

Gordan S. KARAMAN
Biological Institute — Titograd

THE GENUS *GAMMARUS* FABR. IN JAPAN
(FAM. GAMMARIDAE)

(Contribution to the Knowledge of the Amphipoda 162)

ABSTRACT

The presence of taxa of the genus *Gammarus* Fabr. (*Amphipoda Gammaridea*, fam. *Gammaridae*) in Japan is discussed and *Gammarus nipponensis* Ueno 1940 and *Gammarus sobaegensis* Ueno 1966 are redescribed and figured from Japan. The taxonomic differences between both taxa are analysed and their similarity and possible synonymy are suggested.

INTRODUCTION

Recently I received the samples of freshwater amphipods collected on island Honshu in Japan: cave near Akiyoshi (Ube), and from Omiya River near Kyoto. The analysis of taxonomic characters of these samples showed that the specimens from Akiyoshi cave belong to the species *Gammarus sobaegensis* s. str. Ueno 1966, one species widely distributed in Korea, but never mentioned from Japan.

The specimens from Omiya River belong to the species *Gammarus nipponensis* Ueno 1940, showing one transitive position between *G. nipponensis* and *G. sobaegensis*.

Based on absence of distinct differences between *G. nipponensis* and *G. sobaegensis*, and recent description of several new taxa of *G. sobaegensis* (Lee et Kim 1980, G. Karaman 1984), we decided to redescribe both species from Japan, to put some more light on the relations between *nipponensis* and *sobaegensis* and suggest possible synonymy of *G. sobaegensis* s. str. with *G. nipponensis*.

Acknowledgments: I am thankful to Dr. Masanori Hiroki from Kyoto University of Education (Japan) and Dr. Christa Deeleman — Reinhold from Ossendrecht (Holland) for the loan of material used in this study.

GENUS GAMMARUS IN JAPAN AND SOME ADJACENT AREAS

The genus *Gammarus* Fabr. although widely distributed over whole Euroasiatic continent (from England and Spain to Japan and China) and North America, was very poorly studied in Japan. Till now, only one species was known from Japan, *Gammarus nipponensis* Ueno 1940, described from Kiyotaki in Kyoto (Honshu Island) and mentioned also for Syuhodo at Akiyosi (western part of Honshu Island) (Ueno, 1940). Hiroki in several his ecological papers (1981, 1982, 1984) mentioned *G. nipponensis* for Honshu Island, but without any taxonomical data.

Ueno (1966) described a new species from southern part of Korea, *Gammarus pulex sobaegensis*, n. ssp. from limnestone cave Simbog-gul in central part of southern Korea (Kumdae-ri, Yeon-pung-myeon, Koesan-gun, Chungcheongpuk-do); Ueno mentioned this species also (1966) for limnestone cave Hwanseon-gul in eastern part of southern Korea (Daei-ri, Dogye-eub, Samcheog-gun, Kwan-gweon-do).

Kim and Lee (1977) in their study of genus *Gammarus* in Korea, they recognized several groups of similar populations of genus *Gammarus*, but without establishing exact specific names for each of these groups.

Later, Lee and Kim (1980), in their further study of genus *Gammarus* from Korea they described several new taxa (*G. galgoensis*, *G. odaensis*, *G. soyoensis*, *G. zeongogensis*). They also redescribed *Gammarus sobaegensis* from type-locality, removing it to the specific rank. They collected *G. sobaegensis* from numerous localities over whole area of southern Korea, recognizing 7 different types of populations of this species through whole southern Korea (types 1—7); among these populations (types), type 1 was with the largest area of distribution, other six types were limited only to certain area each.

Lee and Kim (1980) showed the large limits of variability and taxonomic differences within the population or taxa of *G. sobaegensis* (presence or absence of plumose setae on outer margin of outer ramus in uropod 3, different types of pilosity of segment 2 and segments 4—5 of pereopods 5—7, the length and density of setae on peduncle and flagellum of antenna 2, all characters which can have a specific value in many *Gammarus* species known from Europe, N. Africa and Asia Minor (*G. fossarum*, *G. dulensis*, *G. kisch-*

neffensis). On the other hand, in many European species, the shape of eyes and armature on urosomites 1—3 can be very variable and poorly valuable in the taxonomic point of view (*G. balcanicus*, *G. fossarum*).

As the differences and characteristics of some of these Korean types were very peculiar, G. Karaman (1984) in his analysis of taxonomic characters of *Gammarus* species from Japan, China, Korea and adjacent areas, elevated Lee and Kim's types No. 2, 4 and 5 of *G. sobaegensis* to the subspecific rank (*kimi*, *leei*, *marginalis*), composing the key to the determination of all these species and subspecies of this region.

GAMMARUS NIPPONENSIS Ueno 1940:

figs.: I — III

Syn.: *Gammarus* (*Rivulogammarus*) *nipponensis* Ueno 1940: 81, fig. 91—116.

Gammarus nipponensis Hiroki 1981:286; Hiroki 1982:337; Barnard and Barnard 1983:468; G. Karaman 1984:153; Hiroki 1984:1.

? *Gammarus pulex* Tattersall 1922:451, pl. 20, fig. 19—27.

Material examined: JAPAN: Omiya River, Otsu, Shiga prefecture, (Honshu Island), July 3, 1973, several spec., water temperature 14°C (leg. M. Hiroki).

Description: Male 10 mm: Metasomsegments with several short setae at dorsoposterior margin; urosome low, urosomites 1—3 with one dorsomedial and 2 dorsolateral groups of elements consisting of spines and/or setae (fig. III, 4, 5).

Lateral cephalic lobes subrounded, eyes moderate, subreniform, (fig. III, 3). Antenna 1 slightly exceeding half of body, peduncular segment poorly setose (fig. I, 5), main flagellum with up to 29 articles bearing one short aesthetasc each and poorly setose, accessory flagellum consisting of 4—5 articles.

Antenna 2 densely setose, setae are long and straight, peduncular segments 4—5 each with up to 7 transversal groups of ventral setae (fig. I, 6), main flagellum slightly swollen, with up to 9 articles, articles with many long straight setae along ventral margin, calceola absent (fig. I, 6).

Mouthparts normal. Mandibular palp segment 1 smooth, segment 2 with up to 15 setae, segment 3 on outer face with one group of A-setae, on inner face with one group of B-setae, and with nearly 25 D and 5 E-setae (fig. III, 2).

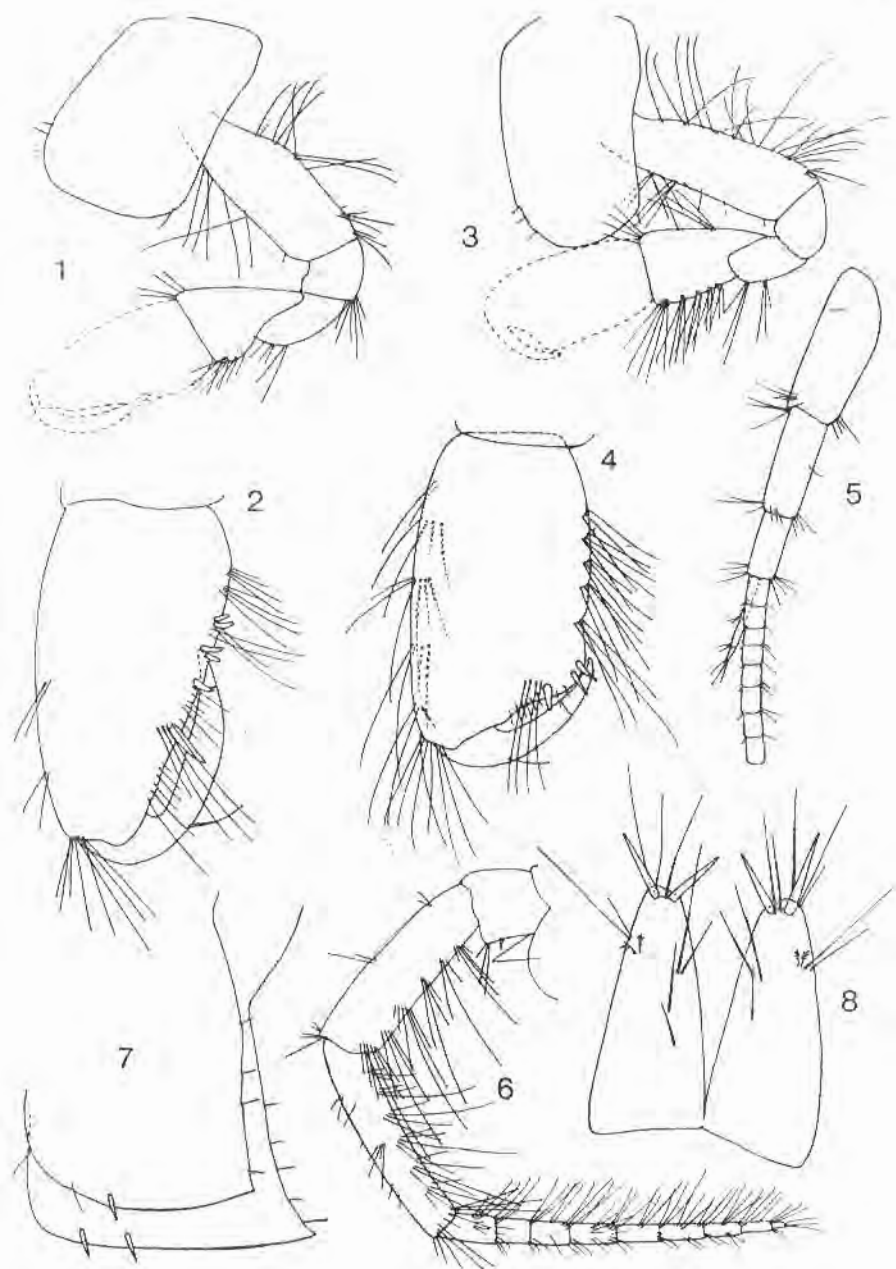


Fig. 1. *Gammarus nipponensis* Ueno 1940, Omiya River, Otsu, male 10 mm
 1—2 = gnathopod 1; 3—4 = gnathopod 2; 5 = antenna 1; 6 = antenna 2; 7 =
 epimeral plates 2—3; 8 = telson.

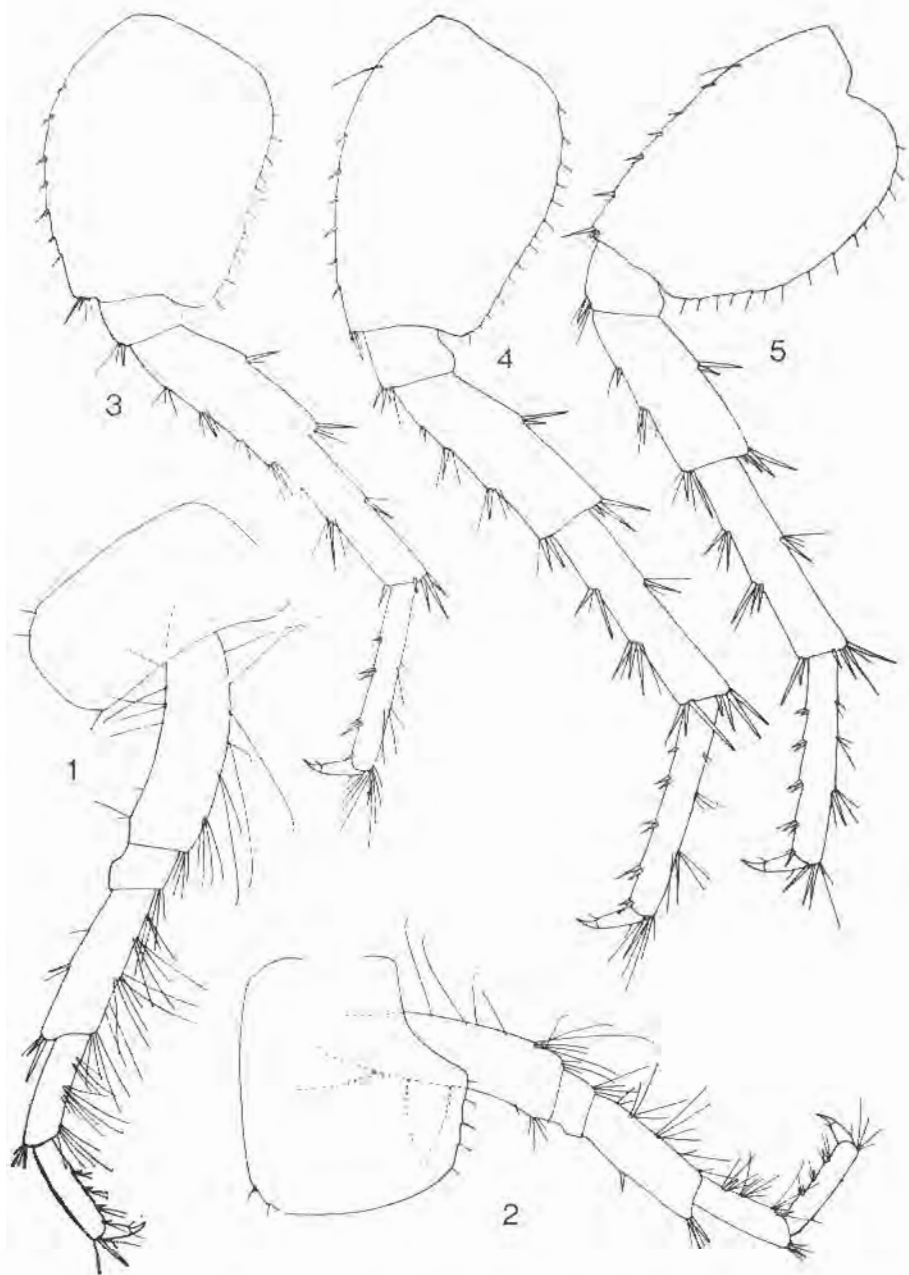


Fig. 11. *Gammarus nipponensis* Ueno 1940, Omiya River, Otsu, male 10 mm: 1 = pereopod 3; 2 = pereopod 4; 3 = pereopod 5; 4 = pereopod 6; 7 = pereopod 7.

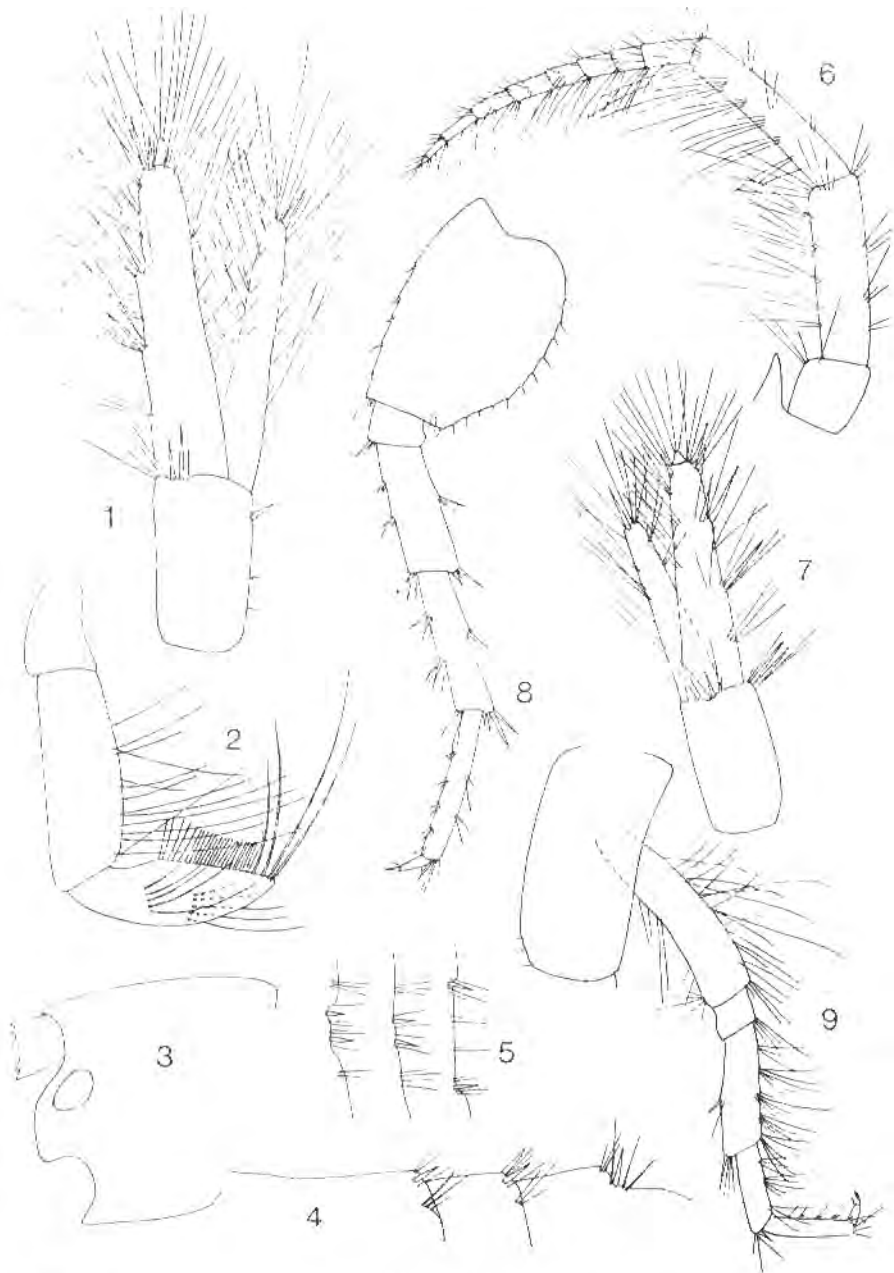


Fig. III. *Gammarus nipponensis* Ueno 1940, Omiya River, Otsu, male 10 mm: 1 = uropod 3; 2 = mandibular palp; 3 = head; 4 = urosome, lateral projection; 5 = urosome, dorsal projection; 6 = antenna 2, female 10 mm; 7 = uropod, 3, female 10 mm; 8 = pereopod 7, female 10 mm; 9 = pereopod 3, female 10 mm.

Coxae normal, poorly setose (fig. I, 1, 3; III, 1, 2). Gnathopods 1—2 moderately setose, with all straight setae only (fig. I, 1—4), dactyl with one seta at outer margin.

Pereopods 3—4 relatively slender, along posterior margin with long straight setae, especially on segments 4—5. Segment 6 with several pairs of short spines along posterior margin, accompanied by shorter setae (fig. II, 1, 2), dactyl short. Pereopod 4 is less setose and setae are shorter than these in pereopod 3 (fig. II, 2).

Pereopods 5—7 with relatively broad segment 2 bearing short setae along posterior margin and without inferior facial setae (fig. II, 3—5), ventroposterior lobe undistinct in pereopod 7, distinct in pereopod 5 (fig. II, 3, 5); segments 3—6 of pereopods 5—7 along anterior and posterior margin with spines, sometimes accompanied by single short setae, dactyl short and stout, with one seta at inner margin and short nail (fig. II, 3—5).

Pleopods with 2 retinacula each, accompanied by 2 setae. Epimeral plates 1—3 pointed, epimeral plates 2—3 each with 1—2 ventral spines (fig. I, 7).

Peduncle of uropod 1 with one ventrofacial spine, rami subequal. Uropod 2 with inner ramus distinctly longer than outer one. Uropod 3 moderately long, densely setose (fig. III, 1), outer margin of outer ramus bearing numerous simple setae only, inner margin of outer ramus and both margins of inner ramus bearing numerous long simple and plumose setae; second segment of outer ramus very short, shorter than spines; inner ramus reaching nearly 4/5 of outer ramus (fig. III, 1).

Telson is longer than broad, each lobe with 2, rarely only 1 spine and with several long facial and distal setae longer than spines (fig. I, 8).

Coxal gills occur on pereonites 2—7, ovoid.

Female like male, but antenna 2 is with slightly longer setae (fig. III, 6), calceola absent. Shape and pilosity of pereopods 3—7 like these in males (fig. III, 8, 9). Segment 6 of gnathopods 1—2 without medial palmar spine, and bearing all straight setae only. Epimeral plates and head like these in males. Each group of elements on dorsal surface of urosomites is consisting of spines or setae.

Uropod 3 like that in males but shorter, outer margin of outer ramus with simple setae only (fig. III, 7). Telson like that in males. Oostegys broad, occur on pereonites 2—5.

Loc. typ.: Japan: Kiyotaki in Kyoto, Honshu island.

Localities cited: loc. typ.; subterranean waters in Syuhodo at Akiyosi, Honshu island (Ueno 1940). He mentioned also that this species seems to be widely distributed from northern part of Honshu to Hyushu, Omiya river, Otsu (Hiroki 1981); in moun-

tain streams in Kyoto prefecture, mainly in southern part of the prefecture (Hiroki 1984).

Remarks and Affinities: Our specimens agree with description and figures given by Ueno (1940), except uropod 3. Ueno mentioned that outer margin of outer ramus in uropod 3 in males and females is with plumose setae; in all specimens in hands from Omiya river, outer margin of outer ramus of uropod 3 in males and females was with simple setae only.

On the other hand, the absence of long setae along anterior margin of pereopods 5—7 is identical with these mentioned and figured by Ueno (1940).

For this reason, we attributed our specimens to the species, *G. nipponensis* Ueno 1940, although the absence of plumose setae on outer margin of outer ramus in uropod 3 suggested the similarity with *G. sobaegensis*, or more precisely, with *G. sobaegensis* type 6 sensu Lee and Kim 1980. Unfortunately, the pilosity of anterior margin of pereopods 5—7 of type 6 was not described by Lee and Kim.

G. sobaegensis type 3 sensu Lee and Kim (1980) seems to be identical with *G. nipponensis* (except hardly more setose anterior margin of pereopods 5—7).

G. odaensis Lee and Kim 1980, known from several localities of southern part of Korea (loc. typ.: Sangwangbong, Mt. Odae), seems to be also very close to *G. nipponensis* (scarce pilosity of anterior margin of pereopods 5—7, presence of plumose setae at outer margin of outer ramus in uropod 3, etc.). But, in *G. odaensis* plumose setae on outer margin of outer ramus in uropod 3 can be sometimes replaced by simple setae also. For this reason, the value of *Gammarus odaensis* must be reexamined.

GAMMARUS SOBAEGENSIS Ueno 1966

figs: IV — VI

Syn.: *Gammarus* (*Rivulogammarus*) *pulex sobaegensis* Ueno 1966 : 525, fig. 14—18; Barnard and Barnard 1983 : 469.

Gammarus sp. (second group, part.) Kim and Lee 1977 : 29.

Gammarus sabaegensis Lee and Kim 1980 : 47, fig. 2—8.

Gammarus sobaegensis sobaegensis G. Karaman 1984 : 143.

Material examined: JAPAN: Island Honshu: Akiyoshi-Do Cave, Akiyoshi (Ube), March 16, 1969, several spec. (leg. C. Deeleman-Reinhold).

Description: Male 12.5 mm: Body smooth, urosomite low, urosomites 1 and 2 each with 4 groups of dorsal setae (fig. V, 8), urosomite 3 with 2 dorsolateral groups of setae accompanied by single spine.

Lateral cephalic lobes of head nearly subrounded (fig. IV, 6), eyes small, elyptic, shorter than the diameter of peduncle of antenna 1 (fig. IV, 6).

Antenna 1 long, only hardly shorter than body (12.5: 11.5), peduncle poorly setose, peduncular segments progressively shorter (fig. V, 1); main flagellum consisting of up to 45 articles, accessory flagellum 5—6—articulate.

Antenna 2 densely setose, at ventral margin of peduncular segment 5 appear nearly 9 groups of setae, setae are slightly longer than the diameter of segments, straight (fig. V, 2), flagellum slightly swollen, densely setose, consisting of 12 segments bearing numerous setae longer than the diameter of segments, calceola absent (fig. V, 2).

Mouthparts normal. Mandibular palp segment 1 smooth, segment 2 with nearly 28 setae (fig. IV, 7), segment 3 shorter than segment 2, bearing 25 D and 4—5 E-setae, on outer face with one group of A-setae and one group of B-setae on inner face (fig. IV, 7).

Coxae 1—4 normal, with short ventral marginal setae (fig. IV, 1, 2; V, 3, 5). Gnathopods 1 and 2 poorly setose, bearing all straight setae only; gnathopod 1 with segment 4 shorter than 6, palm of segment 6 with one median and several corner spines on outer face and 2 subcorner spines on inner face (fig. V, 3, 4).

Gnathopod 2: segment 6 with concave palm bearing one median and 4 corner spines on outer face and 2 groups of spines at inner face (fig. V, 6).

Pereopods 3—4 slender, posterior margin of pereopod 3 with numerous long straight setae, setae are much longer than diameter of segments themselves (fig. IV, 1, 2), dactyl short. Pereopod 4 is less setose than pereopod 3, with slightly shorter setae (fig. IV, 2).

Pereopods 5—7 moderately long, pereopod 5 only slightly shorter than pereopod 7. Segment 2 of pereopod 5 is with marked ventroposterior corner and with numerous posterior short marginal setae (fig. IV, 3); segment 2 of pereopods 6 and 7 long, without distinct ventroposterior corner (fig. IV, 4, 5), no setae on dorsal surface of segment 2; anterior margin of segments 4—5 of pereopods 5—7 with numerous setae nearly as long as or hardly longer than the diameter of segments themselves; setae are often accom-

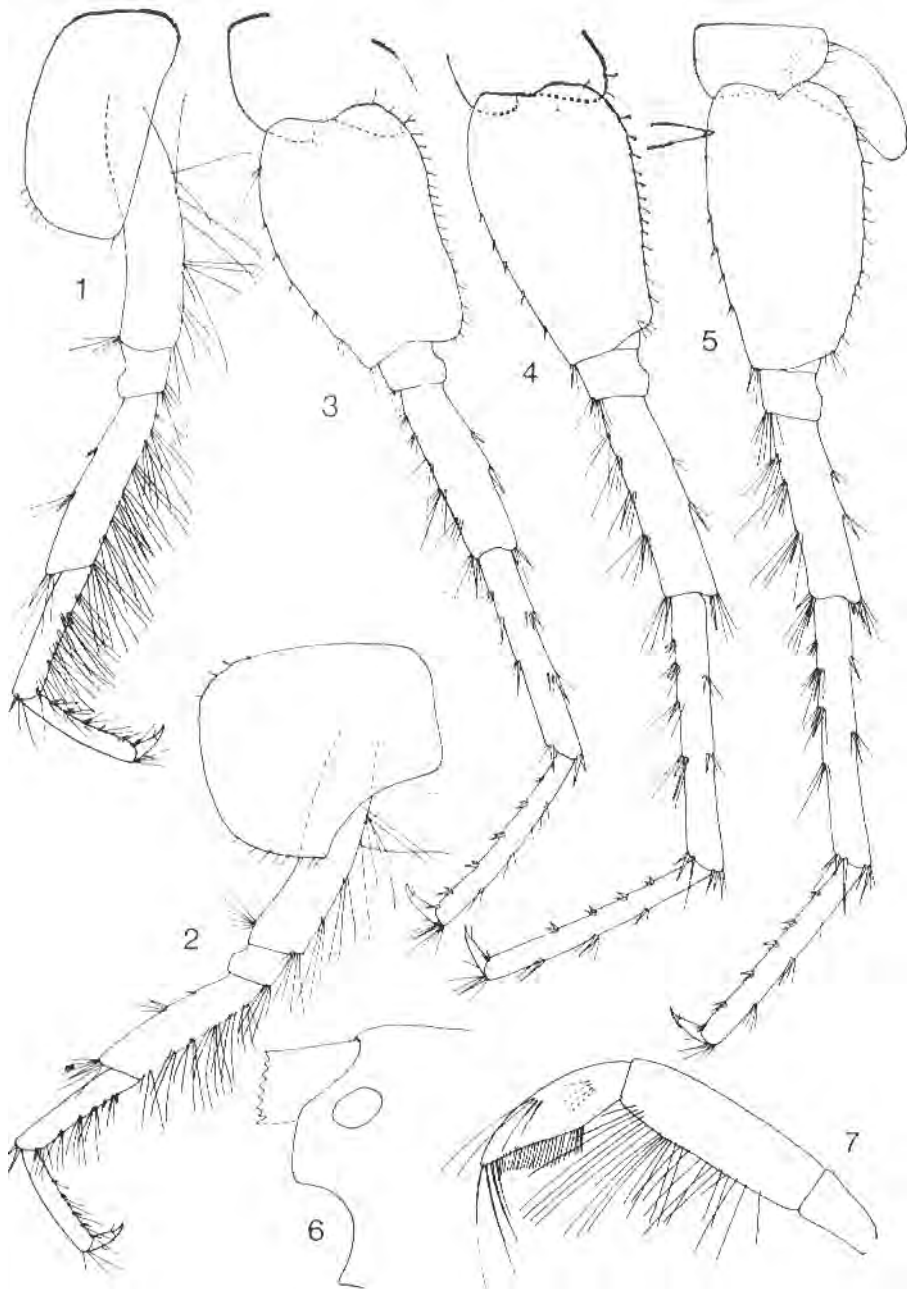


Fig. IV. *Gammarus sobaegenis* Ueno 1966, Akiyoshi — Do cave, Honshu, male 12.5 mm: 1 = pereopod 3; 2 = pereopod 4; 3—5 = pereopods 5—7; 6 = head; 7 = mandibular palp.

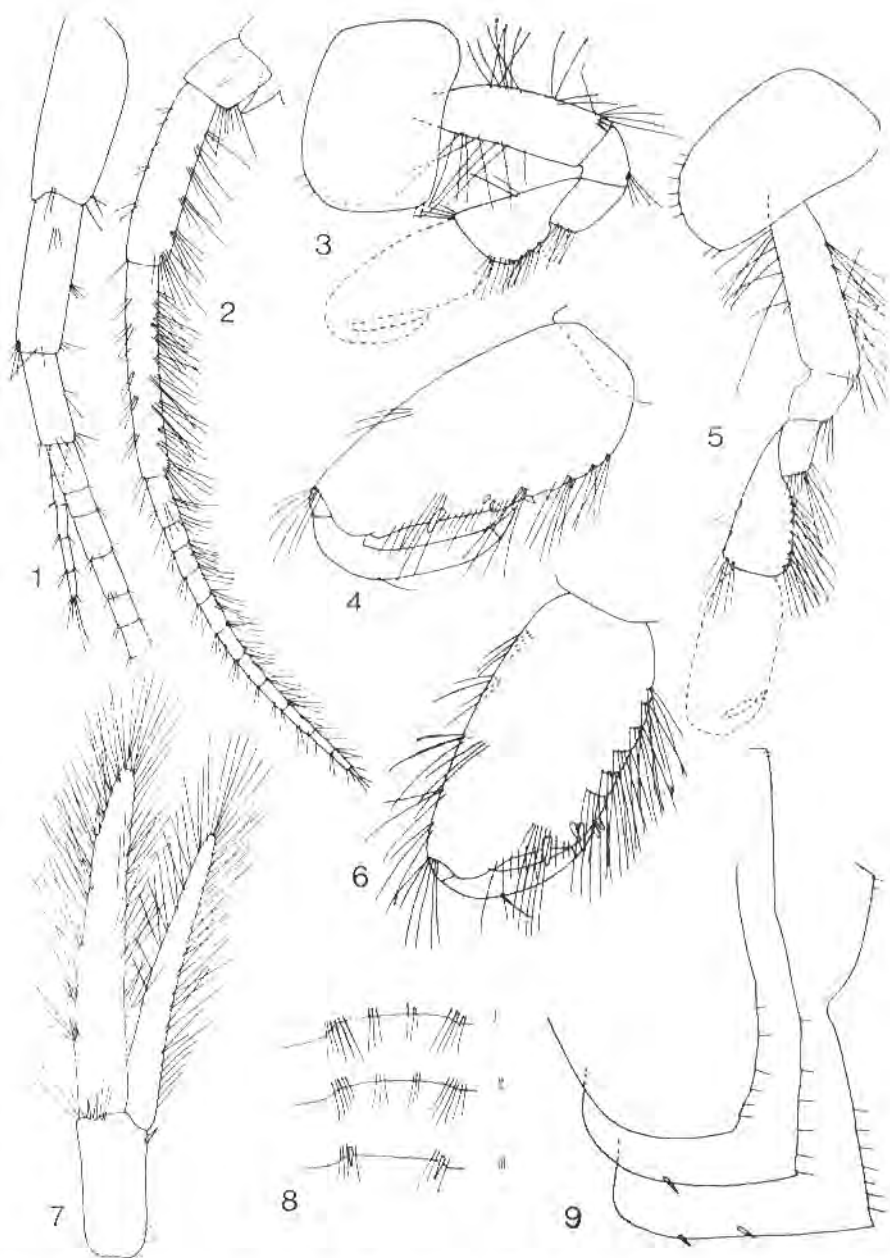


Fig. V. *Gammarus sobaegensis* Ueno 1966, Akiyoshi — Do cave, Honshu, male 12.5 mm; 1—2 = antennae 1—2; 3—4 = gnathopod 1; 5—6 = gnathopod 2; 7 = uropod 3; 8 = urosome, dorsal projection; 9 = epimeral plates 1—3.

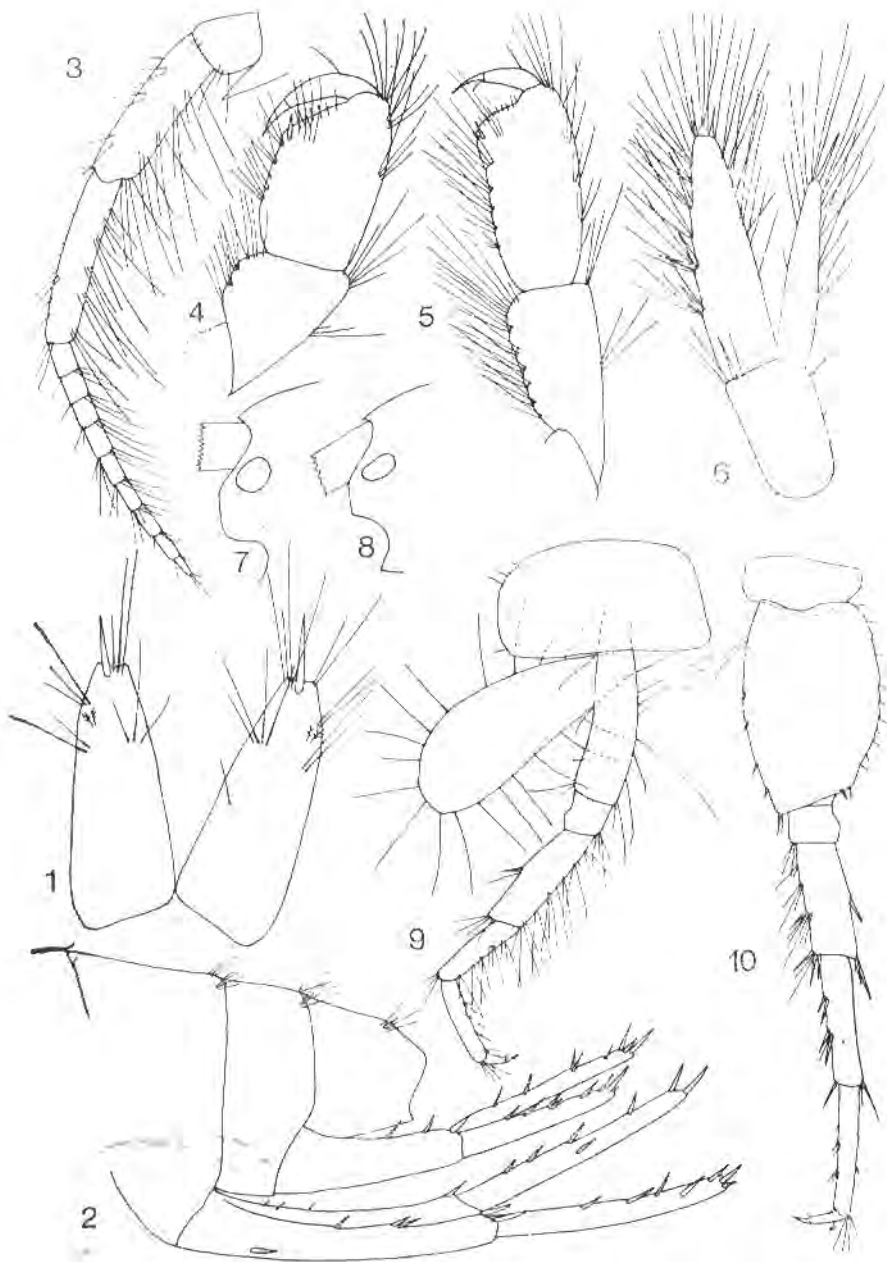


Fig. VI. *Gammarus sobaegensis* Ueno 1966, Akiyoshi — Do cave, Honshu, male 12.5 mm; 1 = telson; 2 = urosome with uropods 1—2; 3 = antenna 2, female 7.5 mm; 4—5 = gnathopods 1—2, female 7.5 mm; 6 = uropod 3, female 7.5 mm; 7—8 = head, females 7.5 and 7.4 mm; 9 = pereopod 3, female 7.5 mm; 10 = pereopod 7, female 7.5 mm.

panied by single spines shorter than setae, anterior margin of segment 6 with spines only; dactyl short, with one longer seta at outer margin, nail short (fig. IV, 3—5).

Pleopods 1—3 with 2 retinacula each accompanied by 2 strong setae each. Epimeral plates 1—3 angular, with several setae at posterior margin, ventral margin of epimeral plates 2—3 with spines only (fig. V, 9).

Ursomite 1 near basis of peduncle of uropod 1 without spine (fig. VI, 2). Uropod 1: peduncle with one ventrofacial spine, dorso-inferior margin of peduncle without spines, rami subequal (fig. VI, 2).

Uropod 2: inner ramus distinctly longer than outer one (fig. VI, 2). Uropod 3 long, much exceeding tip of uropods 1—2, rami long, densely setose, inner ramus reaching nearly $\frac{4}{5}$ of outer ramus, with simple and plumose setae along both margins (fig. V, 7); outer ramus 2-segmented, second segment short; outer margin of outer ramus with numerous simple setae only (only one plumose seta was observed in one uropod 3), inner margin with plumose and simple setae.

Telson longer than broad, deeply incised, each lobe with one distal spine and several long distal and facial setae longer than spine itself (fig. VI, 1). Coxal gills occur on pereonites 2—7.

Female ovig. up to 7.5 mm: Eyes small, ovoid to elyptic (fig. VI, 7, 8). Armature of urosome like that in males, or urosomite 2 sometimes with one lateral spine near setae.

Antenna 1 reaching up to $\frac{3}{4}$ of body, main flagellum consisting of up to 32 articles. Antenna 2 peduncle and flagellum bearing setae longer than these in males (fig. VI, 3), flagellum consisting of up to 10 articles, calceola absent; antennal gland cone longer than that in males (fig. VI, 2; VI, 3).

Mandible and coxae like these in males. Gnathopods 1—2 smaller, bearing straight setae only (fig. VI, 4, 5). Gnathopod 1: segment 5 shorter than segment 6, segment 6 without median palmar spine.

Gnathopod 2: segment 5 as long as segment 6, segment 6 without median palmar spine, palm convex, finely crenellated.

Pereopods 3—4 are less setose than these in males, all setae are straight, usually longer than the diameter of articles themselves (fig. VI, 9).

Pereopods 5—7 like these in males, but shorter (fig. VI, 10). Uropods 1—2 like these in males, epimeral plates also. Uropod 3 inner ramus reaching $\frac{2}{3}$ of outer ramus, outer margin of outer ramus with simple setae only, other margins of both rami with plu-

mose and simple setae, second segment of outer ramus short (fig. VI, 6). Telson like that in males. Oostegyts broad.

Variability: Eyes of variable shape, small. Ventrofacial spine on peduncle of uropod 1 is stable, as well as the absence of spine near basis of peduncle of uropod 1. The armature of urosome is rather variable, some spines can be present or absent, but all groups of setae are always present.

Loc. typ.: KOREA: Simboggul Cave (Geumdae, Galgeum-ri, Yeonpung-myeon).

Localities cited. KOREA: loc. typ.; Hwanseongul Cave Daei-ri, Dogye-eub) in southern part of Korea (Ueno 1966); numerous localities in southern part of Korea (Lee and Kim 1980; G. Karaman 1984);

JAPAN: present data.

Remarks and Affinities: Analysis of our specimens in hand from Akiyoshi Cave, showed that they belong to the *Gammarrus sobaegensis* type 1, i. e. to *G. sobaegensis* s. str., with some small differences: antenna 1 poorly shorter than body — length, consisting of 45 articles (shorter antenna, with 36 articles by Ueno 1966); pereopods 3—7 are slightly longer and narrower, especially segment 2 of pereopods 5—7 (shorter and broader by Ueno 1966); urosomites 1 — 2 with 2 lateral and 2 dorsal groups of setae, spines are almost absent (two lateral and one median group of spines and setae by Ueno 1966).

Lee and Kim (1980) mentioned that outer margin of outer ramus in uropod 3 is without plumose setae, or with only few plumose setae in some populations. They mentioned also some variability of eyes in specimens from cave and these from outside of cave, as well as certain variability of shape of segment 2 of preopod 7.

Unfortunately, neither Ueno (1966) nor Lee and Kim (1980) never compared the taxonomic characters of *G. sobaegensis* with these of former described and known species *G. nipponensis* Ueno 1940.

Type population of *G. sobaegensis* s. str. is very similar to the type population of *G. nipponensis* s. str. and differs from later only in two points: absence of plumose setae on outer margin of outer ramus in uropod 3, and presence of long setae at anterior margin of pereopods 5—7.

It seems that all 7 types of *G. sobaegensis* are with numerous setae at anterior margin of pereopods 5—7. The large limits of variability of numerous populations of *G. sobaegensis* and their »types 1—7«, as well as discovery of population of *G. nipponensis* with smooth setae on uropod 3 from Omiya River (transitive population

between *nipponensis* and *sobaegensis*), suggested that probably *G. sobaegensis* can be identical with *G. nipponensis*. This opinion is supported also by recent discovery of seasonal changes in the pilosity of body-parts during whole year in some populations of genus *Echinogammarus* in Europe (Pinkster, in litt.), as well as by variable pilosity of uropod 3 in *G. odaensis*.

As we have not more abundant material of *Gammarus* from Japan to establish the real value and stability of the taxonomic characters: pilosity of uropod 3 and pilosity of anterior margin of pereopods 5—7 within the populations from Japan, we leave for the moment both species as a distinct taxa.

CONCLUSION

The genus *Gammarus* Fabr. in the fresh waters of Japan is presented by two species, *G. nipponensis* Ueno 1940 and *G. sobaegensis* Ueno 1966 (last one is mentioned at the first time for Japan). The taxonomic differences between both species are very small and undistinct, suggesting their possible synonymy. These two species must be reexamined based on much richer material to establish the variability and value of taxonomic characters of each of these species.

LITERATURE CITED

- Barnard, J. L., C. M. Barnard, 1983. Freshwater Amphipoda of the World II. Handbook and Bibliography. — Hayfield Associates Mt. Vernon, Virginia, pp. 359—830.
- Hiroki, M. 1981. Comparison of locomotor behavior between standing-water — and running-water — dwelling Gammarids. — Japan. J. Ecol. 31:265—294.
- Hiroki, M. 1982. Diel changes in traffic frequency of three fresh-water Gammarid species in their natural habitats and in a laboratory aquarium. — Polskie Archiwum Hydrobiologii, 29 (2): 331 — 342.
- Hiroki, M. 1984. Biogeographical Survey on Malacostracan Fauna of the Mountain Streams in Kyoto Prefecture. (in Japanese). — 1: 17—24.
- Karaman, G. 1984. Remarks to the Freshwater Gammarus species (fam. Gammaridae) from Korea, China, Japan and some adjacent region (Contribution to the Knowledge of the Amphipoda 134). — Crnogorska Akademija Nauka i Umjetnosti, Glasnik Odjeljenja prirodnih nauka, 4: 139—162.
- Karaman, G., Pinkster, S. 1977. Freshwater Gammarus species from Europe, North Africa and adjacent regions of Asia (Crustacea — Amphipoda). Part. I *Gammarus pulex*-Group and related species. — Bijdragen tot de Dierkunde, 47 (1): 1—97.
- Kim, H. S., Lee, K. S. 1977. A Systematic Study on the Amphipoda in Korea, II On the Geographical Distribution and Variation of Species of Fresh-water *Gammarus* (Crustacea: Amphipoda, Gammaridae). — Korean Journal of Zoology, 20: 29—40, 7 figs.

- Lee, K. S., Kim, H. S.: 1980. On the geographical Distribution and Variation of Freshwater Gammarus in Korea, including Descriptions of Four new Species. — Crustaceana, Suppl., 6: 44—67.
- Ueno, M. 1940. Some Freshwater Amphipods from Manchoukuo, Korea and Japan. — Bulletin of the Biogeographical Society of Japan, 10: 63—85, 116 figs.
- Ueno, M. 1966. Results of the Speleological Survey in South Korea 1966. II. Gammaric Amphipoda found in subterranean waters of South Korea. — Bulletin of the National Science Museum, Tokyo, 9 (4): 501—535, 18 figs.
- Tattersall, W. M. 1922. Zoological Results of a Tour in the Far East. Amphipoda with Notes on an Additional Species of Isopoda. — Memoirs of the Asiatic Society of Bengal, 6: 435—459.

REZIME

ROD GAMMARUS FABR. U JAPANU (FAM. GAMMARIDE)

(162. Prilog poznavanju Amphipoda)

Gordan S. KARAMAN
Biološki zavod — Titograd

U radu je obrađen rod *Gammarus* Fabr. (*Amphipoda Gammaridea*, fam. *Gammaridae*) u Japanu. Rod *Gammarus*, iako široko rasprostranjen preko cijele Evroazije i sjeverne Amerike, relativno je slabo proučen u Japanu. Do sada je u kopnenim slatkim vodama Japana bila poznata samo jedna vrsta, *Gammarus nipponensis* Ueno 1940, prvobitno opisana iz Kiyotaki kod Kjota u Japanu, i kasnije navedena na još samo nekoliko lokaliteta. Međutim, nedostajao je detaljni opis vrste.

Ueno je opisao 1966 godine vrstu *Gammarus pulex sobaegensis*, n. ssp. iz Koreje, iz pećine Simbog-gul i naveo ju je također iz većeg niza drugih lokaliteta u Koreji.

Kim i Lee su 1977 godine u jednoj studiji o rodu *Gammarus* u Koreji, izdvojili nekoliko grupa sličnih populacija iz roda *Gammarus*, ali nisu postavili taksonomske kategorije za njih.

Lee i Kim su 1980 godine, nastavljajući studiju roda *Gammarus* u Koreji, opisali nekoliko novih taksona (*G. galg^osensis*, *G. odaensis*, *G. soyoensis*, *G. zeongogensis*). Oni su također ponovno opisali vrstu *G. sobaegensis* iz tipičnog lokaliteta i podigli je na nivo zasebne vrste. Oni su našli vrstu *G. sobaegensis* u velikom broju lokaliteta širom Koreje, i izdvojili su 7 različitih tipova populacija ove vrste. G. Karaman je 1984 godine neke od ovih tipova postavio kao zasebne podvrste (ssp. *kimi*, ssp. *leei*, ssp. *marginalis*) i dao ključ za determinaciju svih taksona ove grupe.

Proučavajući materijal amfipoda iz Japana, utvrdili smo postojanje pored vrste *G. nipponensis* još i vrste *G. sobaegensis sobaegensis* (iz pećine Akiyoshi-Do, na otoku Honšu). Analiza taksonomskih karaktera vrste *G. nipponensis* iz Omiya rijeke u prefekturi Shiga na otoku Honšu i taksonomskih karaktera vrste *G. sobaegensis* iz pećine Akiyoshi-Do kod mjesta Ube, pokazala su da postoje veoma male razlike između ove dvije vrste i da upravo populacije iz ova dva lokaliteta ukazuju na mogućnost da su ove vrste ustvari sinonimi jedne vrste, *G. nipponensis* Ueno 1940. Međutim, kako ne raspoložemo sa obimnim materijalom roda *Gammarus* iz Japana, nije moguće utvrditi sada širinu varijabilnosti svake od ovih taksona i potvrditi te naše sumnje, pa provizorno ostavljamo ove taksone kao zasebne vrste.