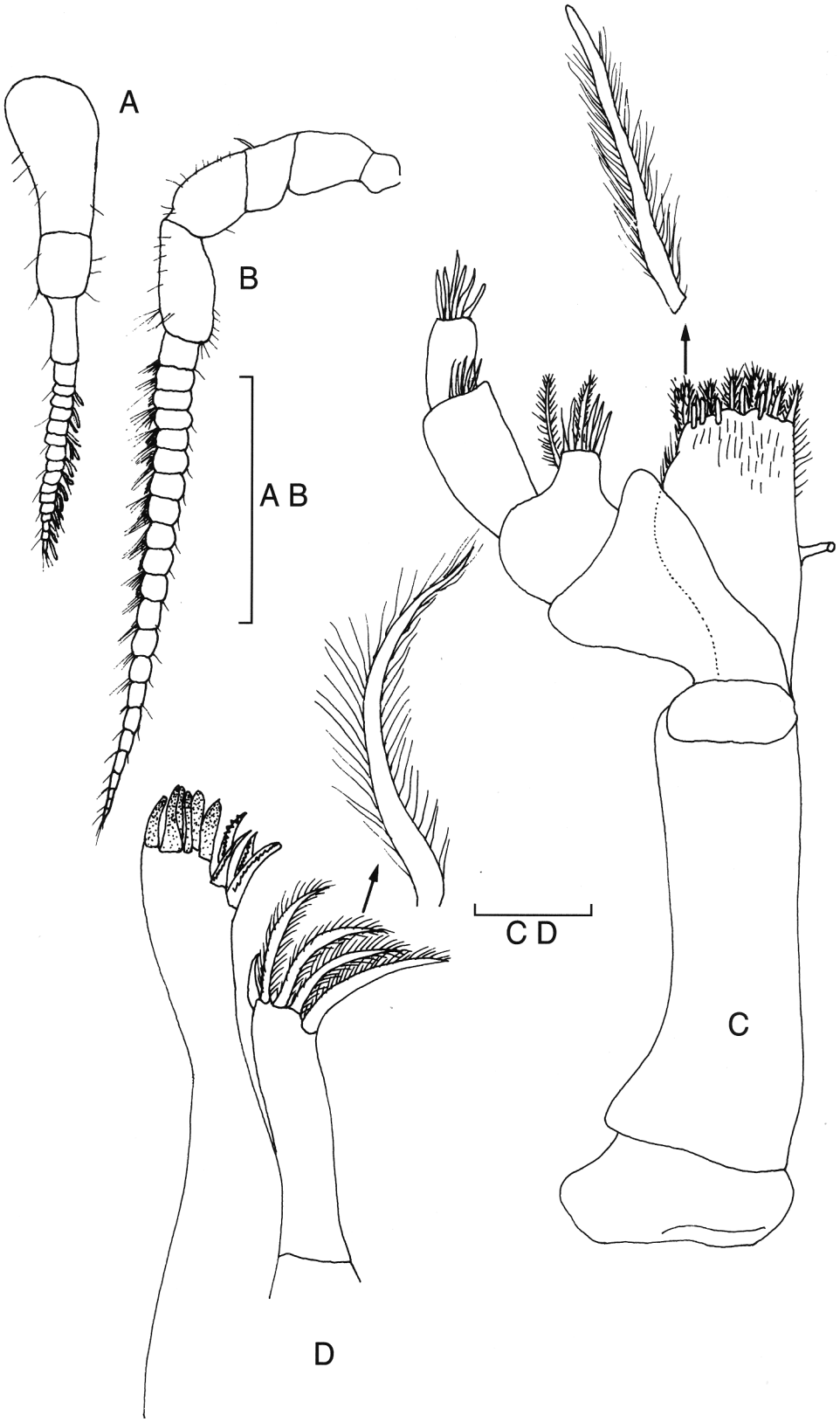

Figure 2. *Dynoides daguilarensis* n.sp. A,B, AM P55944, adult male, bl 6.2 mm; C,D, AM P55949, adult male, bl 6.5 mm. A, right antennule; B, left antenna; C, right maxilliped; D, right maxillule. Scale bars AB 1 mm; CD 0.1 mm.

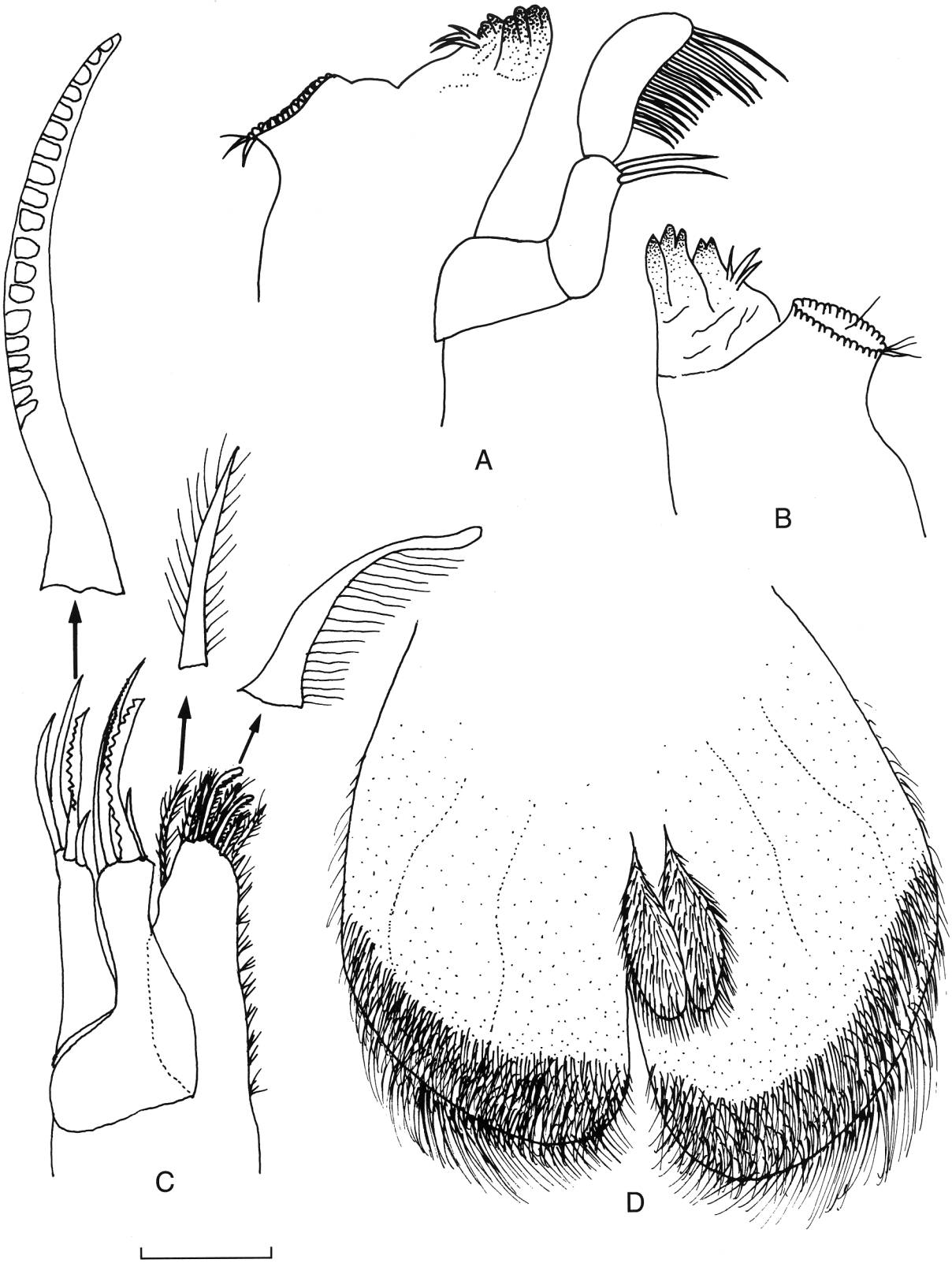

Figure 3. *Dynoides daguilarensis* n.sp. A–C, AM P55949, adult male, bl 6.5 mm; D, AM P55946, adult male, bl 7.4 mm. A, right mandible; B, left mandible, distal part; C, right maxilla; D, ventral view of lower lip. Scale bar 0.1 mm.

Antennule (Fig. 2A). Reaching about antennal flagellum article 8, to middle of pereonite 1; article 1 long, robust and somewhat curved at basal portion, second about half as long as first, article 3 narrower than second; flagellum 16-articulate, each article bearing laterally prominent sensory setae, last article bearing one long seta terminally; flagellum shorter than peduncle.

Antenna (Fig. 2B). Extending to posterior margin of peraeon segment 3; first peduncle article 1 short, article 2 twice as long as 1; combined lengths of articles 3, 4 almost as long as articles 1, 2 combined; article 5 longest, narrowest proximally. Flagellum with 22 articles, setae becoming progressively fewer distally, 1st flagellum article shorter than 3rd peduncle article.

Labrum (Fig. 1E). Almost rounded, setae on free margin; distance from proximal margin to base of labrum about two-thirds breadth across arms, proximal end, each end of arms truncate, sides slightly concave.

Labium (Fig. 3D). Lobes almost rounded, distal portion strongly setose. Two small elongated median lobes situated between them, each setose on surface.

Mandible (Fig. 3A,B). Lacinia mobilis with six spines. Mandibular palp segment 2 bearing two plumose setae on outer distal margin; segment 3 with gradually lengthening plumose setae. Left mandible similar to right.

Maxillule (Fig. 2D). Exopod bearing terminally about ten spines, of which six outer ones larger and dark brown, four inner ones slender and serrate; endopod delicate, with one simple and four plumose setae on terminal margin.

Maxilla (Fig. 3C). Endopod tip bearing about two long pectinate setae and six plumose setae, exopods each bearing about four serrulate spines.

Maxilliped (Fig. 2C). Endite armed with five spines and eight plumose setae on distal margin.

Pereopods (Fig. 6A–C). All biunguiculate and ambulatory, ventral margins more strongly setulose; with one strong secondary unguis on dactyl. Pereopod 1 short, robust; basis and ischium subequal in length; carpus short, about 1/3 length of propodus; basis with some dark chromatophores. Pereopod 2 more slender but longer than first. Pereopod 7 as similar as pereopod 2 in shape.

Penes (Fig. 4F). Long and straight, entirely fused along proximal half of length. Distal exterior margin with minute spinules.

Pleopods (Fig. 4A–E). Pleopod 1 with two coupling hooks on inner margin of peduncle; marginal setae of endopod around 20; one prominent spine present at proximal outer angle of exopod, marginal setae around 23; both ramus with dendritic chromatophores. Pleopod 2 appendix masculina about twice length of endopod, proximal half serrated, distal half slender, flexible and tapering, doubled back on proximal half, marginal setae around 23; exopod marginal setae around 36; peduncle with two coupling hooks. Pleopod 3 peduncle with two coupling hooks; endopod marginal setae around 17; exopod marginal setae around 28 and with simple setae. Pleopod 4 exopod 2-segmented with dark chromatophores. Pleopod 5 with dark chromatophores on surface; two subapical spinulose protuberances present, third one on basal part of inner margin.

Pleotelson (Fig. 1D). Scattered covered with minute tubercles. Open sub-parallel slit, serrated at both edges from bottom to two sides of apex. Teeth on both sides not uniform in shape, distributed asymmetrically, seven teeth on left side, nine on right; one small median lobe on anterior border with setae, projecting posteriorly into slit.

Uropods (Fig. 1D). Extending beyond pleotelson. Endopod sub-apically notched externally.

Colour. Fresh specimens are brown, with bright green or yellow-brown longitudinal median patch on peraeon segments 1–7 and extending onto pleon process.

Body length. 6.5 mm (holotype). Body length ranges between 2.9–7.9 mm (including sub-adult males); numbers of teeth on edges of pleotelson slit are variable from 7–11 asymmetrically.

Sub-adult male (Fig. 4G,H). Pleon with posterior margin produced into short triangular process pointed posteriorly. Pleopod 2 with appendix masculina of same length as endopod, no fold medially, but serrate distally; marginal setae of endopod around 20 and 36 of exopod. (Fig. 4I). Penes very short, minute and separated (Fig. 6I). Pleotelsonic apex with open dome, smooth, both edges not serrate. Uropods smaller, lamellar, not extending beyond pleotelson. Exopod with anterior outer margin folded; endopod not sub-apically notched externally compared to adult males.

Body length. 5.6 mm.

Ovigerous female (Fig. 5A–C). Whole body setose, smaller than male in most individuals; suture in fused pleon visible; three pairs of brood lamellae well developed from pereonites 2, 3 and 4, overlapping in mid-line, brood pouch yellow. Antennae with longer sensory setae (Fig. 6G). Mouthparts all similar to male. Pleon lacks conical median process. Pereopod 1 short, carpus very short and overlapped by strongly produced merus; succeeding pereopod merus moderately produced as compared to pereopod 1 and with one long and strong seta (Fig. 6D–F). Pleopod 3 exopod 2-segmented. Pleopod 5 exopod with 3 spinulose protuberances, 2 subapical and 1 on mediodistal margin (Fig. 5D–H). Pleotelson medially convex, bilobed, with fewer minute tubercles than male, flattened near margins and apex; apex with smooth dome, similar to sub-adult male. Uropods small, never extending beyond pleotelson; endopod longer than exopod; apex of endopod truncate, rounded at exopod.

Body length. 4.8 mm. Body length ranges between 3–5.5 mm.

Sub-adult female (Fig. 5I,J). Smaller than adult female. Peraeopods 2–4 coxae with 3 pairs of triangular oostegite buds. Body surface smoother than adult female. Uropodal exopod shorter than endopod.

Body length. 4.1 mm. Body length ranges between 3–5.5 mm.

Juvenile (Fig. 5K). Uropodal exopod lacking transverse black band.

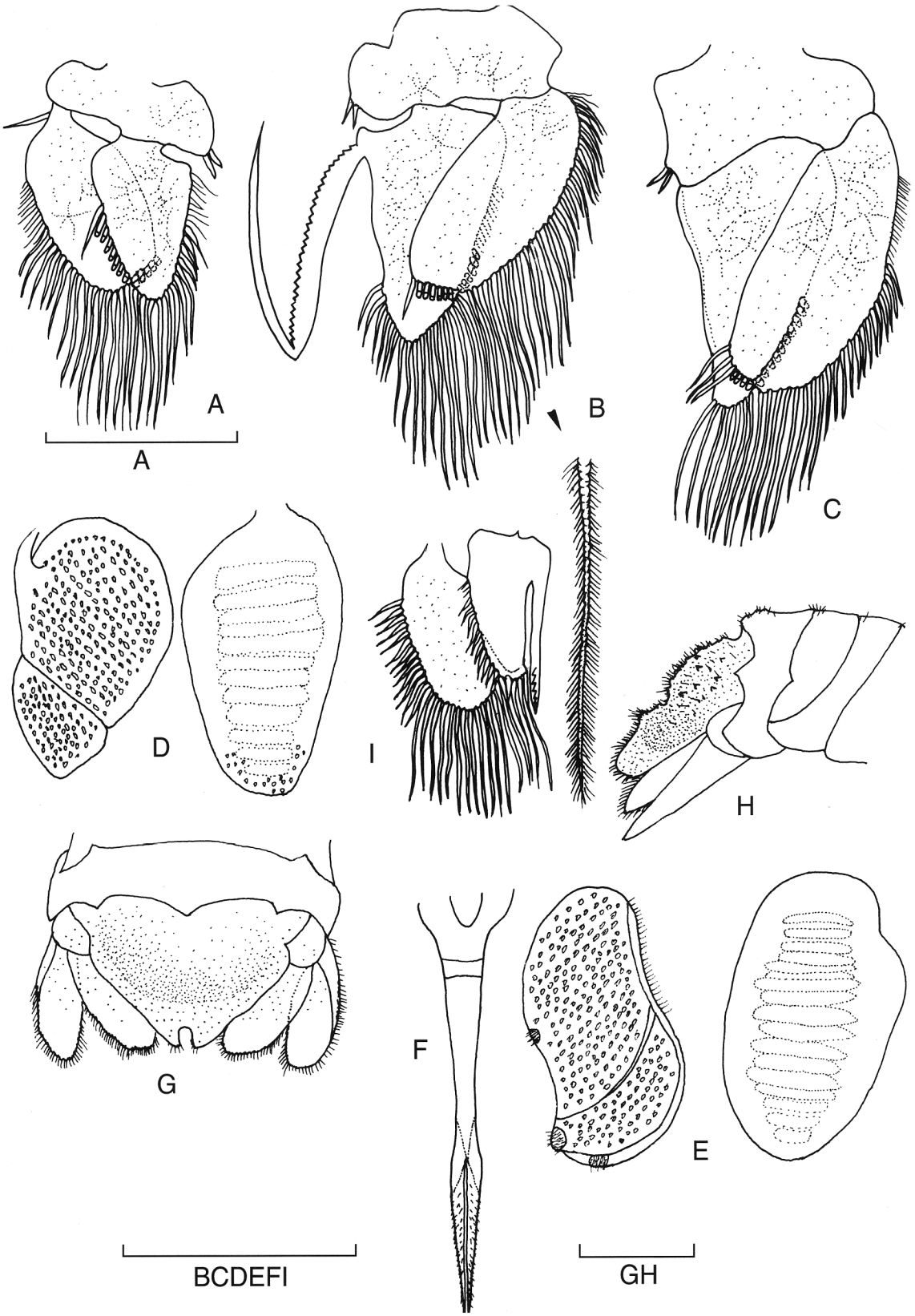

Figure 4. *Dynoides daguilarensis* n.sp. A–F, AM P55944, adult male, bl 6.2 mm; G,H, AM P55947, sub-adult male, bl 5.6 mm; I, AM P55948, sub-adult male, bl 4.5 mm. A, right pleopod 1; B, left pleopod 2; C, left pleopod 3; D, left pleopod 4; E, right pleopod 5; F, penes; G, pleotelson, dorsal view; H, pleotelson, side view; I, pleopod 2 with appendix masculina. Scale bars 1 mm.

Body length. 1.8 mm. Body length is generally less than 3 mm. Manca length ranges between 0.9–1.5 mm. Freshly collected juveniles occur in a variety of colours and ornamental patterns on the dorsal surface.

Remarks. This species is easily distinguished from most other described species of *Dynoides* by its pleotelson tip having a parallel-sided slit decorated with teeth and a median lobe at the anterior end. The only other species with these characters is *Dynoides serratisinus* Barnard, 1914, but the pleonal process and uropod differ in the two species. In *Dynoides daguilarensis*, the pleonal process has a tubercle on the ventral side, the pleotelsonic slit edges are serrated from the bottom to the two sides of the apex. The uropodal endopod apex is not truncate as in *D. serratisinus*, but has a sub-terminal, marginal indentation. Additionally in *Dynoides daguilarensis*, the antennule flagellum is shorter than the peduncle and the apex of the inner plate of the maxilliped is not rounded as in *D. serratisinus*. Furthermore, in *D. serratisinus*, Barnard (1914) described a seventh joint in all pereopods with 3 lamella-like teeth, and Kensley (1978) reported that the tubercles on the telson are sharp, neither of which is the case in *D. daguilarensis*.

Kussakin & Malyutina (1993) recorded specimens of *Dynoides serratisinus* Barnard, 1914 from the Cape d'Aguilar Marine Reserve, Hong Kong. These authors were uncertain of the identity of this species and only focused on the parallel-sided slit of the pleotelson, but neglected the morphology of the posterior body parts, e.g., the numbers of teeth on the edges of the slit and their asymmetrical arrangement. The inner ramus of the uropod was not truncate but with a sub-terminal marginal indentation instead. These are the key characters that differentiate *D. daguilarensis* from *D. serratisinus*.

Kussakin & Malyutina (1993) also recorded *D. dentisinus* Shen (1929). There is little doubt that the record is a sub-adult of *D. daguilarensis* with a developing short pleonal process. Furthermore, their specimen was collected from the type locality of *D. daguilarensis* in Cape d'Aguilar. However, during the present three year study period, *D. dentisinus* has not once been collected from Hong Kong. *Dynoides dentisinus* Shen may be distributed in more temperate waters, as previously reported, such as northern China, Korea and Japan. In Japan, beds of *Septifer virgatus* are the habitat of *D. dentisinus* (Iwasaki, 1996).

Ong Che & Morton (1992) reported upon two species of *Dynoides* from the *Septifer virgatus* community at Cape d'Aguilar, Hong Kong, i.e., *D. dentisinus* and *D. serratisinus*. Examination of their material shows that the ecological information they recorded relates to *D. daguilarensis*.

Etymology. This species' name refers to the type locality—Cape d'Aguilar, Hong Kong.

Discussion

Habitat and distribution. *Dynoides daguilarensis* lives on intertidal rocky shores, commonly in association with beds of the black mussel *Septifer virgatus*, which is present year round at Cape d'Aguilar. This dense mat supplies the isopods with food, a means of escaping desiccation, immersion and predation, protection from wave action and a permanent, stable, refuge. The *Dynoides daguilarensis* population at Cape d'Aguilar spends its entire life cycle in the mussel beds. It can, however, also be found in the empty tests of the barnacle *Tetraclita squamosa squamosa*, among clumps of the stalked barnacle *Capitulum mitella* and is associated, seasonally, with the algae *Dermonema frappierii, Pterocladia tenuis, Chaetomorpha antennina* and *Ulva fasciata*, all characteristic biota of wave-exposed shores in Hong Kong.

In Hong Kong, this isopod is not restricted to the type locality, but has been found from Shek O and Big Wave Bay on Hong Kong Island, and also in beds of *Septifer virgatus*. Both localities are on the southeastern coastline of Hong Kong, where wave action is strong and oceanic, and where the environment is less polluted (Morton, 1989). *Dynoides daguilarensis* is absent from the western regions of Hong Kong, where the salinity is lower (Morton & Morton, 1983), ranging between 6.0 and 33.5‰ (Chiu, 1998), whereas in the southeast the salinity ranges from 20–35 ‰ (Morton & Wu, 1975). Because the shore is more sheltered than in the east, no *S. virgatus* is present and *Dynoides daguilarensis* has not been recorded. This species appears to have a habitat preference for exposed rocky shores experiencing strong wave action, oceanic waters and a relatively unpolluted environment and is always associated with the mussel *S. virgatus*.

Population biology. Data on *Dynoides daguilarensis* collected from March 1997 to January 1999 at four sites in the Cape d'Aguilar Marine Reserve, indicates that three separate peaks of recruitment occurred, producing spring, summer and late autumn cohorts. Individuals were sexual active year round and gravid females occurred in all months. Juveniles were released continuously and were always more abundant than adults over the course of the year. *Dynoides daguilarensis* was more abundant during the warm months from spring to early winter (April and May to December) and declined during colder months from winter to early spring (January to April). During the warmer months, isopods grew and matured faster but to a smaller size whereas in the colder months they grew at a slower rate but to a larger size.

The eggs of *Dynoides daguilarensis* are yellow, nearly round and 0.3 mm in diameter. Newly hatched mancas were 0.9 mm long, 0.5 mm wide and sexually indistinguishable. The body was bright yellow, semi-transparent with a pair of dark compound eyes. No movement was observed other than body contractions. A week after hatching, black dots of pigment occurred on the body surface and movement commenced. Mancas tended to swim at the water surface and were distinctly photopositive. A positive relationship between the size of ovigerous females and brood size (r =

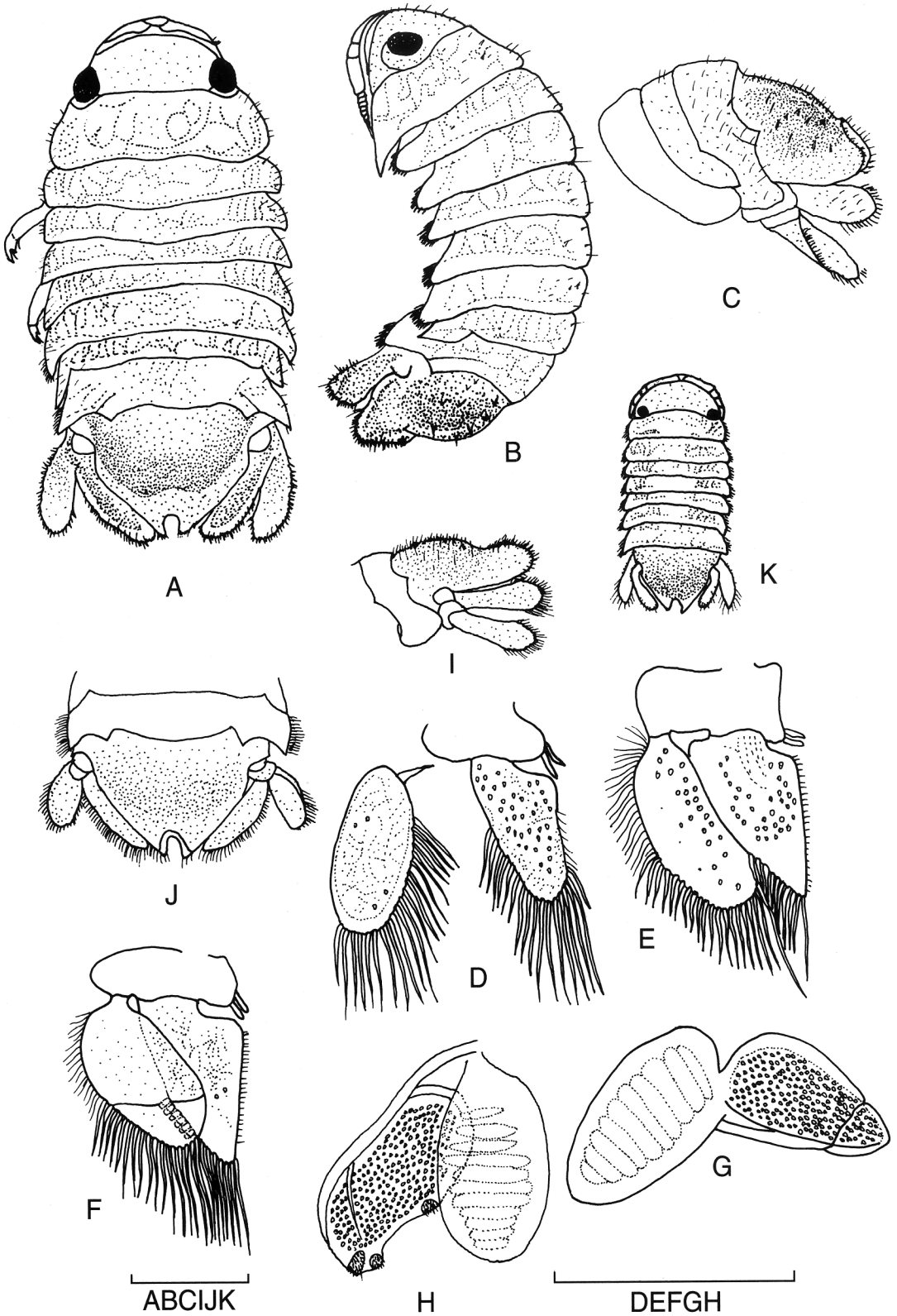

Figure 5. *Dynoides daguilarensis* n.sp. A–C, AM P55950, ovigerous female, bl 4.8 mm; D–H, AM P55951, ovigerous female, bl 4.3 mm; I,J, AM P55953, sub-adult female, 4.1 mm; K, AM P55954, juvenile bl 1.8 mm. A, dorsal view; B, side view; C, pleotelson, side view; D, left pleopod 1; E, left pleopod 2; F, left pleopod 3; G, left pleopod 4; H, left pleopod 5; I, pleotelson side view; J, pleotelson dorsal view; K, dorsal view. Scale bars 1 mm.

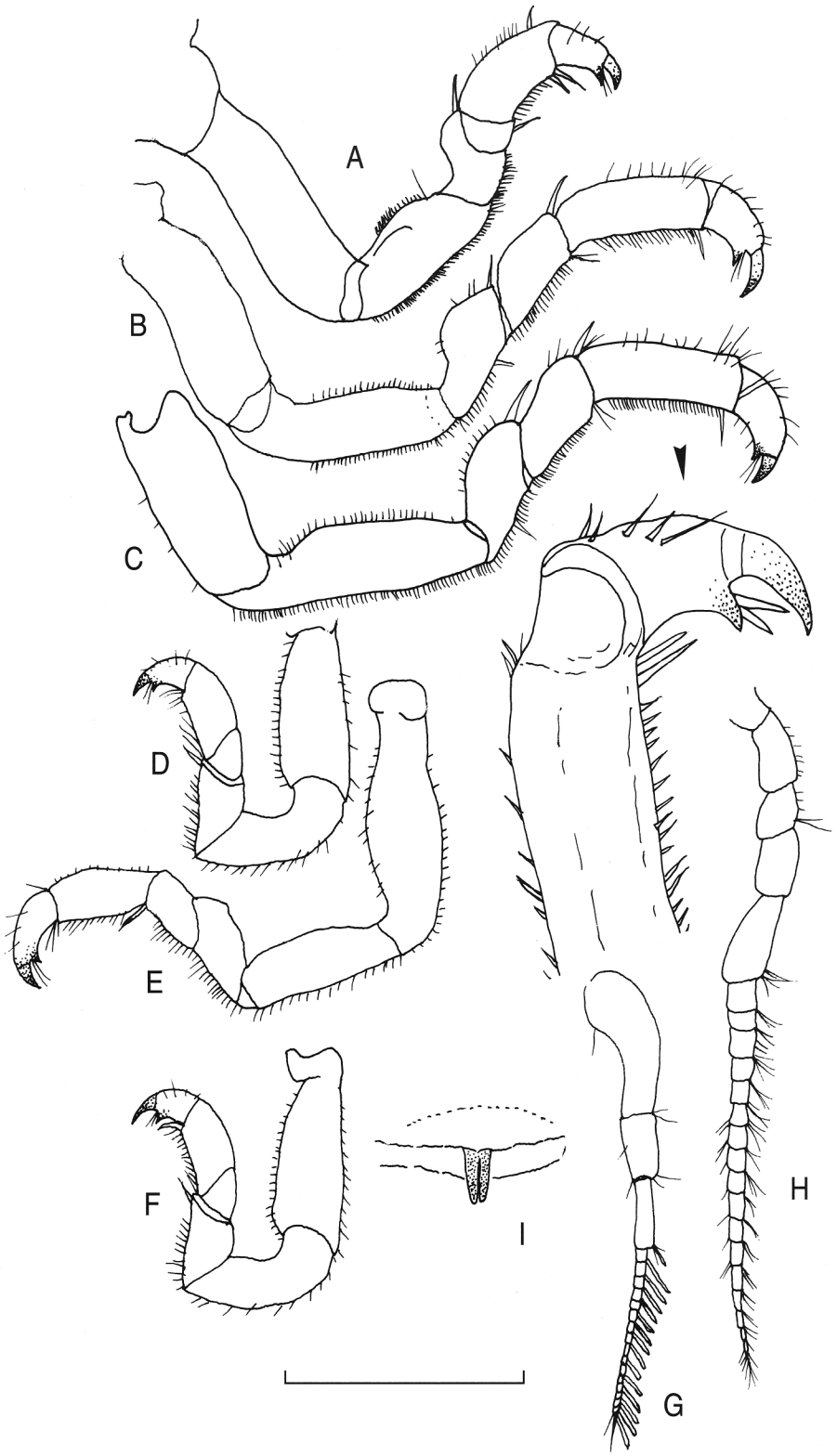

Figure 6. *Dynoides daguilarensis* n.sp. A–C, AM P55945, adult male, bl 5.8 mm; D–F, AM P55952, ovigerous female, bl 4.5 mm; G,H, AM P55951, ovigerous female, bl 4.3 mm; I, AM P55947, subadult male, bl 5.6 mm. A, pereopod 1; B, pereopod 2; C, pereopod 7; D, pereopod 1; E, pereopod 2; F, pereopod 7; G, left antennule; H, left antenna; I, penes. Scale bar 1 mm.

0.57, $p<0.001$) was observed. The number of brooded eggs or juveniles, significantly increased with increasing parental size, regardless of season. The brood size ranged from 26 to 56 eggs per brood (Li, 2000).

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