

**Studies on the Terrestrial Isopod Crustaceans in Japan**  
**V. Taxonomy of the Families Armadillidiidae, Armadillidae and**  
**Tylidae, with Taxonomic Supplements to some Other Families\***

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日本産陸棲等脚目甲殻類の研究  
V. オカダンゴムシ科, コシビロダンゴムシ科およびハマダンゴムシ科の分類、  
ならびに分類補遺

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第V報では、日本産陸棲等脚類のうち、偽気管（白体）を持ち、第二触角の鞭部が2節からなり、体を丸くする能力を持つオカダンゴムシ科ならびにコシビロダンゴムシ科について記載を行った。この2科は、第IV報で扱ったワラジムシ科やトウヨウワラジムシ科などとともにワラジムシ亜目の中で系統上最も高等とされているグループである。

今回扱った2科のうち、オカダンゴムシ科は、日本全国の都市部や農村部を中心に海岸や裸地等でも普通にみられ、個体数も多いので人目につきやすく、実験材料や学校教材としても重要視されているグループである。本報告では2種を扱った。コシビロダンゴムシ科は、中央日本から南日本にかけて、とくに森林地帯等人間営為の影響のほとんど無い環境に多く生息するもので日本列島で盛んに種分化が行われたもののようである。本報告では、10新種を含む以下の14種を扱った。

また、ワラジムシ亜目とは別箇の陸産等脚類のグループと考えられるハマダンゴムシ亜目の1種についても取り扱った。

さらに本シリーズをまとめ初めてから6年が経過したので各グループの記載の後、新たな材料にもとずいて研究する機会を得たことのできたフナムシ科、ナガワラジムシ科、ウミベワラジムシ科ならびにミギワベワラジムシ科に属する7種類について補遺として、追加記載した。

なお、本研究の一部は昭和63年度文部省科学研究費奨励研究B63917032による。

オカダンゴムシ科	Armadillidiidae BRANDT & RATZENBURG, 1831
オカダンゴムシ属	<i>Armadillidium</i> BRANDT & RATZENBURG, 1831
オカダンゴムシ（ダンゴムシ）	<i>Armadillidium vulgare</i> (LATREILLE, 1804)
ハナダカダンゴムシ	<i>Armadillidium nasatum</i> BUDDE-LUND, 1885
コシビロダンゴムシ科	Armadillidae BRANDT & RATZENBURG, 1831

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\*Contributions from the Toyama Science Museum No.84

コブコシビロダンゴムシ属	<i>Hybodillo</i> HEROLD, 1931
イシイコブコシビロダンゴムシ	<i>Hybodillo ishiui</i> n. sp.
コシビロダンゴムシ属	<i>Sphaerillo</i> VERHOEFF, 1926
トウキョウコシビロダンゴムシ	<i>Sphaerillo obsculus</i> (BUDDE-LUND, 1885)
セグロコシビロダンゴムシ	<i>Sphaerillo dorsalis</i> (IWAMOTO, 1943)
ヘリジロコシビロダンゴムシ	<i>Sphaerillo elegans</i> n. sp.
ダイトウコシビロダンゴムシ	<i>Sphaerillo daitoensis</i> n. sp.
ムニンコシビロダンゴムシ	<i>Sphaerillo boninensis</i> n. sp.
シロコシビロダンゴムシ	<i>Sphaerillo albus</i> n. sp.
イリオモテシロダンゴムシ	<i>Sphaerillo iriomotensis</i> n. sp.
タテジマコシビロダンゴムシ	<i>Sphaerillo russoi</i> (ARCANGELI, 1927)
シュリコシビロダンゴムシ	<i>Sphaerillo shuriensis</i> n.sp.
ヨナグニコシビロダンゴムシ	<i>Sphaerillo yonaguniensis</i> n. sp.
ヤエヤマコシビロダンゴムシ	<i>Sphaerillo yaeyamanus</i> n. sp.
オビコシビロダンゴムシ	<i>Sphaerillo lineatus</i> n. sp.
コシビロダンゴムシの一種	<i>Sphaerillo</i> sp.
ハマダンゴムシ亜目	Tyloidea
ハマダンゴムシ科	Tylidae MILNE-EDWARDS, 1840
ハマダンゴムシ属	<i>Tylos</i> AUDOUIN, 1826
ハマダンゴムシ	<i>Tylos granuriferus</i> BUDDE-LUND, 1885
補遺	
フナムシ科	Ligiidae BRANDT & RATZENBURG, 1831
フナムシ属	<i>Ligia</i> FABRICIUS, 1798
アシナガフナムシ	<i>Ligia yamanishii</i> n.sp.
ナガワラジムシ科	Trichoniscidae SARS, 1896
ホラワラジムシ属	<i>Hyloniscus</i> VERHOEFF, 1908
ニシカワホラワラジムシ	<i>Hyloniscus nishikawai</i> n. sp.
キイホラワラジムシ	<i>Hyloniscus kiiensis</i> n. sp.
ホンドワラジムシ属	<i>Hondoniscus</i> VANDEL, 1968
モガミワラジムシ	<i>Hondoniscus mogamiensis</i> n. sp.
チョウチンワラジムシ属	<i>Koshiniscus</i> n. gen.
ノトチョウチンワラジムシ	<i>Koshiniscus notojimensis</i> n. sp.
ウミベワラジムシ科	Scyphacidae DANA, 1853
ウミベワラジムシ属	<i>Scyphax</i> DANA, 1853
ツシマウミベワラジムシ	<i>Scyphax tsushimaensis</i> n. sp.
ミギワワラジムシ科	Marinoniscidae NUNOMURA, 1986
ミギワワラジムシ属	<i>Marinoniscus</i> NUNOMURA, 1986
クロシオミギワワラジムシ	<i>Marinoniscus pacificus</i> n. sp.

**Family Armadillidiidae BRANDT & RATZENBURG, 1831**

(Jap. name : Oka-dangomushi-ka)

Body very convex. Body capable of enrolling. Both antennae and peraeopods very short. Pseudotracheae in the exopodites of pleopods I-II. The Armadillidiidae is mostly confined to Europe. Only two species which are found in Japan, may apparently have been dispersed through human agency.

***Armadillidium* BRANDT & RATZENBURG, 1831**

(Jap. name : Oka-dangomushi-zoku)

Body elliptical. Body capable of being rolled up into a perfect ball. Body very convex. Both antennae and all the peraeopods are short. Cephalon with the front distinctly emarginate, lateral lobes rounded and sharply defined the base. Eyes distinct and lateral.

Key to the Japanese species of the Genus *Armadillidium*

- 1 Rostral projection only slightly protruded. Pleotelson wider than long .....  
.....*A. vulgare* (LATREILLE, 1804)
- 1' Rostral projection remarkably protruded. Pleotelson longer than wide.....  
.....*A. nasatum* BUDDE-LUND, 1885

***Armadillidium vulgare* (LATREILLE, 1804)**

(Jap. name : Oka-dangomushi, or Dangomushi)

Fig.137

*Armadillidium vulgare* LATREILLE, 1804

*Armadillidium pilulare* STUXBERG, 1875

*Armadillidium cinererum* ARCANGELI, 1932

For further synonymy, see VANDEL, 1966

*Material examined* : More than 1500 samples from various parts of Japan, Hokkaido through Kyushu.

*Description* : Body elliptical, 2.1 times as long as wide. Body size attaining 14mm. Body colour blackish blue, dark grey in male but paler brown in female. Cephalon broad and quadrangular, frontal part transversely truncated, lateral lobes comparatively rounded. Eyes mediocre in size, each eye composed of 50 ocelli. Pleotelson triangular, tapering towards the distal end.

First antenna ; first segment big ; second segment short ; terminal segment rectangular.

Second antenna (Fig.137 C) short, scarcely exceeding 1/4 of the body length ; flagellum almost as long as the fifth peduncular segment. First flagellar segment somewhat shorter than the second.

Right mandible ; pars incisiva 3-headed ; lacinia mobilis single-toothed ; several hairy

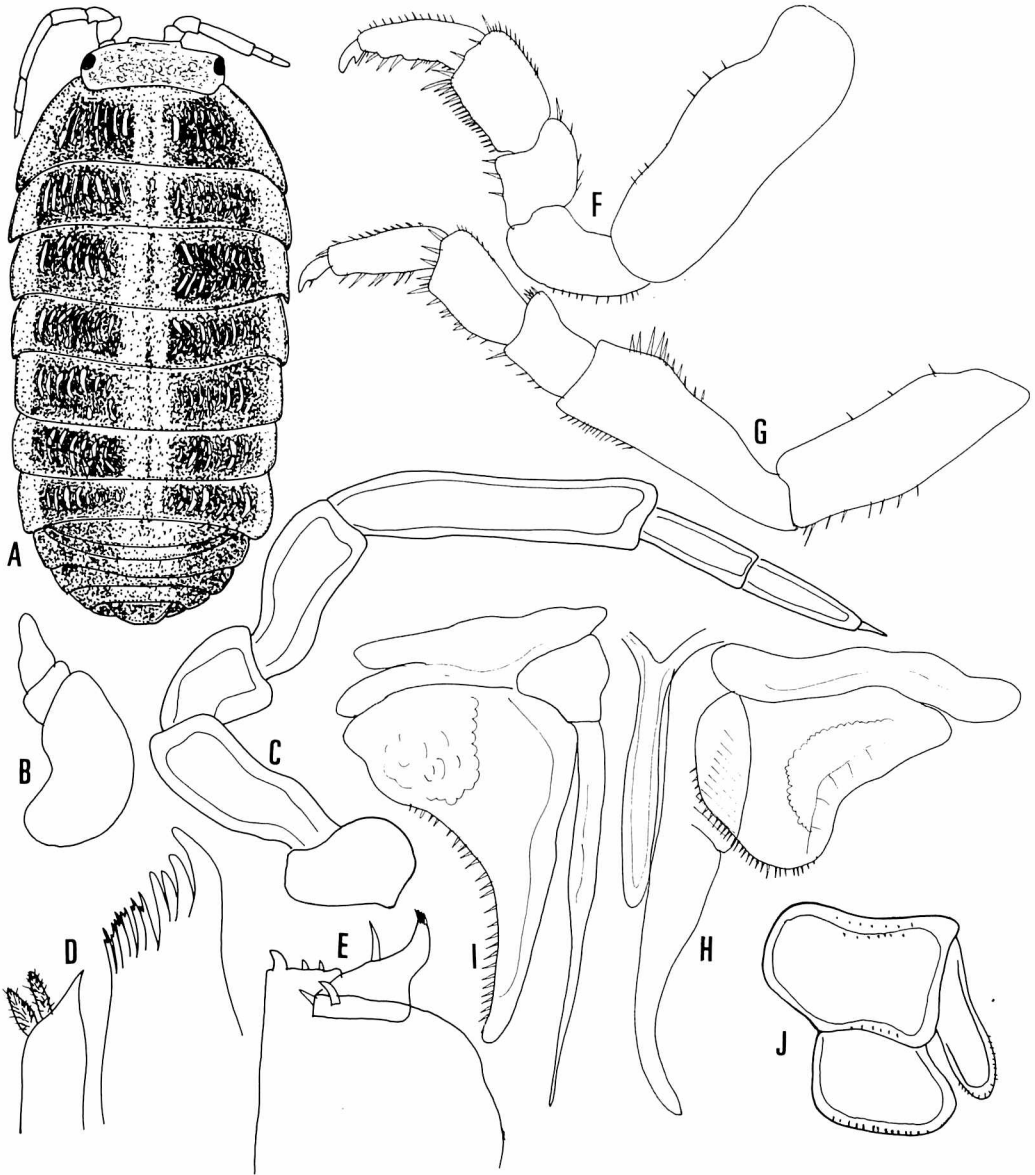


Fig.137 *Armadillidium vulgare* LATREILLE, 1804

A. Dorsal view ; B. First antenna ; C. Second antenna ; D. First maxilla ; E. Maxilliped ; F. First pereopod ; G. Seventh pereopod ; H. Penes and male first pleopod ; I. Male second pleopod ; J. Uropod (All : Male specimen collected from Hyogo Pref).

bristles between lacinia and processus molaris ; processus molaris is represented by a tuft of hairy bristles.

Left mandible ; pars incisiva 3-headed ; lacinia mobilis 2-headed ; several hairy bristles between lacinia mobilis and processus molaris ; processus molaris is represented by a tuft of



hairy bristles.

First maxilla (Fig.137 D) ; inner lobe with 2 plumose setae and an acute protuberances ; outer lobe with 10 (4+6) teeth at the tip.

Second maxilla round.

Maxilliped (Fig.137 E) ; endite rectangular with 3 spines ; palp relatively short.

First peraeopod (Fig.137 F) ; basis rectangular ; ischium rectangular but shorter than basis ; carpus almost square ; carpus a little longer than merus and with a series of many setae on inner margin ; propodus rather short with a series of setae on basal half on inner margin and 4 setae on distal half of the inner margin.

Seventh peraeopod (Fig.137 G) ; basis oblong ; ischium rather large, equaling to the succeeding part of the leg in length ; merus short and almost square ; carpus rectangular and a little longer than merus ; propodus rather short with 10 setae on inner margin.

Penes (Fig.137 E) narrow.

Male first pleopod (Fig.137 H) ; endopodite straight but apical part bends innerwards ; exopodite elliptical.

Male second pleopod (Fig.137 I) ; endopodite slender and straight ; exopodite transverse with a shallow concavity on outer margin.

Uropod (Fig.137 J) ; exopodite wider than long, oblique-transversely truncated ; endopodite slender and club-shaped.

*Remarks* : This species is very common in urban area throughout Japan, especially abundant in the large cities of central Japan, but never recorded from the forest zone. Perhaps, it might be an invader from Europe.

***Armadillidium nasatum* BUDDE-LUND , 1885**

(Jap. name : Hanadaka-dangomushi, new)

Figs.138-139

*Armadillidium nasatum* BUDDE-LUND, 1885

*Armadillidium quadrifrons* STOLLER, 1902

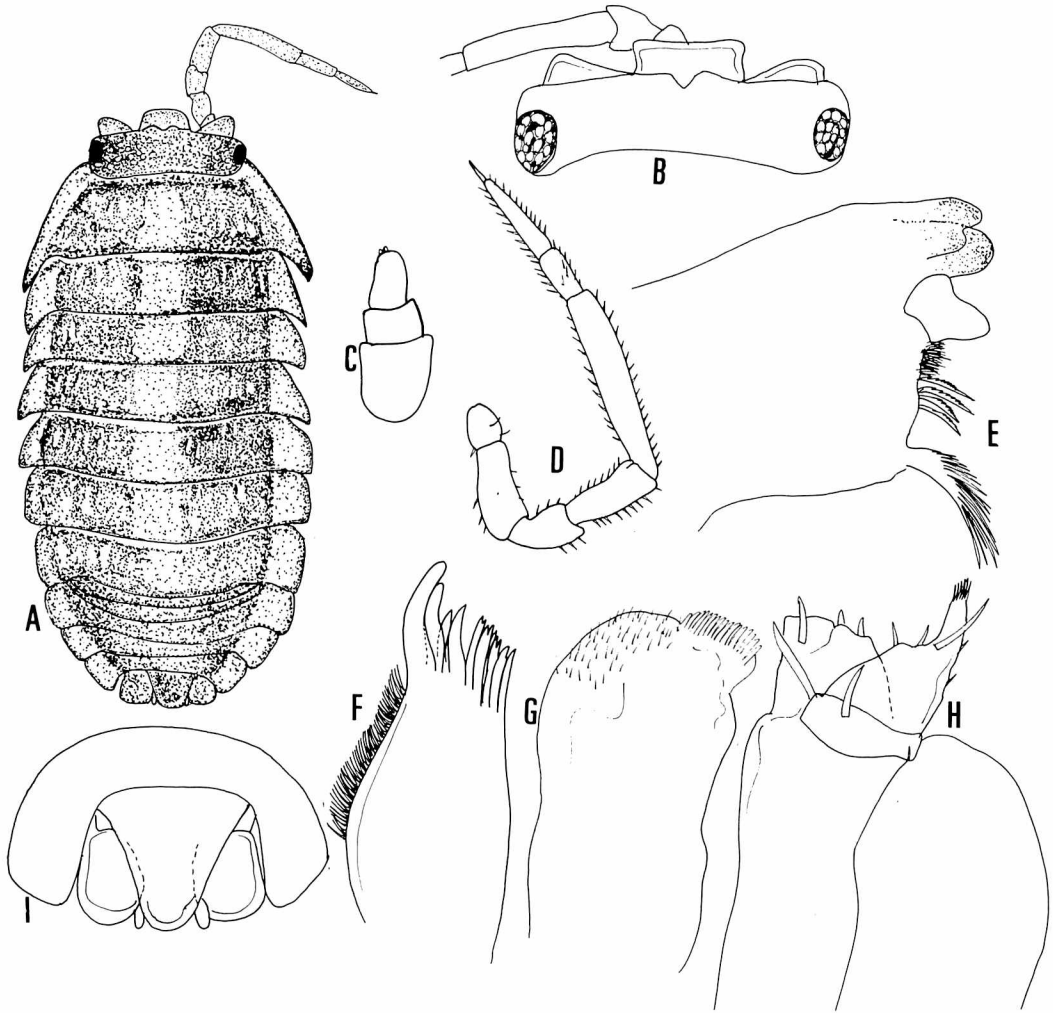
For further synonymy, see VANDEL, 1966

*Material examined* : 1 ♂ 2 ♀ ♀, Sankeien-Park, Honmoku, Naka-ku, Yokohama City, Kanagawa Pref., coll. Noboru Nunomura, Nov. 26, 1983.

*Description* : Body size reaches 13mm in length. Body 2.0 times as long as wide. Body colour black but lateral part gray, medial part with many longitudinal paler patterns. Cephalon with remarkably protruded frontal medial part. Eyes mediocre, each eye with 16 ocelli. Pleotelson triangular, with a rounded tip.

First antenna (Fig.138 C) 3-segmented ; first and second segment rectangular ; terminal segment with 2 short aesthetascs at the tip.

Second antenna (Fig.138 D), reaching the boundary between the first and second per-



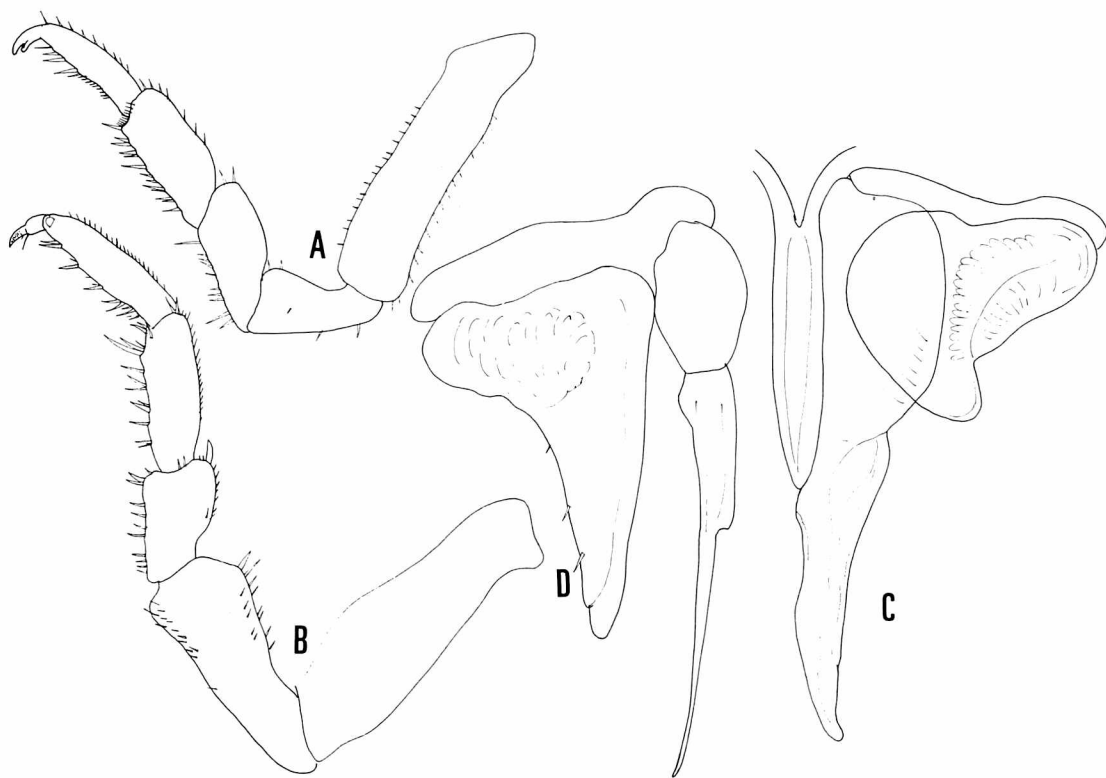
**Fig.138** *Armadillidium nasatum* BUDDE-LUND, 1885

A. Dorsal view ; B. Cephalon ; C. First antenna ; D. Second antenna ; E. Right mandible ; F. Outer lobe of first maxilla ; G. Second maxilla ; H. Maxilliped ; I. Pleotelson and uropods (All : Male specimens from Yokohama).

aeonal segments, mutual length of first to fifth peduncular segments is almost 2 : 4 : 3 : 4 : 9. Flagellum about 2/3 of the fifth peduncular segment, terminal segment almost twice as long as the first.

Right mandible (Fig.138 E) ; pars incisiva 3-headed ; lacinia mobilis is single-toothed ; a group of 4 hairy bristles between lacinia mobilis and processus molaris. Processus molaris is represented by a tuft of hairy bristles.

Left mandible ; pars incisiva 3-headed ; lacinia mobilis 2-toothed ; a group of 4 hairy bristles between lacinia mobilis and processus molaris. Processus molaris is represented by



**Fig.139** *Armadillidium nasatum* BUDDE-LUND, 1885

A. First peraeopod ; B. Seventh peraeopod ; C. Penes and male first pleopod ; D. Male second pleopod (All : Male specimens from Yokohama).

a tuft of hairy bristles.

First maxilla (Fig.138 F) ; outer lobe with 10 (4+6) stronger simple teeth and 6 weaker teeth.

Second maxilla (Fig.138 G) rather wide.

Maxilliped (Fig.138 H) ; endite wide and rectangular with 3 spines on distal margin ; palp rather short with a long seta on the middle part of inner margin.

First peraeopod (Fig.139 A) ; basis oblong ; ischium rather short  $\frac{1}{5}$  as long as basis ; merus and carpus rectangular, each of them almost as long as ischium, with many setae on inner margin ; propodus as long as carpus.

Seventh peraeopod (Fig.139 B) ; basis oblong ; ischium oblong but a little shorter than basis ; merus short,  $\frac{2}{5}$  time as long as ischium, with a seta at outer distal margin ; carpus 1.4 times as long as merus with a series of setae on inner margin ; propodus as long as carpus.

Penes (Fig.139 C) narrow lanceolate.

Male first pleopod (Fig.139 C) ; almost straight but only slightly recurved at the apical part ; apical part without denticle. Exopodite semicircular and with a right-angled concavity on outer margin.



Fig.140 Map showing the geographical distribution of the genus *Armadillidium*

Male second pleopod (Fig.139 D) ; endopodite straight and narrow ; exopodite triangular with 3~5 spines on outer margin.

Uropod ; exopodite rectangular ; endopodite slender.

*Remarks* : This species seems to be an invader from southern Europe (the type locality is near Rome, Italy). The species is now found only in a well-preserved garden in Yokohama, one of the oldest harbours in Japan opened for overseas trades.

**Family Armadillidae BRANDT & RATZENBURG, 1831**

(Jap.name: Koshibiro-dangomushi-ka)

This family is characterized by having a special apparatus for enrolling, five pairs of pseudotracheae on pleopods, and pleotelson which spreads towards the distal margin. The family is distributed around the Pacific area, is commonly in the forest part of central to southern Japan. There may be many species belonging to this family in Japan.

Key to the subfamilies of the Family Armadillidae in Japan

- 1 Body small, body length not exceeded 3.5 mm even in adult. Tergite is covered with granules or tubercles. Peraeonal somite seldom with schisma...Subfamily Acanthodillinae  
1' Body rather large, adult exceeds 5 mm in adult in length. Tergite without tubercles. Peraeonal somites I and II with deep schisma .....Subfamily Armadillinae

**Subfamily Acanthodillinae VANDEL, 1973**

(Jap. name: Toge-koshibiro-dangomushi-aka, new)

Body small. Tergite is covered with many granules or tubercles. Only the genus *Hybodillo* is recorded in Japan.

**Genus *Hybodillo* HEROLD, 1931**

(Jap. name : Kobu-warajimushi-zoku, new)

Body small, less than 3.5mm in body length. Tergite is covered with many granules or tubercles. Eyes small, composed of 5~6 ocelli or blind.

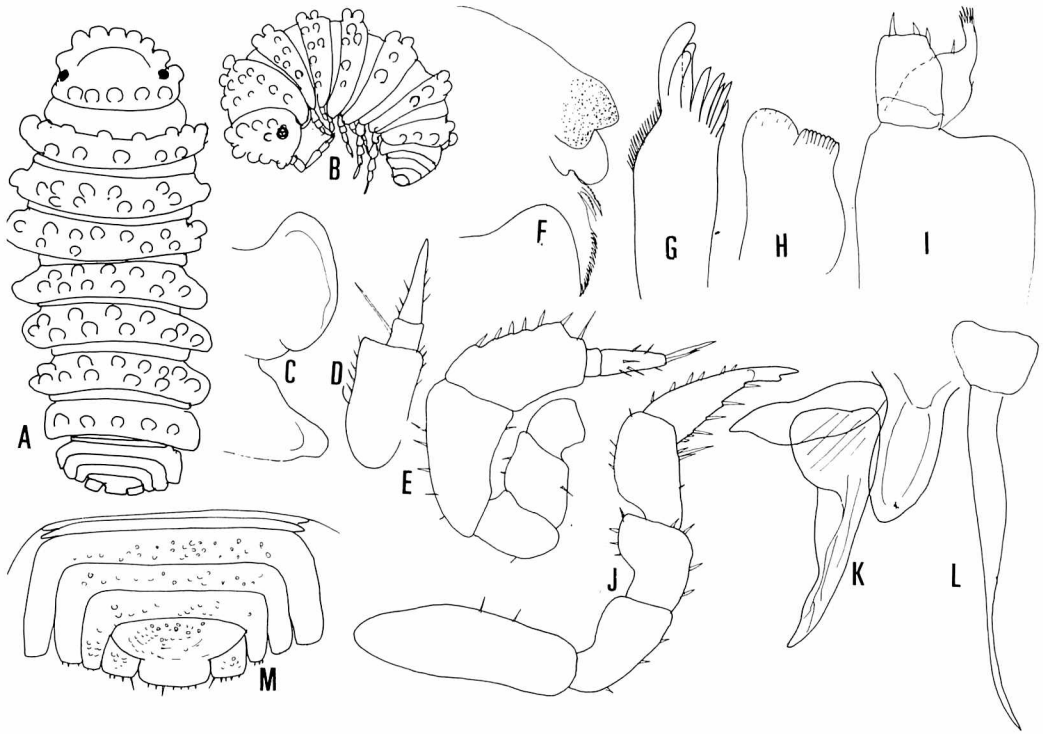
***Hybodillo ishiii* n. sp.**

(Jap. name : Ishii-kobu-kosibiro-dangomushi, new)

Fig.141

*Material examined* : 3 ♂♂ (1 ♂ holotype, 2.2mm in body length and 2 ♂♂ paratypes, 1.8~2.4mm in body length) and 10 ♀♀ (1 ♀ allotype, 2.4mm in body length and 9 ♀♀, paratypes, 1.8~2.3mm in body length), Shuri, Naha City, Okinawa Island, Okinawa Pref. coll. Kiyoshi Ishii. Type series is deposited as follows : holotype (TOYA-Cr-8896), allotype (TOYA-Cr-8897) and 3 paratypes (TOYA-Cr-8898~8890) at the Toyama Science Museum, 2 paratypes (OMNH-Ar-3303~3304) at the Osaka Museum of Natural History, 2 paratypes (YCM-CI-954~955) at the Yokosuka City Museum and 2 paratypes (NSMT-Cr-9773) at the National Science Museum, Tokyo.

*Description* : Body is capable of enrolling. Body colour is white. Dorsal surface of body is covered with many small tubercles. Eyes small, each eye with 5~6 ocelli. First peraeonal somite with shallow schisma. Second peraeonal somite with a shallow tooth.



**Fig.141** *Hybodillo ishiii* n.sp.

A. Dorsal view ; B. Lateral view ; C. Ventral view of first and second peraeonal somites ; D. First antenna ; E. Second antenna F. Right mandible ; G.Outer lobe of first maxilla ; H. Second maxilla ; I. Maxilliped ; J. Seventh peraeopod ; K. Penes and male first pleopod ; L. Endopodite of male second pleopod ; M. Pleotelson and uropods (All : Holotype male).

Pleotelson with cup-shaped, distal part short and much narrower than the basal part.

First antenna (Fig.141 D) ; first segment is stout ; second segment is short with a long seta ; terminal segment tapering towards the tip.

Second antenna (Fig.141 E) short, mutual length of peduncular segments is 1 : 1 : 1 : 2 : 2. Flagellum narrow and short, about half the length of the fifth peduncular segment. Second segment is 4 times as long as the first.

Right mandible (Fig.141 F) ; pars incisiva weakly bilobed ; lacinia mobilis 2-headed ; 2 hairy bristles between lacinia mobilis and processus molaris ; processus molaris is represented by a robust tuft of hairy bristles.

Left mandible ; pars incisiva bilobed ; lacinia mobilis 3-headed ; 2 hairy bristles between lacinia mobilis and processus molaris ; processus molaris is represented by a robust tuft of hairy bristles.

First maxilla (Fig.141 G) ; outer lobe with 8 teeth at the tip.

Second maxilla (Fig.141 H) normal, dental part narrow.

Maxilliped (Fig.141 I) endite rectangular with a relatively long seta and a spine on distal end ; palp short and tapering towards the tip.

First peraeopod ; basis oblong ; ischium about half the length of basis; merus almost square with 2 setae ; carpus square with 2 serrated setae on inner margin ; propodus short.

Seventh peraeopod (Fig.141 J) ; basis oblong ; ischium about half the length of basis ; merus almost square ; carpus a little longer than merus ; propous rather short with 4 setae and 2 short setae on inner margin.

Penes (Fig.141 K) short and stout.

Male first pleopod (Fig.141 K) ; exopodite short ; endopodite rather short.

Male second pleopod (Fig.141 L) ; endopodite long ; exopodite elongated.

*Remarks* : The present new species, apparently allied to *Hybodillo pygmaeus* VANDEL, from Bismark Archipelago, New Britain, is separated from the latter in the following features : (1) presence of eyes, (2) shape of first peraeonal somite, and (3) shape of pleotelson.

#### **Subfamily Armadillinae DANA, 1853**

(Jap. name : Koshibiro-dangomushi-aka, new)

Structures for enrolling such as schisma well developed. In Japan the only the genus *Sphaerillo* is distributed.

#### **Genus *Sphaerillo* VERHOEFF, 1926**

(Jap. name : Koshibiro-danngomushi-zoku, new)

Body not so small. Tergite smooth. There are many species of the genus in Japan.

#### ***Sphaerillo obsculus* (BUDDE-LUND, 1885)**

(Jap. name : Tôkyo-koshibiro-dangomushi, new)

Fig.142

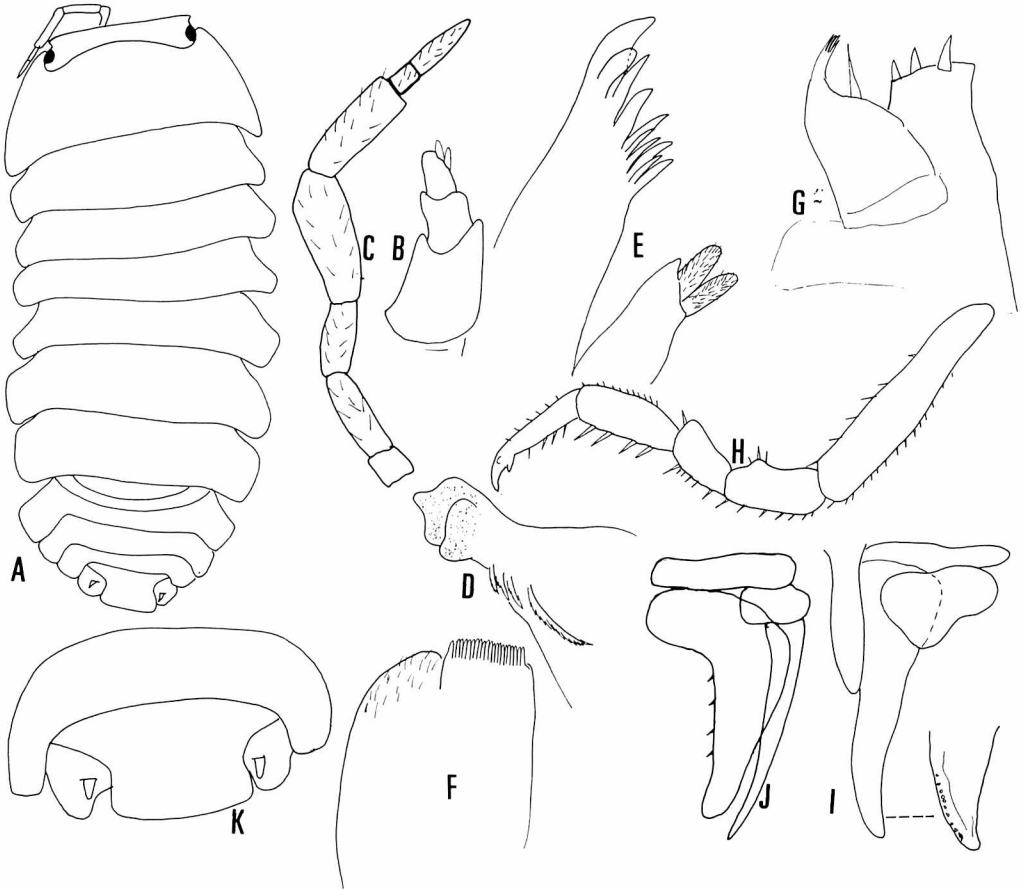
*Armadillo obsculus* BUDDE-LUND, 1885

*Material examined* : 2 ♂♂ 2 ♀♀, Uweno Park (= Ueno Park, Taito-ku, Tokyo ?), Mar 9, 1873, coll. Hilgendorf ; 3 damaged specimens, Berlin Museum, Germany (No.8665) ; 3 ♀♀, "Moji" Japan, coll. "R. Mull", July 31, 1900, Zoologisches Museum, Hamburg Universität.

*Description of the male specimen collected from Uweno Park* : Body 2.1 times as long as wide. Body size reaches 8.5 mm in length. Body colour dull yellow in alcohol but it might be blackish in alival state. Eyes mediocre, each eye composed of 15~16 ocelli in Uweno specimens. Pleotelson spread towards the tip, distal margin almost straight.

First antenna (Fig.142 B) ; first segment big and square ; second segment almost square ; teminal segment conical with 2 aesthetascs.

Second antenna (Fig.142 C), reaching anterior part of first peraeonal somite, mutual length of 5 peduncular segment is 1 : 3 : 2 : 4.5 : 4. Flagellum a little shorter than the fifth



**Fig.142** *Sphaerillo obsculus* (BUDDE-LUND, 1885)

A. Dorsal view ; B. First antenna ; C. Second antenna; D. Left mandible ; E. First maxilla ; F. Second maxilla ; G. Maxilliped ; H. Seventh pereopod ; I. Penes and male first pleopod ; J. Male second pleopod ; K. Pleotelson and uropods (All : Male specimen collected from Uweno Park, Deutsches Museum Collection, No.8665).

peduncular segment, second segment 2.3 times as long as the first.

Right mandible ; pars incisiva single-toothed ; lacinia mobilis single-toothed ; a hairy bristle behind lacinia mobilis ; processus molaris is represented by a single tuft of hairy bristles.

Left mandible ; pars incisiva 3-headed ; lacinia mobilis single-toothed ; 3 hairy bristles behind lacinia mobilis ; processus molaris is represented by a single tuft of hairy bristles.

First maxilla (Fig. 142 E) ; outer lobe with 10 entire teeth, outer 4 teeth are stouter than the inner ones.

Second maxilla (Fig. 142 F) wide.



Maxilliped (Fig.142 G) ; endite rectangular with 3 stout spines ; palp rather stout.

First peraeopod ; basis oblong ; ischium 40% as long as basis ; merus 2/3 time as long as ischium ; carpus a little longer than ischium, with 4 long setae on inner margin ; propouls almost as long as carpus.

Seventh peraeopod (Fig.142 H) ; basis oblong ; ischium elongated triangular ; merus a little shorter than ischium ; carpus a little longer than ischium, with 4 long setae and many short setae on inner margin ; propouls almost as long as carpus.

Penes (Fig.142 I) fusiform

Male first pleopod (Fig. 142 I) ; endopodite rather short terminal part with 10 denticles ; exopodite triangular and rather long.

Male second pleopod (Fig.142 J) ; endopodite rather short and wide ; exopodite long with a rectangular dent on outer margin.

*Remarks* : Specimens collected from "Uweno" are provided with relatively large eye which is consisted of 16 ocelli, but a specimen collected from Moji has small eye which consists of only 8 ocelli.

***Sphaerillo dorsalis* (IWAMOTO, 1943)**

(Jap. name : Seguro-koshibiro-dangomushi)

Fig.143

*Armadillo dlrsalis* IWAMOTO, 1943

*Material examined* : 6 ♂♂, 3 ♀♀, Obama City, Fukui Pref., coll. Shingo Tanaka, May 11, 1981. Body size reaches 8.9mm in length.

*Description* : Body length reaches 7.5 mm in length. Body 2.0 times as long as wide. Body colour black with paler patterns on dorsal surfaces. Eyes mediocre in size, each with 12 ocelli. Schisma of the first peraeonal somite well developed ; second peraeonal somite with a long tooth. Pleotelson hour-glass-shaped, distal part relatively long and slightly recurved.

First antenna (Fig.143 C) ; first and second segments square ; terminal segment rectangular with 3 aesthetascs.

Second antenna (Fig.143 D), reaching the peraeonal somite, mutual length mutual length of 5peduncular segments is 2 : 7 : 6 : 9 : 11. Flagellum a little shorter than the fourth peduncular segment ; terminal segment 3 times as long as the first.

Right mandible ; pars incisiva 3-headed ; lacinia mobilis weakly 2-headed ; hairy bristles between lacinia mobilis and processus molaris ; processus molaris is represented by a single tuft of hairy bristles.

Left mandible (Fig.143 E) ; pars incisiva 2-headed ; lacinia mobilis weakly 2-headed ; 3 hairy bristles between lacinia mobilis and processus molaris, processus molaris is represented by a single tuft of hairy bristles.

First maxilla (Fig.143 F) ; endite rectangular with 4 spinies ; palp slender with apical

setae and a long seta on inner margin.

Second maxilla normal.

Maxilliped (Fig.143 G) ; endite rectangular with 3 spines on the distal margin ; palp

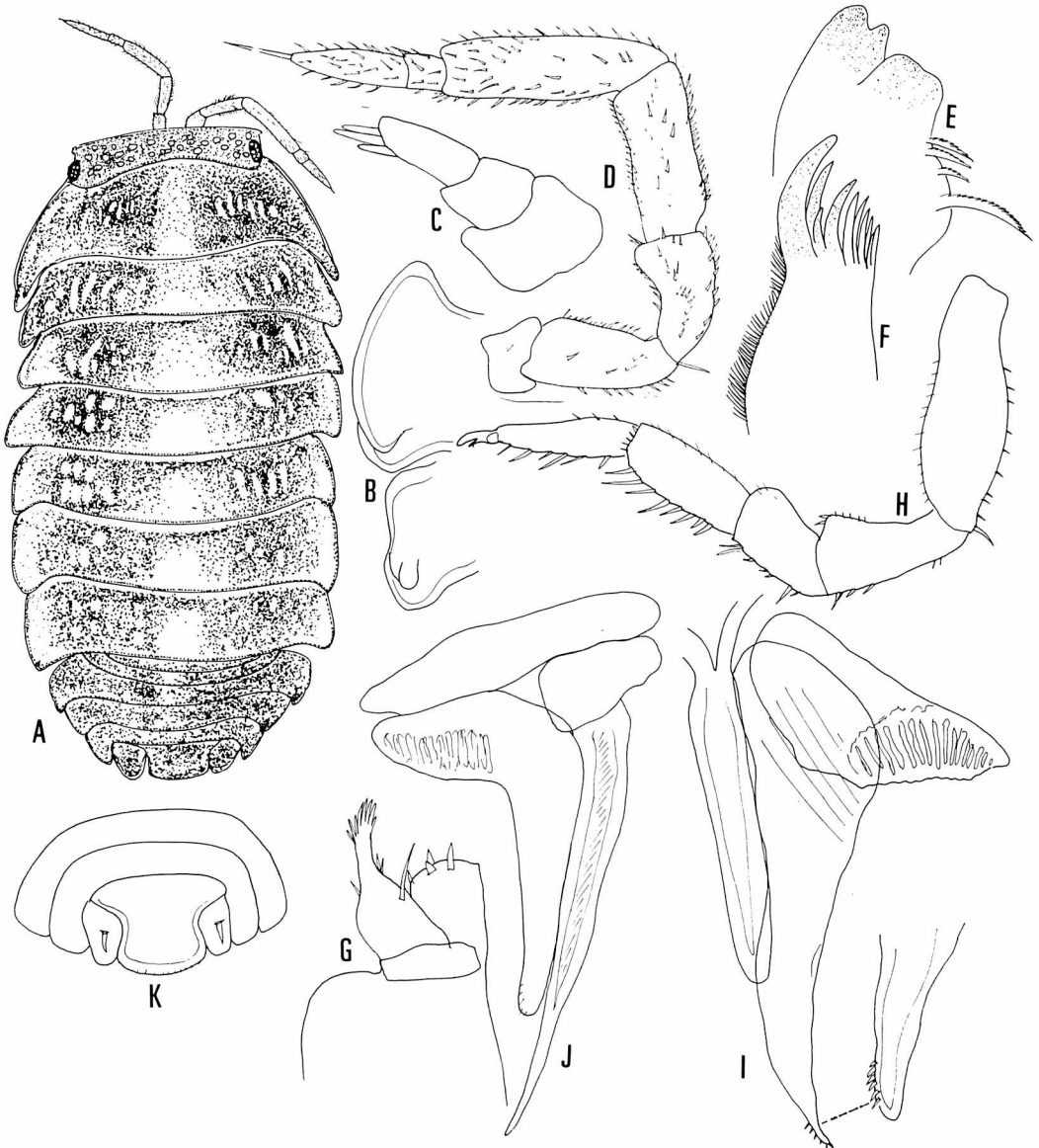


Fig.143 *Sphaerillo dorsalis* (IWAMOTO, 1943)

A. Dorsal view ; B. Ventral view of first and second pereopodal somites ; C. First antenna ; D. Second antenna E. Left mandible ; F. Outer lobe of first maxilla ; G. Maxilliped ; H. Seventh pereopod ; I. Penes and male first pleopod ; J. Male second pleopod ; K. Pleotelson and uropods (All : Holotype male).

slender with a long seta on the middle part of inner margin.

First peraeopod ; basis oblong ; ischium rectangular ; merus rectangular with 10 long setae on inner margin ; carpus rectangular also rectangular with 10 setae on inner margin ; propodus with 10 short setae on the basal half of inner margin and 2 setae on inner margin.

Seventh peraeopod (Fig.143 H) ; basis oblong ; ischium triangular ; merus rectangular ; carpus rectangular, 1.5 times as long as merus, bears 8 long setae on inner margin ; propodus rectangular with 6 setae on inner margin.

Penes (Fig.143 I) narrow.

Male first pleopod (Fig.143 I) ; endopodite stout, apical part bends outerwards with 6 spines; exopodite short and low triangular.

Male second pleopod (Fig.143 J) ; endopodite straight and long ; exopodite long.

*Remarks* : IWAMOTO (1943) described *Armadillo dorsalis*, but his description was deficient in the generic features, In all probability, the species might really belong to the genus *Sphaerillo*. The present specimen agrees with *dorsalis* in external features and male first two pairs of pleopods, but is separated from the description of *dorsalis* in the red coloured cephalon.

***Sphaerillo elegans* n. sp.**

(Jap. name : Herijiro-koshibiro-dangomushi, new)

Fig.144

*Material examined* : 3 ♂♂ (1 ♂ holotype 5.1mm in body length and 2 ♂♂ paratypes, 4.7~5.2mm in body length) and 2 ♀♀ (1 ♀ allotype, 6.6mm in body length and 1 ♀ paratype, 6.1mm in body length), Between Tonoazaki and Shitazaki, Kamitsushima-cho, Kamiagata-gun Tsushima Island, Nagasaki Pref., coll. Noboru Nunomura, Oct.11,1986. Type series is deposited as follows : holotype (TOYA-Cr-8938), allotype (TOYA-Cr-8939) and a paratype (TOYA-Cr-8940) at the Toyama Science Museum, a paratype (OMNH-Ar-3308) at the Osaka Museum of Natural History and a paratype (NSMT-Cr-9770) at the National Science Museum, Tokyo.

*Description* : Body convex, 2.0 times as long as wide. Body colour black with paler irregular patterns and lateral marginal areas. Eyes mediocre in size, each eye composed of 16 ocelli. First peraeonal somite ; hind corner with a lateral margin grooved along its length, schisma rounded. Second peraeonal somite with a tooth. Pleotelson long and hour-grass-shaped, distal margin almost straight.

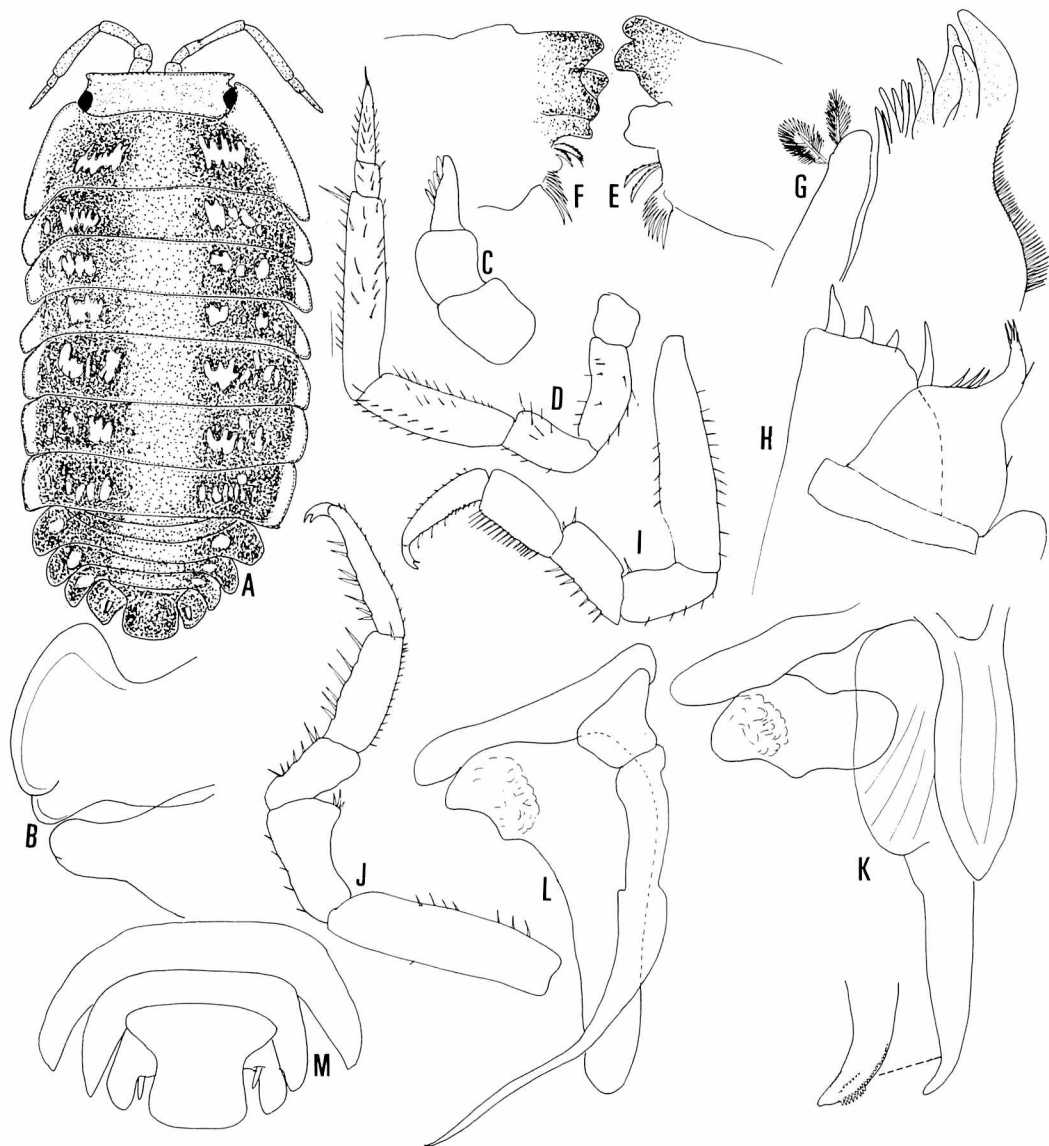
First antenna (Fig.144 C) ; first and second segments square ; terminal segment slender with 4 aesthetascs.

Second antenna (Fig.144 D) ; mutual length of 5 peduncular segments is 1 : 2 : 2 : 3 : 4. Flagellum about half the length of peduncular segments ; terminal segment 2.5 times as long as the first.

Right mandible (Fig.144 E) ; pars incisiva 2-headed ; lacinia mobilis single-toothed ; 2

hairy bristles behind lacinia mobilis ; processus molaris is represented by a tuft of hairy bristles.

Left mandible (Fig.144 F) ; pars incisiva 2-headed ; lacinia mobilis 3-toothed ; 2 hairy



**Fig.144** *Sphaerillo elegans* n. sp.

A. Dorsal view ; B. Ventral view of first and second peraeonal somites ; C. First antenna ; D. Second antenna ; E. Right mandible ; F. Left mandible ; G. First maxilla ; H. Maxilliped ; I. First peraeopod ; J. Seventh peraeopod ; K. Penes and male first pleopod ; L. Male second pleopod ; M. Pleotelson and uropods (All : Holotype male).

bristles behind lacinia mobilis ; processus molaris is represented by a tuft of hairy bristles.

First maxilla (Fig.144 G) ; outer lobe with 10 (4+6) simple setae ; inner lobe with 2 brush-like setae.

Second maxilla rather narrow.

Maxilliped (Fig.144 H) ; endite round with 4 stout teeth on distal margin ; palp rather wide but short.

First peraeopod (Fig.144 I) ; basis oblong ; ischium elongated triangular with 4~5 setae on outer distal corner ; merus short and rectangular with 4~5 setae on inner margin ; carpus long with 7~8 setae on inner margin ; propodus rather short with several small setae on the basal half of inner margin and 3 setae on the distal half of inner margin.

Seventh peraeopod (Fig.144 J) ; basis long ; ischium triangular ; merus short ; carpus rectangular ; propodus long with 5 big spines on the inner margin.

Penes (Fig.144 K) rather stout.

Male first pleopod (Fig.144 K) ; exopodite transverse ; endopodite stout, apical part bents outerwards slightly and bears with many rows of small denticles.

Male second pleopod (Fig.144 L) ; exopodite elongated triangular with rounded tip ; endopodite very long and bents outerwards.

*Remarks* : The present new species is most closely allied to *S. obsculus* BUDDE-LUND. The former is separated from the latter in the following features : (1) longer pleotelson, (2) triangular exopodite of male first pleopod, (3) white lateral margin of body colour, (4) more numerous denticles on the distal part of endopodite of male first pleopod, and (5) longer endopodite of male second pleopod.

***Sphaerillo daitoensis* n. sp.**

(Jap. name : Daitō-koshihiro-dangomushi, new)

Fig.145

*Material examined* : 5 ♂♂ (1 ♂ holotype, 5.6mm in body length, 4 ♂♂ paratypes, 3.1~5.1mm in body length and 5 ♀♀ (1 ♀ allotype, 5.3mm in body length and 4 ♀♀, 3.6~4.2mm in body length), Forst of *Livistona subglobosa*, Hinomaru-yama, Minami-daito-jima Island, Okinawa Pref., coll. Jun-Ichi Aoki, Oct. 8, 1978. Type series is deposited as follows : holotype (TOYA-Cr-8929), allotype (TOYA-Cr-8930), 2 paratypes (TOYA-Cr-8931~8933) at the Toyama Science Museum, 2 paratypes (OMNH-Ar-3301~3302) at Osaka Museum of Natural History and 2 paratypes (YCM-CI-952~953) at the Yokosuka City Museum, and 2 paratypes (NSMT-Cr-9767) at the National Science Museum, Tokyo.

*Description* : Body convex, 2.2 times as long as wide. Body colour black with irregular paler patterns. Cephalon rectangular. Eyes rather small in size, each eye composed of 9 ocelli. First peraeonal somite ; hind corner with a deep groove and a schisma. Second peraeonal somite with a pair of small teeth. Pleotelson hour-glass-shaped, with a pair of lateral concavities ; distal margin straight.

First antenna (Fig.145 C) ; first segment square ; second segment short ; third segment slender with 5 aesthetascs at the tip.

Second antenna (Fig.145 D), reaching the anterior part of the first peraeonal somite ;

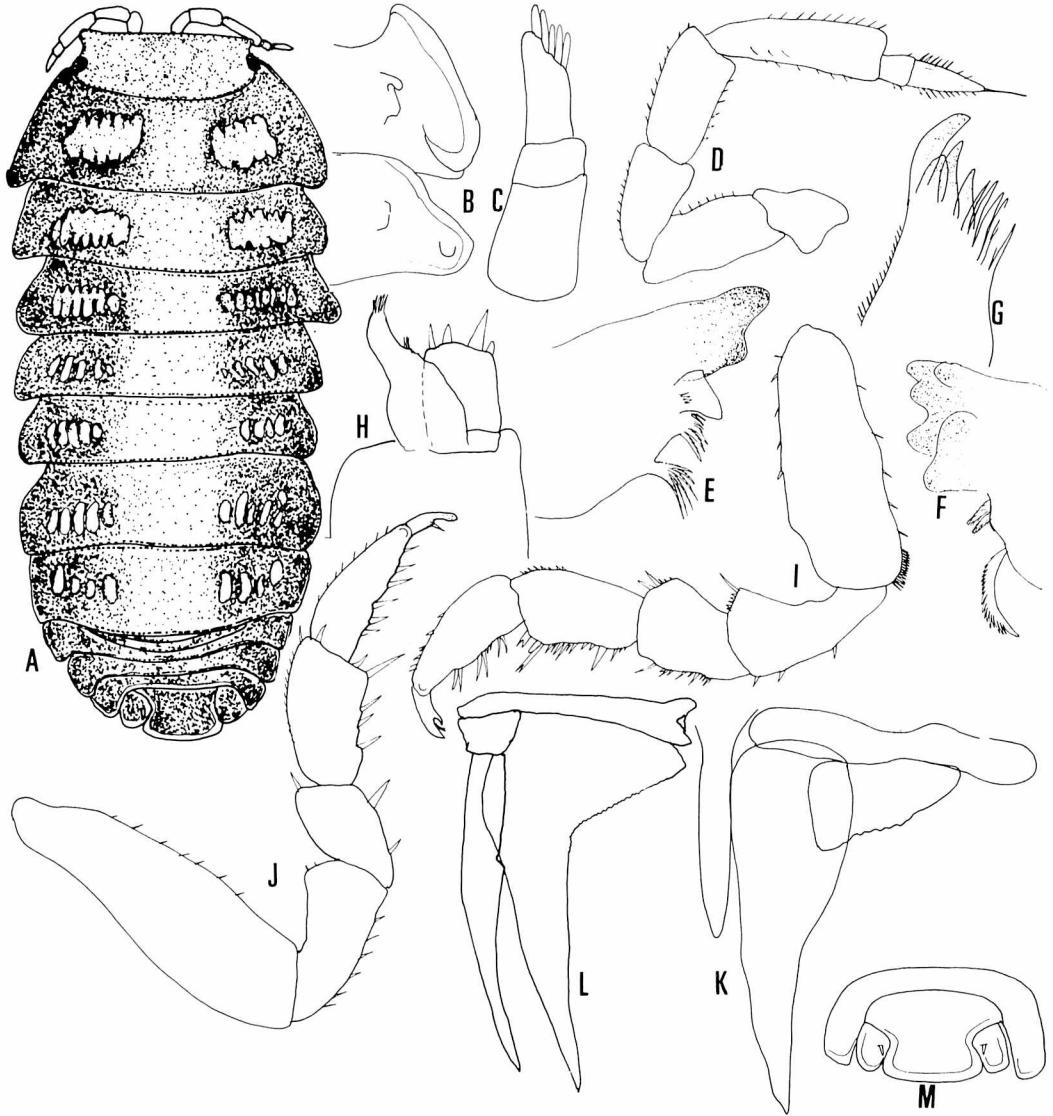


Fig.145 *Sphaerillo daitoensis* n. sp.

A. Dorsal view ; B. Ventral view of first and second peraeonal somites ; C. First antenna ; D. Second antenna ; E. Right mandible ; F. Left mandible ; G. Outer lobe of first maxilla ; H. Maxilliped ; I. First peraeopod ; J. Seventh peraeopod ; K. Penes and male first pleopod ; L. Male second pleopod ; M. Pleotelson and uropods (All : Holotype male).

mutual length of first to fifth peduncular segment is 3 : 6 : 4 : 4 : 8. Flagellum is almost as long as the fourth peduncular segment ; terminal segment 2.3 times as long as the basal one.

Right mandible (Fig.145 E) ; pars incisiva chitinized 2-headed ; lacinia mobilis narrow and single-headed ; more than 3 hairy bristles between lacinia mobilis and processus molaris ; processus molaris is represented by a tuft of hairy bristles.

Left mandible (Fig.145 F) ; pars incisiva 4-headed ; lacinia mobilis chitinized and weakly 2-headed ; 2 hairy bristles between lacinia mobilis and processus molaris ; processus molaris is represented by a single tuft of hairy bristles.

First maxilla (Fig.145 G) ; outer lobe with 10 teeth at the tip.

Second maxilla normal.

Maxilliped (Fig.145 H) ; endite rectangular with 3 spines at the distal margin ; palp rather stout with a bundle of long setae at the tip and 2 long setae on inner margin.

First pereopod (Fig.145 I) ; basis oblong ; ischium about 40% as long as basis with a series of short setae on inner margin ; merus square with 3 stout setae on inner margin and a stout seta at outer distal corner ; carpus square with 4 stout setae on inner margin ; propodus 6 stout setae on inner margin.

Seventh pereopod (Fig.145 J) ; basis oblong ; ischium elongated triangular ; merus triangular ; carpus rectangular with 4 setae on inner margin and 4 setae on distal margin ; propodus rather short with 6 setae on inner margin.

Penes (Fig.145 K) fusiform and rather stout.

Male first pleopod (Fig.145 K) ; exopodite triangular and short, with a sinuate distal margin ; endopodite straight and tapering towards the tip, apical part without any denticles.

Male second pleopod (Fig.145 L) ; exopodite long ; endopodite straight and shorter than exopodite.

Remarks : Most closely allied to *Sphaerillo dorsalis* (IWAMOTO) , but the present new species is separated from that species in the following features : (1) relatively short ; terminal flagellar segment of the second antenna, (2) triangular exopodite of male first pleopod, (3) longer and acute end of the exopodite of male second pleopod, and (4) shape of the endopodite of male first pleopod.

***Sphaerillo boninensis* n. sp.**

(Jap. name : Munin-koshihiro-dangomushi, new)

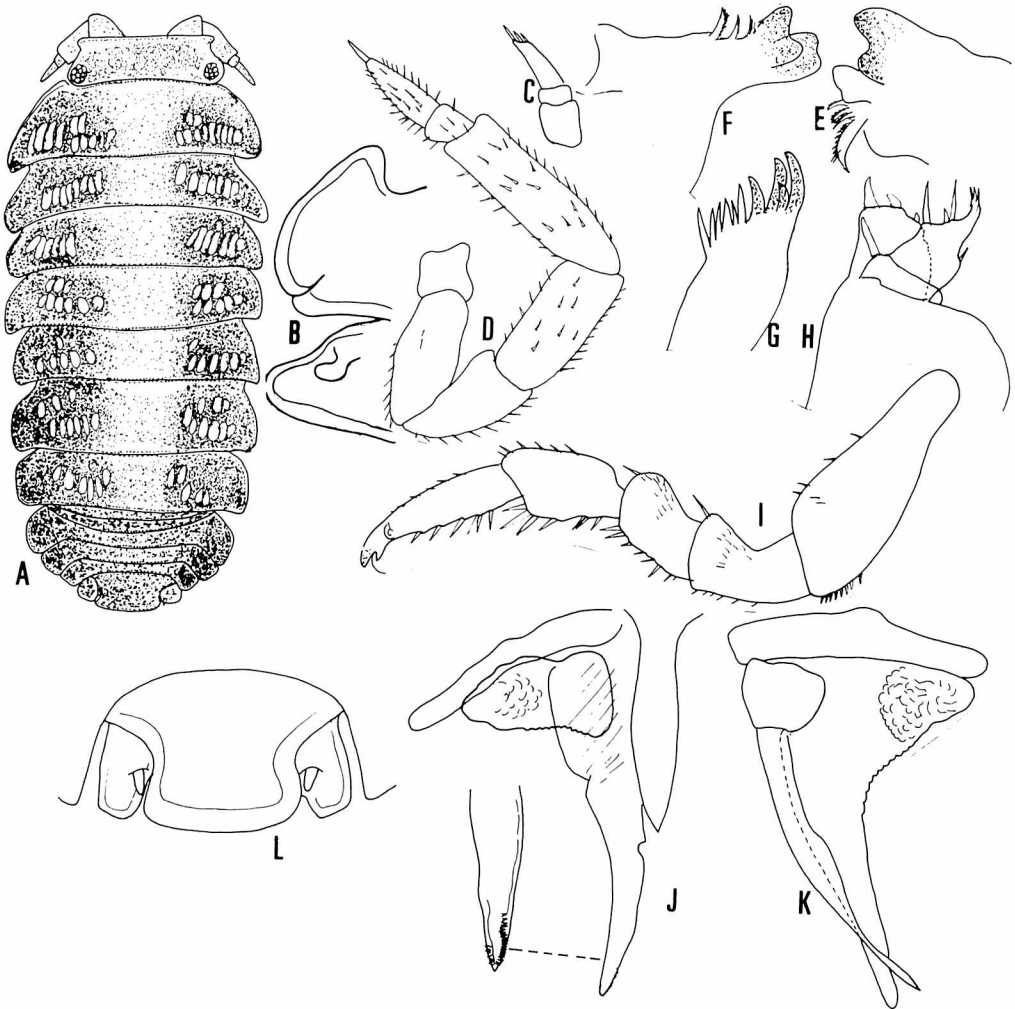
Fig.146

*Material examined* : 5 ♂♂ (1 ♂ holotype, 5.0mm in body length and 4 ♂♂ paratypes, 4.1~4.8mm in body length) and 12 ♀♀ (1 ♀ allotype, 5.0mm in body length and 11 ♀♀ paratypes, 4.5~5.2mm in body length), forest of *Casuaria equisetifolia*, Suzaki, Chichi-jima Island, coll. Jun Ichi, Aoki, Hiroshi Harade, July 1, 1977. Type series is deposited as follows : holotype (TOYA-Cr-8953), allotype (TOYA-Cr-8954) and 7 paratypes (TOYA-Cr-8955~8961) at the Toyama Science Museum, 3 paratypes (OMNH-Ar-3312~3314) at the Osaka Museum

of natural History, 2 paratypes (YCM-CI-961~962) at the Yokosuka City Museum and 3 paratypes (NSMT-Cr-9771) at the National Science Museum.

*Description* : Body 2.1 times as long as wide. Body colour black with irregular paler patterns. Eyes mediocre in size, each eye composed of 9 ocelli. Pleotelson hour-glass-shaped, with a shallow lateral concavities, distal margin round.

First antenna (Fig.146 C) ; first segment almost square ; second segment short ; third segment slender with 3 aesthetascs at the tip.



**Fig.146** *Sphaerillo boninensis* n. sp.

A.Dorsal view ; B.Ventral view of first and second pereopodal somites ; C. First antenna ; D.Second antenna ; E.Right mandible ; F.Left mandible ; G.Outer lobe of first maxilla ; H. Maxilliped ; I.Seventh pereopod ; J.Penes and male first pleopod ; K.Male second pleopod ; L. Pleotelson and uropods (All : Holotype male).



Second antenna (Fig.146 D), reaching the anterior part of the first peraeonal somite ; mutual length of first to fifth peduncular segment is 1 : 2 : 2 : 2 : 3. Flagellum is about 60% as long as the fifth peduncular segment ; terminal segment 2.5 times as long as the basal one.

Right mandible (Fig.146 E) ; pars incisiva -headed ; lacinia mobilis thin and weakly 2-headed ; 3 hairy bristles between lacinia mobilis and processus molaris ; procesus molaris is represented by a single tuft of hairy bristles.

Left mandible (Fig.146 F) ; pars incisiva chitinized and 2-headed ; lacinia mobilis chitinized and weakly 2-headed ; 3 hairy bristles between lacinia mobilis and processus molaris ; processus molaris is represented by a single tuft of hairy bristles.

First maxilla (Fig.146 G) ; outer lobe with 10(4+6) teeth at the tip.

Second maxilla normal.

Maxilliped (Fig.146 H) ; endite rectangular with 3 spines at the distal margin ; palp rather stout with a bundle of long setae at the tip and 2 long setae on inner margin.

First peraeopod ; basis oblong ; ischium about 40% as long as basis with a series of short setae on inner margin ; merus square with 3 stout setae on inner margin and a stout seta at outer distal corner ; carpus square with 4 stout setae on inner margin ; propodus 6 stout setae on inner margin.

Seventh peraeopod (Fig.146 I) ; basis become stouter towrds the distal end ; ischium about half the length of basis ; merus square with 3 stout setae on inner margin and 2 stout setae at outer distal corner ; carpus square with 6 stout setae on inner margin ; propodus 6 stout setae on inner margin.

Penes (Fig.146 J) fusiform and rather stout.

Male first pleopod (Fig. 146 J) ; endopodite straight with more than 20 small denticles on inner disstal margin and with more than 4 denticles on distal outer end, and bears a shallow concavity on the middle part of inner margin ; exopodite elliptical, posterior marigin weakly sinuated.

Male second pleopod (Fig.146 K) ; endopodite rather short ; exopodite as long as endopodite.

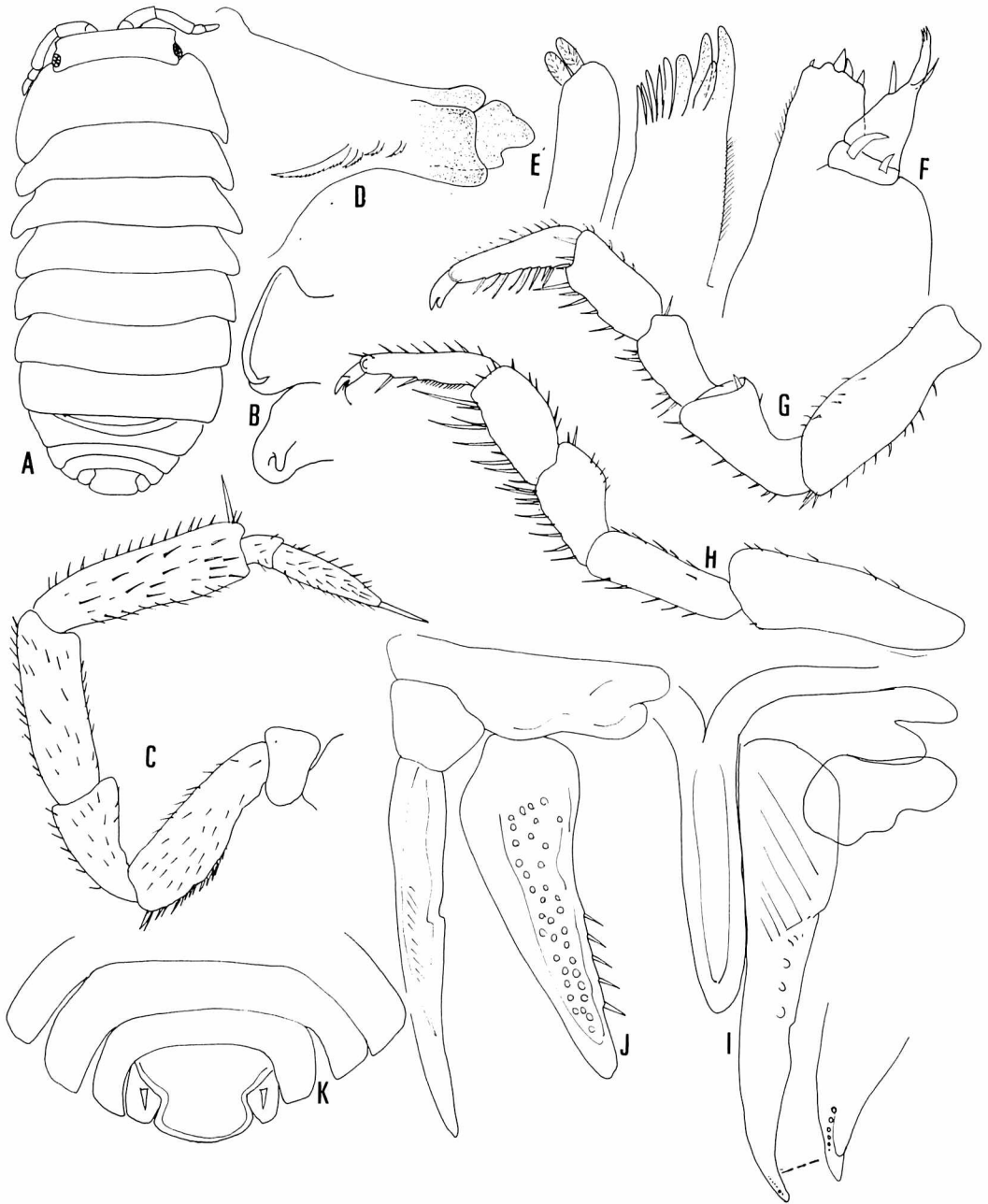
*Remarks* : The present new species is most closely allied to *Sphaerillo dorsalis* (IWAMOTO), but the former is separated from the latter in the following features : (1) terminal flagellar segment less than 3 times longer than the first segment, (2) rectangular exopodite of male first pleopod, (3) longer exopodite of male second pleopod, and (4) more numerous denticles on the apical part of male first pleopod.

***Sphaerillo albus* n. sp.**

(Jap name : Shiro-koshibiro-dangomushi, new)

Fig.147

*Material examined* : 3 ♂♂ (1 ♂ holotype, 5.6mm in body length and 2 ♂♂ paratypes, 4.2~6.1mm in body length) and 2 ♀♀ (1 ♀ allotype, 5.3mm in body length and 1 ♀ paratype,



**Fig.147** *Sphaerillo ablus* n. sp.

A. Dorsal view ; B. Ventral view of first and second peraeonal somites ; C. Second antenna ; D. Left mandible ; E. First maxilla ; F. Maxilliped ; G. First peraeopod ; H. Seventh peraeopod ; I. Penes and male first pleopod ; J. Male second pleopod ; K. Pleotelson and uropod (All : Holotype male).

4.9mm in body length), Washino-mine, alt. ca. 300m, Fuse mura, Oki-gun, Oki, Dogo Island, Shimane Pref., coll. Yoshiaki Nishikawa, Aug. 21, 1984. Type series is deposited as follows : Holotype (TOYA-Cr-8890), allotype (TOYA-Cr-8891) and a paratype (TOYA-Cr-8892) at the Toyama Science Museum, a paratype (OMNH-Ar-3287) at the Osaka Museum of Natural History and a paratype (NSMT-Cr-9763) at the National Science Museum, Tokyo.

*Description* : Body elliptical 1.9 times as long as wide. Body colour pure white and pigmentless. Eyes small, each eye composed of 7~8 ocelli. First pereoneal somite ; hind corner of epimera with deep schisma, both lobes rounded. Second pereoneal somite ; hind corner of epimera with a small and acute tooth. Pleotelson hour-glass-shaped ; distal margin round.

First antenna; first segment big and square ; second segment rather short ; terminal segment rectangular with 3~4 aesthetascs.

Second antenna (Fig.147 C) short, reaching the middle part of the first pereoneal somite ; first segment small ; second segment long ; third segment a little shorter than the second ; fourth segment as long as the second ; fifth segment a little longer than the fourth. Flagellum, as long as the fourth peduncular segment ; terminal segment 3.5 times as long as the first.

Right mandible ; pars incisiva 2-headed ; lacinia mobilis single-toothed; a hairy bristle behind lacinia mobilis ; processus molaris is represented by a tuft of hairy bristles.

Left mandible (Fig.147 D) ; pars incisiva 3-headed ; lacinia mobilis single-toothed ; 3 hairy bristles behind lacinia mobilis ; processus molaris is represented by a single tuft of hairy bristles.

First maxilla (Fig.147 E) ; outer lobe with 10 (4+6) entire teeth.

Second maxilla ; dental part narrow.

Maxilliped (Fig.147 F) ; endite rectangular with 4 spines ; palp narrow.

First pereopod (Fig.147 G) ; basis oblong ; ischium elongated trigangular ; merus rectangular with more than 10 setae on inner margin ; carpus rectangular with 10 setae on inner margin propodus with a series of short setae on the basal half of inner margin and 2 setae on posterior half on inner margin.

Seventh pereopod (Fig.147 H) ; basis oblong ; ischium triangular ; merus and carpus rectangular ; propodus with 8 setae on inner margin.

Penes (Fig.147 I) fusiform.

Male first pleopod (Fig.147 I) ; endopodite straight but the apical part bends outerwards bearing 6~7 spinules near the distal part ; exopodite depressed orbicular.

Male second pleopod (Fig.147 J) ; endopodite relatively short and straight ; exopodite lanceolate with 5~6 setae on outer margin.

*Remarks* : The present new speices is peculiar in the colourless body and shape of the exopodite of male first and second pleopods.

*Sphaerillo iriomotensis* n. sp.

(Jap. name : Iriomote-koshibiro-dangomushi, new)

Fig.148

*Material examined* : 4 ♂♂ (1 ♂ holotype, 8.7mm in body length and 3 ♂♂ paratypes, 7.0~8.3mm in body length) and 11 ♀♀ (1 ♀ allotype, 8.5mm in body length and 10 ♀♀ paratypes, 5.2~9.2mm in body length), Ohara, Iriomote Island, Taketomi-cho, Yaeyama-gun,

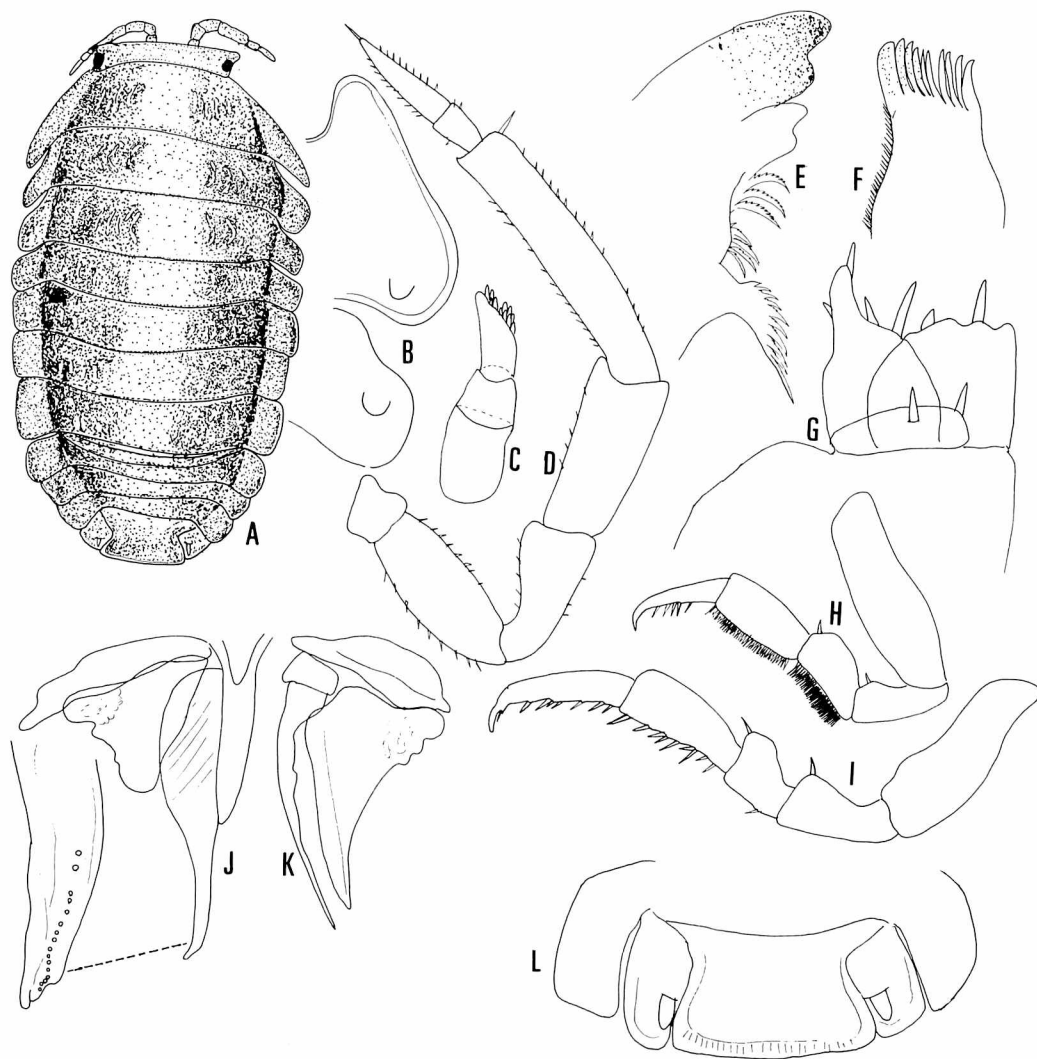


Fig.148 *Sphaerillo iriomotensis* n. sp.

A. Dorsal view ; B. Ventral view of first and second pereopodal somites ; C. First antenna ; D. Second antenna ; E. Right mandible ; F. Outer lobe of first maxilla ; G. Maxilliped ; H. First pereopod ; I. Seventh pereopod ; J. Penes and male first pleopod ; K. Male second pleopod ; L. Pleotelson and uropods (All : Holotype male).

Okinawa Pref. coll. Noboru Nunomura, Mar. 23, 1977. Type series is deposited as follows ; holotype (TOYA-Cr-8884), allotype (TOYA-Cr-8885) and 4 paratypes (TOYA-Cr-8886~8889) at the Toyama Science Museum, 3 paratypes (OMNH-Ar-3290~3292) at the Osaka Museum of Natural History, 3 paratypes (YCM-CI-948~950) at the Yokosuka City Museum and 3 paratypes (NSMT-Cr-9764) at the National Science Museum, Tokyo.

*Description* : Body 1.8 times as long as wide. Body colour uniformly purplish brown. Body convex but low. Eyes mediocre in size, each eye composed of 16 ocelli. First peraeonal somite with a lateral margin grooved along its length ; schisma small. Second peraeonal somite with a small tooth. Pleotelson hour-grass-shaped, distal margin almost straight.

First antenna (Fig.148 C) rather long ; first segment rectangular ; second segment square ; third segment conical with 10~12 aesthetascs.

Second antenna (Fig.148 D) short, reaching the anterior part of the first peraeonal somite, mutual length of five peduncular segments is 2 : 6 : 5 : 6 : 11. Flagellum as long as the fourth peduncular segment ; terminal segment 2.5 times as long as the first.

Right mandible (Fig.148 E) ; pars incisiva 2-headed ; lacinia mobilis 2-headed ; 7 hairy bristles behind lacinia mobilis ; processus molaris is represented by a single tuft of hairy bristles.

Left mandible ; pars incisiva 2-headed ; lacinia mobilis 3-headed ; 4 hairy bristles behind lacinia mobilis ; processus molaris is represented by a single tuft of hairy bristles.

First maxilla (Fig.148 F) ; outer lobe with 10 (4+6) teeth at tlo tip.

Second maxilla rather wide.

Maxilliped (Fig.148 G) ; endite wide rectangular, with 3~4 stout setae ; palp stout and tapering towards the tip.

First peraeopod (Fig.148 H) ; basis oblong ; ischium rectangular ; merus and carpus rectangular with many setae on inner margin ; propodus slender with 5~6 setae on inner margin.

Seventh peraeopod (Fig.148 I) ; basis oblong ; ischium elongated triangular ; merus rather short ; carpus more than twice as long as merus and with about 10 setae on inner margin ; propodus rather long with 7 setae on inner margin.

Penes (Fig.148 J) narrow lanceolate.

Male first pleopod (Fig.148 J) ; endopodite relatively narrow and straight, but apical part bends outerwards slightly bearing 17 small denticles ; exopodite triangular with some irregular concavities on distal margin.

Male second pleopod (Fig.148 K) ; endopodite narrow and recurved outerwards ; exopodite elongated triangular with an irregular concavity on the basal part of outer margin.

*Habitat* : Plowed field, garden of farm house and side of farm road.

*Remarks* : The present new species seems to be most closely allied to *S. dorsalis* (I WAMOTO), but the former is separated from the latter in the following features : (1) flatter

body shape, (2) shape of pleotelson, (3) stouter processus molaris of both mandibles, (4) shape of exopodite of male first pleopod, and (5) more setae on merus and carpus of first peraeopod.

***Sphaerillo russoi* (ARCANGELI, 1927)**

(Jap. name : Tatejima-koshibiro-dangomushi, new)

Fig.149

*Armadillo russoi* ARCANGELI, 1927

*Spherillo russoi* ARCANGELI, 1934

*Material examined* : 3 ♂♂, 5 ♀♀, Hamasaki, Nishi-ku, Fukuoka City, Fukuoka Pref., coll. Shingo Tanaka, July 13, 1981 ; 1 ♂ 2 ♀♀, Katsumoto, Katsumoto-cho, Iki Iskand, coll. Noboru Nunomura, June, 1988 ; 1 ♂ 2 ♀♀, Ougiyama, Narao-cho, Goto Island, coll. Noboru Nunomura, June, 1988 ; 2 ♂♂ 4 ♀♀, Fukue City, Fukue Island, coll. Noboru Nunomura ; 1 ♂ 1 ♀, Iki Island, 1 ♂ 1 ♀, Aoshima, Miyazaki City, Miyazaki Pref., coll. Noboru Nunomura ; 5 ♀♀, Ibi, Nichinann City, Miyazaki Pref., coll. Noboru Nunomura, Sep, 23, 1983 and more than 220 samples. Body size reaches 7.7 mm in length.

*Description* : Body 2.0 times as long as wide. Back without tubercle or spine. Body colour creamy yellow with 2 pairs of longitudinal darker lines. First peraeonal somite with schisma well developed, with a ventral tooth. Second peraeonal somite with a large triangular lobe. Pleotelson long, 2/3 time as long as wide, both sides without any remarkable concavity.

First antenna (Fig.149 C) ; first and second segments square ; terminal segment rectangular with 7 aesthetascs at the tip.

Second antenna (Fig.149 D) ; mutual length of 5 peduncular segment is about 1 : 3 : 3 : 4 : 5. Flagellum as long as the fourth peduncular segment ; terminal segment 3.5 times as long as the basal segment.

Right mandible (Fig.149 E) ; pars incisiva single-toothed ; lacinia mobilis single-toothed ; 2 hairy bristles behind lacinia mobilis ; processus molaris is represented by a single seta.

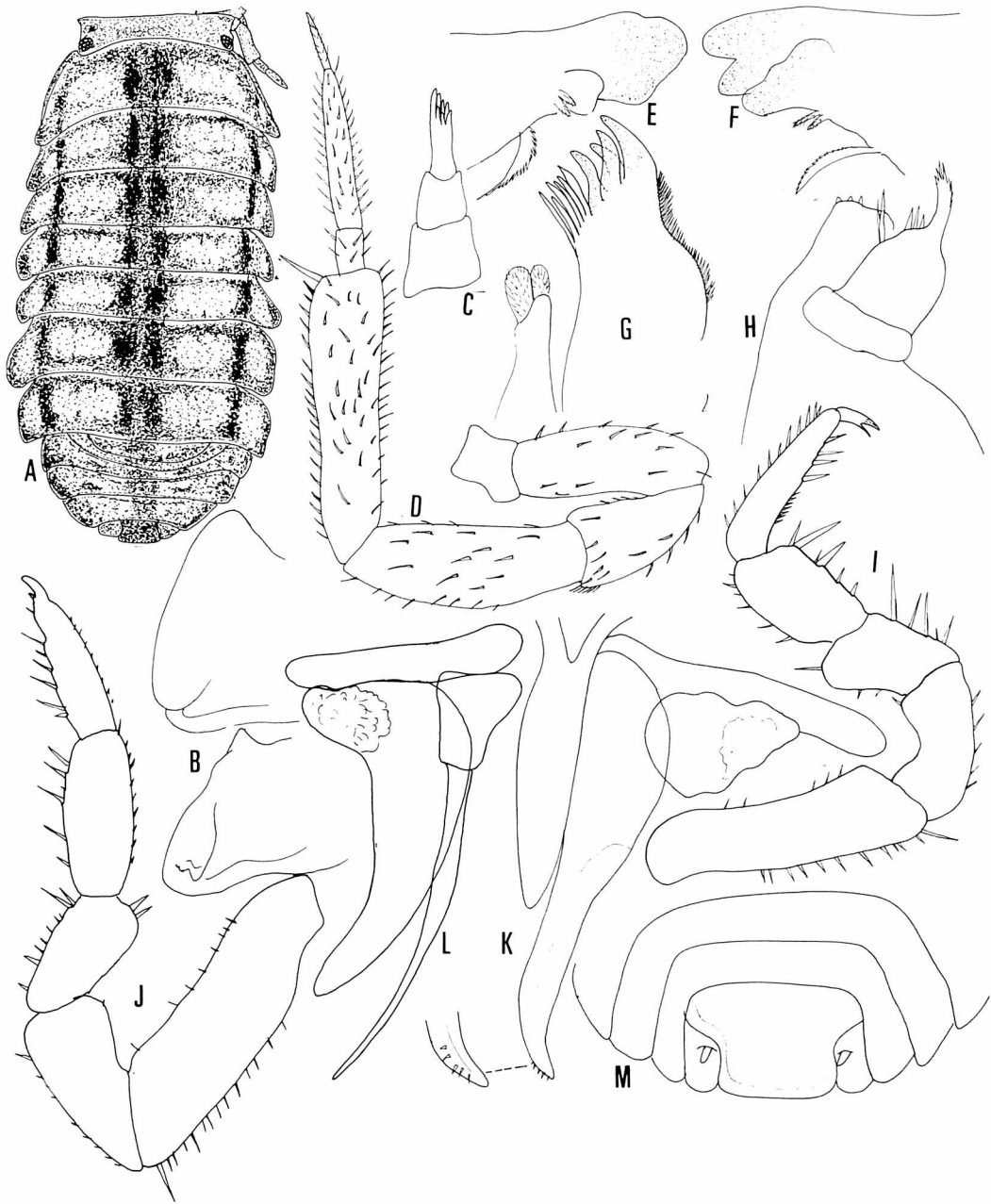
Left mandible (Fig.149 F) ; pars incisiva single-toothed ; lacinia mobilis weakly 3-headed ; 2 hairy bristles behind lacinia mobilis ; processus molaris is represented by a single seta.

First maxilla (Fig.149 G) ; outer lobe with 10 teeth, all of them are simple type and rather short.

Second maxilla rather narrow.

Maxilliped (Fig.149 H) ; endite rectangular with 3 stout spines on distal margin ; palp rather stout with 3 groups of setae.

First peraeopod (Fig.149 I) ; basis oblong ; ischium rectangular with 6~7 fine setae on inner margin ; merus almost square with 4 long setae at the outer distal corner ; carpus rectangular with 6~7 long setae on inner margin ; propodus 7~8 fine setae on the basal half of inner margin and 4 stout setae on inner margin, and with 12 setae on outer margin.



**Fig.149** *Sphaerillo russoi* (ARCANGELI, 1927)

A. Dorsal view ; B. Ventral view of first and second pereopodal somites ; C. First antenna ; D. Second antenna ; E. Right mandible ; F. Left mandible ; G. First maxilla ; H. Maxilliped ; I. First pereopod ; J. Seventh pereopod ; K. Penes and male first pleopod ; L. Male second pleopod ; M. Pleotelson and uropods (All : Male specimens from Fukuoka).

Seventh peraeopod (Fig.149 J) ; basis oblong ; ischium rectangular with many setae on outer margin ; merus rectangular with a long seta at the outer distal corner ; carpus rectangular with 10 setae on inner margin ; propodus 6~7 setae on inner margin.

Penes (Fig.149 K) fusiform and rather stout.

Male first pleopod (Fig.149 K) ; exopodite  $1/2 \sim 2/3$  time as long as wide ; endopodite stout and straight ; its apical part bents outerwards slightly and with 4~5 small denticles at the tip.

Male second pleopod (Fig.149 L) ; exopodite long bents outerwards ; endopodite long and slightly recurved outward.

*Remarks* : The specimens examined agree with the original description of this species, especially in the characteristic long pleotelson. The species is common in the forests of south-eastern Japan.

***Sphaerillo shuriensis* n. sp.**

(Jap. name : Shuri-koshihiro-dangomushi, new)

Fig.150

*Material examined* : 3 ♂♂ (1 ♂ holotype, 5.3mm in body length and 2 ♂♂ paratypes, 5.6~5.8mm in body length) and 5 ♀♀ (1 ♀ allotype, 7.3mm in body length and 4 ♀♀, paratypes, 4.4~6.1mm in body length), Shuri, Tounokura-cho, Naha City, Okinawa Island Okinawa Pref., July 2, 1975. Type series is deposited as follows : holotype (TOYA-Cr-8867), allotype (TOYA-Cr-8868) and 3 paratypes (TOYA-Cr-8869~8871) at the Toyama Science Museum, a paratype (OMNH-Ar-3299) at the Osaka Museum of Natural History, a paratype (YCM-CI-951) at the Yokosuka City Museum and a paratype (NSMT-Cr-9765) at the National Science Museum, Tokyo.

*Description* : Body colour pale yellow with a pair of black lateral lines and a medial line. Cephalon rectangular with a pair of protruded lateral projection. Eyes mediocre in size, each eye composed of 16 ocelli. First peraeonal somite with deep schisma, which continues into a groove in the epimeral thickening, peraeonal somite with a short tooth. Pleotelson long without any lateral concavity, terminal margin round.

First antenna (Fig.150 D) ; first segment square ; second segment short ; terminal segment long with 2 aesthetascs near the distal end.

Second antenna (Fig.150 E) ; mutual length of 5 peduncular segments is 2 : 6 : 6 : 9 : 12. Flagellum  $2/3$  time as long as fifth peduncular segment ; terminal flagellar segments 2.5 times as long as the first.

Right mandible (Fig.150 F) ; pars incisiva 4-headed ; lacinia mobilis narrow and single-headed ; 3 hairy bristles between lacinia mobilis and processus molaris ; processus molaris is represented by a tuft of hairy bristles.

Left mandible (Fig.150 G) ; pars incisiva 2-headed ; lacinia mobilis weakly 3-headed ; 2 hairy bristles between lacinia mobilis and processus molaris ; processus molaris is represent-



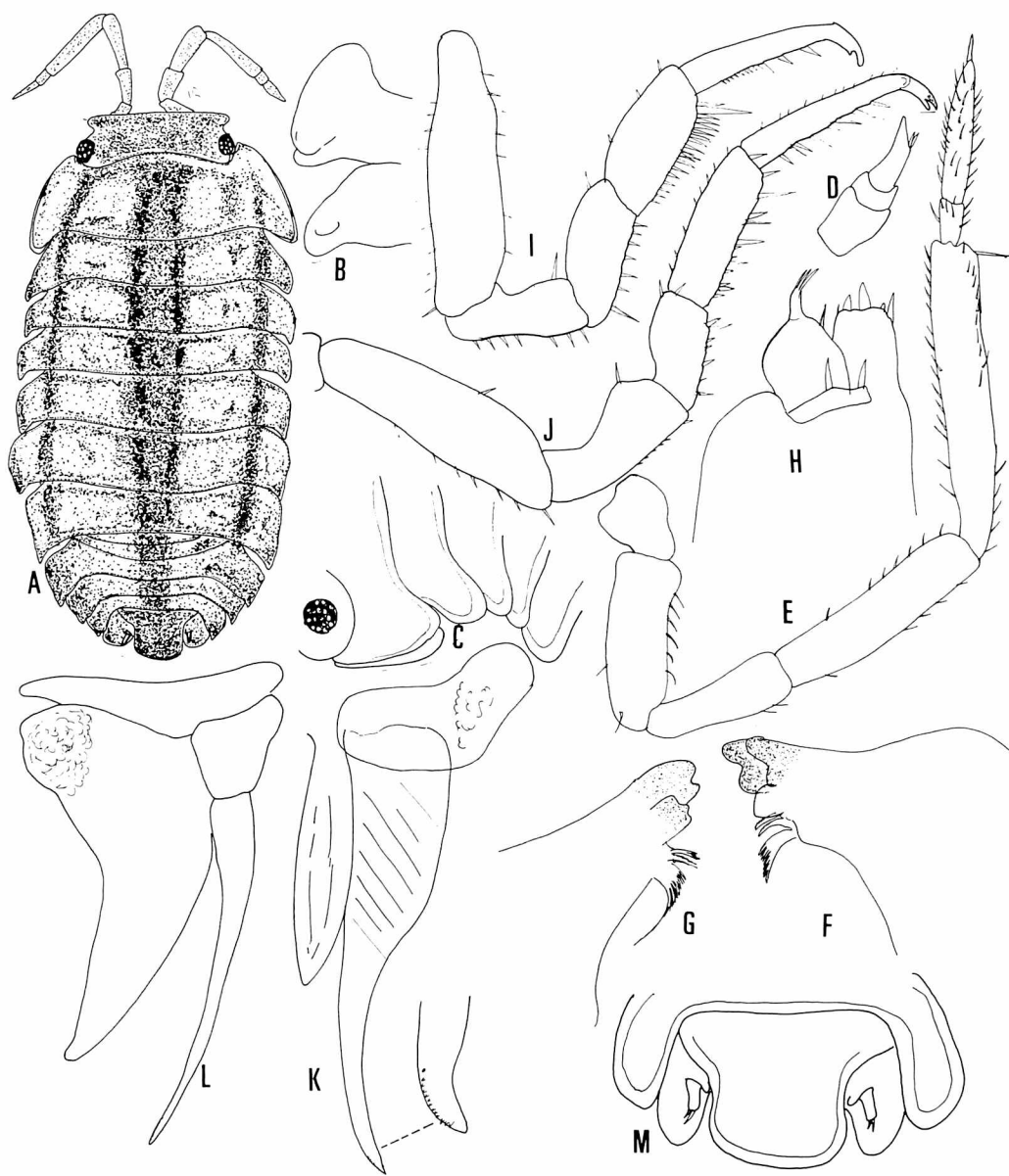


Fig.150 *Sphaerillo shuriensis* n. sp.

A. Dorsal view ; B. Ventral view of first and second pereopodal somites ; C. Lateral view of first to fifth pereopodal somites ; D. First antenna E. Second antenna ; F. Right mandible ; G. Left mandible ; H. Maxilliped ; I. First pereopod ; J. Seventh pereopod ; K. Penes and male first pleopod ; L. Endopodite of male second pleopod ; M. Pleotelson and uropods (All : Holotype male).

ed by a tuft of hairy bristles.

First maxilla ; outer lobe with 10 (4+6) entire teeth.

Second maxilla wide.

Maxilliped (Fig.150 H) ; endite rectangular with 3 spines at the distal margin ; palp rather stout with a bundle of long setae at the tip and 2 long setae on inner margin.

First peraeopod (Fig.150 I) ; basis oblong, ischium 40% as long basis and bears a seta on the outer distal corner ; merus as long as ischium with 7 setae on inner margin ; carpus again as long as ischium with many setae on inner margin ; propodus somewhat longer than carpus with small denticles on the basal half of inner margin and 3 stronger teeth sparsely on the distal half on inner margin.

Seventh peraeopod (Fig.150 E) ; basis oblong ; ischium about half the length of basis ; merus 2/3 time as long as ischium ; carpus almost as long as ischium, and with 12~14 setae on inner margin; propodus with 7~8 setae on inner margin.

Penes (Fig.145 K) fusiform but rather stout.

Male first pleopod (Fig.150 K) ; exopodite elliptical, endopodite slightly recurving outwards, apical part bearing more than 12 denticles.

Male second pleopod (Fig. 150 L) ; exopodite triangular with a shallow concavity on the outer margin ; endopodite straight.

Uropod (Fig.150 M) endopodite rather long.

*Remarks* : The present new species is most closely allied to *Sphaerillo russoi* ARCANGELI, but the former is distinguished from the latter in the following features : (1) longer and round pleotelson, (2) stout processus molaris of both mandibles, (3) elliptical exopodite of male first pleopod, (4) shape of first antenna, and (5) shape of exopodite of male second pleopod.

***Sphaerillo yonaguniensis* n. sp.**

(Jap. name : Yonaguni-koshibiro-dangomushi, new)

Fig.151

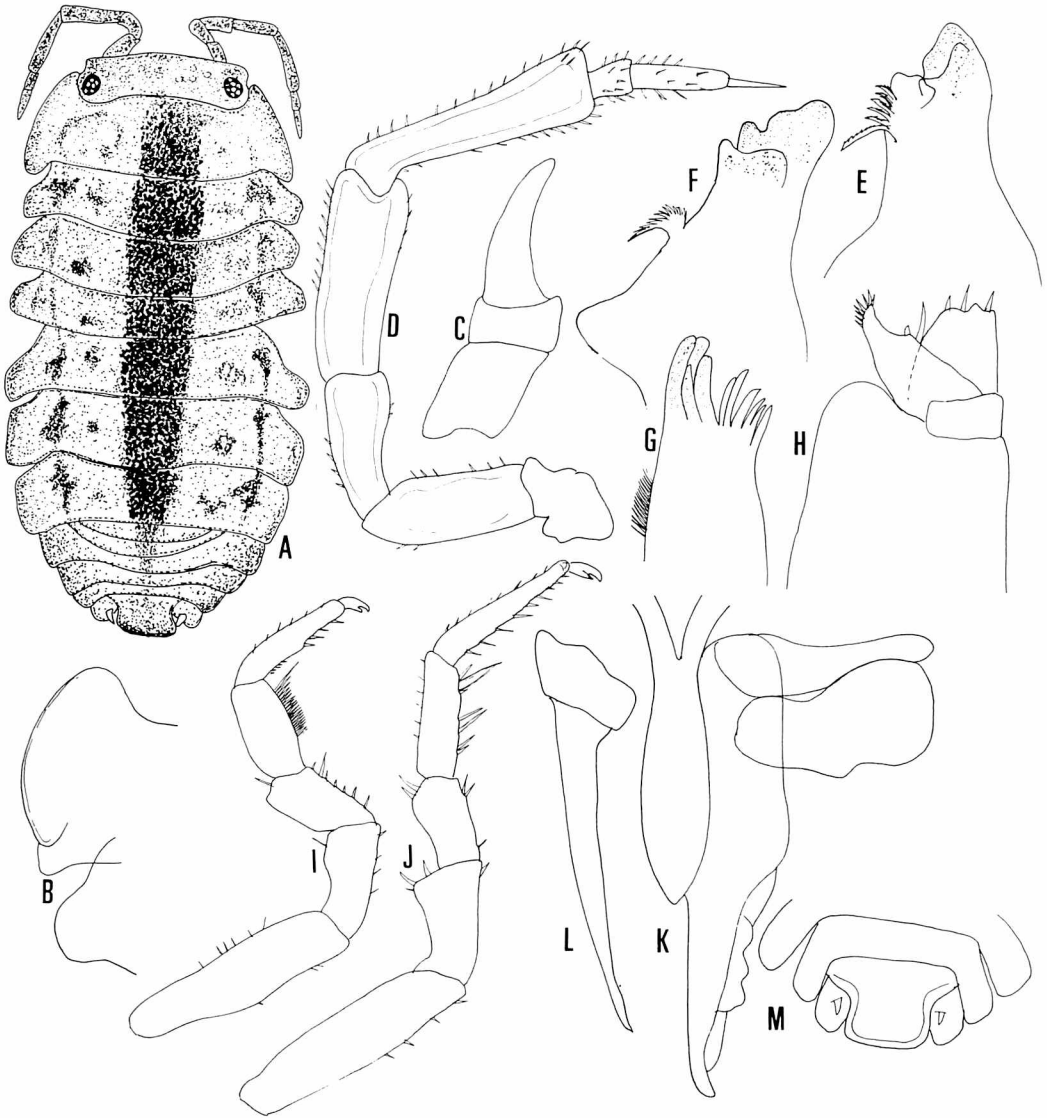
*Material examined* : 1 ♂ (holotype, 4.9mm in body length) and 3 ♀♀ (1 ♀ allotype, 7.3mm in body length and 2 ♀♀ paratypes, 5.3~5.6mm in body length) forest of *Casuarina equisetifolia*, Higawa, Yonaguni-Island, Okinawa Pref., coll. Hiroshi Harada, June, 28, 1978. Type series is deposited as follows : holotype (TOYA-Cr-8901), allotype (TOYA-Cr-8902) and a paratype (TOYA-Cr-8903) at the Toyama Science Museum, a paratype (OMNH-Ar-3300) at the Osaka Museum of Natural History, and a paratype (NSMT-Cr-9763) at the National Science Museum, Tokyo.

*Description* : Body 1.9 times as long as wide. Body colour dull yellow with two groups of lateral darker part and a medial stout darker part. Inner lobe of the first pereopod is narrow but protruded backwards. Second pereopod without distinct lobe. Pleotelson hour-glass-shaped, oblique sides excavate ; the apex round.

First antenna (Fig.151 C) ; first segment rectangular ; second segment short ; third

segment rather long tapering toward the tip.

Second antenna (Fig.151 D) rather short, reaching the posterior part of the first peraeonal somite, mutual length of first to fifth peduncular segments is 2 : 4 : 4 : 5 : 7. Flagellum short, about half the length of the fifth peduncular segment, terminal segment is 2.5 times as long



**Fig.151** *Sphaerillo yonaguniensis* n. sp.

A. Dorsal view ; B. Ventral view of First and second peraeonal somites ; C. First antenna ; D. Second antenna ; E. Right mandible ; F. Left mandible ; G. Outer lobe of first maxilla ; H. Maxilliped ; I. First peraeopod ; J. Seventh peraeopod ; K. Penes and male first pleopod ; L. Endopodite of male second pleopod ; M. Pleotelson and uropods (All : Holotype male).

as the first.

Right mandible (Fig.151 E) ; pars incisiva 2-headed ; lacinia mobilis single-toothed ; processus molaris is represented by a tuft of hairy bristles.

Left mandible (Fig.151 F) ; pars incisiva 2-headed ; lacinia mobilis single-toothed ; processus molaris is represented by a tuft of hairy bristles.

First maxilla (Fig.151 G) ; outer lobe with 10 teeth at the tip.

Maxilliped (Fig.151 H) ; endite rectangular with 3 spines ; palp rather slender with a group of setae on apical part.

First peraeopod (Fig.151 I) ; basis oblong ; ischium less than half the length of basis ; merus rectangular with 7 setae on inner margin ; carpus rectangular with many long setae on inner margin ; propodus long with a group of 5~6 setae on the basal half on inner margin and 4 setae on distal half of inner margin.

Seventh peraeopod (Fig.151 J) ; basis oblong ; ischium triangular ; merus rectangular ; carpus rectangular with 8~9 setae on inner margin ; propodus relatively long with 9 setae on inner margin.

Penes (Fig.151 K) fusiform.

Male first pleopod (Fig.151 K) ; exopodite transversely long with a slight concavity on the distal margin ; endopodite rather narrow and straight, apical part only slightly bent outwards and with a series of 5~6 spinules, a sinuate lappet are seen in the medial part.

Male second pleopod (Fig.151 L) ; endopodite straight and rather short.

*Remarks* : The new species is allied to *S.russoi* ARCANGELI which is distributed in the southern Japan, but the former is separated from the latter in the following features : (1) relatively short terminal segment of flagellum, (2) short and elliptical exopodite of male first pleopod, (3) shape of endopodite of the same, and (4) more numerous setae on inner margin of carpus.

***Sphaerillo yaeyamanus* n. sp.**

(Jap. name : Yaeyama-koshibiro-dangomushi, new)

Fig.152

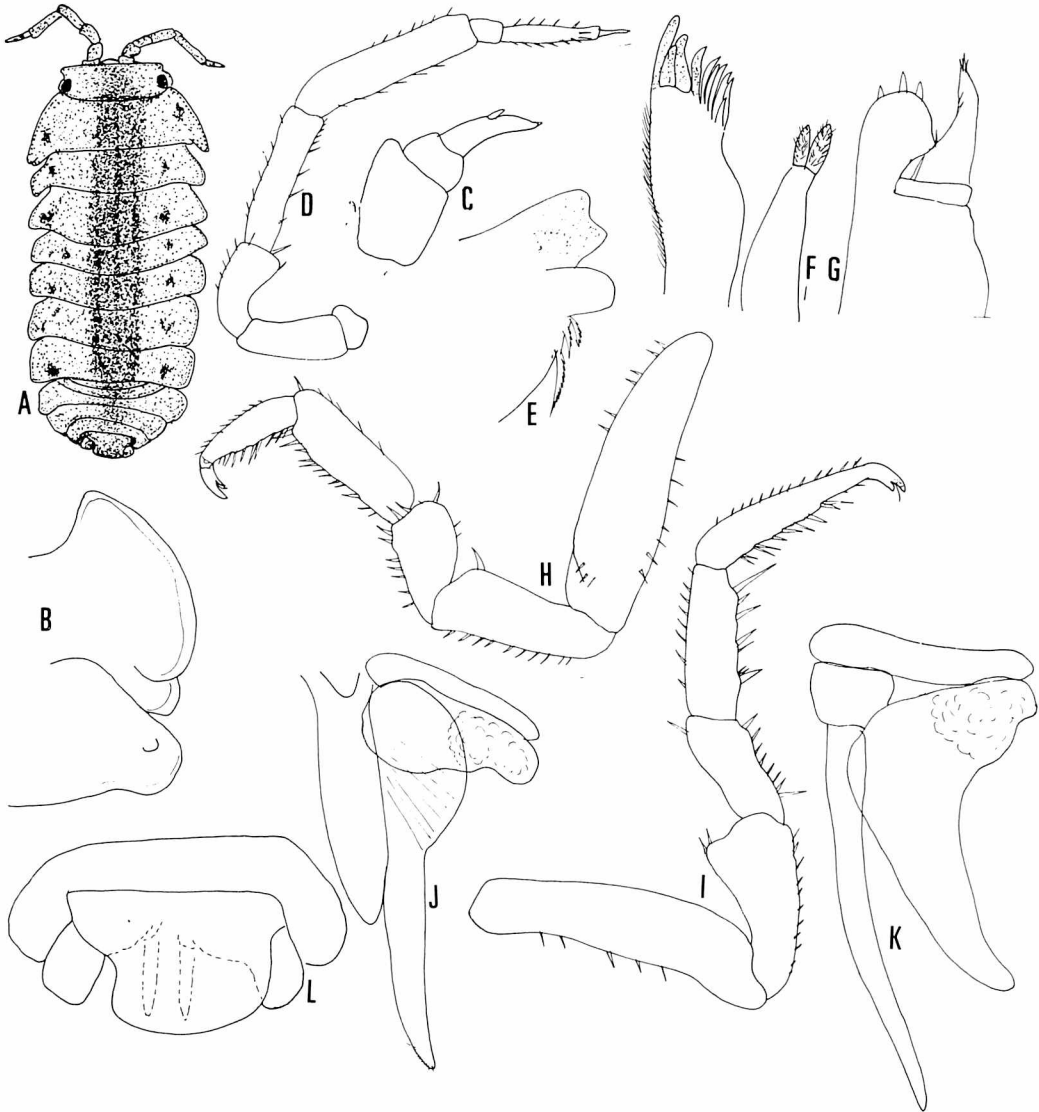
Material examined : 2 ♂♂ (1 ♂ holotype, 3.8mm in body length and 1 ♂ paratype, 6.1mm in body length) and 10 ♀♀ (1 ♀ allotype, 8.6mm in body length and 9 ♀♀ paratypes, 3.3~6.9mm in body length), Kabira, Ishigaki-Island, Okinawa Pref., coll. Noboru Nunomura, June 25, 1975. Type series is deposited as follows : holotype (TOYA-Cr-8876), allotype (TOYA-Cr-8877) and 2 paratypes (TOYA-Cr-8878~8879) at the Toyama Science Museum, 2 paratypes (OMNH-Ar-3306~3307) at the Osaka Museum of Natural History, 2 paratypes (YCM CI-956~957) at the Yokosuka City Museum, and a paratype (TSMT-Cr-9769) at the National Science Museum, Tokyo.

*Description* : Body 2.2 times as long as wide. Eyes mediocre in size, each eye composed of 18 ocelli. First peraeonal somite with a lateral groove along its length ; schisma protund-

ed but small. Second peraeonal somite with a small tooth. Pleotelson hour-glass-shaped with a lateral concavity and long hind margin, 2.1 times as long as wide.

First antenna (Fig.152 C) ; first segment stout ; second segment short; terminal segment with an aesthetasc near the medial part.

Second antenna (Fig.152 D), reaching the posterior half of the first peraeonal somite.



**Fig.152** *Sphaerillo yaeyamanus* n. sp.

A. Dorsal view ; B. Ventral view of first and second peraeonal somites ; C. First antenna ; D. Second antenna ; E. Right mandible ; F. First maxilla ; G. Maxilliped ; H. First peraeopod ; I. Seventh peraeopod ; J. Penes and male first pleopod ; K. Male second pleopod ; L. Pleotelson and uropods (All : Holotype male).

Mutual length of 5 peduncular segments is 2 : 8 : 7 : 10 : 14. Flagellum almost as long as the third peduncular segment ; terminal segment 3 times as long as the basal one.

Right mandible (Fig.152 E) ; pars incisiva 2-headed ; lacinia mobilis single-toothed ; 2-hairy bristles between lacinia mobilis and processus molaris ; processus molaris is represented by a single tuft of hairy bristles.

Left mandible ; pars incisiva weakly 2-headed ; lacinia mobilis single-toothed ; processus molaris is represented by a single tuft of hairy bristles.

First maxilla (Fig.152 F) ; outer lobe with 10 (4+6) teeth at the tip.

Second maxilla normal.

Maxilliped (Fig.152 G) ; endite round bearing 3 spines on the distal margin ; palp narrow.

First pereopod (Fig.152 H) ; basis oblong ; ischium rectangular ; merus short ; carpus rectangular ; propodus relatively short with 10 setae on inner margin.

Seventh pereopod (Fig.152 I) ; basis oblong ; ischium elongated triangular merus rectangular with 8 setae on inner margin ; carpus a little longer than merus with 4 groups of 2~3 setae on inner margin ; propodus long with 10~12 setae on inner margin.

Penes (Fig.152 J) fusiform.

Male first pleopod (Fig.152 J) ; endopodite relatively short with 10~12 denticles near the apex ; exopodite elliptical.

Male second pleopod (Fig.152 K) ; endopodite long ; exopodite elongated with a round tip.

*Remarks* : The present new species is most closely allied to *Sphaerillo shuriensis* already described in this paper, but the former is separated from the latter in the following features : (1) shape of pleotelson, and (2) single setae of processus molaris of both mandibles.

### ***Sphaerillo lineatus* n. sp.**

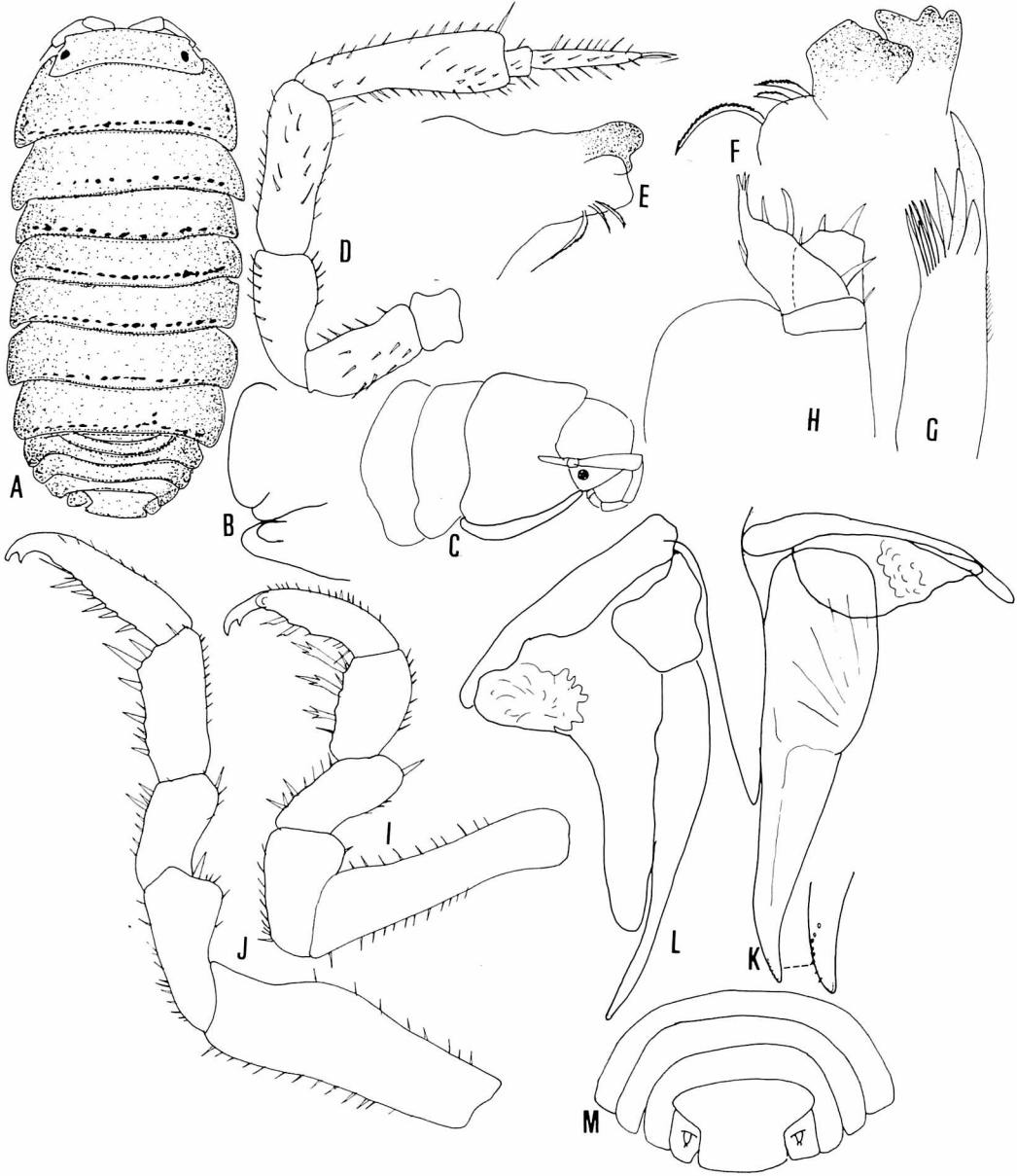
(Jap. name : Obi-koshibiro-dangomushi, new)

Fig.153

*Material examined* : 3 ♂♂ (1 ♂ holotype, 6.6mm in body length and 2 ♂♂ paratypes, 6.9~7.1mm in body length) and 4 ♀♀ (1 ♀ allotype 9.5mm in body length and 2 ♀♀ paratypes, 9.0~9.4mm in body length), Kushiga-hama, Shimonoseki City, Yamaguchi Pref., coll.Noboru Nunomura, Sep. 25, 1983. Type series is deposited as follows : holotype (TOYA-Cr-8921), allotype (TOYA-Cr-8922) and 3 paratypes (TOYA-Cr-8923~8925) at the Toyama Science Museum, a paratype (OMNH-Ar-3305) at the Osaka Museum of natural History, a paratype (NSMT-Cr-9768) at the National Science Museum, Tokyo.

*Description* : Body convex and rather long, times as long as wide. Body colour dull yellow with a line of black spots along the posterior margins of every pereopodal somite. Eyes small, each eye composed of 8 ocelli. Cephalon rectangular. First pereopodal somite with a schisma. Second pereopodal somite with a transverse long tooth. Pleotelson (Fig.153 M) hour-grass-shaped.

First antenna ; first segment big ; second segment rectangular ; terminal segment with



**Fig.153** *Sphaerillo lineatus* n. sp.

A. Dorsal view ; B.Ventral view of first and second pereopodal somites ; C. Lateral view of anterior part of pereopod ; D. Second antenna ; E. Right mandible ; F. Left mandible ; G. Outer lobe of first maxilla ; H. Maxilliped ; I. First pereopod ; J. Seventh pereopod ; K. Penes and male first pleopod ; L. Male second pleopod ; M. Pleotelson and uropods (All : Holotype male).

5 aesthetascs.

Second antenna(Fig.153 D) ; mutual length of 5 peduncular segments is 2 : 5 : 5 : 7 : 9.

Flagellum,  $2/3$  as long as the fifth peduncular segment ; second segment 5 times as long as the first.

Right mandible (Fig.153 E) ; pars incisiva 2-headed ; lacinia mobilis single-toothed ; 2 hairy bristles behind lacinia mobilis ; processus molaris is represented by a single tuft of hairy bristles.

Left mandible (Fig.153 F) ; pars incisiva 3-headed ; lacinia mobilis weakly 3-toothed ; 2 hairy bristles behind lacinia mobilis ; processus molaris is represented by a single tuft of hairy bristles.

First maxilla (Fig.153 G) ; outer lobe with 10 teeth. All of them are entire and long but the outermost one is remarkably big.

Second maxilla wide.

Maxilliped (Fig.153 H) ; endite rectangular with 2 strong spines ; palp wide.

First peraeopod (Fig.153 I) ; basis long 4.5 times as long as wide ; ischium triangular ; merus as long as ischium with a stout seta on distal corner and 2 stout setae on inner margin ; propodus slightly longer than long with 3 setae.

Seventh peraeopod ( Fig.153 J) ; basis oblong ; ischium  $2/3$  time as long as basis, with a stout seta at the outer distal corner ; merus 60% as long as merus ; carpus rectangular, almost as long as ischium, bearing 6 stout setae on inner margin ; propodus as long as carpus with 5 stout setae on inner margin.

Penes (Fig.153 K) fusiform.

Male first peraeopod (Fig.153 K) ; endopodite straight and apical part bents outerwards slightly and bears 8~10 small spines on the inner side ; exopodite narrow-lanceolate.

Male second pleopod (Fig.153 L) ; endopodite long and slightly recurved outerwards ; exopodite long but shorter than endopodite with a right-angled concavity on the margin.

*Remarks* : The present species is rather unique as to colour patterns among the Japanese Armadilidae. Most closely allied to *Sphaerillo russoi* (ARCANGELI), the species is separated from the latter in the following features : (1) peraeonal somite with tranverse black patterns, (2) shape of exopodite of male first pleopod, (3) shape of pleotelson, and (4) presence of 3 big trident setae on inner margin of carpus of first peraeopod.

### ***Sphaerillo* sp.**

Fig.154

*Material examined* : 2 ♀♀, Uotsuroi Island, Senkaku Group, Okinawa Pref., coll.Takuya Abe, May 30, 1974. The specimens are deposited at the Toyama Science Museum (TOYA-Cr-8893~8894).

*Description* : Body convex, 2.0 times as long as wide. Body size of two female specimens are 6.7mm and 6.9mm respectively in length. First peraeonal somite. Schisma of first peraeonal somite is typical in the genus *Sphaerillo*. Hind corner of second peraeonal somite with a low tooth. Eyes mediocre in size, each eye composed of 16 ocelli. A gravid female

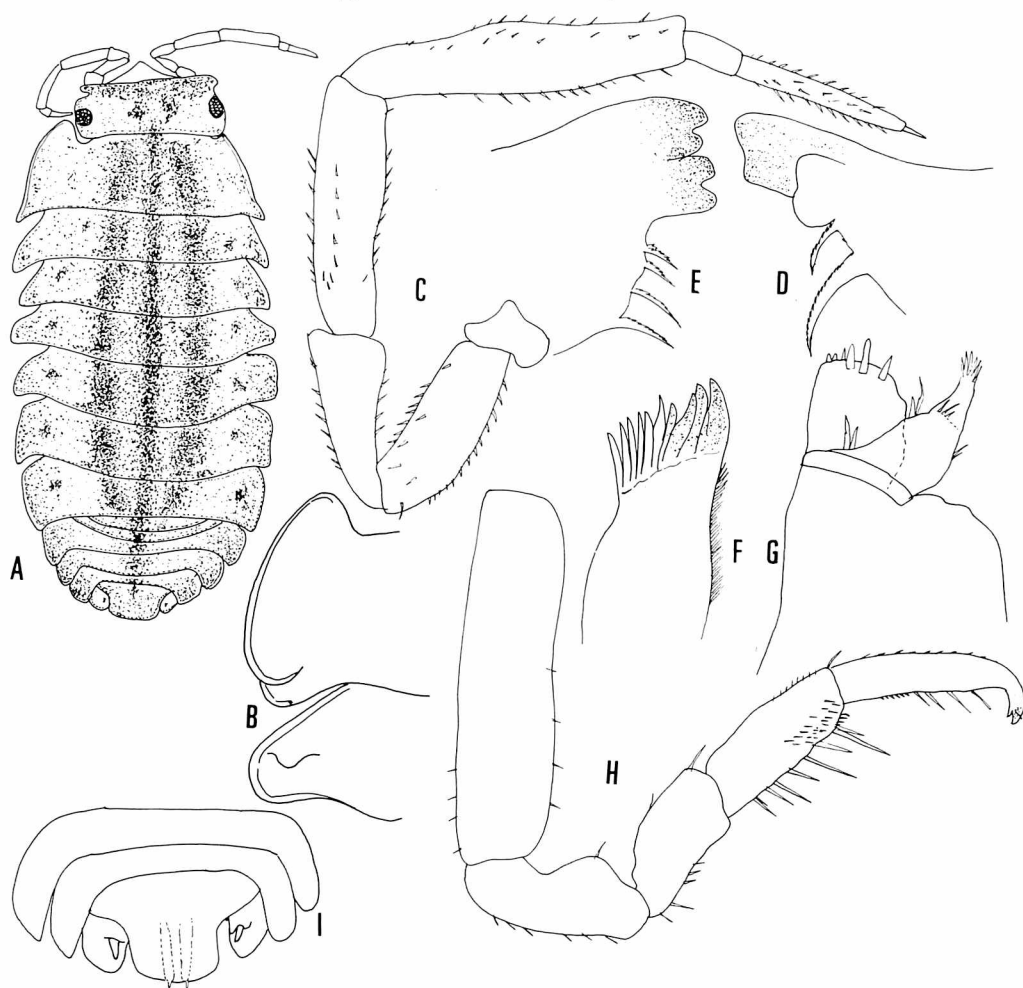


has 26 eggs in her brood pouch. Pleotelson hour-glass shaped.

Second antenna (Fig.154 C), reaching the posterior half of the first pereaeonal somite. Mutual length of 5 peduncular segments is 1 : 4 : 4 : 5 : 7. Flagellum a littleshorter than the fifth peduncular segment, terminal segment 3.5 times as long as the basal one.

Right mandible (Fig.154 D) ; pars incisiva single-toothed ; lacinia mobilis single-toothed ; a hairy bristle behind lacinia mobilis ; processus molaris is represented by a long seta.

Left mandible (Fig.154 E) ; pars incisiva 2-headed ; lacinia mobilis 2-headed ; 2 hairy bristles behind lacinia mobilis ; processus molaris is represented by a long seta.



**Fig.154** *Sphaerillo* sp.

A. Dorsal view ; B. Ventral view of first and second pereaeonal somites ; C. Second antenna ; D. Right mandible ; E. Left mandible ; F. Outer lobe of first maxilla ; G. Maxilliped ; H. Seventh pereaeopod ; I. Pleotelson and uropods (All : Female specimens from Uotsuri Island).

First maxilla (Fig.154 F) ; outer lobe with 10 (4+6) long simple teeth at the tip.

Maxilliped (Fig.154 G) ; endite rectangular with 6 spines ; palp slender.

Seventh pereopod (Fig.154 H) ; basis oblong ; ischium rectangular ; merus rectangular with 10 long setae on inner margin ; carpus rectangular with 10 long setae on inner margin ; propodus rectangular with 4 longer and several shorter setae on inner margin.

*Remarks* : The present specimens resembles *Sphaerillo yaeyamanus* already described in this paper, but the former has slight differences from the latter in the following features : (1) longer pleotelson, (2) shorter teeth on outer lobe of first maxilliped, and (3) more numerous

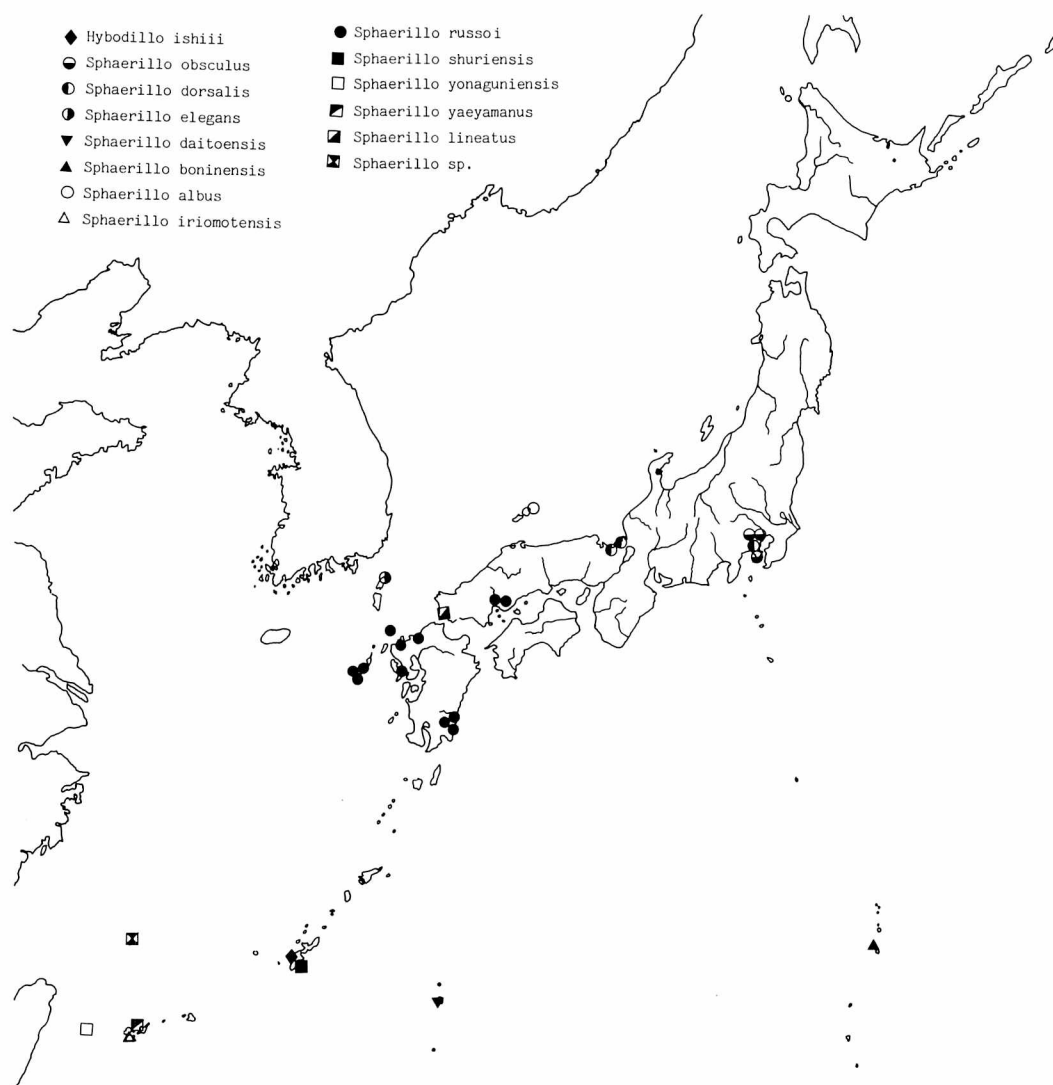


Fig.155 Map showing the geographical distribution of the family Armadillidae.

spines on the tip of endite of maxilliped. As no male specimen has hitherto been collected, I had to refrain from establishing a new species.

### **Suborder Tyloidea**

(Jap. name : Hama-dangomushi-amoku)

Formerly, this isopod group was considered to constitute a unique family or infraorder within the suborder of Oniscoidea. Based on the morphology of uropods, however, it has recently been suggested that the group would be related to Valvifera.

### **Family Tylidae MILNE-EDWARDS, 1840**

(Jap. name : Hama-dangomushi-ka)

The family Tylidae contains more than 3 genera but a single genus *Tylos* LATREILLE and a single species, *T. granuriferus* BUDDE-LUND, has hitherto been known in Japan.

### ***Tylos granuriferus* BUDDE-LUND, 1885**

(Jap. name : Hama-dangomushi)

Fig.156

*Tylos granulatus* MIERS (not KRAUSS) 1877

*Tylos granuriferus* BUDDE-LUND, 1885

*Material examined* : 1 ♂ 3 ♀ ♀, Senri, Minabe-cho, Hidaka-gun, Wakayama Pref., coll. Ryohei Yamanishi, 1986 ; 1 ♂ 4 ♀ ♀, Tassya, Aikawa-cho, Sado-gun. Sado Island, Niigata-Pref., coll. Noboru Nunomura, Aug. 9, 1977. 2 ♂♂ 2 ♀ ♀, Toyo, Kami tushima-cho, Kami Agata-gun, Tushima Island, Nagasaki Pref., coll. Noboru Nunomura, July, 4, 1988. And more than 150 specimens from the various parts of Japan (Fig.157).

*Description* : Body elliptical, 1.8 times as long as wide. Body colour various, dull yellow in some specimens, but white with green yellow in other specimens. Epimera of peraeon well developed. Biggest specimen attains 25mm in length.

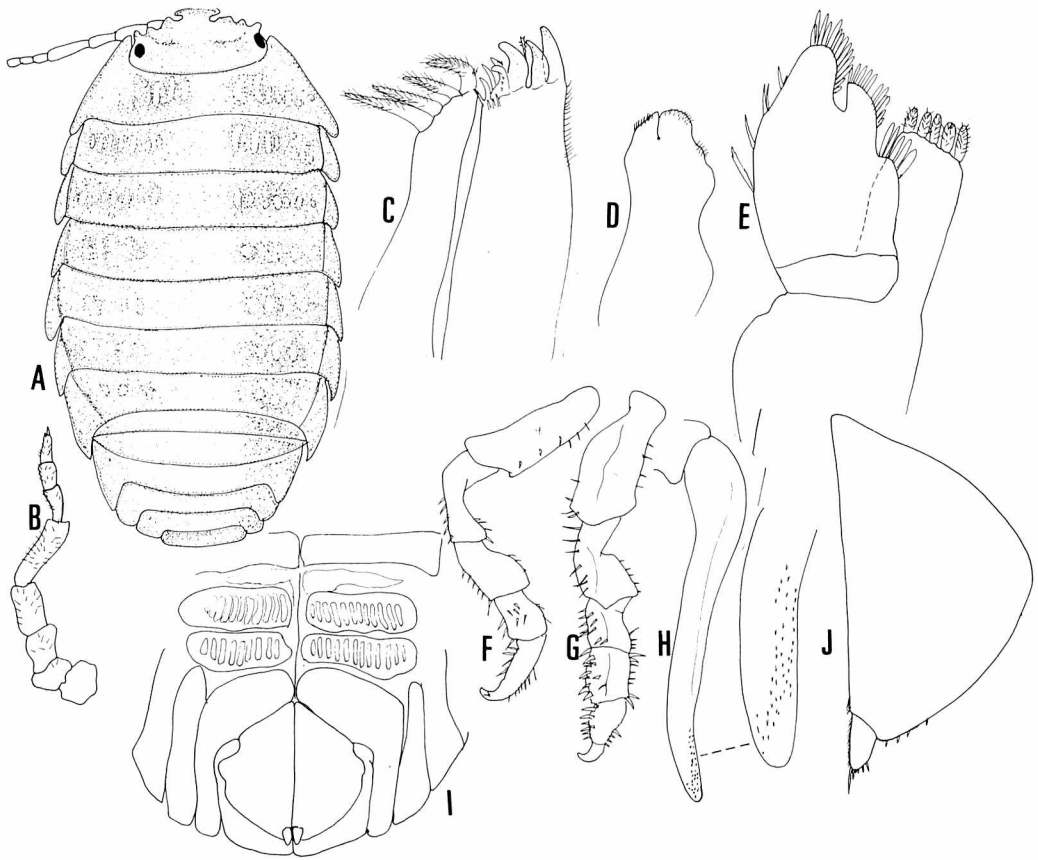
First antenna rudimentary.

Second antenna (Fig.156 B), reaching the posterior end of the second peraeonal somite. Mutual length of 5 peduncular segments is 6 : 4 : 7 : 10 : 15. Flagellum 3-segmented and a little longer than the fifth peduncular segments. Three flagellar segments are subequal in length.

Right mandible ; pars incisiva 3-headed ; lacinia mobilis thin and 8~9 toothed ; 7~8 hairy bristles behind lacinia mobilis ; processus molaris wide.

Left mandible ; pars incisiva 3-headed ; lacinia mobilis 3-headed ; 3~7 hairy bristles behind lacinia mobilis ; processus molaris wide.

First maxilla (Fig.156 C) ; outer lobe with 10 teeth, four of which are serrated ; inner lobe slender with 4 plumose hairs on distal end.



**Fig.156** *Tylos granuliferus* BUDDE-LUND, 1885

A. Dorsal view ; B. Second segment ; C. First maxilla ; D. Second maxilla ; E. Maxilliped ; F. First antenna ; G. Seventh pereopod ; H. Endopodite of male second pleopod ; I. Ventral view of pleon ; J. Uropod (All : Male specimen from Minabe, Wakayama Pref.,)

Second maxilla (Fig.156 D) relatively narrow with a groove.

Maxilliped (fig.156 E) ; endite rectangular with 5 setose spines on the distal end ; palp stout, external surface scattered with blunt spines

First pereopod ; (Fig.156 F) ; basis oblong ; ischium rectangular ; merus and carpus almost square ; propodus relatively short.

Second to sixth pereopods (Fig.156 G) subequal ; basis rectangular ; ischium elongated triangular ; merus and carpus almost square ; propodus relatively short.

Seventh pereopod ; basis rectangular ; ischium elongated triangular ; merus and carpus almost square ; propodus relatively short.

First pleopod reduced to slender lamellate



Fig.157 Map showing the geographical distribution of *Tylos granuliferus*.

Male second pleopod (Fig.156 H) ; endopodite linear.

Third to fifth pleopod rectangular.

Uropod (Fig.156 J) valve-like and lunate in form, ventral, covering anal aperture with tiny endopodite near the distal end.

*Remarks* : Formerly, the name, *Tylos granulatus* MIERS, has been used among the Japanese zoologists. Since *granulatus* had been preoccupied by KRAUSS, the name *granurifera* proposed by BUDDE-LUND should be used. The species has been recorded in Japan and Borneo. But I have not yet studied the Borneo specimens.

**Taxonomic supplements to some other Families**

**Family Ligiidae BRANDT & RATZENBURG, 1831**

**Genus *Ligia* FABRICIUS, 1798**

Hitherto, 4 species of the genus *Ligia* has been recorded as valid in Japan. The fifth species of the genus will be described in the present paper.

***Ligia yamanishii* n. sp.**

(Jap. name : Ashinaga-funamushi, new)

Figs.158~159

*Material examined* : 4 ♂♂ (1 ♂ holotype, 13.6mm in body length and 3 ♂♂ paratypes, 8.1~13.5mm in body length) and 5 ♀♀ (1 ♀ allotype, 15.8mm in body length, 4 ♀♀ paratypes, 9.1~9.6mm in body length). Under stones near the high tide mark, Hatsune-ura, Chichi-jima Island, Ogasawara-mura, Ogasawara Islands, Tokyo Pref. coll. Ryohei Yamanihi, Nov. 16, 1986. Type series is deposited as follows : holotype (TOYA-Cr-8481), allotype (TOYA-Cr-8482) and 2 paratypes (TOYA-Cr-8483~8484) at the Toyama Science Museum and 5 paratypes (OMNH-Ar-3293 ~3298) at the Osaka Museum of Natural History.

*Description* : Body narrow, 2.3 times as long as wide. Body colour black, with a pair of longitudinal epimera protruded posteriorly. Body surface smooth. Eyes big, each eye composed of about 800 ocelli. Pleotelson with a pair of acute lateral processes and a blunt medial process.

First antenna (Fig.158 B) ; first segment big ; second segment rectangular ; terminal segment small and semicircular with 5 short aesthetascs.

Second antenna (Fig.158 C), reaching the middle part of basis of uropods. Pleotelson with an acute lateral process and 2 pairs of baymouthes. Flagellum is composed of 32 segments.

Right mandible (Fig 159 A) ; pars incisiva 2-headed ; lacinia mobilis also 3-headed ; 6~8 plumose setae behind lacinia mobilis ; processus molaris wide.

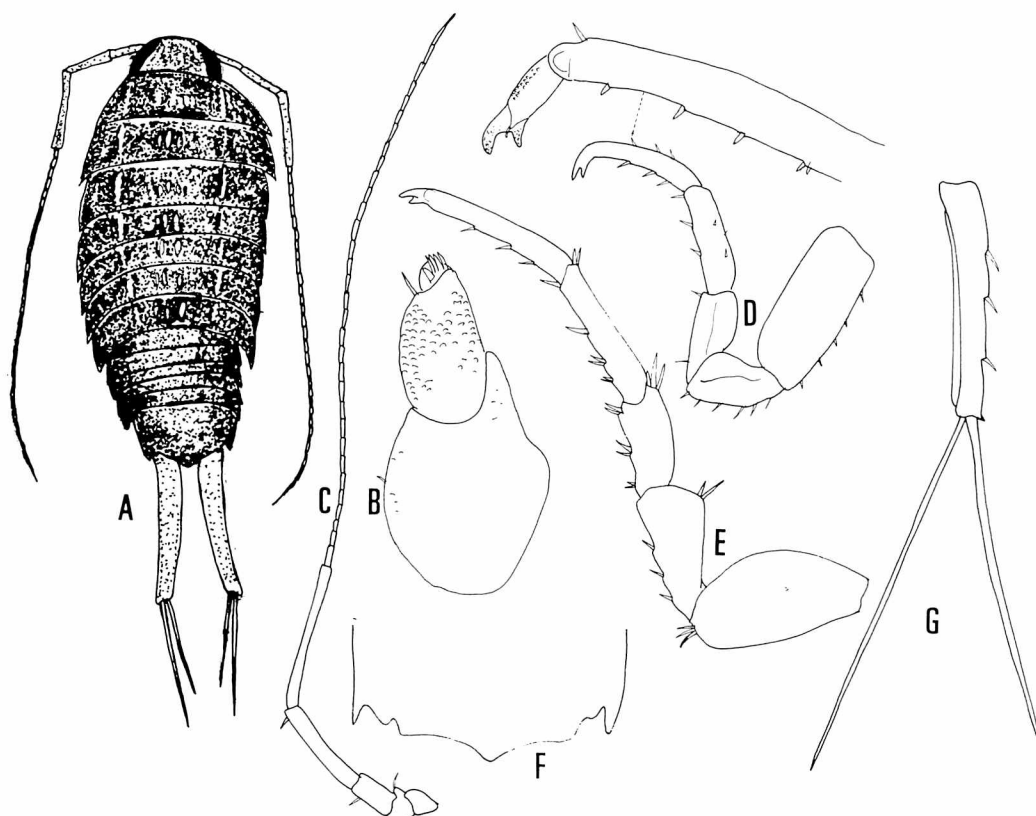
Left mandible (Fig.159 B) ; pars incisiva 2-headed; lacinia mobilis also 2-headed ; 7~8 plumose setae behind lacinia mobilis ; processus molaris wide.

First maxilla (Fig.159 C) ; inner lobe with 3 plumose setae at the tip ; outer lobe with 10 teeth at the tip.

Second maxilla (Fig.159 D) ; broad and divided into 2 lappets.

Maxilliped (Fig.159 E) ; endite narrow with 7 teeth at the distal margin ; palp with 4 indistinct sutures.

First pereopod (Fig.158 D) ; basis stout ; ischium, merus and carpus about half the length of basis ; propodus long without protuberance in both sexes.



**Fig.158** *Ligia yamanishii* n. sp.

A. Dorsal view ; B. First antenna ; C. Second antenna ; D. Male first peraeopod ; E. Seventh peraeopod ; F. Pleotelson ; G. Uropod (All : Holotype male).

Seventh peraeopod (Fig.158 E) ; basis stout ; ischium triangular with 3 setae on inner margin ; merus rectangular with 3 groups of 32 setae on inner margin and a group of setae ; carpus oblong ; propodus oblong.

Penes (Fig.159 F) long and straight.

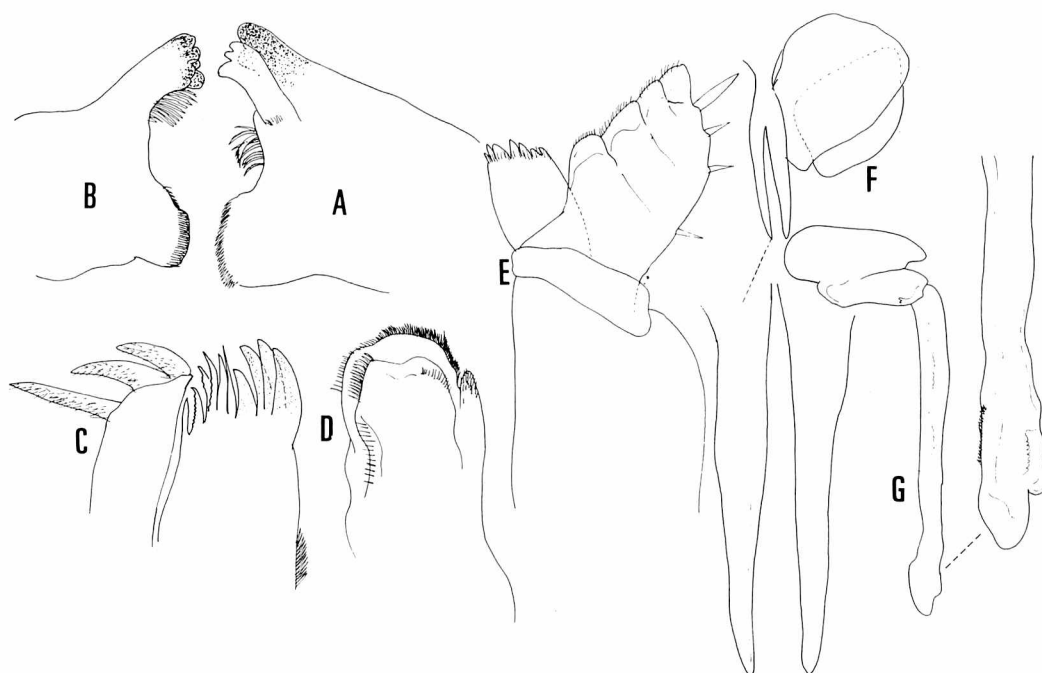
Male first pleopod ; both rami round and broad.

Male second pleopod (Fig.159 G) ; endopodite with swollen tip.

Uropod (Fig.158 G) long ; basis 7 times as long as wide with 3 spines on outer margin ; exopodite about 1.6 times as long as basis ; endopodite somewhat shorter than the exopodite.

*Remarks* : Although allied to *Ligia exotica* ROUX, the present new species is distinguished in the following features : (1) longer uropod, especially with long basis, (2) absence of soft cushion-like expansions on merus and carpus of male first peraeopod, and (3) absence of protuberances of male first peraeopod.

The new species is, on the other, separated from another Bonin Island species, *Ligia*



**Fig.159** *Ligia yamanishii* n. sp.

A. Right mandible ; B. Left mandible ; C. First maxilla ; D. Second maxilla ; E. Maxilliped ; F. Penes and both rami of male first pleopod ; G. Endopodite of male second pleopod (All : Holotype male).

*boninensis* NUNOMURA in the following features : (1) more numerous-segmented flagellum of second antenna, (2) longer and recurved basis of uropod.

**Family Trichoniscidae Sars, 1899**  
**Genus *Hyloniscus* Verhoeff, 1908**

Hitherto 6 species have been known as valid in Japan, 2 additional species will be described in this paper.

***Hyloniscus nishikawai* n. sp.**

(Jap. name : Nishikawa-hora-warajimushi, new)

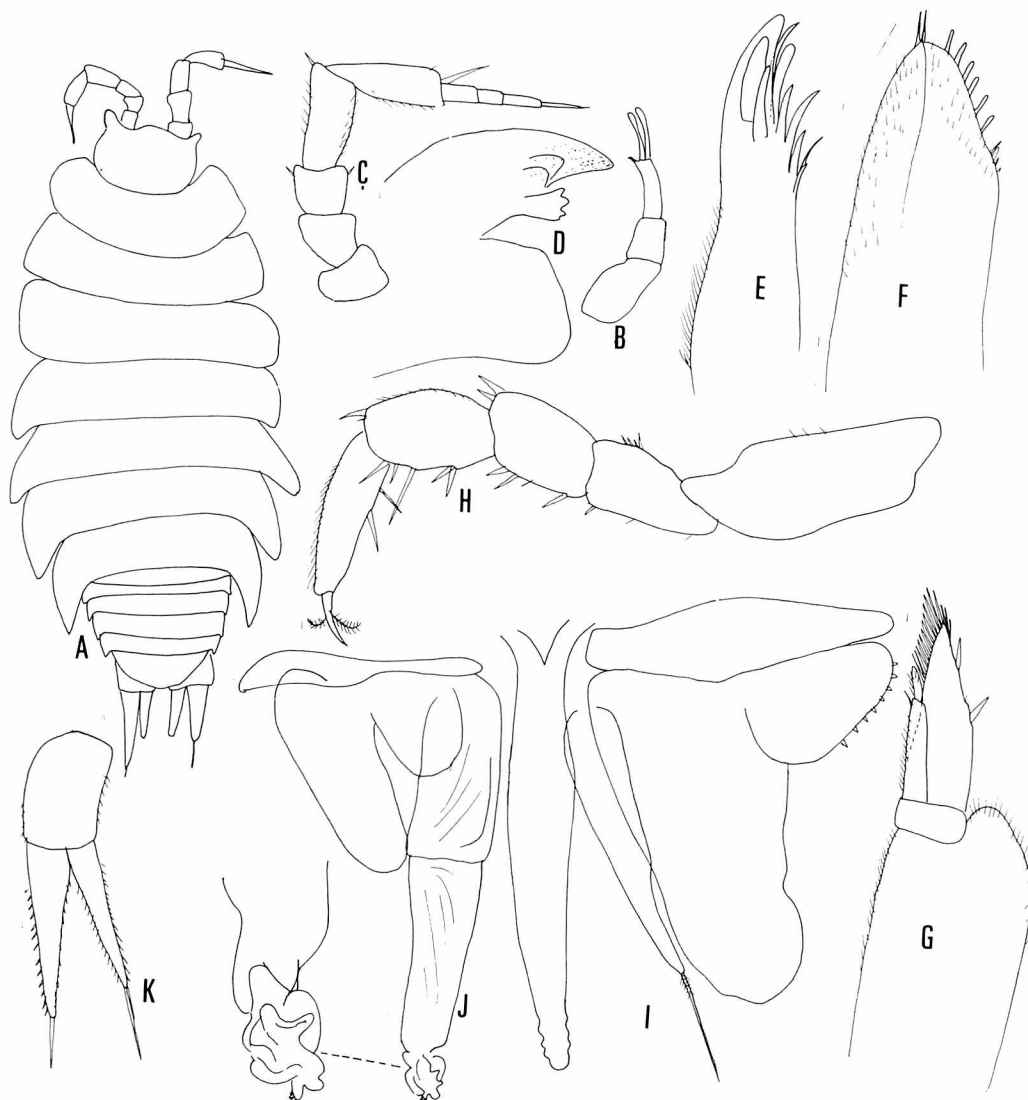
**Fig.160**

*Material examined* : 5 ♂♂ (1 ♂ holotype, 3.6mm in body length and 4 ♂♂ paratypes, 3.3~3.6mm in body length) and 7 ♀♀ (1 ♀ allotype, 4.2mm in body length and 6 ♀♀ paratypes, 3.3~4.8mm in body length), abandoned mine adit, between Iwami-ginzan, and Omori-machi, Ooda City, Shimane Pref., coll. Yoshiaki Nishikawa, Sep. 5, 1984. Type series is deposited as follows : holotype (TOYA-Cr-8915), allotype (TOYA-Cr-8916) and 4 paratypes



(TOYA-Cr-8917~8920) at the Toyama Science Museum, 2 paratypes (OMNH-Ar-3309~3310) at the Osaka Museum of Natural History, 2 paratypes (YCM-CI-958~959) at the Yokosuka City Museum and 2 paratypes (NSMT-Cr-9775) at the National Science Museum, Tokyo.

*Description* : Body 1.9 times as long as wide. Body surface smooth. Body colour white ; pigment of body completely lacking. Eyes lacking. Cephalon round with a pair of lateral



**Fig.160** *Hyloniscus nishikawai* n. sp.

A. Dorsal view ; B. First antenna ; C. Second antenna ; D. Right mandible ; E. Outer lobe of first maxilla ; F. Second maxilla ; G. Maxilliped ; H. Seventh pereopod ; I. Penes and male first pleopod ; J. Male second pleopod ; K. Uropods (All : Holotype male).

distal protuberences and a low medial process. Distal margin of pleotelson round. Gravid female with 5 eggs.

First antenna (Fig.160 B) composed of 3 segments ; all the segments slender.

Second antenna (Fig.160 C), reaching the middle part of first peraeonal somite. Mutual length of five peduncular segments is 1 : 1 : 1 : 2 : 2. Flagellum, 3-segmented, and almost as long as the fifth peduncular segment, three flagellar segments are similar in length.

Right mandible (Fig.160 D) ; pars incisiva 3-headed ; lacinia mobilis narrow, 3-headed ; processus molaris wide.

Left mandible ; pars incisiva 3-headed ; lacinia mobilis 3-headed ; processus molaris wide.

First maxilla (Fig.160 E) ; outer lobe with 10 teeth at the tip.

Second maxilla (Fig.160 F) slender with many setae.

Maxilliped (Fig.160 G) ; endite slender with a stout spine at the tip ; palp straight.

First peraeopod ; basis slender ; ischium rectangular ; merus rectangular with a seta on inner distal part ; carpus rectangular 2 big setae on inner margin ; propodus slender with a big seta on the middle part on inner margin.

Seventh peraeopod (Fig.160 H) ; basis stout ; ischium rectangular ; merus rectangular with 3 stout setae on inner margin and 2 setae at the outer distal part ; carpus rectangular with 5 setae on inner margin and a seta outer distal end ; propodus rather slender.

Penes (Fig.160 I) rather slender and exceeding the both rami of first pleopod.

Male first pleopod (Fig.160 I) ; endopodite slender with narrower structure like sensory seta in shape. Exopodite triangular with a deep incision on the outer part of distal margin.

Male second pleopod (Fig.160 J) ; endopodite stout and 2-segmented ; apical part very complicated with a protuberences with 3 denticles.

Uropod (Fig.160 K) ; basis rectangular ; both rami elongated triangular, similar in shape.

*Remarks* : The present new species is similar to *Hyloniscus unidentatus* VANDEL reported from Yoshino, Nara Prefecture, but the former is separated from the latter in the following features : (1) round posterior end of pleotelson, (2) shape of the apical part of endopodite of male second pleopod, (3) shape of both rami of exopodite of male first pleopod, (4) especially deep incision of exopodite, (5) more numerous teeth outerlobe of first maxilla, and (6) slenderer endite of maxilliped.

***Hyloniscus kiiensis* n. sp.**

(Jap. name : Kii-hora-warajimushi, new)

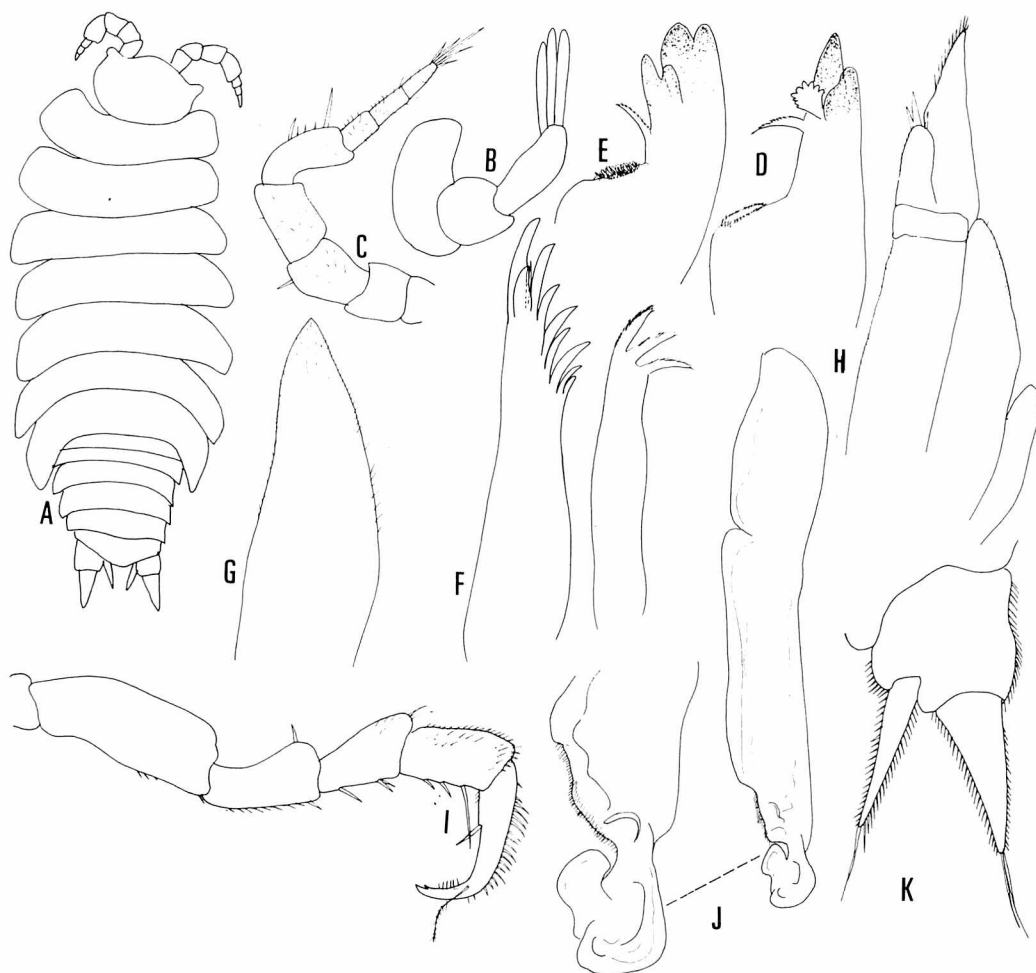
Fig.161

*Material examined* : 2 ♂♂ (1 ♂ holotype, 3.3mm in body length and 1 ♂ paratype, 2.8mm in body length) and 5 ♀♀ (1 ♀ allotype 4.3mm in body length and 3 ♀♀ paratypes, 3.2~3.8mm in body length), Gonji-ana, alt. ca 170m, Kawabe-cho, Hidaka-gun, Wakayama Pref., coll. Yoshiaki, Nishikawa, Mar. 19, 1980 ; 1 ♂ 3 ♀♀, Gochi-dani, alt. ca 180, Shirahama-cho, Nishimuro-gun, Wakayama Pref., coll. Yoshiaki, Nishikawa, Mar. 17, 1980. Type series is

deposited as follows : holotype (TOYA-Cr-8946), allotype (TOYA-Cr-8947) and a paratype (TOYA-Cr-8948) at the Toyama Science Museum, paratype (OMNH-Ar-3311) at the Osaka Museum of Natural History, a paratype (YCM-CI-960) at the Yokosuka City Museum and a paratype (NSMT-Cr-9774) at the National Science Museum, Tokyo.

*Description* : Body 2.2 times as long as wide. Body colour white and pigmentless, cephalon round with a triangular medial process and a pair of lateral lobes. Each peraeonal somite subequal in length. Pleonal somites much narrower than peraeonal somites. Pleotelson low triangular. Dorsal surface smooth, without any tubercle.

First antenna (Fig.161 B) ; composed of 3 segments ; first segment stout ; second segment



**Fig.161** *Hyloniscus kiiensis* n. sp.

A. Dorsal view ; B. First antenna ; C. Second antenna ; D. Right mandible ; E. Left mandible ; F. First maxilla ; G. Second maxilla ; H. Maxilliped ; I. Seventh peraeopod ; J. Endopodite of male second pleopod ; K. Uropod (All : Holotype male).

almost square ; teminal segment slender with 3 long aesthetascs at the tip.

Second antenna (Fig.161 C), reaching the posterior margin of the first peraeonal somite, composed of 5 peduncular segments. Mutual length of five peduncular segment is 1 : 1 : 1 : 2 : 3. Flagellum 3-segmented, a little shorter than the fifth peduncular segment, each segment subequal in length.

Right mandible (Fig.161 D) ; pars incisiva 2-headed ; lacinia mobilis not chitinized and 9-toothed ; processus molaris is represented by a single tuft of hairy bristles.

Left mandible (Fig. 161 E) ; pars incisiva 2-headed ; lacinia mobilis chitinized and 2-headed ; processus molaris is represented by a single tuft of hairy bristles.

First maxilla (Fig.161 F) ; inner lobe with with 3 hairy bristles on the distal end ; outer lobe with 10 teeth at the tip.

Second maxilla (Fig.161 G) lanceolate with many setae.

Maxilliped (Fig.161 H) ; endite relatively short with 3 spines at the tip ; palp not segmented distinctly, with 3 stout setae at the tip.

First peraeopod basis oblong ; ischium and merus rectanular ; carpus and propodus rather short.

Seventh peraeopod (Fig.161 I) ; basis oblong ; ischium, merus and caprus rectangular ; propodus rather short with a long plumose seta.

Penes narrow and straight.

Male first pleopod ; endopodite slender, especially distal half thread-like ; exopodite triangular with a big right-angled depression and 8~9 spines on the distal margin.

Male second pleopod (Fig.161 J) ; endopodite elliptical and complicated ; it bears 4 stout spines.

Uropod (Fig.161 L) ; basis almost square ; endopodite narrow ; exopodite stout and almost as long as exopodite.

*Romarks* : Most closely allied to *Hyloniscus unidentatus* VANDEL collected from Yoshino, Nara Prefecture, the present new species is separated from that species in the following features : (1) shape of endopodite of male second pleopod, especially absence of stout hooks, (2) shape of the hind margin of pleotelson, (3) longer merus and carpus of male seventh peraeopod, (4) stouter exopodite of uropod, and (5) more numerous teeth on the outer lobe of first maxilla.

### Genus *Hondoniscus* VANDEL, 1968

Hitherto, a species, *Hondoniscus kitakamiensis* VANDEL has been recorded as valid not only in Japan but also in the world. The second species will be described below.

***Hondoniscus mogamiensis* n. sp.**

(Jap. name : Mogami-warajimushi, new)

Fig.162

*Material examined* : 1 ♂ (holotype, 2.4mm in body length), Suginoiri, Mogami-machi, Mogami-gun, Yamagata Pref., coll. Yoshiaki Nishikawa Aug. 5, 1983. Holotype is deposited at the Toyama Science Museum (TOYA-Cr-8553).

*Description* : Body ovate, 2.4 times as long as wide. Cephalon round with a pair of lateral protuberances and a stout and low medial process. Distal part of pleotelson truncated.

First antenna (Fig.162 B) ; first and second segments almost square ; terminal segment slender with 3 aesthetascs at the tip.

Second antenna (Fig.162 C), reaching the posterior margin of first pereopod somite. Mutual length of 5 peduncular segments is 2 : 3 : 4 : 4 : 5. Flagellum almost as long as fifth peduncular segment and divided of 3 segments.

Right mandible (Fig.162 D) ; pars insciva stout and 3-headed ; lacinia mobilis narrow and 4-toothed ; a hairy bristle behind lacinia mobilis ; processus molaris stout.

Left mandible (Fig.162 E) ; pars insciva stout and 3-headed ; lacinia mobilis 2-toothed ; 2 hairy bristles behind lacinia mobilis ; processus molaris stout.

First maxilla (Fig.162 F) ; outer lobe with slender with 10 teeth at the tip.

Second maxilla (Fig. 162 G) rather slender.

Maxilliped (Fig.162 H) ; endite narrow with 3 stout setae at the tip and with any hairs ; palp stout without any segment.

First pereopod (Fig.162 I) ; basis stout and rectangular ; ischium rectangular ; merus triangular with 2 setae on inner margin and a seta outer distal corner ; carpus rectangular with 3 long setae on inner margin and a short seta at the outer distal corner ; propodus rather short with a series of 7 setae on inner margin.

Seventh pereopod (Fig.162 J) ; basis stout and rectangular ; ischium rectangular ; merus triangular ; carpus rectangular with long setae on inner margin and a short seta at the outer distal corner ; propodus rather short with a series of setae on inner margin.

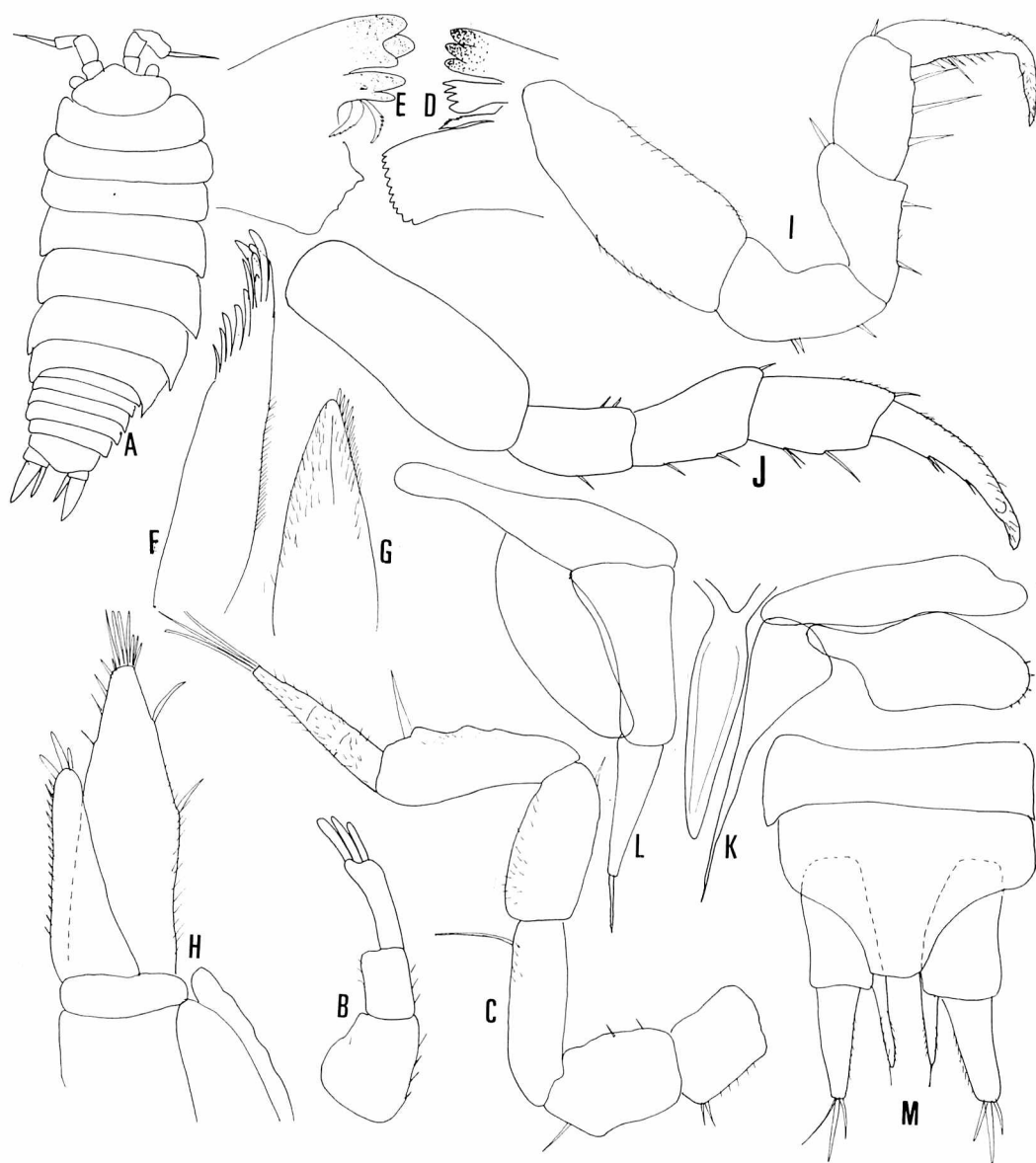
Penes (Fig.162 K) fusiform.

Male first pleopod (Fig.162 K) ; endopodite slender and straight ; its end is sharp.

Male second pleopod (Fig.162 L) ; endopodite 2-segmented and terminal segment slender with a long seta ; exopodite elliptical.

Uropod (Fig.162 M) ; basis rectangular ; endopodite narrow ; exopodite long and stout ; terminal segment tapering towards the tip.

*Remarks* : The present new species is separated from *H. kitakamiensis* in the following features : (1) shorter exopodite of male first pleopod, (2) shorter and stouter endopodite of male second pleopod, and (3) elliptical exopodite of the same.



**Fig.162** *Hondoniscus mogamiensis* n. sp.

A. Dorsal view ; B. First antenna ; C. Second antenna ; D. Right mandible ; E. Left mandible ; F. Outer lobe of first maxilla ; G. Second maxilla ; H. Maxilliped ; I. First pereopod ; J. Seventh pereopod ; K. Penes and male first pleopod ; L. Male second pleopod ; M. Pleotelson and uropods (All : Holotype male).

**Gen. *Koshiniscus* n. gen.**

(Jap. name : Chôchin-warajimushi-zoku, new)

Eye absent. Cephalon with several protuberences. Ornamentation of peraeonal somite in two rows of tubercles. Pleonal somites provided with a row of protuberences. Pleotelson round. Flagellum of second antenna 4-segmented.

The new genus is allied to *Carloniscus* VERHOEFF, but is separated in the following features : (1) well developed 2~5 th pleonal somites, (2) round pleotelson, and (3) flagellum of the second antenna distinctly divided into 4 segments.

Type species : *Koshiniscus notojimensis* n. sp.

***Koshiniscus notojimensis* n. sp.**

(Jap. name : Noto-chôchin-warajimushi, new)

Figs.163 and 164

*Material examined* : 1 ♂ (holotype, 4.0mm in body length), in the crevice of artificial stone wall, supratidal zone on Yatsugasaki-shore, Notojima-cho, Notojima Island, Kashima-gun, Ishikawa Pref., coll. Noboru Nunomura, June. 30, 1984. Type specimen is deposited at the Toyama Science Museum (TOYA-Cr-9100).

*Description* : Body elongated, 2.6 times as long as wide. Body colour white. Cephalon round with 8~9 spheric tubercles. Each peraeonal somite with 2 pairs of round tubercles on the dorsal surface. Each pleonal somite with a pair of round tubercles. Eyes very small, each eye with 5 ocelli. Pleotelson small and round.

First antenna (Fig.164 F) 2-segmented ; first segment stout ; second segment triangular with many hairs.

Second antenna (Fig.164 G), reaching the posterior part of the first peraeonal somite, mutual length of five peduncular segments is 1 : 2 : 2 : 2 : 3. Flagellum 1.3 times as long as the fifth peduncular segment and abruptly narrower than the peduncular segments ; flagellum composed of 4 segments.

Right mandible (Fig.164 A) ; pars incisiva 3-headed ; lacinia mobilis weak and 3-toothed ; 2 hairy bristles between lacinia and processus molaris. Processus molaris is represented by a tuft of hairy bristles.

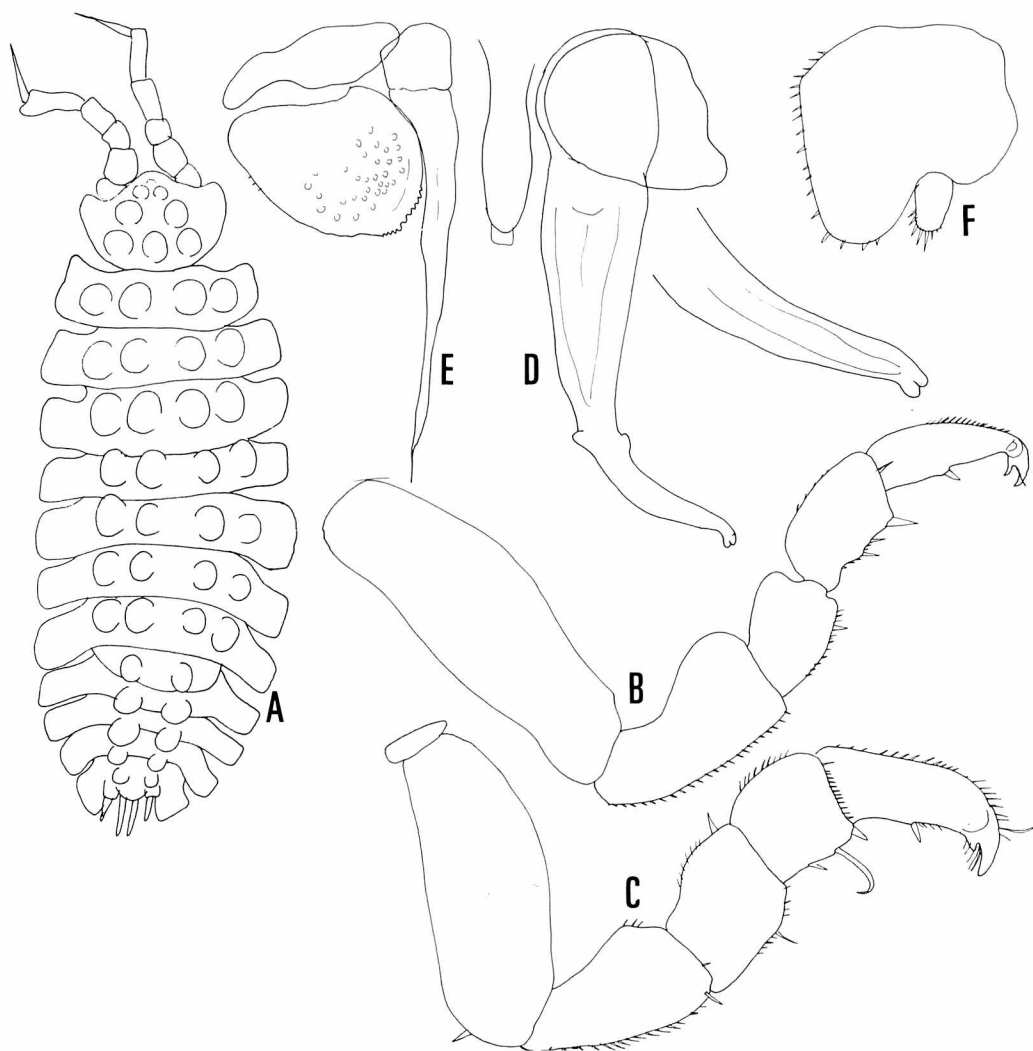
Left mandible (Fig.164 B) ; pars incisiva 3-headed ; lacinia mobilis strong and 3-toothed ; 2 hairy 5~6 bristles between lacinia and processus molaris. Processus molaris is represented by a tuft of hairy bristles.

First maxilla (Fig.164 C) ; endopodite narrow with a tuft of setae ; exopodite with 10 recurved entire teeth.

Second maxilla (Fig.164 D) rather narrow.

Maxilliped (Fig.164 E) ; endite narrow ; palp rather big and setose.

First peraeopod (Fig.163 B) ; basis long ; ischium rectangular ; merus short with a big setae and many hair on inner margin ; carpus rather short with 2 stout setae and many fine



**Fig.163** *Koshiniscus notojimensis* n. sp.

A. Dorsal view ; B. First pereopod ; C. Seventh pereopod ; D. Penes and male first pleopod ; E. Male second pleopod ; F. Uropod (All : Holotype male).

hairs on inner margin ; propodus short with a big seta on inner margin.

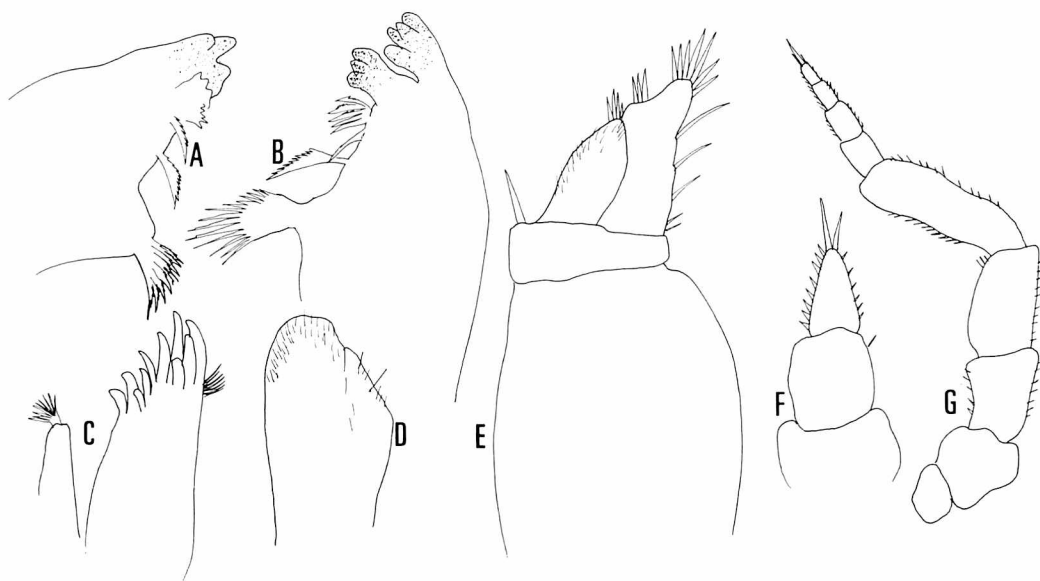
Seventh pereopod (Fig.163 C) ; basis short ; ischium triangular ; merus and carpus almost square ; propodus rather short with a seta on inner margin ; dactylus not so long with many hair.

Penes (Fig.163 D) fusiform and rather short.

Male first pleopod (Fig.163 D) ; exopodite round ; endopodite long and recurving towards outerwards, its apex with 2 small knobs.

Male second pleopod (Fig.163 E) ; exopodite round with sinuate inner margin ; endopodite





**Fig.164** *Koshiniscus notojimensis* n. sp.

A. Right mandible ; B. Left mandible ; C. First maxilla ; D. Second maxilla ; E. Maxilliped ; F. First antenna ; G. Second antenna (All : Holotype male).

straight and very narrow in the apical part.

Uropod (Fig.163 F) ; exopodite big and round ; endopodite small and narrow.

Habitat : The single specimen was collected from the litter among stones in the splash zone of an artificial breakwater.

### Family Scyphacidae DANA, 1853

#### Genus *Scyphax* DANA, 1853

The second species of the genus *Scyphax* was collected from Tsushima Island in the Japan Sea and will be herein described.

#### *Scyphax tsushimaensis*, n. sp.

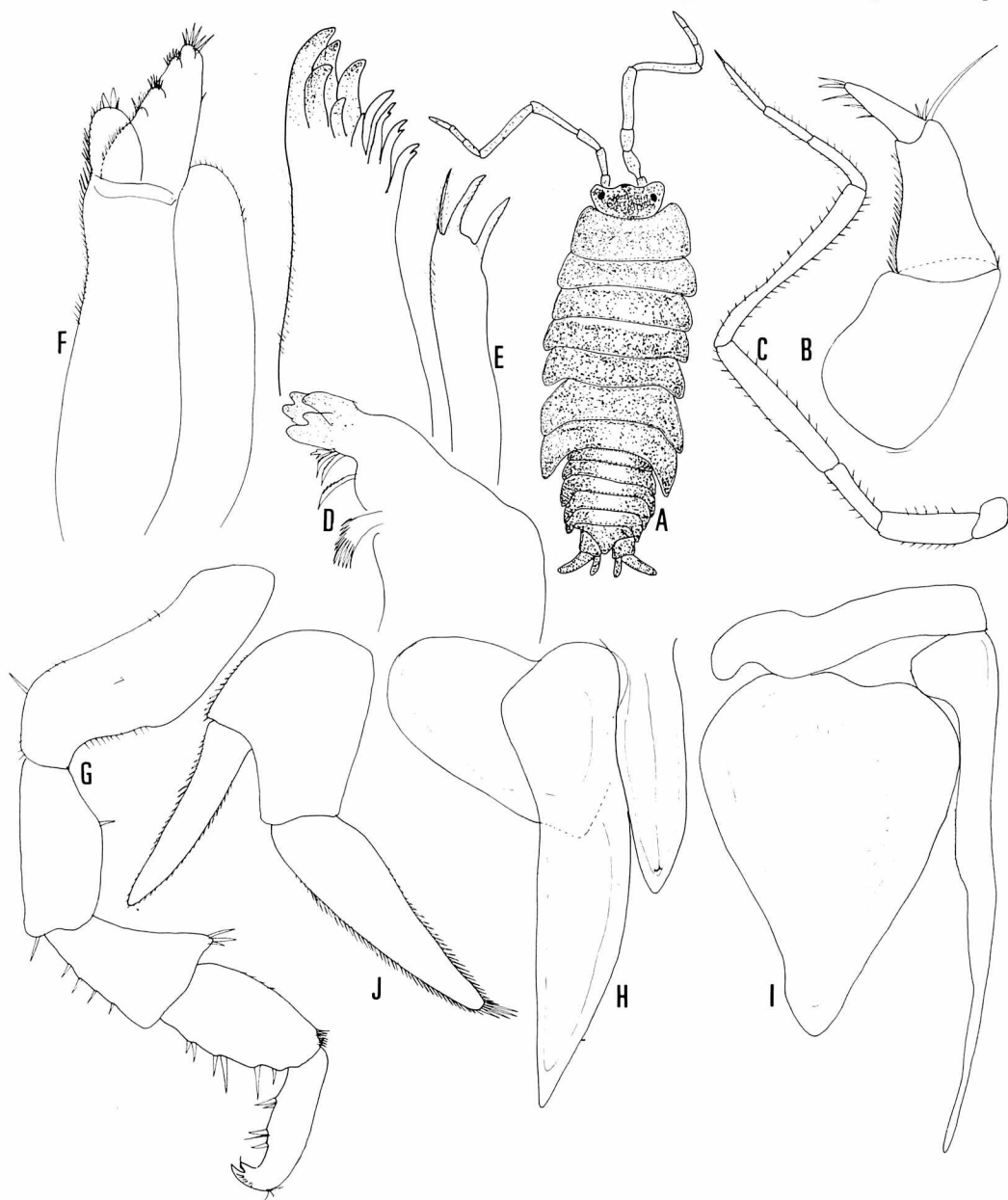
(Jap name : Tsushima-umibe-warajimushi, new)

Fig.165

*Material examined* : 3 ♂♂ (1 ♂ holotype, 6.7mm in body length and 2 ♂♂ paratypes, 6.8~7.8mm in body length) and 2 ♀♀ (1 ♀ allotype, 8.4mm in body length, 1 ♀ paratype, 6.3mm in body length), beach of Naiin-hama, near Tsutsu, Izuhara-cho, Shimoagata-gun, Tsushima Island, Nagasaki Pref., coll. Noboru Nunomura. Type series is deposited as follows : holotype (TOYA-Cr-8981), allotype (TOYA-Cr-8982) and 8 paratypes (TOYA-Cr-8983 ~8990) at the Toyama Science Museum, 2 paratypes (OMNH-Ar-3288 ~3289) at the Osaka

Museum of Natural History, 2 paratypes (YCM-CI-963~964) at the Yokosuka City Museum and 2 paratypes (NSMT-Cr-9776) at the National Science Museum, Tokyo.

*Description* : Body somewhat oblong, 2.5 times as long as wide. Body colour pale



**Fig.165** *Scyphax tsushimaensis* n. sp.

A. Dorsal view ; B. First antenna ; C. Second antenna ; D. Right mandible ; E. First maxilla ; F. maxilliped ; G. Seventh peraeopod ; H. Penes and male first pleopod ; I. Male second pleopod ; J. Uropod (All : Holotype male).

purplish pink. Eyes mediocre in size, each eye composed of 18 ocelli. All the peraeonal somites subequal in length. Pleotelson triangular. A gravid female bears 15 eggs in her brood pouch.

First antenna (Fig.165 B) ; 3-segmented ; first segment stout and square ; second segment conical ; terminal segment small.

Second antenna (Fig.165 C) long, reaching the fourth peraeonal somite ; mutual length of 5 peduncular segments is 1 : 3 : 2 : 5 : 6. Flagellum 3-segmented and almost as equal as the fifth peduncular segment ; mutual length of 3 segments is almost equal.

Right mandible ; pars incisiva 3-headed ; lacinia mobilis 5-headed : 9 hairy bristles behind lacinia mobilis ; processus molaris is represented by a tuft of hairy bristles.

Left mandible (Fig. 165 D) ; pars incisiva 3-headed ; lacinia mobilis 2-headed ; 3 hairy bristles behind lacinia mobilis ; processus molaris is represented by a tuft of hairy bristles.

First maxilla (Fig.165 E) ; outer lobe with 10 teeth at the tip, outer 5 of which is entire and stout ; inner lobe with 3 plumose setae on the tip.

Second maxilla conical.

Maxilliped (Fig.165 F) ; endite round with 2 stout spines at the distal end ; palp with indication of suture lines of 4 segments partly.

First peraeopod ; basis stout but relatively short ; ischium somewhat shorter than basis ; merus rectangular with many setae on inner margin and 3 setae at the outer distal corner ; carpus rectangular with 9~10 setae on inner margin ; propodus rather short and with 6 setae on inner margin.

Seventh peraeopod (Fig.165 G) ; basis oblong ; ischium about half the length of basis ; merus triangular with 3 setae at distal outer corner ; carpus swollen with 6 setae on inner margin and a group of fine setae at the outer distal corner ; propodus rather short with 4~5 setae on inner margin.

Penes (Fig.165 H) fusiform

Male first pleopod (Fig.165 H) ; endopodite lanceolate, rather short ; exopodite cordate in shape.

Male second pleopod (Fig.165 I) ; endopodite narrow and straight ; exopodite ovate.

Uropod (Fig.165 J) basis almost square ; endopodite narrow lanceolate ; exopodite stout and 1.5 times as long as the endopodite.

*Remarks* : The present new species is the second species of *Scyphax* reported from Japan. The species is separated from *S.nipponensis*, another species recorded from Osaka, in the following features : (1) slenderer body shape, (2) protruded pleotelson, (3) well developed lateral lobes of cephalon, (4) bigger eyes, (5) round endite of maxilliped, (6) stouter penes, and (7) more numerous teeth on outer lobe of first maxilla, the number of teeth might be 10 in *nipponensis*, too, if the minute teeth are included.

Family Marinoniscidae

Genus *Marinoniscus* NUNOMURA, 1986

The third species of the genus *Marinoniscus* is described from Kushimoto, Kii Peninsula, as follows.

*Marinoniscus pacificus* n. sp.

(Jap. name : Kuroshio-migiwa-warajimushi, new)

Figs.166 and 167

*Material examined* : 1 ♂ (holotype, 4.5mm in body length) and 5 ♀♀ (1 ♀ allotype, 4.4mm in body length and 4 ♀♀ paratypes, 2.8~4.1mm in body length), Sabiura, Kushimoto-cho, Nishimuro-gun, Wakayama Pref. coll. Noboru Nunomura, Mar. 20~21, 1988. Type series is deposited as follows : holotype (TOYA-Cr-8972), allotype (TOYA-Cr-8973) and 2 paratypes

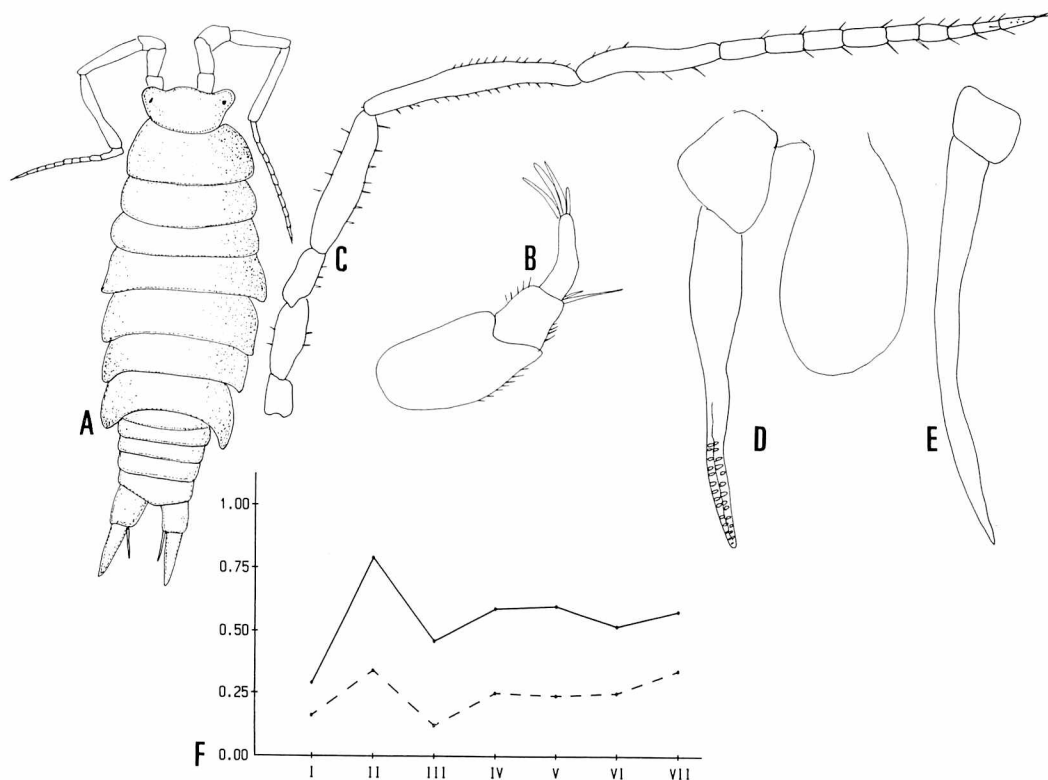


Fig.166 *Marinoniscus pacificus* n. sp.

A. Dorsal view ; B. First antenna ; C. Second antenna ; D. Male first pleopod ; E. Endopodite of male second pleopod ; F. Position of noduli lateralis, a full line shows b/c and a broken line shows d/c (All : Holotype male).

(TOYA-Cr-8974~8975) at the Toyama Science Museum and a paratype (OMNH-Ar-3293) at the Osaka Museum of Natural History, a paratype (NSMT-Cr-9776) at the National Science Museum.

*Description* : Body 2.4 times as long as wide. Colour pure red. Anterior part of cephalon weakly triangular ; epimera of peraeon indistinct. Pleon abruptly narrower than peraeon. Position of noduli lateralis on all the peraeonal somites are rather narrow to the lateral margin. Pleotelson triangular (Fig.166F).

First antenna (Fig.166 B) ; first segment big and rectangular ; second segment rectangular ; terminal segment rectangular with 5 aesthetascs at the tip.

Second antenna (Fig.166 C) long, reaching the fourth peraeonal somite ; mutual length of 4~5 peduncular segments is 1 : 2 : 2 : 4 : 6. Flagellum long, a little longer than the fifth peduncular segment.

Right mandible (Fig.167 A) ; pars incisiva 3-headed ; lacinia mobilis single-toothed ; a hairy bristle behind lacinia mobilis ; processus molaris is represented by a single tuft of hairy bristles.

Left mandible (Fig.167 B) ; pars incisiva 3-headed ; lacinia mobilis 3-headed ; 4 hairy bristles behind lacinia mobilis ; processus molaris is represented by a single tuft of hairy bristles.

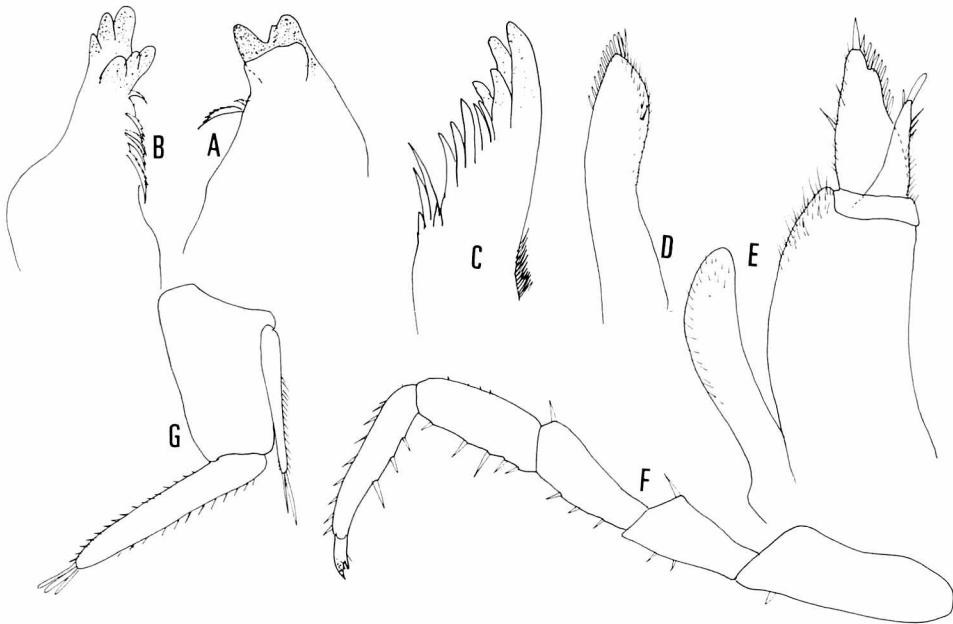


Fig.167 *Marinoniscus pacificus* n. sp.

A. Right mandible ; B. Left mandible ; C. Outer lobe of first maxilla ; D. Second maxilla ; E. Maxilliped ; F. Seventh peraeopod ; G. Uropod (A : Holotype male).

First maxilla (Fig.167 C) ; inner lobe narrow ; outer lobe with 11 teeth at the tip.

Second maxilla (Fig.167 D) narrow.

Maxilliped (Fig.167 E) ; endite narrow with a spine at the tip ; palp straight without any distinct suture line, with 10 spines.

Seventh peraeopod (Fig.167 F) ; basis rectangular ; ischium almost rectangular with a sternal margin ; merus rectangular as long, as ischium, with 3 spines on inner margin ; carpus as long as merus with 5 spines on inner margin ; propodus long with 3 spines on inner margin ; dactylus bifid.

Male first pleopod (Fig.166D) ; endopodite straight ; exopodite elliptical.

Male second pleopod (Fig.166 E) ; endopodite long.

Uropod (Fig.167 G) ; basis square ; endopodite narrow ; exopodite lanceolate.

*Habitat* : Under the stones, among wet sand, in the intertidal zone.

*Remarks* : The present new species is allied to *M. tomiokaensis* NUNOMURA, but is separated from the latter in the following features : (1) more numerous-segmented flagellum of second antenna, (2) shorter cephalon, and (3) shape of first antenna.