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GAMMARUS EMEIENSIS, A NEW SPECIES OF AMPHIPOD CRUSTACEAN FROM SICHUAN PROVINCE, CHINA

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ABSTRACT

Specimens of a new species of gammarid Amphipoda, *Gammarus emeiensis* n. sp., were found on Emei Mt., Sichuan Province, China. A detailed description of this freshwater amphipod is given and differences to related species are discussed.

Key words: Amphipoda, *Gammarus*, new species, China

INTRODUCTION

Gammarus is the largest genus with the highest number of freshwater Amphipoda. Worldwide 117 species were recorded until 1983 (Barnard & Barnard, 1983), including five species from China. After 1983, intensive study on Chinese *Gammarus* has been conducted (Karaman, 1984, 1989, 1991; Barnard & Dai, 1988; Morino & Dai, 1990). In a recent work on Chinese freshwater Amphipoda, a total of 45 species of the genus *Gammarus* are described (Hou, 2002). All of these works facilitated the comparative study of the present new species, *Gammarus emeiensis* n. sp.

SYSTEMATIC DESCRIPTION

Gammarus emeiensis n. sp.
Figs. 1-4

MATERIAL. - Holotype, male (7.5 mm, IZCAS-I-A0011); allotype, female (8.1 mm, IZCAS-I-A0012); paratypes, 1 male and 1 female. All specimens were collected by Peter Jaeger from Emei Mt. (29.5°N 103.3°E) in Sichuan Province, China on 29-III-1999. Types of this new species are deposited in the Institute of Zoology, Chinese Academy of Sciences (IZCAS).

ETYMOLOGY. - The epithet *emeiensis* is derived from the name of the type locality, Emei Mt.

DESCRIPTION OF THE HOLOTYPE MALE. - Body length 7.5 mm, eyes moderately large, reniform, (Fig. 1A). Antenna 1 (Fig. 3E): length ratios of peduncular segments 1-3 = 1 : 0.72 : 0.31, primary flagellum with up to 25 segments, most of which with aesthetascs; accessory flagellum with two-four segments.

Antenna 2 (Fig. 3D): peduncular segment 3 bearing a few distal setae; segment 4 about as

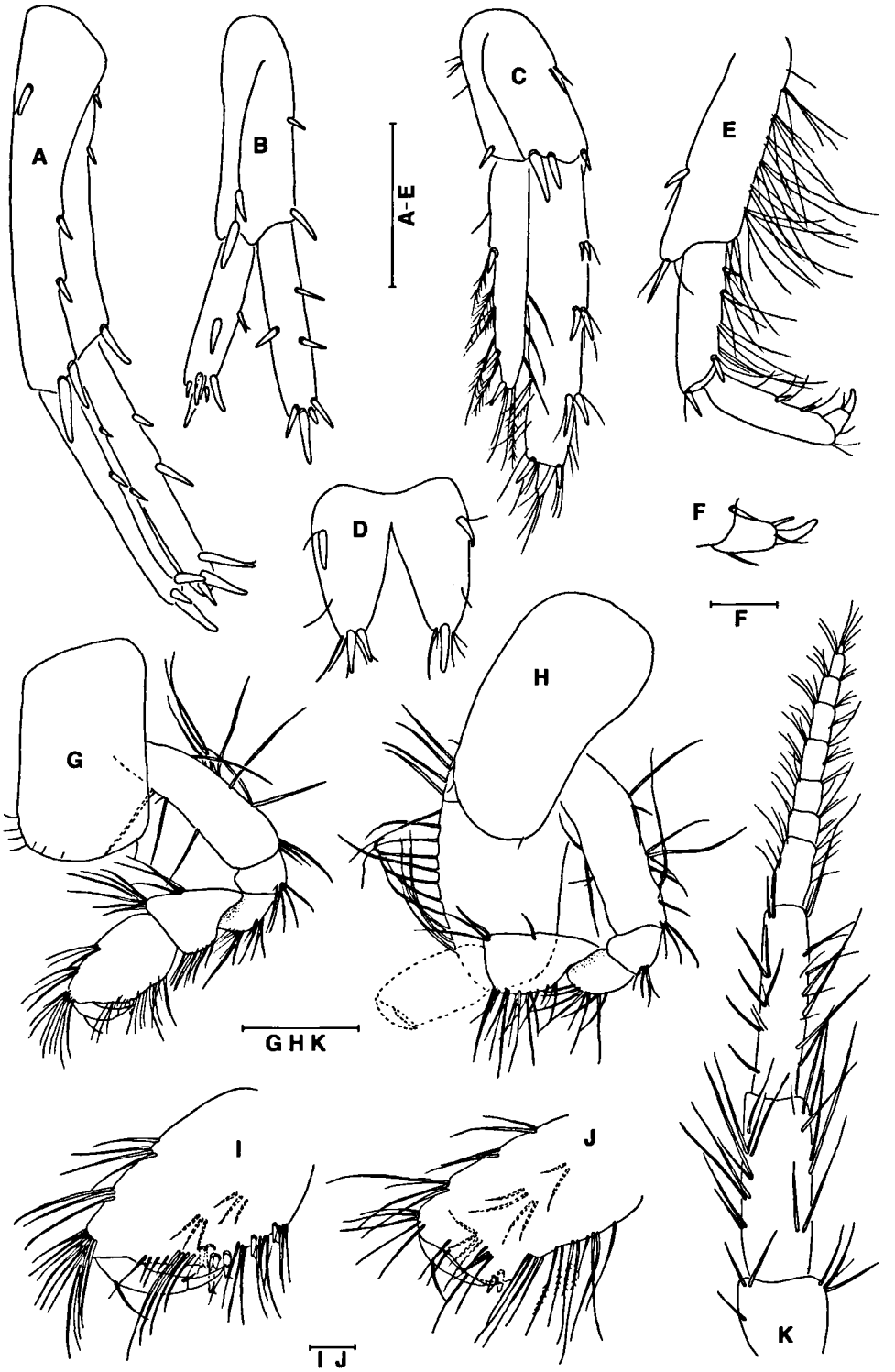

Fig. 1. *Gammarus emeiensis* n.sp., male. A, head. B, epimeral plates. C, urosomites (dorsal view). D, urosomites and uropods. E, lower lip. F, upper lip. G, incisor of right mandible. H, incisor of left mandible. I, palp of left mandible (medial view). J, maxilliped. K, maxilla 2. L, maxilla 1. M, outer plate of maxilla 1. N, palp of right maxilla 1 (scales: A-D = 0.5 mm; E-N = 0.1 mm).

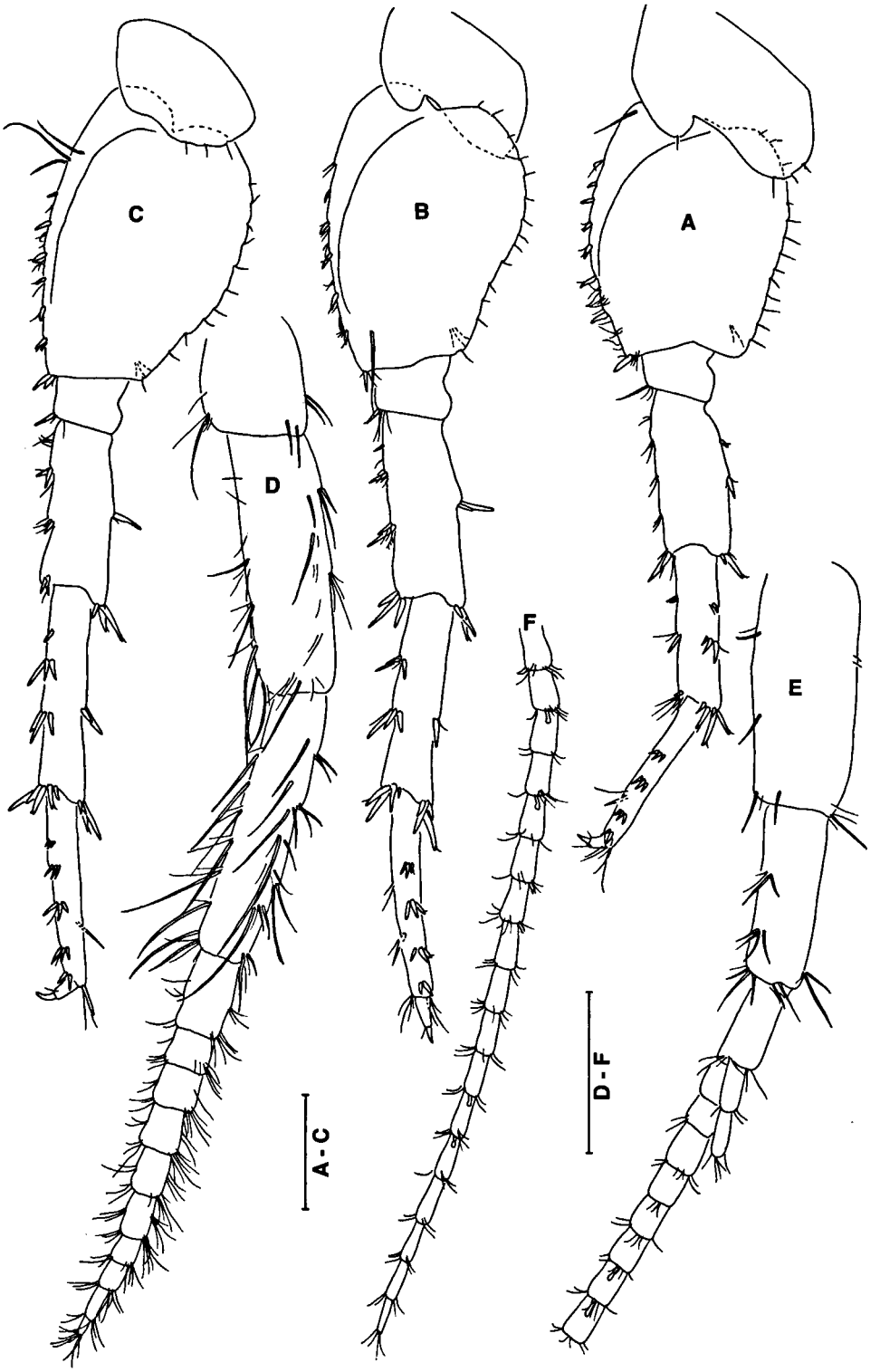

Fig. 2. *Gammarus emeiensis* n.sp., male. A, gnathopod 2. B, gnathopod 1. C, propodus of gnathopod 2 (medial view). D, propodus of gnathopod 1. E, propodus of gnathopod 2. F, pereopod 3. G, pereopod 4. H, pleopod 2. I, pleopod 1. J, pleopod 3 (scales: A-C, F-J = 0.5 mm; D, E = 0.1 mm).

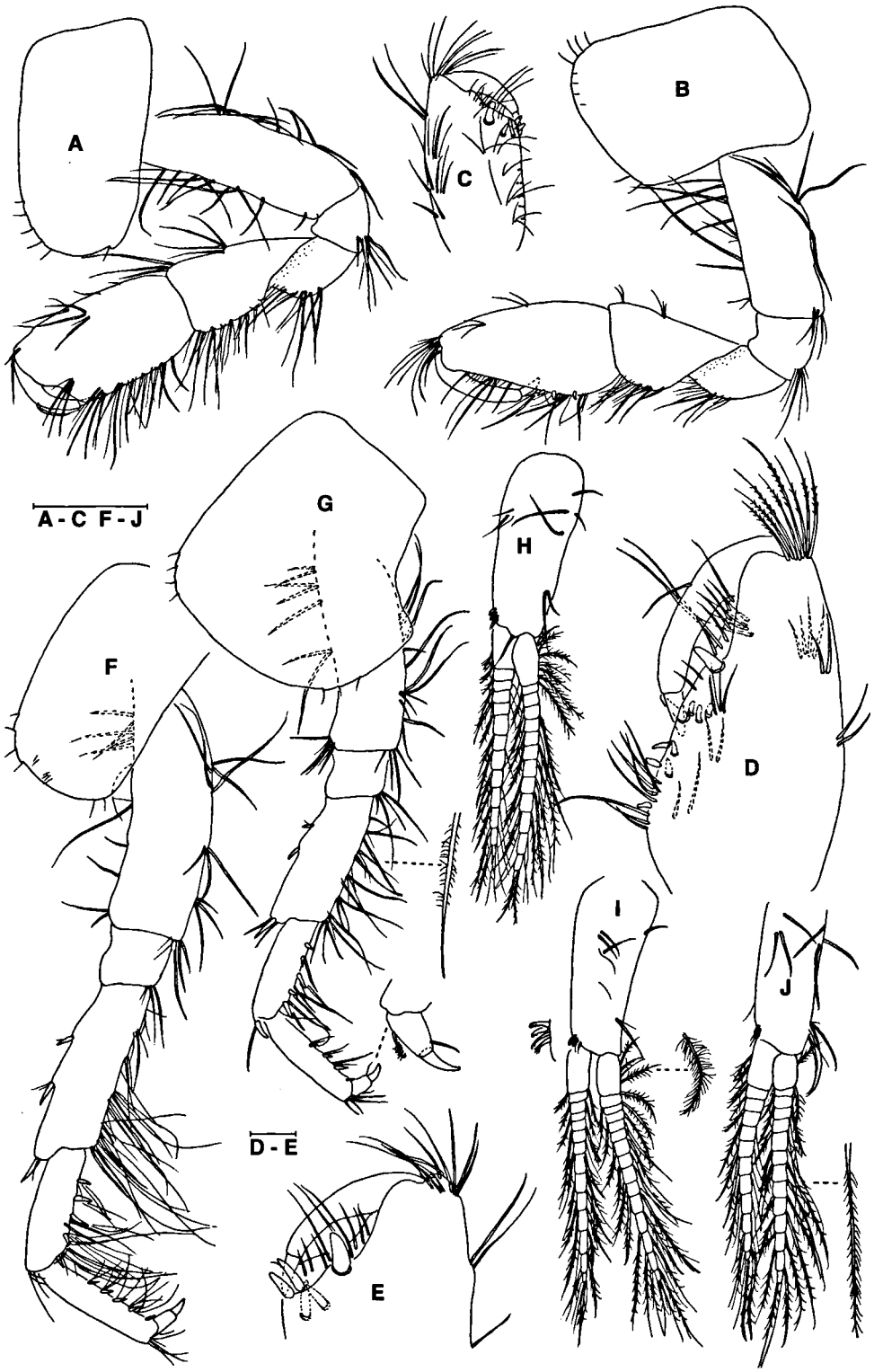

Fig. 3. *Gammarus emeiensis* n.sp., male. A, pereopod 5. B, pereopod 6. C, pereopod 7. D, antenna 2. E, antenna 1. F, flagellum of antenna 1 (scales: A-C, D-F = 0.5 mm).

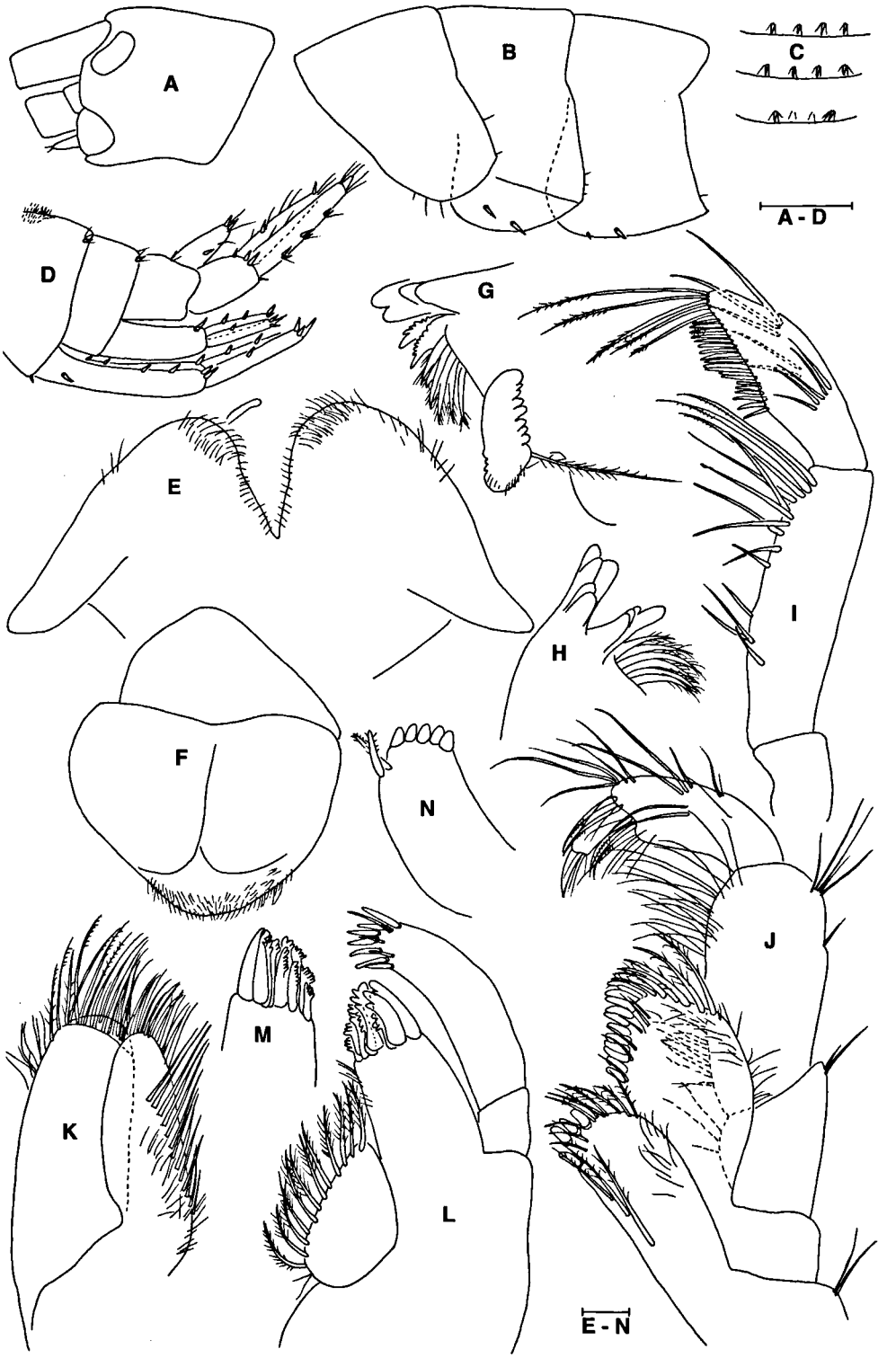

Fig. 4. *Gammarus emeiensis* n.sp, male (A-D) and female (E-K). A, uropod 1. B, uropod 2. C, uropod 3. D, telson. E, pereopod 3. F, dactylus of pereopod 3. G, gnathopod 1. H, gnathopod 2. I, propodus of gnathopod 1. J, propodus of gnathopod 2. K, antenna 2 (scales: A-E, G, H, K = 0.5 mm; F, I, J = 0.1 mm).

long as segment 5; segments 4 and 5 with three-four groups of long setae on anterior and posterior margins; flagellum with up to 10 segments, calceoli absent.

Upper lip (Fig. 1F): convex, with minute apical setae. Mandibles: incisor of left mandible (Fig. 1H) five-dentate; lacinia mobilis with four dentitions; molar triturative with one seta; palp segment 2 longer than segment 3, bearing 11 setae on lateral and medial margins; segment 3 with two groups of A-setae, four B-setae, 20 D-setae and five E-setae. Incisor of right mandible (Fig. 1G) four-dentate, lacinia mobilis bifurcate and with irregular denticles.

Maxilla 1 (Fig. 1L): inner plate with 12 plumose setae; outer plate bearing 10 serrated spines; second segment of left palp bearing seven slender spines and three stiff setae. Second segment of right palp with five short blunt spines and two plumose setae. Maxilla 2 (Fig. 1K): inner plate bearing oblique row of 13 setae on inner surface; outer plate bearing many apical setae.

Maxilliped (Fig. 1J): inner plate with three blunt spines apically; outer plate bearing about 12 blade-like spines on medial margin and five pectinate apical setae; palp with four segments.

Coxal plates: coxal plates 1-3 subrectangular, longer than wide, with four-five and one-two setae on anterior and posterior corners, respectively (Figs. 2A, B, F); coxal plate 4 with concave posterior margin, bearing four and three setae on anterior corner and posterior margin, respectively (Fig. 2G); coxal plates 5-7 wider than long, with one to three setae on posterior corner (Figs. 3A, B, C).

Gnathopods: gnathopods 1 and 2 with all straight setae (Figs. 2A, B, D, E). Bases of gnathopods 1 and 2 similar, bearing some long setae on anterior and posterior margins. Carpus of gnathopod 1 shorter than propodus; propodus ovate, palm oblique, bearing one large medial spine and nine spines on posterior margin. Carpus of gnathopod 2 subrectangular; palm of propodus short, slightly oblique, bearing one large medial spine and two spines on lateral and medial corner, respectively. Dactylus of gnathopod 1 about half of palm margin, that of gnathopod 2 about as long as palm margin.

Pereopods 3-4: bases of pereopods 3 and 4 narrow (Figs. 2G, F). Segments 4-6 of pereopod 3 with long setae on posterior margins, segments 5-6 with five spines posteriorly. Pereopod 4 shorter than pereopod 3, armature of segments 4-6 reduced.

Pereopods 5-7: pereopods 6 and 7 longer than pereopod 5, pereopod 6 slightly longer than pereopod 7 (Figs. 3A-C). Bases of pereopods 5-7 expanded posteriorly; anterior margins bearing ca. eight spines and a few short setae; segments 4-5 with groups of two-three spines on anterior margins; segment 6 bearing groups of two-three spines on anterior margin. Coxal gills on pereopods 2-7 sac-like.

Pleopods 1-3 subequal, peduncles bearing two retinaculae accompanied by two setae; rami with 13-15 segments, bearing plumose setae (Figs. 2H, I, J).

Epimeral plates 1-3 with two-three short setae on posterior margin (Fig. 1B). Epimeral plate 1 ventrally rounded, bearing four setae on anterior corner; epimeral plate 2 nearly straight at posterior angle, with two spines; epimeral plate 3 weakly acuminate, with two spines on ventrodistal margin.

Urosomites 1-3 (Fig. 1C) with four clusters of spines accompanied by short setae on posterodorsal margin. Urosomite 1 bearing minute setae dorsally (Fig. 1D). Uropod 1 (Figs. 1D, 4A): peduncle bearing one basofacial spine, dorsolateral and dorsomedial margins with two spines, respectively; distal corners with one and two spines, respectively. Both rami subequal, outer ramus with one medio-lateral spine on outer margin, two spines on inner margin and three-five distal spines. Uropod 2 (Figs. 1D, 4B): peduncle with four spines, outer ramus a little shorter than inner ramus, both rami with one-two spines on inner and outer margins respectively. Uropod 3 (Figs. 1D, 4C): peduncle bearing a few setae and four spines on distal corners; inner ramus about 74% length of segment 1 of outer ramus, bearing two marginal spines and one distal spine; segment 1 of outer ramus with six dorsomedial spines; segment 2 about as long as apical spines of segment 1. Telson deeply cleft, each lobe bearing one-two distal and one basofacial spine (Fig. 4D).

SEXUAL DIMORPHISM. - Minor sexual dimorphism could be observed in a 8.1 mm female (Figs. 4E-K) as follows: propodus of gnathopod 1

shorter than that of male, bearing four spines on posterior corner and two spines on posterior margin. Propodus of gnathopod 2 with almost rectangular palm, bearing two spines on posterior corner. Oostegites on pereopods 2-5 ovate, with many long setae.

HABITAT. - The new species, *Gammarus emeiensis* n. sp., was collected from a brook on Emei Mt., a branch of Qionglaishan Mts. located in the southwest of the Sichuan Basin. The western part of Emei Mt. belongs to the Qinghai-Tibet Plateau, the so-called 'third pole' of the earth. There are three rivers, Minjiang, Qingyijiang and Daduhe River, to the north and south of Emei Mt.

DISCUSSION. - *Gammarus emeiensis* n. sp. is distinguished by the following diagnostic characters: peduncular segments 4 and 5 of antenna 2 with rows of long setae; calceoli absent on antenna 2; pereopod 3 with long straight setae on posterior margins of segments 4 and 5; outer ramus of uropod 3 with a few setae on outer margin; urosomite 1 with minute setae dorsally.

Similar to *G. emeiensis* n. sp., long setae on antenna 2 are also present in *Gammarus taliensis* Shen, 1954, from Yunnan province. But *G. taliensis* differs from *G. emeiensis* n. sp. by the presence of calceoli on antenna 2 and plumose setae on the outer ramus of uropod 3.

The remaining eight species of *Gammarus* known from China (*G. gregoryi* Tattersall, 1924, *G. hongyuanensis* Barnard & Dai, 1988, *G. lacustris* Sars, 1863, *G. lasaensis* Barnard & Dai, 1988, *G. nekkensis* Uchida, 1935, *G. shanxiensis* Barnard & Dai, 1988, *G. spinipalmus* Chen, 1939, and *G. suifuensis* Martynov, 1925) can be easily distinguished from *G. emeiensis* n. sp. by a less setose antenna 2, and the presence of calceoli on antenna 2 in males.

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REFERENCES

BARNARD, J. L. & C. M. BARNARD, 1983. Freshwater Amphipoda of the world. I. Evolutionary Patterns. II. Handbook and bibliography. Hayfield Assoc. Mt. Vernon, Virginia: 1-830.

BARNARD, J. L. & A. Y. DAI, 1988. Four species of *Gammarus* (Amphipoda) from China. Sinozoologia **6**: 85-112.

CHEN, Y. T., 1939. Notes on some freshwater amphipods of Peiping. Peking National University. 40th Anniversary Papers **18**: 41-55 (1-15).

HOU, Z. E., 2002. Systematics of Chinese freshwater Amphipoda (Crustacea: Amphipoda: Gammaridea): 1-462. (Dissertation).

KARAMAN, G. S., 1984. Remarks to the freshwater *Gammarus* species (Fam. Gammaridae) from Korea, China, Japan and some adjacent regions (Contribution to the knowledge of the Amphipoda 134). Montenegrin Acad. Sci. arts, Glasnik, Sect. Nat. Sci. **4**: 139-162.

KARAMAN, G. S., 1989. One freshwater *Gammarus* species (Gammaridea, Fam. Gammaridae) from China (Contribution to the knowledge of the Amphipoda 189). Poljopr. Sum. **35** (1-2): 19-36.

KARAMAN, G. S., 1991. The survey of described and cited freshwater *Gammarus* species (Fam. Gammaridae) from Soviet Union with redescription of two taxa (Contribution to the knowledge of the Amphipoda 205). Poljopr. Sum. **37** (3-4): 37-73.

MARTYNOV, A. V., 1925. On a new freshwater species of *Gammarus* from south Ussurjan Land. Russk. gidrobiol. Zh. **4**: 189-194.

MORINO, H. & A.Y. DAI, 1990. Three amphipod species (Crustacea) from East China. Publ. Itako Hydrobiol. Stat. 4: 7-27.

SARS, G. O., 1863. Beretning om en i Sommeren 1862 foretagen zoologisk Reise i Christianias og Trondhjems Stifter. Nyt Mag. Naturvid. **12**: 193-340.

SHEN, C. J., 1954. On two species of Amphipoda Crustacea from Yunnan. Acta zool. sin. **6**: 15-22.

TATTERSAL, W. M., 1924. Zoological results of the Percy Sladen Trust expedition to Yunnan, under the leadership of professor J. W. Gregory, F. R. S.(1922). J. Proc. Asiatic Soc. Bengal (n. s.) **19** (9): 429-435.

UCHIDA, H., 1935. Crustacea of Jehol freshwater Amphipoda. Rep. 1st sci. exped. Manchoukuo, sect. 5, div. 1, part **2** (9): 1-6.

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