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Some remarks on the genus *Echinogammarus* Stebbing, 1899 with description of a new species *E. valedictus* from Algeria (Crustacea, Amphipoda)

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Abstract

Some short remarks are made on taxonomic problems in the genus *Echinogammarus* and a description is given of a new species from mountain streams in Algeria, characterized by a one-segmented exopodite in uropod 3.

Résumé

On fait quelques remarques sur les problèmes taxonomiques du genre *Echinogammarus* et donne la description d'une espèce nouvelle, provenante des eaux de montagne de l'Algérie. L'uropode 3 de cette espèce est charactérisée par une exopodite unisegmentée.

Introduction

The genus *Echinogammarus* was established by Stebbing (1899) without indicating a type species. In this genus Stebbing incorporated many different forms which now are considered members of other genera. Chevreux & Fage (1925) gave a more precise definition of the genus and indicated, by subsequent selection, *E. berilloni* (Catta, 1878) as type species.

In the same year, Martynov (1925) described the genus *Chaetogammarus*, also without indicating a type species, but Stock (1968) proposed *C. ischnus* (Stebbing, 1899) as type species. When S. Karaman (1931) erected the new genus *Ostiogammarus*, and Schellenberg (1937a, 1937b, 1943) created the genera *Marinogammarus*, *Homoeogammarus*, and *Parhomoeogammarus*, the confusion was complete.

Stock (1968) started to solve the difficulties, proving that *Ostiogammarus* is a junior synonym of *Echinogammarus*, both sharing the same type species. Likewise he proved that *Marinogammarus* is a junior synonym of *Chaetogammarus*. In the same paper he showed that the genera *Homoeogammarus* and *Parhomoeogammarus* can not be separated from *Echinogammarus*. Although he showed the close relationship between *Chaetogammarus* and *Echinogammarus*, both genera were not synonymized. Likewise, he created the *Echinogammarus pungens*-group, viz. a group of sibling species, all described as *E. pungens*, that share a number of characters but likewise differ in many others. The reason to do so was a mere practical one, based on morphological criteria only. The same practical arguments were used by Pinkster & Stock (1972) and Pinkster (1973) to create the *Echinogammarus simoni*-group and the *Echinogammarus berilloni*-group.

In the following years, when hundreds of new samples were studied from all over Europe and northern Africa, it became clear that no clear distinction could be made, neither between *Echinogammarus* and *Chaetogammarus*, nor between the species-groups mentioned before since all kinds of intermediates could be found.

Karaman (1977) finally cut the Gordian knot and synonymized *Echinogammarus* and *Chaetogammarus*, an opinion we can agree with (in the same

paper he discussed the position of some other genera, but this discussion will not be treated in the present paper). Karaman (1977: 78–79) gives a definition of the genus *Echinogammarus* and among other characteristics he mentions a multi-segmented accessory flagellum of antenna 1 and a bi-segmented outer ramus of uropod 3. This definition is adopted by Barnard & Barnard (1983). Neither Karaman nor Barnard & Barnard were very consistent, however; in reality they applied a much wider definition in retaining *E. tacapensis* (Chevreux & Gauthier, 1924) and *E. afer* Stock, 1974 (both with a one-segmented accessory flagellum) as well as *E. sicilianus monomerus* Stock, 1977 (with a one-segmented outer ramus of uropod 3) within the genus, an opinion generally accepted.

We therefore want to propose that the definition of the genus *Echinogammarus* should be widened as far as the one-segmented accessory flagellum of antenna 1 and the one-segmented outer ramus of uropod 3 are concerned. This is logical, after having synonymized many genera in which all steps of reduction in both the accessory flagellum and in the outer ramus of uropod 3 are found. The situation found in *E. tacapensis*, *E. afer*, and *E. sicilianus monomerus* is just a final stage in an evolutionary process. In view of these considerations a new species is described, likewise with a one-segmented outer ramus of uropod 3. For a more complete discussion on the genus *Echinogammarus* and related genera, we refer to a forthcoming revision of the genus (Pinkster, in prep.).

Echinogammarus valedictus n. sp. (Figs. 1–3)

Material examined. – Algeria, Djurdjura Mts., Tikja, alt. 1200 m, 5-V-1983, leg. Osella. The ♂ holotype, ♀ allotype, and about 75 paratypes are deposited in the collections of the Museo Civico di Storia Naturale, Verona, Italy. About 40 paratypes are deposited in the Zoölogisch Museum Amsterdam, coll. no. Amph. 108.000.

– Algeria, Djurdjura Mts., Tizi Ouzou, Tikja, alt. 2000 m, 13-VI-1982, leg. Sama, many specimens, deposited in the Museo Civico di Storia Naturale, Verona, Italy.

Diagnosis. – Small species with one-segmented exopodite of uropod 3. Coxal plates 1 to 4 with many setae on lateral surface. Marked sexual dimorphism in pereiopods 5 to 7.

Description. – Male: Habitus (Fig. 3A) slender, maximum length observed ca. 10 mm. Body smooth, urosomites 1 to 3 flat, not keeled or compressed laterally. Urosomites 1 and 3 with 1 dorsomedian group of 1 or 2 spines and 3 to 5 setae, urosomite 2 with 1 dorsomedian and 2 dorsolateral groups of spine(s) and setae (Fig. 1E).

Lateral cephalic lobes rounded, eyes relatively small, ovoid (Fig. 1F). Antenna 1 (Fig. 1B) about half of body length; peduncle segment 1 little longer than segment 2, segment 3 about half the length of segment 1. Flagellum 25- to 28-segmented, poorly setose; accessory flagellum 3-segmented. Antenna 2 (Fig. 1A): peduncle segment 4 about 4/5 of segment 5, both set with groups of setae about as long as diameter of peduncular segments. Flagellum up to 12-segmented with tufts of setae longer than the flagellar segments; calceoli always absent.

Mandible palp (Fig. 2G): segment 2 with several long ventral setae and some setae on both inner and outer surface; segment 3 very slender, little shorter than segment 2 with 3–4 A-setae, 4–5 B-setae, 14–16 barbed D-setae decreasing in length distally, and 4 or 5 E-setae.

Coxal plates 1 to 4 (Figs. 1D, G, J, and 2B) have rounded ventral corners, set with short setules; lateral surface with a row of setules. Gnathopod 1 (Figs. 1G, H): carpus 2/3 of length of propodus, with 4 rows of posterior setae; propodus more or less pyriform, armed with a strong medial palmar spine, a palmar angle spine and a varying number of smaller spines along posterior margin. The setation is well developed. Gnathopod 2 (Figs. 1J, 2A): carpus 2/3 of length of propodus with 5 rows of posterior setae; propodus little longer than in gnathopod 1, with subparallel margins; a strong medial palmar spine, 2 or 3 palmar angle spines and some smaller spines are present; many groups of medium long setae are found on the inner and outer surface.

Pereiopods 3 and 4 (Figs. 1D, 2B): in P3 the setae on segments 4 and 5 are as long as or little longer than the diameter of the segments, in P4 these setae are usually shorter than these segments.

Pereiopod 5 (Fig. 2F): basis subrectangular with a backward protruding lobe. In P6 and P7 (Figs. 2C, E) the aspect of the basis gradually changes into a more elongate one; some setae are found on the

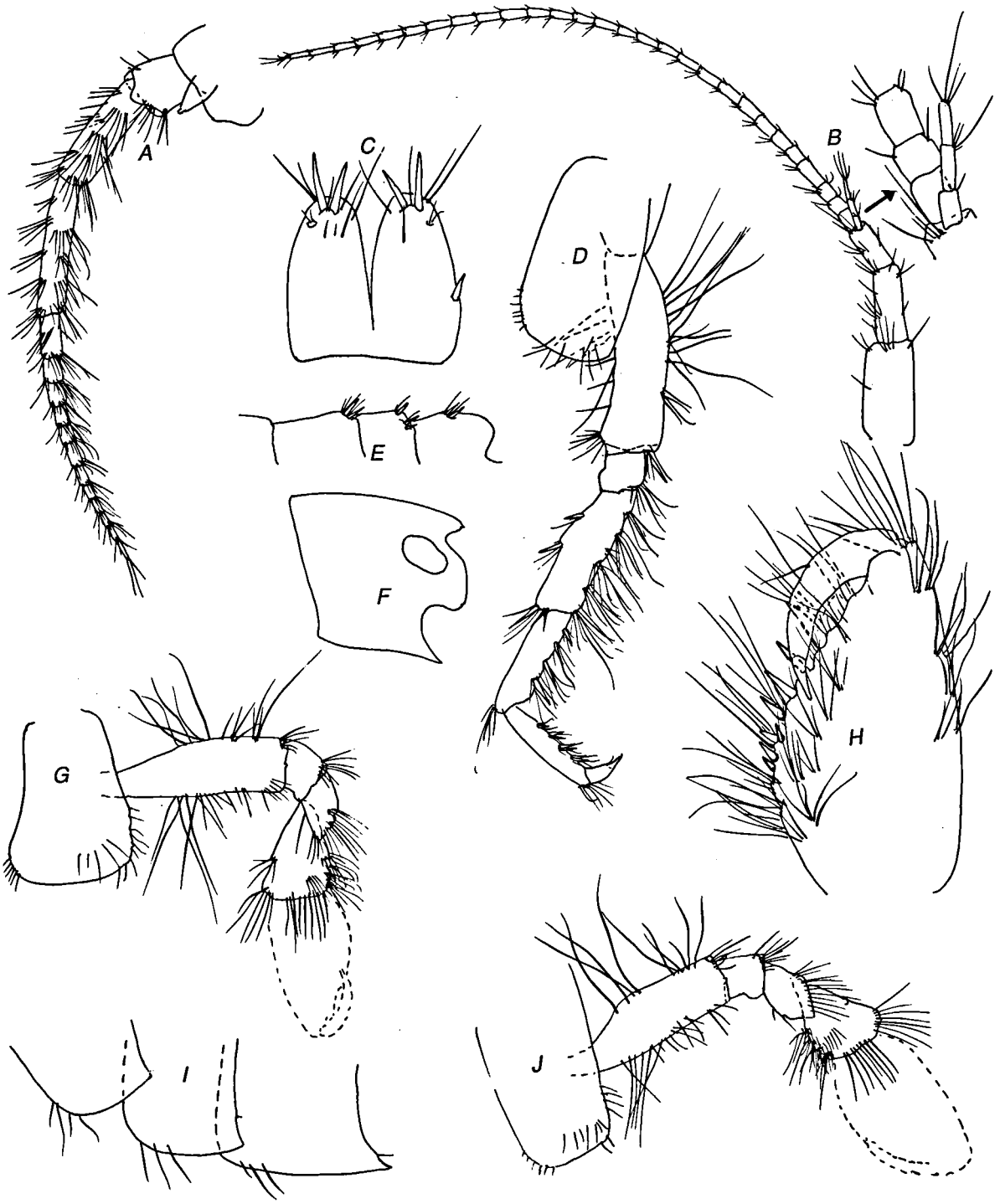

Fig. 1. Echinogammarus valedictus n. sp., ♂ paratype 9.8 mm: A, second antenna (scale 3); B, first antenna (3) and detail of accessory flagellum (4); C, telson (3); D, third pereiopod (3); E, urosome (1); F, head (1); G, gnathopod 1 (3); H, propodus of gnathopod 1 (4); I, epimeres (1); J, gnathopod 2 (3).

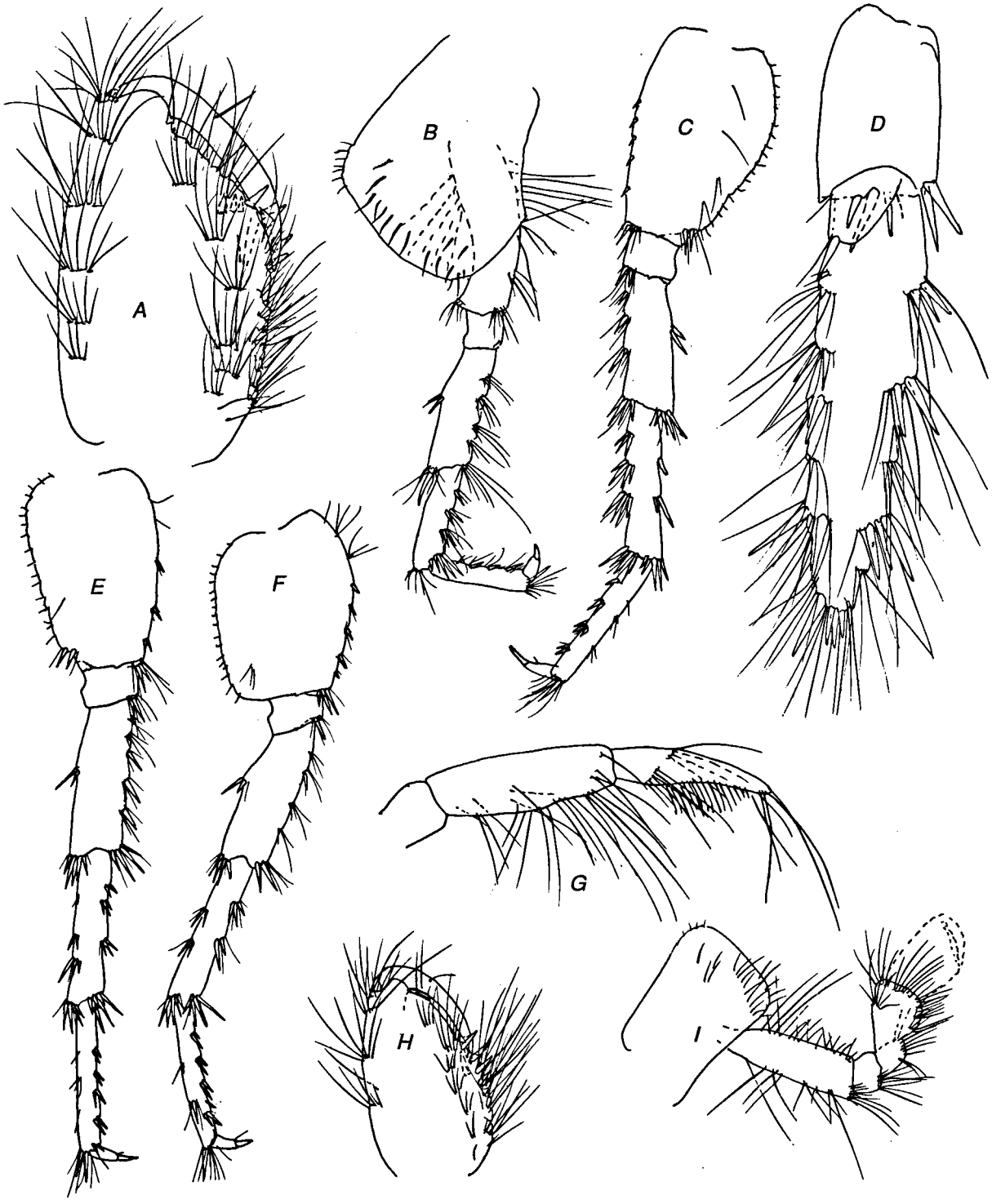

Fig. 2. Echinogammarus valedictus n. sp. (A–G, ♂ paratype 9.8 mm, H and I, ♀ paratype 7 mm): A, propodus of gnathopod 2 (scale 4); B, pereiopod 4 (3); C, pereiopod 7 (3); D, uropod 3 (4); E, pereiopod 6 (3); F, pereiopod 5 (3); G, mandibular palp (4); H, propodus of gnathopod I (4); I, gnathopod 1 (3).

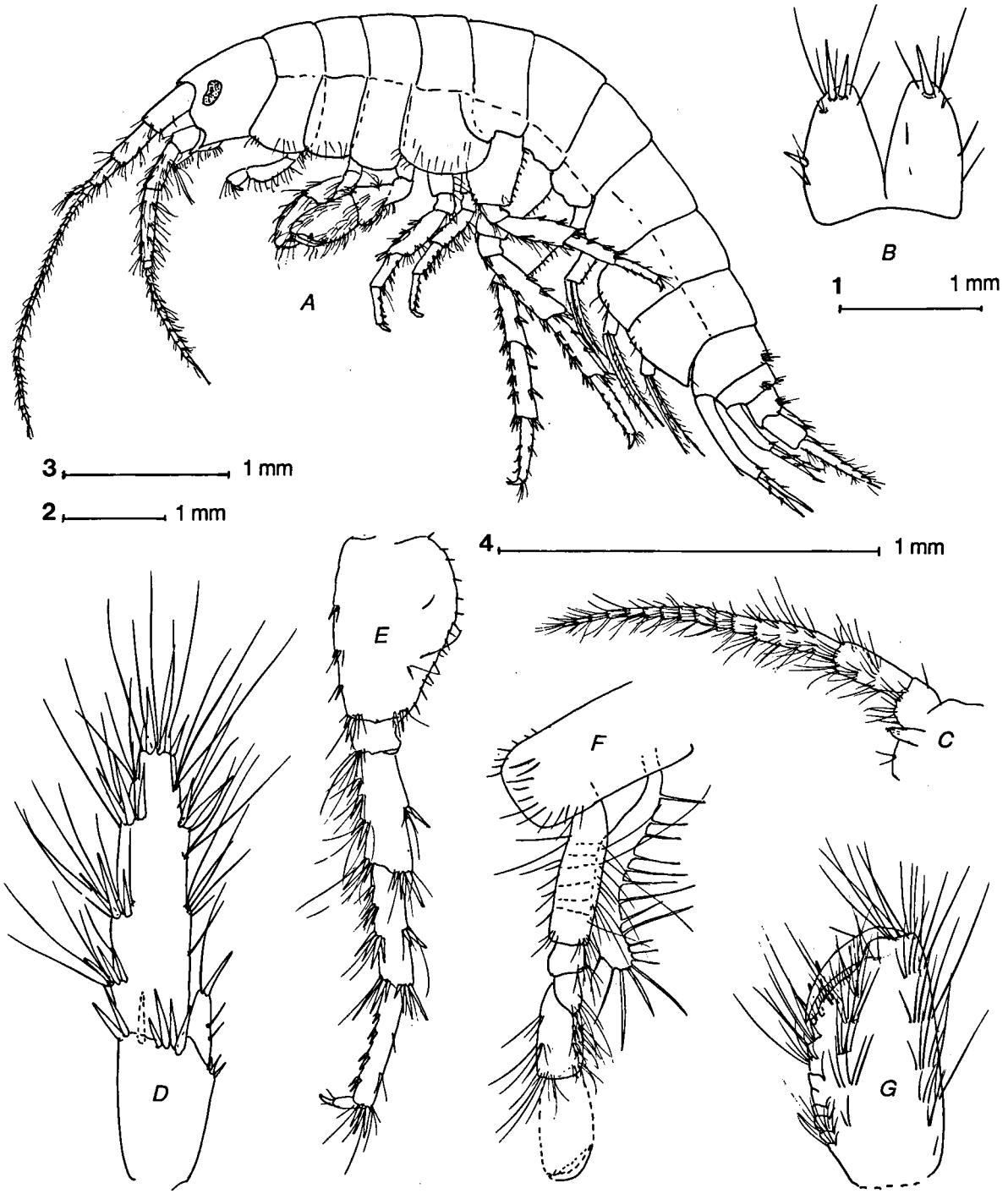

Fig. 3. Echinogammarus valedictus n. sp. (A, ♂ paratype 9.8 mm; B–G, ♀ paratype 7 mm): A, habitus (scale 2); B, telson (4); C, antenna 2 (3); D, uropod 3 (4); E, pereiopod 7 (3); F, gnathopod 2 (3); G, propodus of gnathopod 2 (4).

inner surface; segments 3 to 6 armed with groups of spines and/or short setae. Dactyli of pereiopods 5–7 slender.

Epimeres 1–3 (Fig. 1-I; scarcely armed, posteroinferior corner almost rectangular in plate 1, moderately to sharply pointed in plates 2 and 3.

Uropod 3 (Fig. 2D): endopodite very short with one distal spine; exopodite armed with 5 or 6 groups of spines and/or setae along both margins. Characteristic of the species is the absence of the second exopodal segment.

Telson (Fig. 1C) shorter than basis of uropod 3, about as long as wide; armature variable, usually with 1 to 3 distal spines and some medium long distal setae; along the margins and on the dorsal surface of the lobes some spines and/or setae can be present.

Female. – Antennae (Fig. 3C) basically identical to those in male, but shorter. Gnathopods 1 and 2 (Figs. 2I, H; 3F, G) without medial palmar spine; carpus of Gn 2 as long as propodus.

Pereiopods 5 to 7 (Fig. 3E) differ from those in males in the presence of many long setae along the posterior margins of segments 3 to 5. Uropod 3 (Fig. 3D) relatively short; telson (Fig. 3B) as long as basis of uropod 3.

Variability. – As far as can be concluded from the two samples studied, variability is not very pronounced. In general it can be said that the relative length of the segments and the number of elements in all pereiopods increase with age.

Remarks and affinities. – Because of the relative size of the propodi in gnathopods 1 and 2 and the shape of the eyes, this species resembles the members of the *Echinogammarus simoni*-group as defined by Pinkster & Stock (1972). It differs from all these species in the absence of a second exopodal segment in uropod 3 and the fringe of lateral setae on coxal plates 1 to 4. It differs from *E. afer* Stock, 1974, in the accessory flagellum of A1 (3- versus 1-segmented), the relative size of the gnathopods, and the absence of the second exopodal segment in uropod 3. All other species known from northern Africa differ in almost every detail from this new species. The same holds true for the members of the *E. berilloni*-group as defined by Pinkster (1973) and the *E. pungens*-group defined by Stock (1968). The only taxon with a one-segmented exopod in uropod 3 is *E. sicilianus monomerus* Stock, 1977. However, this form is completely different in the shape of the eyes and the long and dense setation on the antennae and all pereiopods.

Distribution and ecology. – This species is only known from two streams in the Djurdjura mountains of N.E. Algeria.

Etymology. – The new species *E. valedictus* is named in honour of Prof. Dr. Jan H. Stock on the occasion of his farewell from the Institute of Taxonomic Zoology.

References

Barnard, J.L. & C.M. Barnard, 1983. Freshwater Amphipoda of the world, I. Evolutionary patterns: i–viii, 1–358, ix–xvii; II, Handbook and bibliography: xix, 359–830 (Hayfield Associates, Mt. Vernon, Virginia, USA).

Catta, J.D., 1878. Note sur le Gammarus berilloni (n. sp.). Bull. Soc. Borda Dax, 1878 (1): 68–73.

Chevreux, E. & L. Fage, 1925. Amphipodes. Faune de France, 9: 1–488.

Chevreux, E. & H. Gauthier, 1924. Description d'un nouveau Gammare de Tunisie. Bull. Soc. Hist. nat. Afr. Nord, 15: 53–55.

Karaman, G.S., 1977. Revision of the Echinogammarus generacomplex (fam. Gammaridae). Arch. Sci. biol., Beograd. 27 (1/2): 69–93.

Karaman, S., 1931. III. Beitrag zur Kenntnis der Amphipoden Jugoslaviens sowie einiger Arten aus Griechenland. Prir. Razprave, Ljubljana, 1: 31–66.

Martynov, A.V., 1925. Etudes sur les Crustacés de mer du bassin du bas Don et leur distribution éthologique. Ann. Mus. zool. Acad. Sci. Russ., 25: 1–115, pl. I.

Pinkster, S., 1973. The Echinogammarus berilloni-group, a number of predominantly Iberian amphipod species (Crustacea). Bijdr. Dierk., 43(1): 1–39.

Pinkster, S. & J.H. Stock, 1972. Members of the Echinogammarus simoni-group and the genus Eulimnogammarus (Crustacea-Amphipoda) from the Iberian peninsula and North Africa, with description of a new species. Bull. zoöl. Mus. Univ. Amsterdam, 2: 85–115.

Schellenberg, A., 1937a. Schlüssel und Diagnosen der dem Süßwasser-Gammarus nahestehenden Einheiten ausschließlich der Arten des Baikalsees und Australiens. Zool. Anz., 117 (1–2): 267–280.

Schellenberg, A., 1937b. Kritische bemerkungen zur Systematik der Süßwassergammariden. Zool. Jahrb., (Syst.) 69: 469–516.

Schellenberg, A., 1943. Portugiesische Süßwasser-Amphipoden. Mem. Est. Mus. zool. Univ. Coimbra, 139: 1–7.

Stebbing, T.R.R., 1899. Amphipoda from the Copenhagen Museum and other sources, II. Trans. Linn. Soc. London, (2) 7 (8): 395–432, pls. 30–35.

Stebbing, T.R.R., 1906. Amphipoda, I. Gammaridea. Tierreich, 21: i–xxxix, 1–806.

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