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Redescription of *Catinia plana* Bocquet and Stock, 1957 and Description of Two New Species of *Myzomolgus* (Copepoda, Poecilostomatoida, Catiniidae) Associated with the Sipunculans in Korea

Il-Hoi Kim
(Department of Biology, Kangnung National University, Kangnung 210-702, Republic of Korea)

ABSTRACT

Catinia plana Bocquet and Stock, the type genus and species of the family Catiniidae, which has been known incompletely is redescribed on the basis of type material. Structure of appendages, especially those of mandible and maxilla, are reinterpreted. In addition, two new species of *Myzomolgus* associated respectively with the sipunculids *Sipunculus nudus* Linnaeus and *Siphonosoma cumanense* (Keferstein) are described from Korean waters. A comparison of already known species of *Myzomolgus* and two new species of the same genus resulted in a conclusion that members of this genus possess homogeneous traits and the genus is a well established taxon. A key to distinguish five genera of the Catiniidae is also provided.

Key words: *Catinia plana*, *Myzomolgus*, new species, sipunculids, Korea

INTRODUCTION

The sipunculids have been known to act as a role of host for seven copepod associates up to now. Of these copepods, *Catinia plana* and *Myzomolgus stupendus*, were described by Bocquet and Stock (1957) who discovered these species on the skin of *Sipunculus nudus* Linnaeus from

* Corresponding author: Il-Hoi Kim
E-mail: ihkim@kangnung.ac.kr, Tel: 033-640-2312

the Atlantic coast of France. In the same report Bocquet and Stock established a new family Catiniidae to accomodate *Catinia plana*. On the other hand, they placed *Myzomolgus* in the family Clausidiidae.

Gooding (1963) reexamined the type material and found some morphological discrepancies between his observation and the original description. But Gooding did not present detailed illustration for the appendages of this species, nor was published his redescription. In a phylogenetic analysis of "nereicoliform" families, Ho (1984) placed *Catinia* near the genera *Myzomolgus*, *Cotylomolgus*, *Cotylemyzon*, and *Goidelia*, and called them the catiniid complex. Recently, Kim (2000) treated the Catiniidae as a valid family.

As the type genus and species of the Catiniidae, *Catinia plana* has been reported to have a peculiar structure of mouthparts, but with uncertainties. Therefore this species is in strong need of a redescription, with the presentation of a detailed illustration of the appendages. In addition to the redescription of *Catinia plana* on the basis of type specimens, the present report deals with description of two new species *Myzomolgus* associated respectively with the sipunculids *Sipunculus nudus* Linnaeus and *Siphonosoma cumanense* (Keferstein).

These sipunculids were dug out by a shovel on the intertidal shore of coral sands in Jeju Island, Korea. Each species of hosts was contained in separate polyetylene bags and fixed with 80% ethyl alcohol. Later, the copepod materials were sorted out from the sediment of the bags. Before microscopic observation and dissection, copepod specimens were soaked in lactic acid for at least 10 minutes. The type specimens of the new species will be deposited in the US National Museum of Natural History, Smithsonian Institution. In the description of species the body lengths were measured from the anterior tip of the cephalothorax to the posterior margin of the caudal rami.

It should be noted here that the above mentioned two species of sipunculids distribute widely along the warm shallow waters in the world (Cutler *et al.*, 1984). Therefore it is desired to examine these two species of sipunculids for copepods in other areas, such as Indian Ocean and West Atlantic, in order to know the zoogeographic aspects of their copepod associates.

SYSTEMATIC ACCOUNTS

Family Catiniidae Bocquet and Stock, 1957

***Catinia plana* Bocquet and Stock, 1957 (Figs. 1-4)**

Catinia plana Bocquet & Stock, 1957, p. 418; Gooding, 1963, p. 213.

Material examined. 18 ♀♀, 6 ♂♂ (paratypes: Z.M.A. Co. 100. 341) from the skin of *Sipunculus nudus* Linnaeus taken out from the intertidal sands, at Morgat Bay in la Manche, France, collected by J. H. Stock, on 30 August 1954. 1♀ and 1♂ dissected.

Female. Body (Fig. 1A) cyclopiform and 1.10 mm long. Greatest width 530 μm. Prosome flat, laterally expanded, roughly discoid, consisting of cephalothorax and 2-segmented metasome, with moderately thick exoskeleton. Cephalothorax and metasomites nearly identical in width. Suture line between cephalothorax and second pedigerous somite incomplete. Third and fourth pedigerous somites completely fused, leaving slight constrictions and sclerotizations at both sides. Posterior margin of prosome weakly incised. Urosome (Fig. 1B) 5-segmented, slender, originated from

posteroventral surface of porsome. Fifth pedigerous somite 160 μm wide, nearly quadrangular, with small tubercle near each posterior corner of dorsal surface, and on ventral surface transverse row of minute spinules and 3 transverse striations (Fig. 1C). Genital double-somite 160 × 123 μm, widest anteriorly, with concave lateral margins. Genital area located laterally at anterior part of somite, concealed both from dorsal and ventral views. Three abdominal somites 105 × 92, 63 × 75, and 19 × 65 μm, respectively. Anal somite very short, deeply incised (Fig. 1D), its anterior suture line on dorsal surface obscure. Caudal ramus 52 × 24 μm (2.17 : 1), with 3 spinules on outer distal corner, 1 setule on proximal part of outer lateral margin and 6 distal setae, 2 of latters located dorsally. Distal one of 2 dorsal setae weakly plumose. Other setae naked. Egg sac not seen.

Rostrum posteriorly double-layered (Fig. 1E). Anterior layer bilobed, and posterior layer roundly convex, with minute spinules on posterior margin. Antennule (Fig. 1F) 6-segmented, gradually narrowed. First segment with broad spinulated process at posteroventral corner in addition to setae. Armature formula: 4, 13, 9, 4+1 aesthetasc, 2+1 aesthetasc, and 7+1 aesthetasc. All aesthetascs small and thin. Setae on second segment consisting of 2 groups, anterior group with 10 setae and distal group 3 setae. Antenna (Fig. 1G) 4-segmented, but third and fourth segments obscurely demarcated. First segment longest, longer than ramaining three segments, with patches of setules of various sizes and 1 large distal seta; latter seta armed with stiff setules on inner margin. Second segment subdivided by indistinct line, distally with 1 seta and 1 large sucker. Third segment distally with 1 scalpel-like seta. Terminal segment with 4 terminal setae of various lengths and 2 subterminal setae, outer one of latters ornamented with setules on outer margin.

Labrum reduced, covering only distal part of mandible, with spinules on ventral surface (Fig. 2A). Mandible (Fig. B) unarmed, bent twice, its distal part hyaline and lamellated, with fine spinules near tip. Paragnath a broad lobe located medial to maxillule. Maxillule (Fig. 2C) lobate, armed with 5 setae. Maxilla strongly transformed. First segment nearly circular, large and plate-like, its inner and posterior margins marginated by membrane. Second segment originated ventrally from first segment, directed posteriorly and then abruptly bent forward, and from this point becoming transparent lamella folded in two along mid-line, with 2 rows of minute spinules at tip (Fig. 2D). Maxilliped absent.

Legs 1-4 with 3-segmented rami. Inner spine on basis of leg 1 scalpel-like (Fig. 2E), as long as first endopodal segment, with convex outer margin armed with spinules. Inner coxal seta of legs 2 and 3 transformed to enlarged element which is distally broadened and curved (Fig. 2F). Leg 4 (Fig. 2G) without inner coxal element. Armature formula of legs 1-4 as follows:

Leg 1: coxa 0-1; basis 1-I; exp I-0; I-1; I, 2, 4; enp 0-1; 0-1; 1, 4

Legs 2 & 3: coxa 0-I; basis 1-0; exp I-0; I-1; I, 1, 5; enp 0-1; 0-1; 1, 4

Leg 4: coxa 0-0; basis 1-0; exp I-0; I-1; I, 1, 5; enp 0-1; 0-1; 4

Leg 5 (Fig. 3A) 2-segmented. Basal segment 50 × 52 μm, with 1 large outer terminal seta. Free segment strongly tapering, 65 × 40 μm (1.63 : 1), with 2 outer lateral setae and terminally 1 thick spine and 1 seta. All setae on free segment small and naked. Leg 6 (Fig. 3B) represented by 3 spinules in genital area.

Male. Body (Fig. 3C) 838 μm long. Greatest width 458 μm. Prosome 4-segmented, with faint suture line between cephalothorax and second pedigerous somite, and between third and fourth pedigerous somites. Urosome (Fig. 3D) 6-segmented. Fifth pedigerous somite 108 μm wide, with a

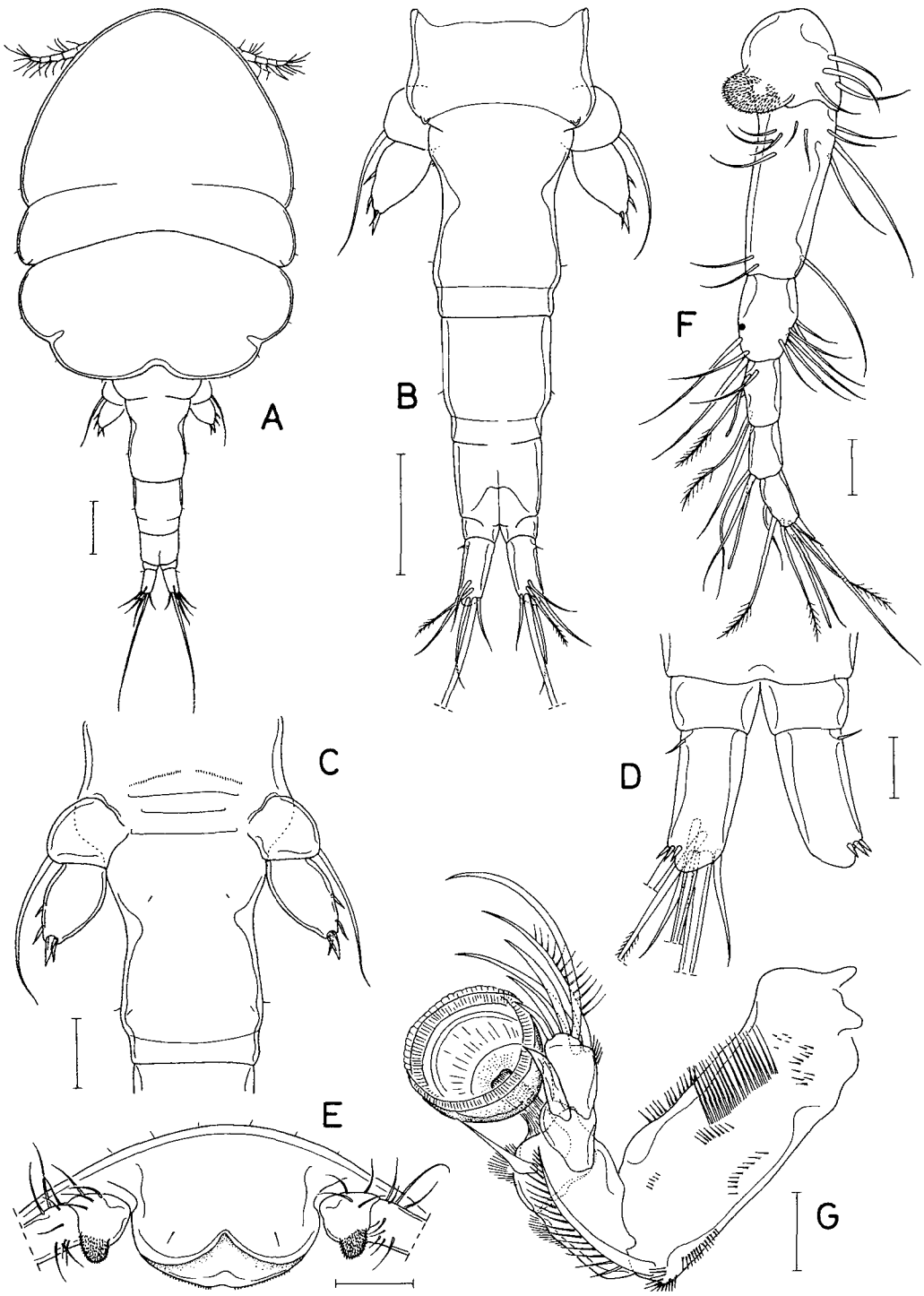

Fig. 1. *Catinia plana* Bocquet and Stock, female. A, habitus, dorsal; B, urosome, dorsal; C, anterior part of urosome, ventral; D, anal somite and caudal rami, ventral; E, rostral area; F, antennule (dot representing the place of addition of seta in male); G, antenna. Scales: A, B = 0.1 mm; C, E = 0.05 mm; D, F, G = 0.02 mm.

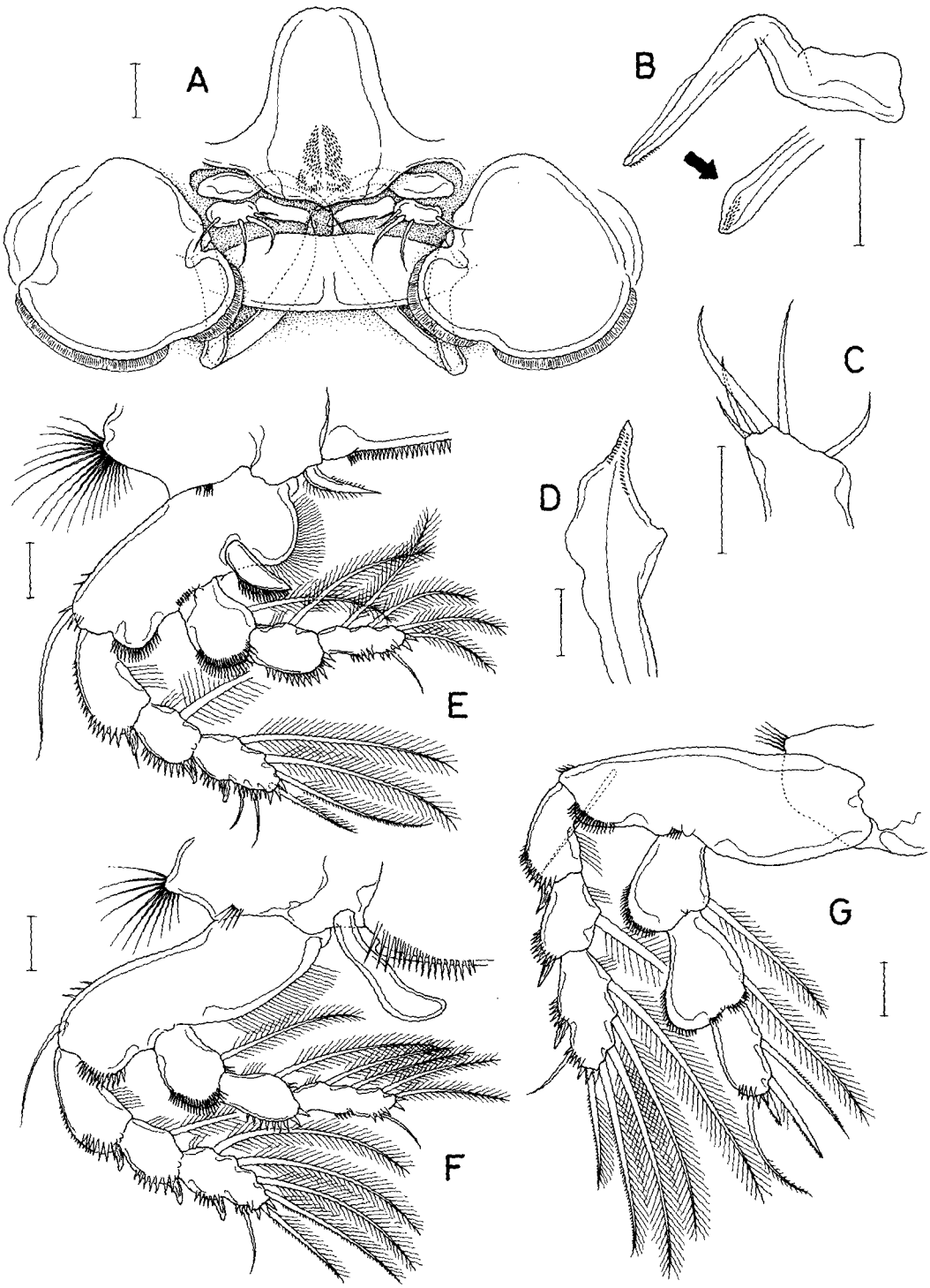

Fig. 2. *Catinia plana* Bocquet and Stock, female. A, mouthparts; B, mandible; C, maxillule; D, terminal portion of second segment of maxilla; E, leg 1; F, leg 2; G, leg 4. Scales: A-G = 0.02 mm.

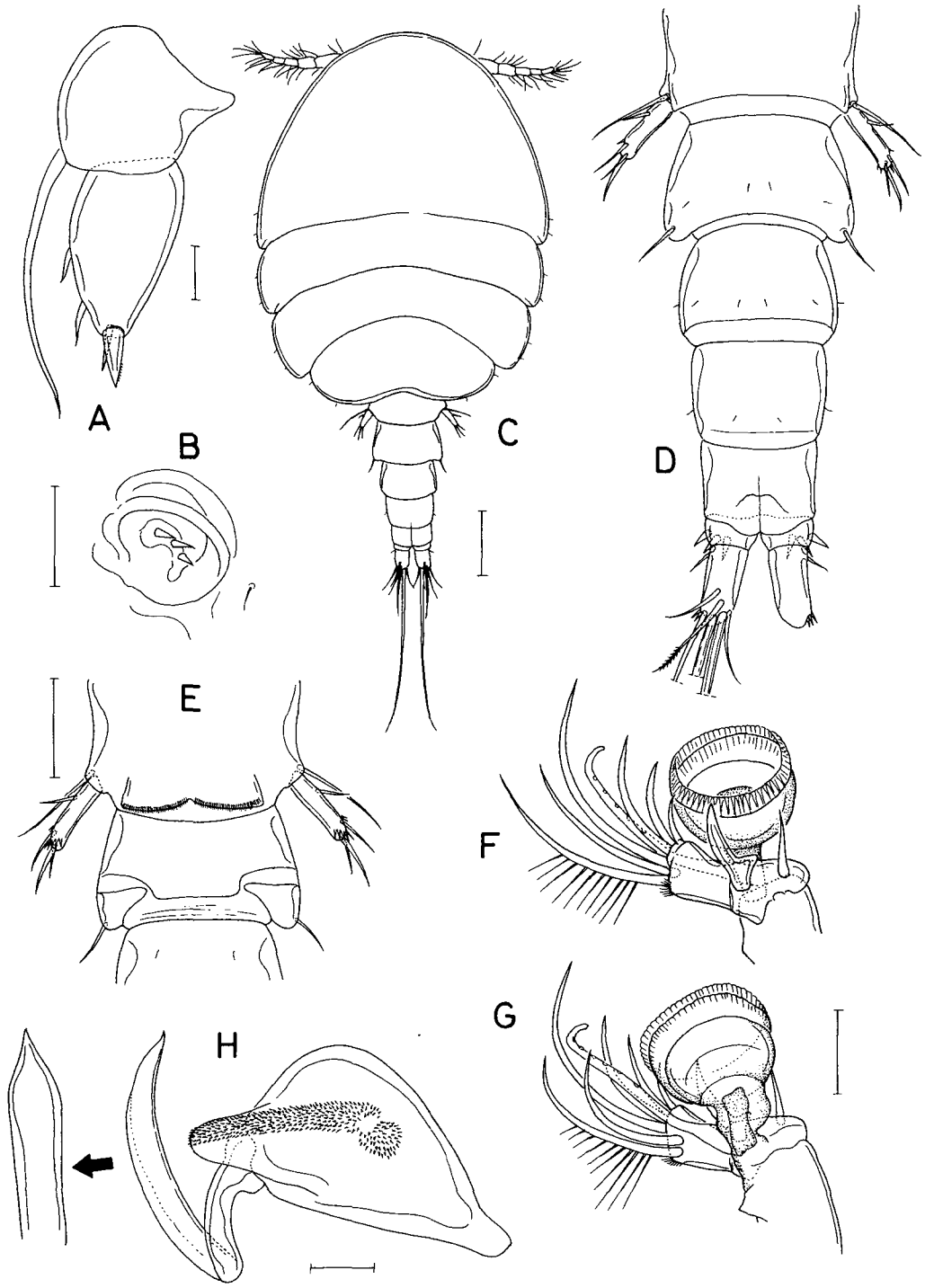

Fig. 3. *Catinia plana* Bocquet and Stock. Female: A, leg 5; B, leg 6. Male: C, habitus, dorsal; D, urosome, dorsal; E, anterior part of urosome, ventral; F, G, distal portion of antenna; H, maxilla. Scales: A, B, F-H = 0.02 mm; C = 0.1 mm; D, E = 0.05 mm.

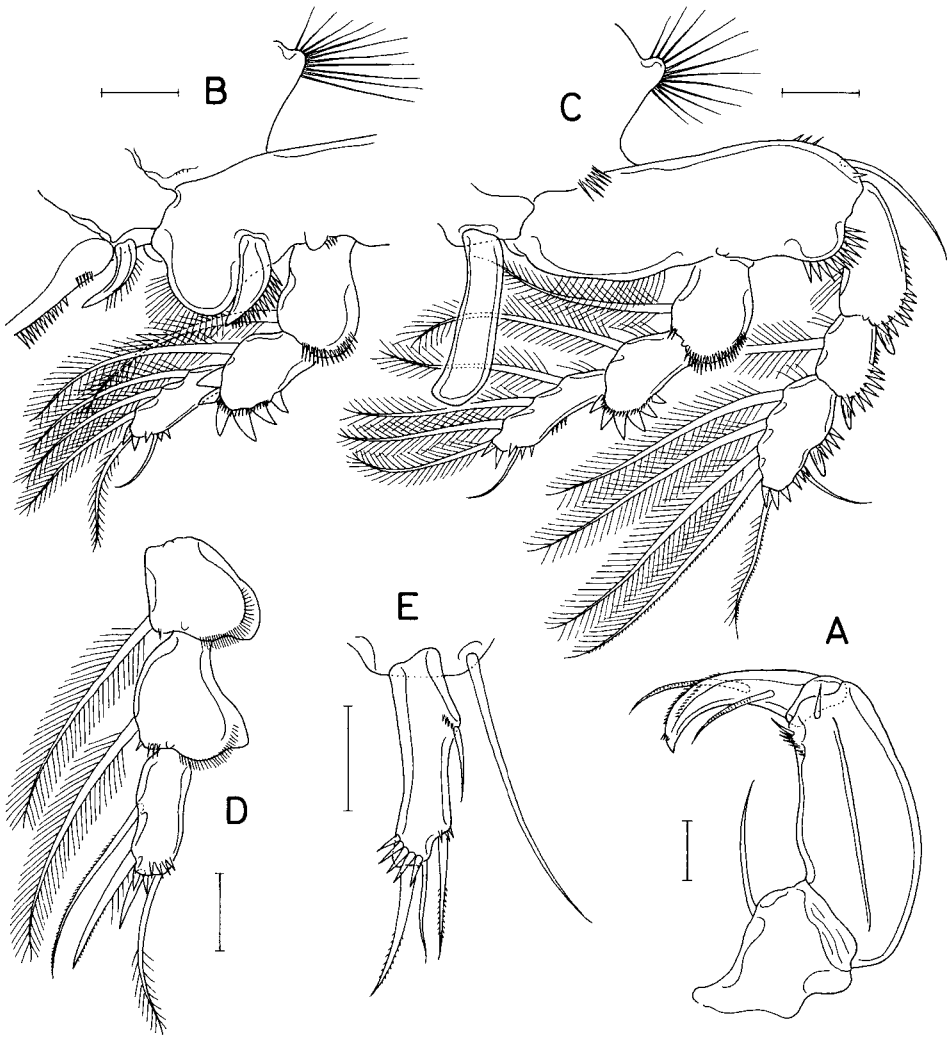

Fig. 4. *Catinia plana* Bocquet and Stock, male. A, maxilliped; B, inner part of leg 1; C, leg 2; C, endopod of leg 4; E, leg 5. Scales: A-E = 0.02 mm.

bilobed, spinulated crest on posterior part of ventral surface (Fig. 3E). Genital somite 65 × 104 μm, distally broadened, with concave posterior border. Four abdominal somites 59 × 86, 52 × 73, 42 × 63, and 16 × 59 μm, respectively. Anal somite with 2 or 3 spines on each side of ventral surface. Caudal ramus 42 × 20 μm (2.10 : 1).

Rostrum sexually dimorphic: proximal layer with concave posterior margin. Antennule with 1 added seta on third segment (therefore 10 setae). Third segment of antenna with 1 large sucker, 1 small seta, 1 basally expanded spine, and 1 long seta bearing several minute suckers (Fig. 3F, G).

Labrum, paragnath, maxillule as in female. First segment of maxilla protruded medially (distally) (Fig. 3H), with long transverse patch of dense spinules on ventral surface. Maxilliped (Fig. 4A) 4-segmented. First segment distally broadened, with 1 seta on inner margin. Second segment with 1

long lateral ridge, 1 seta and several spinules near inner distal corner and 1 seta on distal part of lateral surface. Third segment short and unarmed. Fourth segment as massive claw, with 2 long setae each on each side.

Second endopodal segment of legs 1-3 armed with 6 to 8 large teeth around outer distal corner (Fig. 4B, C). First and second endopodal segments of leg 4 expanded outward (Fig. 4D).

Leg 5 (Fig. 4E) 2-segmented but basal segment not delimited from somite. Free segment narrow, 40 × 12 μm (3.33 : 1), with several distal spinules, and 1 outer lateral, 1 outer subterminal and 2 terminal setae. Inner one of 2 terminal setae spiniform. Leg 6 represented by 1 seta on distal corner of genital flap (Fig. 3D).

Remarks. Gooding's (1963) comment on the structure of the mandible and maxilla of this species is confirmable from this reexamination. The mandible, which is covered in most part by the labrum, is unarmed and terminated in a weak, hyaline lamella. A remnant of this form of mandible is observable in *Cotylemyzon vervoorti* Stock, 1982 as shown by Huys and Boxshall (1991, Figs. 2.10.10E).

The distal segment of the maxilla, that Bocquet and Stock (1957) called errorneously as paragnath, also is highly specialized. This segment inserts to the dorsolateral side of basal segment, and its distal two-thirds appears as a folded tape and extends antero-medially to the mouth, giving rise to a curiosity about its function. The transformation of the distal segment (or one of the elements on this segment) of the maxilla to an elongate lamella, with the deletion or degeneration of other elements on the same segment, is also observable in *Cotylomolgus* Humes and Ho, 1967 and *Cotylemyzon* Stock, 1982 (for a reinterpretation on the sutructure of mouthparts of the latter species, see Ho, 1984).

There are several points that the previous authors overlooked in the their descriptions of *C. plana*. The last two tergites of prosome are completely fused each other, leaving only a constriction and sclerotization at each side. The sucker of the antenna seems to be inserted to the second segment rather than the third, as in *Cotylemyzon vervoorti* (see Huys and Boxshall, 1991, Figs. 2. 10. 8). The paragnaths are equipped in this species, which is located medial to the maxillule as an unarmed lobe and is hardly dissected out. The female leg 6 is observable and represented by three spinules.

It is remarkable to find that the Korean *Sipunculus nudus* Linnaeus is not associated with *Catinia plana*, unlike in the Europe.

Myzomolgus orientalis, n. sp. (Figs. 5-7)

Material examined. 33 ♀♀ and 15 ♂♂ collected from the external body surface of the sipunculid *Siphonosoma cumanense* (Keferstein), dug out from the intertidal sand at Sinhung-ri (33° 33′N, 126° 39′E), northern shore of Jeju Isalnd, collectd by the author on 29 September 1999. Holotype (♀), allotype, and paratypes (30 ♀♀, 12 ♂♂) will be deposited in the U. S. National Museum of Natural History, Smithsonian Institution. Dissected paratypes (2 ♀♀, 2 ♂♂) are kept in the collection of the author.

Female. Body (Fig. 5A) dorsoventrally flat, 950 μm long. Greatest width 424 μm measured across cephalothorax. Prosome occupying about 60% of whole body length, gradually narrower from anterior to posterior. Cephalothorax with numerous fine spinules on ventrolateral suface (Fig. 5D).

Urosome (Fig. 5B) 5-segmented, slender and tapering. First four urosomal somites each with 3 to 4 transverse membraneous stripes on dorsal surface. First 3 urosomal somites with transverse rows of fine spinules on ventral surface: 2 rows one fifth pedigerous somite, about 4 rows on genital double-somite, and 1 row on first abdominal somite (Fig. 5C). Fifth pedigerous somite 162 μm wide, angularly projected laterally in middle. Genital double-somite 71 × 124 μm, narrowed posteriorly. Genital area located dorsolaterally. Three abdominal somites 65 × 74, 67 × 62, and 20 × 44 μm, respectively. Anal somite shorter than 1/3 length of preceding somite, armed with thick spinules on ventral surface. Caudal ramus elongate and slender, 110 × 15.4 μm (7.14 : 1), with 7 caudal setae and 3 distal spinules on ventral surface; outer proximal seta small, aesthetasc-like; other 6 setae grouped near end, all naked, inner one of 2 mid-terminal ones distinctly larger. Egg sac discoid, nearly circular, 212 × 158 μm, with eggs arranged in 2 layers.

Rostrum nearly pentagonal, with roundly protruded posteior tip. Antennule (Fig. 5E) 6-segmented, with armature formula: 5, 11, 9, 4+1 aesthetasc, 2+1 aesthetasc, and 7+1 aesthetasc. First segment with 1 claw-like process, proximal seta of this segment short, blunt and plumose. Setae on second segment aggregated in 2 groups, 8 in proximal and 3 in distal groups. Antenna (Fig. 5F) 4-segmented. First segment longest, with 1 long, plumose seta at inner distal corner and many setules on surface. Second segment unarmed, about 1.5 times as long as wide. Third segment wider than long, armed with 1 large sucker and on inner margin 1 short seta. Terminal segment about twice as long as wide, with 4 setiform claws bearing pectinated tip and 2 unequal outer subterminal setae.

Labrum reduced, roughly rhomboid, not covering mouthparts, with 1 transverse row of denticles (Fig. 6A). Mandible (Fig. 6B) armed with 4 distal elements: 1 short claw-like ventral element, 2 broad foliaceous elements pectinated along ventral and terminal margin, and 1 setiform dorsal element. Paragnath small, naked and lobate. Maxillule (Fig. 6C) lobate, armed with 4 setae. Maxilla (Fig. 6D) 2-segmented. Basal segment enlarged, plate-like, with small spinules on ventral surface and about 2 rows of denticles along posterior margin. Distal segment small and tipped with 4 elements, 2 of which marginated with membrane along one side, and one being spiniform and terminally bifurcate. Maxilliped as sclerotized rudiment.

Legs 1-4 with 3-segmented rami. All these legs armed with dentiform spinules along outer margin of rami and posterior margin of intercoxal plate. Inner spine on basis of leg 1 curved, longer than first endopodal segment, and armed with spinules on outer margin. Legs 1 and 2 (Fig. 6E, F) with rudimentary inner coxal seta. Legs 2-4 with several elongate setules on ventral surface of coxa. Armature formula of legs 1-4 as follows:

Leg 1: coxa 0-1; basis 1-I; exp I-0; I-1; I, 2, I, 3; enp 0-1; 0-1; I, 1, I, 3

Leg 2: coxa 0-1; basis 1-0; exp I-0; I-1; I, 1, I, 4; enp 0-1; 0-1; I, 1, I, 3

Leg 3: coxa 0-0; basis 1-0; exp I-0; I-1; I, 1, I, 4; enp 0-1; 0-1; I, 1, I, 3

Leg 4: coxa 0-0; basis 1-0; exp I-0; I-1; I, 1, I, 4; enp 0-1; 0-1; I, 1, 2

Leg 5 (Fig. 6H) 2-segmented. First segment enlarged, 52 × 38 μm, directed posterolaterally, with 1 long, naked distal seta and a row of spinules on ventrodistal surface. Free segment 37 × 16 μm (2.31 : 1), with 4 setae, and spinules on all margins. Leg 6 represented by 1 setule and 2 blunt minute spinules in genital area (Fig. 5B).

Male. Body (Fig. 7A) resembling that of female, 731 μm long. Greatest width 323 μm. Urosome

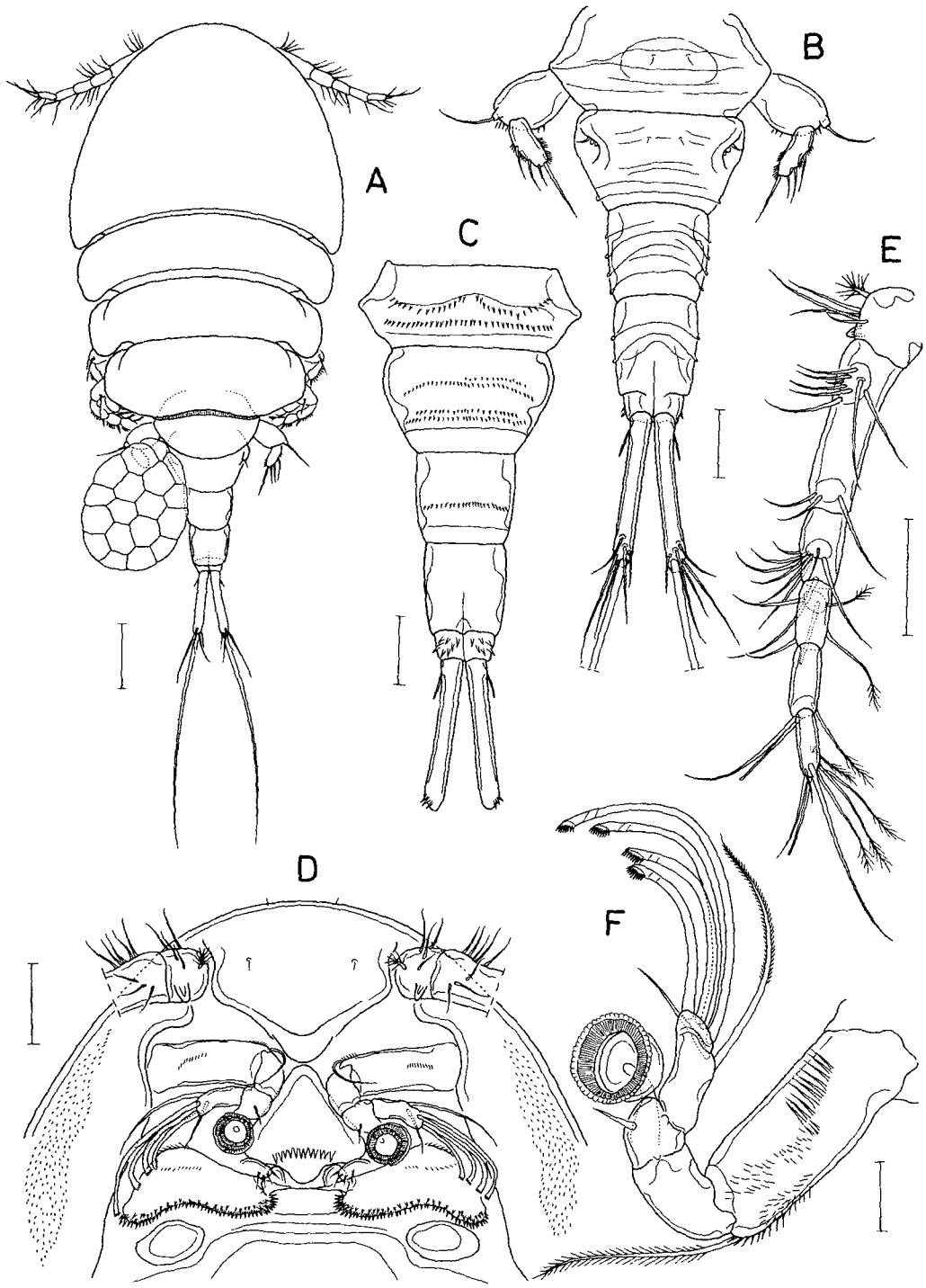

Fig. 5. *Myzomolgus orientalis* n. sp., female. A, habitus, dorsal; B, urosome, dorsal; C, same, ventral; D, anterior part of cephalothorax, ventral; E, antennule; F, antenna. Scales: A = 0.1 mm; B-E = 0.05 mm; F = 0.02 mm.

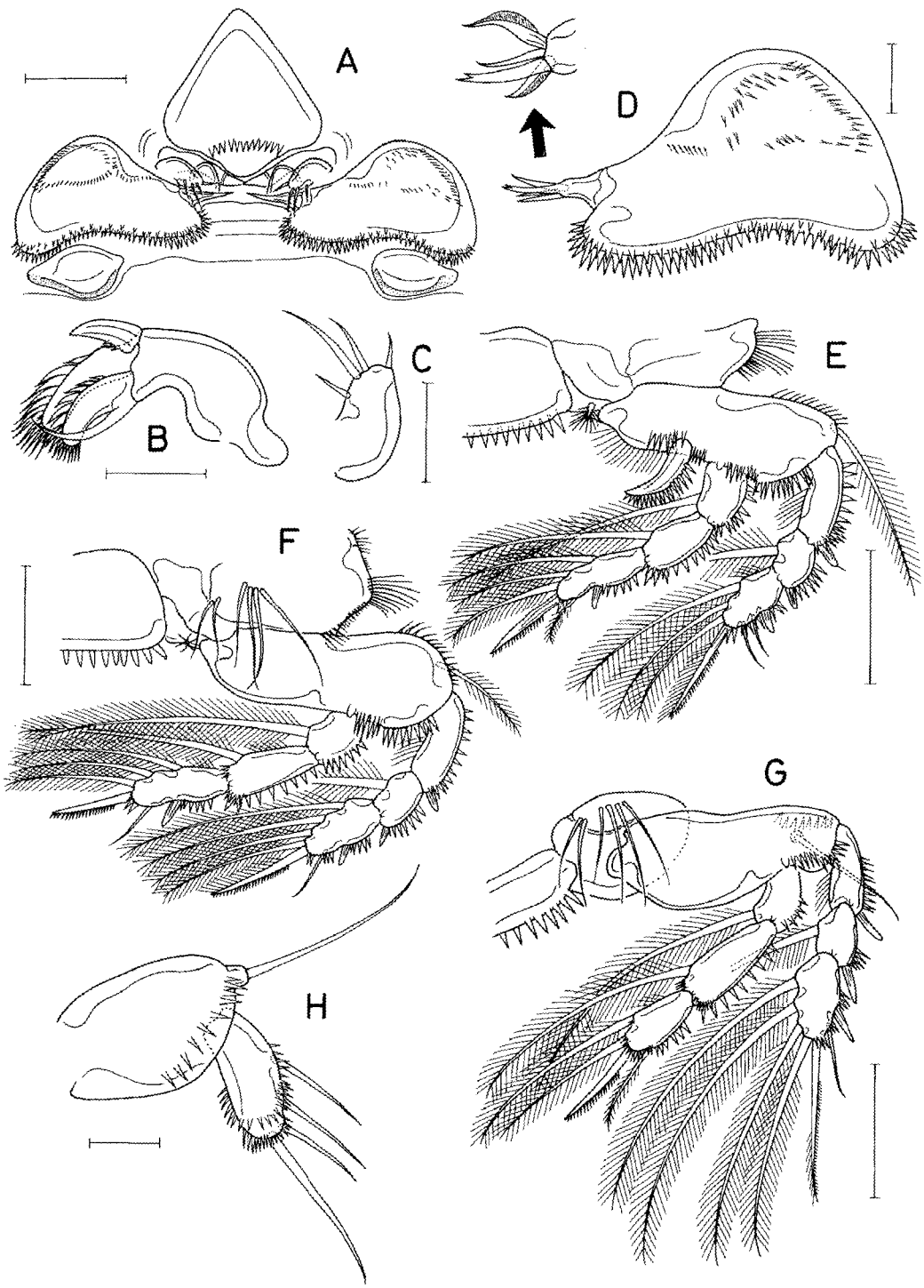

Fig. 6. *Myzomolgus orientalis* n. sp., female. A, mouthpart; B, mandible; C, maxillule; D, maxilla; E, leg 1; F, leg 2; G, leg 4; H, leg 5. Scales: A, E-H = 0.05 mm; B-D = 0.02 mm.

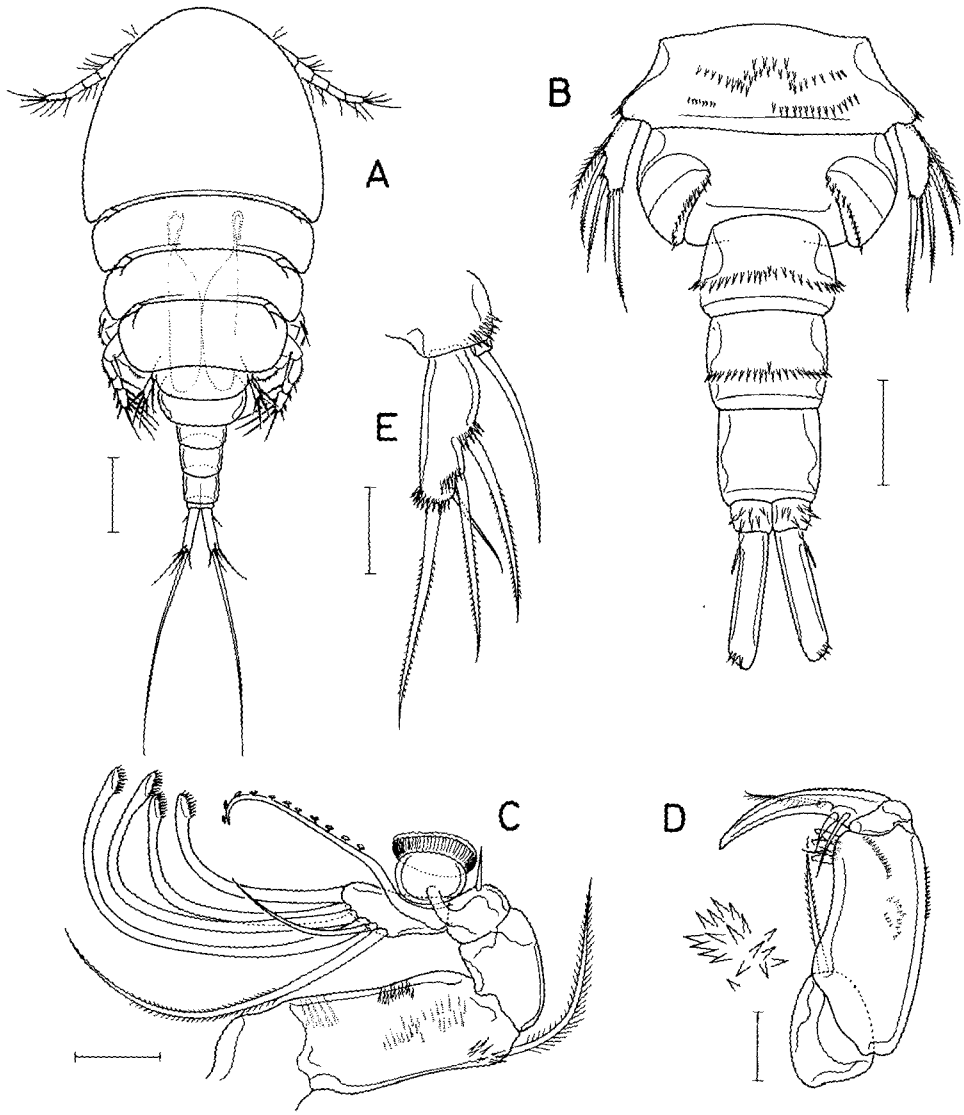

Fig. 7. *Myzomolgus orientalis* n. sp., male. A, habitus, dorsal; B, urosome, ventral; C, antenna; D, maxilliped; E, leg 5. Scales: A = 0.1 mm; B = 0.05 mm; C-E = 0.02 mm.

(Fig. 7B) 6-segmented. Fifth pedigerous somite wider than genital somite, with spinules on ventral surface. Genital somite much wider than long, 54 × 122 μm, with oblique row of spinules on each genital flap. Four abdominal somites 41 × 63, 44 × 56, 57 × 49, and 13 × 38 μm, respectively. First and second abdominal somites with 1 transverse row of spinules on ventral surface. Caudal ramus 65 × 14 μm (4.64 : 1).

Rostrum as in female. Antennule with 1 added seta on third segment (therefore 10 setae). Antenna (Fig. 7C) added on third segment by 1 elongate seta bearing row of about 10 minute suckers.

Labrum, mandible, maxillule and maxilla as in female. Maxilliped (Fig. 7D) 4-segmented, accompanied medially by patch of spinules on body surface. First segment wider than long, with 1 distal seta. Second segment longest, armed with 3 digitiform spinules and 1 small seta on distal area of inner margin. Third segment short and unarmed. Terminal segment as moderately curved claw bearing basally 3 setae.

Legs 1-4 as those of female. Leg 5 (Fig. 7E) 2-segmented but basal segment fused with fifth pedigerous somite, leaving 1 dorsal seta. Free segment 37 × 13 μm (2.85 : 1), with spinules near bases of 4 setae. Leg 6 absent.

Etymology. The specific name *orientalis* refers to the oriental region, a geographical area where the type specimens were recovered.

Remarks. The genus *Myzomolgus* includes only a single known species *M. stupendus* Bocquet and Stock, 1957 recorded from the sipunculid *Sipunculus nudus* Linnaeus on the Atlantic coast of France. *Myzomolgus orientalis* n. sp. is similar to *M. stupendus*. They have a similar body form and the identical armature formula of legs. The new species can be differentiated from the European species by the features that it has the smaller body (0.95 mm in female in contrast to 1.4 mm in *M. stupendus*), the more elements on the first segment of the antennule (five setae and one process in contrast to only four setae in *M. stupendus*), the pectinated tip of spines on the terminal segment of the antenna (simple in *M. stupendus*), and the bearing of four terminal elements on the distal segment of the maxilla (two elements in *M. spupendus*).

Myzomolgus tenuis, n. sp. (Figs. 8-10)

Material examined. 18 ♀♀ and 4 ♂♂ collected from the external body surface of the sipunculid *Sipunculus nudus* Linnaeus dug out from the intertidal sands at Sinhung-ri (33° 33′N, 126° 39′E), northern shore of Jeju Island, collected by the author on 29 September 1999. Holotype (♀), allotype, and paratypes (15 ♀♀, 2 ♂♂) will be deposited in the U. S. National Museum of Natural History, Smithsonian Institution. Dissected paratypes (2♀♀, 1♂) are kept in the collection of the author.

Female. Body (Fig. 8A) slender, spindle-shaped, dorsoventrally flat, and 1.20 mm long. Greatest width 415 μm measured across second pedigerous somite. Prosome occupying about 67% of whole body, and consisting of cephalothorax and 3 metasomites. Cephalothorax with fine spinules on ventrolateral surface (Fig. 8D). Three metasomites nearly equal in length, their posterodorsal border marginated by membrane. Urosome (Fig. 8B) 5-segmented and tapering. Fifth pedigerous somite 254 μm wide, roundly protruded laterally, much wider than genital double-somite, with pair of transverse rows of spinules on both sides of ventral surface in medial area. Genital double-somite gradually narrowing posteriorly, 110 × 173 μm, with pair of spinules on both sides of ventral surface in medial area. Genital field located ventrolaterally. Three abdominal somites 115 × 121, 75 × 88, and 44 × 71 μm, respectively. Anal somite with posteromedian incision (Fig. 8C). Caudal ramus 35 × 24 μm (1.46 : 1), with 7 naked caudal setae, including small outer proximal seta; inner one of 2 mid-terminal setae distinctly larger; other 5 setae relatively small.

Rostrum consisting of tapering basal portion and hemicircular posterior portion (Fig. 8D). Antennule (Fig. 8E) short, 6-segmented, with armature formula 4, 11, 9, 4+1 aesthetasc, 2+1 aesthetasc, and 7+1 aesthetasc. Anterior margin of first segment transformed to straight, comb-

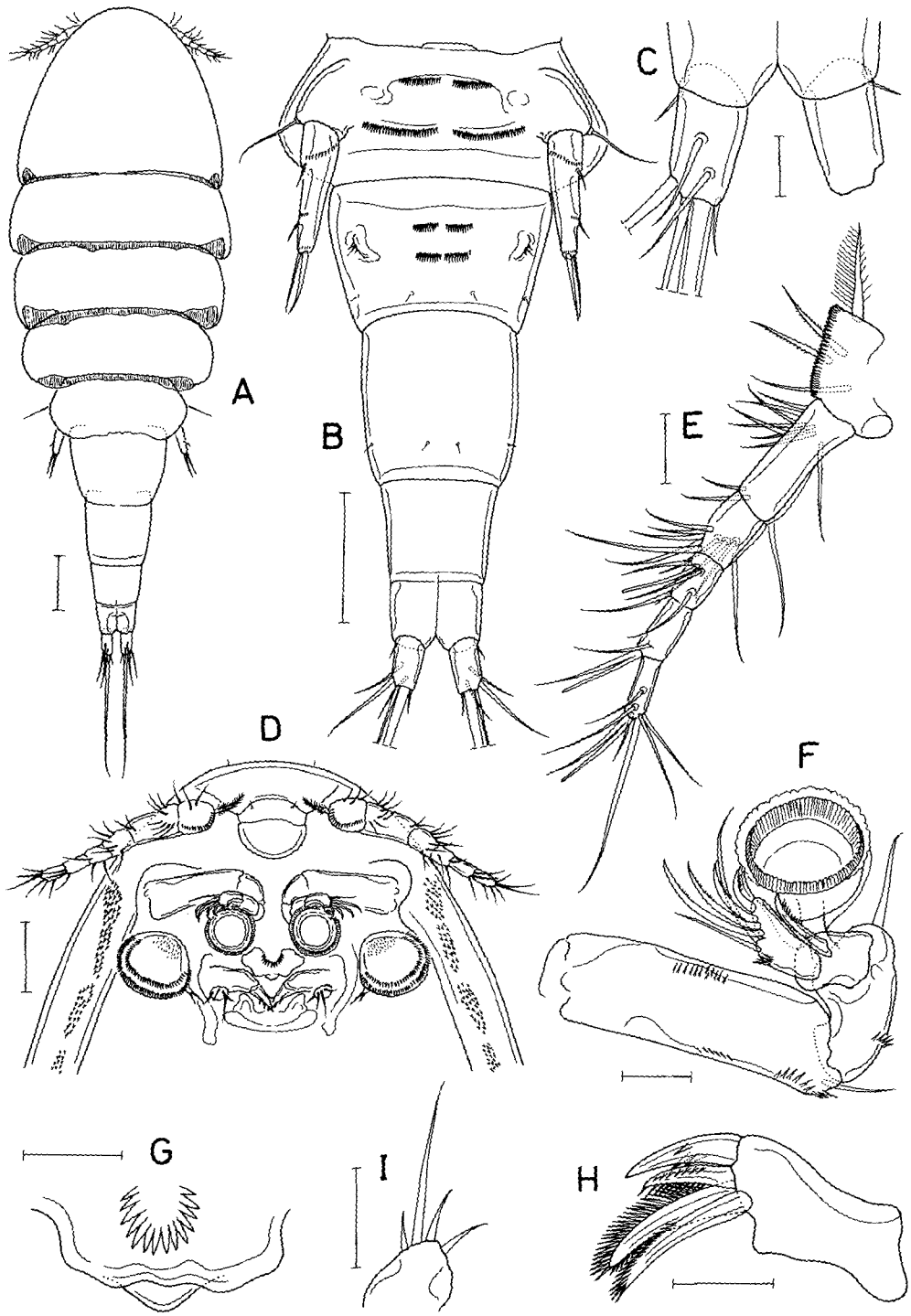

Fig. 8. *Myzomolgus tenuis*, n. sp., female. A, habitus, dorsal; B, urosome, ventral; D, caudal rami, dorsal; D, anterior part of cephalothorax, ventral; E, antennule; F, antenna; G, labrum; H, mandible; I, maxillule. Scales: A, B = 0.1 mm; C, E, F-I = 0.02 mm; D = 0.05 mm.

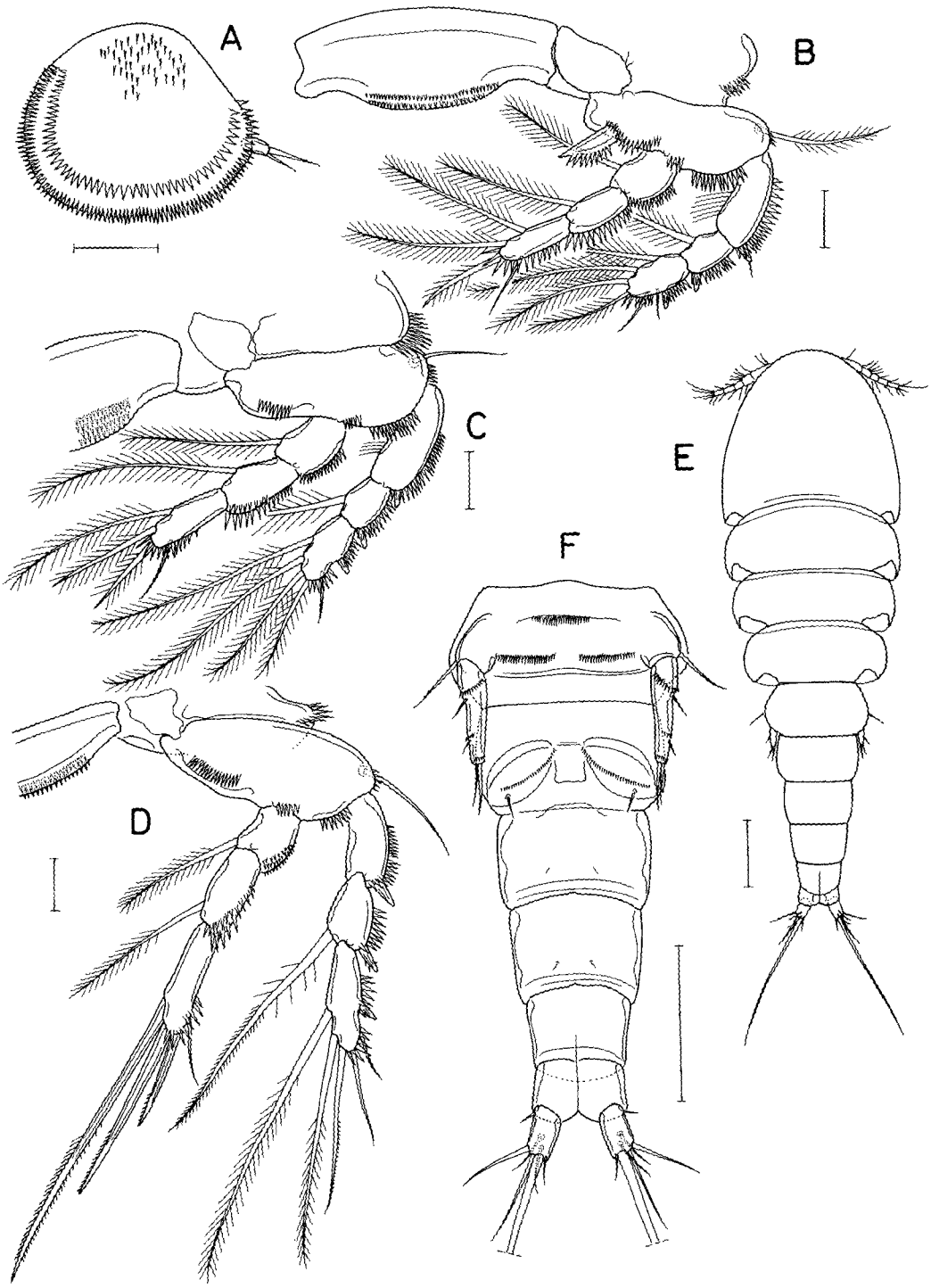

Fig. 9. *Myzomolgus tenuis* n. sp. Female: A, maxilla; B, leg 1; C, leg 2; D, leg 4. Male: E, habitus, dorsal; F, urosome, ventral. Scales: A-D = 0.02 mm; E, F = 0.1 mm.

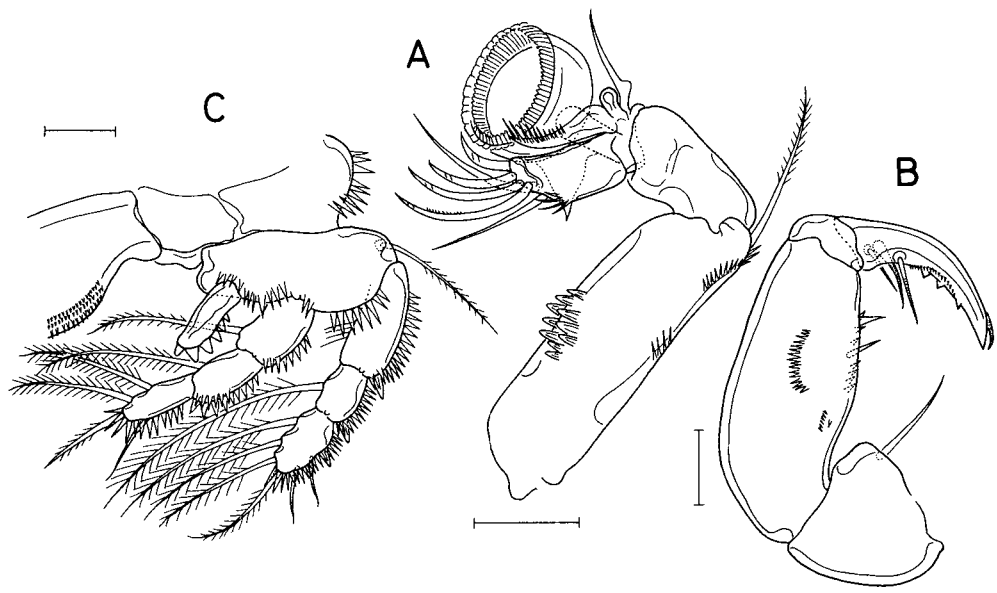

Fig. 10. *Myzomolgus tenuis* n. sp., male. A, antenna; B, maxilliped; C, leg 1. Scales: 0.02 mm for all.

like crest. Proximalmost seta on first segment asymmetrically plumose; other 3 setae naked or very weakly pinnate. Antenna (Fig. 8F) 4-segmented. First segment distinctly longer than other segments, with several patches of spinules and 1 inner distal seta. Second segment distally broadened, with 1 inner distal seta. Third segment armed with 1 large sucker and 1 barbed spines. Terminal segment armed with 2 setae and 4 short setiform spines of unequal lengths.

Labrum (Fig. 8G) with rosette on medial portion of ventral surface and round, broad posterior projection. Mandible (Fig. 8H) armed with 4 spiniform elements: 2 ventral, claw-like shorter elements and 2 dorsal spinulated, longer elements. Paragnath not seen. Maxillule (Fig. 8I) lobate, bearing 3 shorter and 1 longer setae. Maxilla (Fig. 9A) 2-segmented. First segment circular, plate-like, with pair of rows of dense denticles along posterior and lateral margins. Second segment extremely reduced, papilla-like, tipped with 2 unequal setae. Maxilliped lacking.

Legs 1-4 with 3-segmented rami. All these legs without inner coxal seta, armed with dintiform spinules along outer margin of rami and near posterior margin of intercoxal plate. Inner spine on basis of leg 1 as long as first endopodal segment, spinulated along outer margin. Three terminal setae on third endopodal segment of leg 4 spiniform. Armature formula of legs 1-4 as follows:

Leg 1: coxa 0-0; basis 1-I; exp I-0; I-1; I, 6; enp 0-1; 0-1; 4

Legs 2 & 3: coxa 0-0; basis 1-0; exp I-0; I-1; I, 5; enp 0-1; 0-1; 4

Leg 4: coxa 0-0; basis 1-0; exp I-0; I-1; I, 5; enp 0-1; 0-1; 4

Leg 5 2-segmented, located on ventral side of fifth pedigerous somite. First segment with 1 outer seta and short inner margin. Free segment elongate, tapering, 96 × 29 μm (3, 31 : 1), with 2 small setae on outer margin and 2 terminal setae. Leg 6 represented by 2 spinules and 1 setule in genital area.

Male. Body (Fig. 9E) as in female, 850 μm long. Greatest width 260 μm. Urosome (Fig. 9F) 6-

segmented. Fifth pedigerous somite 152 μm wide. Genital somite nearly quadrangular, 68×119 μm, with oblique row of spinules on each genital flap. Four abdominal somites 60×97, 60×83, 42×65, and 30×60 μm, respectively. Caudal ramus 28×17 μm (1.65 : 1).

Rostrum as in female. Antennule with 1 added seta on third segment (10 setae). Antenna (Fig. 10A) with patch of digitiform denticles on outer side of first segment. Third segment very short, with 1 blunt process and 1 basally expanded seta, in addition to sucker and spine.

Labrum, mandible, maxillule and maxilla as in female. Maxilliped (Fig. 10B) 4-segmented. First segment wider than long, with seta on inner margin. Second segment with 2 small setae and 1 row of spinules on inner margin, and 1 row of spinules on lateral surface. Third segment short and unarmed. Terminal segment robust, bent, claw-like, armed basally with 3 setae, 1-3 dentiform processes on concave (inner) margin and 1 subterminal setule.

Leg 1 (Fig. 10C) as in female but inner spine on basis enlarged and armed with several thick denticles. Legs 2-4 as in female. Free segment of leg 5 66×18 μm (3.67 : 1). Leg 6 represented by 1 seta on posterior area of genital flap.

Etymology. The specific name *tenuis* ("slender" in Latin) alludes to the slender body of the new species.

Remarks. *Myzomolgus tenuis* n. sp. can be easily differentiated from its two congeners. Unlike its congeners, it carries the slender body, the crenate anterior margin of the first antennular segment, the reduced setations on legs 1-4, no female maxilliped, and the slender, ventrally located leg 5.

It is remarkable that although *Myzomolgus stupendus* and *M. tenuis* are associated with the identical species of sipunculid host, a close similarity lies unexpectedly between *M. stupendus* and *M. orinetalis* those from the different species of sipunculids.

Genera of the family Catiniidae

Ho (1984) suggested to separate the Catiniidae from other families or family groups such as the Clausidiidae and Clausiidae. He placed the genus *Catinia* near the group of *Myzomolgus* Bocquet and Stock, 1957, *Cotylomolgus* Humes and Ho, 1967, *Cotylemyzon*, and *Goidelia* Embleton, 1901, and characterized them that they have a large sucker on the antenna and a rudimentary or no female maxilliped. Although Kim (2000) treated the Catiniidae as valid, the definition of this family seems still incomplete, because these genera have highly heterogeneous mandibles and maxillae. Whether the similarities of some appendages between these genera are due to the convergences is not yet determined. However, the five genera assigned tentatively to the Catiniidae can be distinguished by the following key.

1. Female antenna without sucker; first segment of female maxilla transformed to powerful hook ..... *Goidelia*
– Female antenna with sucker; first segment of female maxilla styliform or plate-like, not transformed to hook 2
2. Leg 4 absent; leg 1 without inner element on basis 3
– Leg 4 present; leg 1 with inner element on basis 4
3. Leg 3 absent; prosome not segmented ..... *Cotylemyzon*
– Leg 3 present; prosome segmented ..... *Cotylomolgus*

4. Mandible with 4 elements; some of legs 1-4 sexually dimorphic ..... *Catinia*
– Mandible with transformed to a long, curved process; legs 1-4 without sexual dimorphism
..... *Myzomolgus*

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성구동물에서 발견한 *Catinia plana* Bocquet and Stock의 재기재와 *Myzomolgus*속의 2신종 기재 (Copepoda, Poecilostomatoida, Catiniidae)

김 일 회
(강릉대학교 자연과학대학 생물학과)

요 약

Catiniidae과의 모식속이자 모식종이며 불완전하게 기록된 *Catinia plana* Bocquet and Stock을 모식 표본의 재조사를 통하여 재기재 하였다. 부속지의 구조, 특히 대악과 제2소악의 구조를 재해석하였다. 이와 함께, 동일 과에 속하며 지금까지 단형속이었던 *Myzomolgus*속의 2신종을 기재하였다. 이들은 각각 한국산 성구동물 *Sipunculus nudus* Linnaeus와 *Siphonosoma cumanense* (Keferstein)의 피부에 공생한다. *Myzomolgus*속의 종들을 비교한 결과, 이들은 여러 가지 동질적인 형태를 공유하고 있으며, 따라서 이 속은 확실한 속임이 판명되었다. Catiniidae과의 5속을 식별하는데 이용되는 검색표도 제시하였다.