Abyssal benthic Amphipoda (Crustacea) from the East Iceland Basin

2. *Lepechinella* and an allied new genus

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Introduction

R.R.S. *Discovery* Cruise 39 took place in April–May 1971 and was concerned with biological investigations at 60° N 20° W and 53° N 20° W. The main purpose of the cruise was a study of vertical distribution and migration of the zooplankton and nekton. Secondary objectives included an investigation of the benthic fauna, and to this end epibenthic sledge hauls were made at both stations. This paper deals with the dexaminid genus *Lepechinella* and a closely related genus obtained from five hauls at the northern station. It follows a report on species of the eusirid genus *Rhachotropis* (Thurston, 1980).

Material and methods

For station data and methods see previous paper (Thurston, 1980 p. 44–45).

Small circles in some of the illustrations indicate the bases of setae either deliberately omitted for clarity of the underlying structure (particularly coxae and gnathopods) or lost prior to examination.

Systematics

Over 3500 gammarids representing about 120 species were obtained from the five sledge hauls. Although the sledge had no opening/closing facility, contamination was minimal. Only a very small proportion of the total catch was clearly of midwater origin. More than half of the benthic species distinguished appear to be undescribed. Four species are discussed herein, three belonging to *Lepechinella* and represented by a total of 340 specimens, and the fourth to a new genus represented by 93 specimens. Together these four species account for 12·2% of the total number of specimens obtained.

The bottom in the area investigated consisted of dark grey-brown mud together with small quantities of sand, stones, clinker and pteropod shells.

Variation. Barnard (1973) has discussed speciation in *Lepechinella,* pointing out that many of the interspecific characters currently used in the genus are quantitative rather than qualitative. Most species are known from few specimens so that the degree of intraspecific variation is unknown. The volume of material in the present collection has made possible an initial insight into this problem, in that a common pattern of sexual dimorphism and allometric growth can be seen in the three species of *Lepechinella* studied.

As is true of the vast majority of amphipod species bearing dorsal teeth or carinae, these projections in *Lepechinella* become relatively more prominent with increasing size. In juveniles of both sexes, all females and juvenile males, dorsal teeth tend to be rather slender and upstanding. As males develop towards maturity, the bases of these teeth become elongated along the dorsal midline of the segment, and the teeth themselves become more decumbent. A state is reached in fully developed specimens in which body segments, particularly the posterior peraeonites and the pleonites, become carinate, with each carina ending in a posteriorly directed tooth. Concomitant with these changes is the development of a dorsal tooth on urosomite 3. Terminal males also show marked modifications of the

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antennae. The second peduncle article of antenna 1 and the fourth peduncle article of antenna 2 become elongate and, together with the third peduncle article of antenna 1, develop many dense bundles of sensory setae.

Characters of the rostrum have been used previously as a means of species separation. However, study of the species of *Lepechinella* in this collection has shown gross intraspecific variation in both length and form. Within a single species the rostrum may be long or short, deflexed, reflexed or straight. Cephalic teeth, particularly the first, show variation of a similar kind though lesser extent. The degree and nature of variation of general body setation or spination and lateral setal rows on the epimera is poorly known. In the present collection there appears to be a wide degree of intraspecific variation. However, this armature is extremely brittle, at least in some species. It is likely to be radically affected by the processes of retrieval and the removal of adhering debris which is so frequently necessary to reveal even gross morphology. The apparent absence of body setation, both general and epimeral, from some described species should be treated with reserve. Absolute confirmation of presence or absence will require careful examination of appreciable numbers of clean, undamaged specimens.

Lepechinella helgii sp. nov.
(Figs. 1–3)

MATERIAL EXAMINED. Sta. 7709 # 62 3 ovig. ♀ 7–9 mm, 1 ♀ 9mm; Sta. 7709 # 66 3 ♀ 5–7 mm, 1 intersex 8 mm, 2 damaged specimens; Sta 7709 # 72 13 ♂ 7–8 mm, 6 ovig. ♀ 7–8 mm, 28 ♀ 5–9 mm, 19 juv. 3–6 mm, 3 intersex 7–8 mm; Sta. 7709 # 73 33 ♂ 7–8 mm, 9 ovig. ♀ 7–9 mm, 60 ♀ 5–9 mm, 50 juv. 3–6 mm, 19 damaged specimens, HOLOTYPE ♀ ovig. B.M.(N.H.) reg. no. 1978: 232 [carcase and 3 microscope preparations], ALLOTYPE 1978: 233, 9 PARATYPES 1978: 234; Sta 7709 # 85 2 ♀ 8 mm.

The registered type material is deposited in the Zoology Department of the British Museum (Natural History); all the remaining material has been retained at the Institute of Oceanographic Sciences.

ETYMOLOGY. Helgi, youngest son of Njal Thorgeirsson, Burnt Njal.

DESCRIPTION. Holotype, female, 9 mm, from Sta. 7709 # 73. *Peraeon,* all segments dorsally dentate, teeth 30–40% of height of corresponding segment: peraeonites 1 and 7 with two teeth: peraeonites 2–6 with one tooth near posterior margin; small nodules anterior to teeth on peraeonites 5–7. *Pleon,* each segment with long inclined tooth near posterior margin and two upright projections anterior to main tooth; accessory teeth 40–50% of length of main tooth. *Epimera,* all with posterior-distal tooth separated by a sinus from strongly convex posterior margin; tooth and sinus, smallest on epimeron 1, largest on epimeron 3; each epimeron with lateral setal row. *Urosome,* first segment produced into strong, inclined tooth at posterior margin. *Body,* moderately setose.

Head, setose; rostrum slightly upturned, 70% of length of first article of antenna1; first cephalic tooth slender, 35% of length of rostrum; second cephalic tooth broader and rather shorter than first. *Antenna 1,* just shorter than body; first article of peduncle 55% of length of second; third article 20% of length of second; flagellum 1·5 times length of peduncle; accessory flagellum short, tapering. *Antenna 2,* subequal to antenna 1; first four peduncle articles combined 80% of length of fifth article; flagellum as long as peduncle articles 1–4. *Upper lip,* bilobate. *Mandible,* incisor process dentate; lacina mobilis of left mandible dentate, laminar, that of right bluntly dentate, teeth in two rows; molar ridged, triturative; palp as long as body of mandible, first article 25%, third article 35% of length of second article. *Lower lip,* inner lobes broad. *Maxilla 1,* inner plate small, slender with two stout plumose setae apically; outer plate with eleven dentate spine teeth distally; palp, second article expanded distally, seven spine teeth and one spine on nearly transverse distal margin. *Maxilla 2,* inner plate shorter and much more slender than outer. *Maxilliped,* outer plate ovo-rectangular, fifteen spines and spine teeth medially and distally; palp weak, second article slender, as long as third and fourth articles combined.

Gnathopod 1, coxa strongly bifid, marginally setose; propod suboval, 70% of length of carpus, palm gently convex, shorter than posterior margin of propod, palmar angle marked by single stout spine. *Gnathopod 2,* coxa tapering, distally slender; distal articles longer than those of gnathopod 1; propod 60% of length of carpus, margins almost parallel, palm 70% of length of posterior margin. *Peraeopod 3,* coxa strongly produced anterior-distally; carpus and propod subequal, shorter than merus, longer than dactyl. *Peraeopod 4,* coxa bifid, posterior lobe obsolete; distal articles similar to those of peraeopod 3. *Peraeopod 5,* coxa produced at anterior-ventral corner, projection slightly shorter than that of coxa 4; merus and propod subequal, shorter than carpus, longer than dactyl. *Peraeopod 6,* coxa with small triangular projection at anterior-ventral corner; distal articles similar to those of peraeopod 5. *Peraeopod 7,* coxa with posterior-distal angle acute; merus slightly shorter than propod, otherwise distal articles similar to those of peraeopod 5.

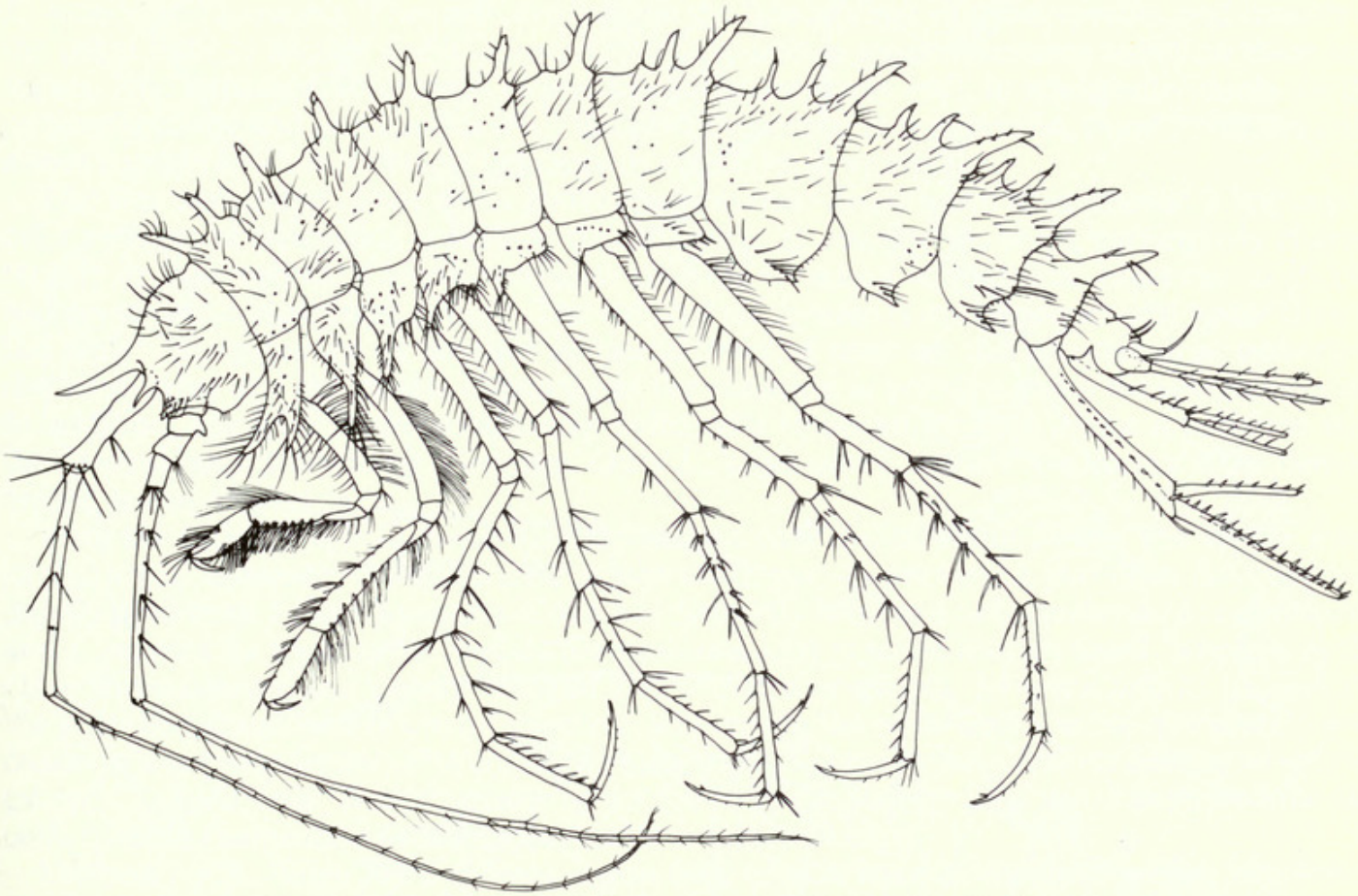

Fig. 1. *Lepechinella helgii* sp. nov. Holotype, female, 9 mm.

Uropod 1, outer ramus not stout, 85% of length of peduncle, spinous; inner ramus 65% of length of outer. *Uropod* 2, not quite reaching apex of inner ramus of uropod 1; rami, slender, subequal, 75% of length of peduncle. *Uropod 3,* extending about as far as uropod 2; peduncle very short; rami slender, subequal. *Telson,* short, length and breadth equal; cleft 40% of length, cleft nearly semicircular; apices bifid, each bearing a long stout spine.

VARIATION. Sexual variation is apparent in the dorsal armature of the pleon and in the third epimera. In adult males the main pleonal teeth are less upright and more carinate, the accessory teeth are rather shorter, and the posterior-distal tooth and sinus of epimera 3 are less prominent than is the case in female specimens. Immature males resemble females in these characters. Juveniles less than about 3·5 mm long have only a single accessory tooth on each of pleonites 1–3. Hatchlings are about 1·5 mm long, and lack rostrum and dorsal armature. The rostrum of adult and subadult individuals is generally straight and about 70% as long as the first peduncle article of antenna 1. A minority of specimens have slightly longer or appreciably shorter rostrums which may be gently upcurved or somewhat deflexed.

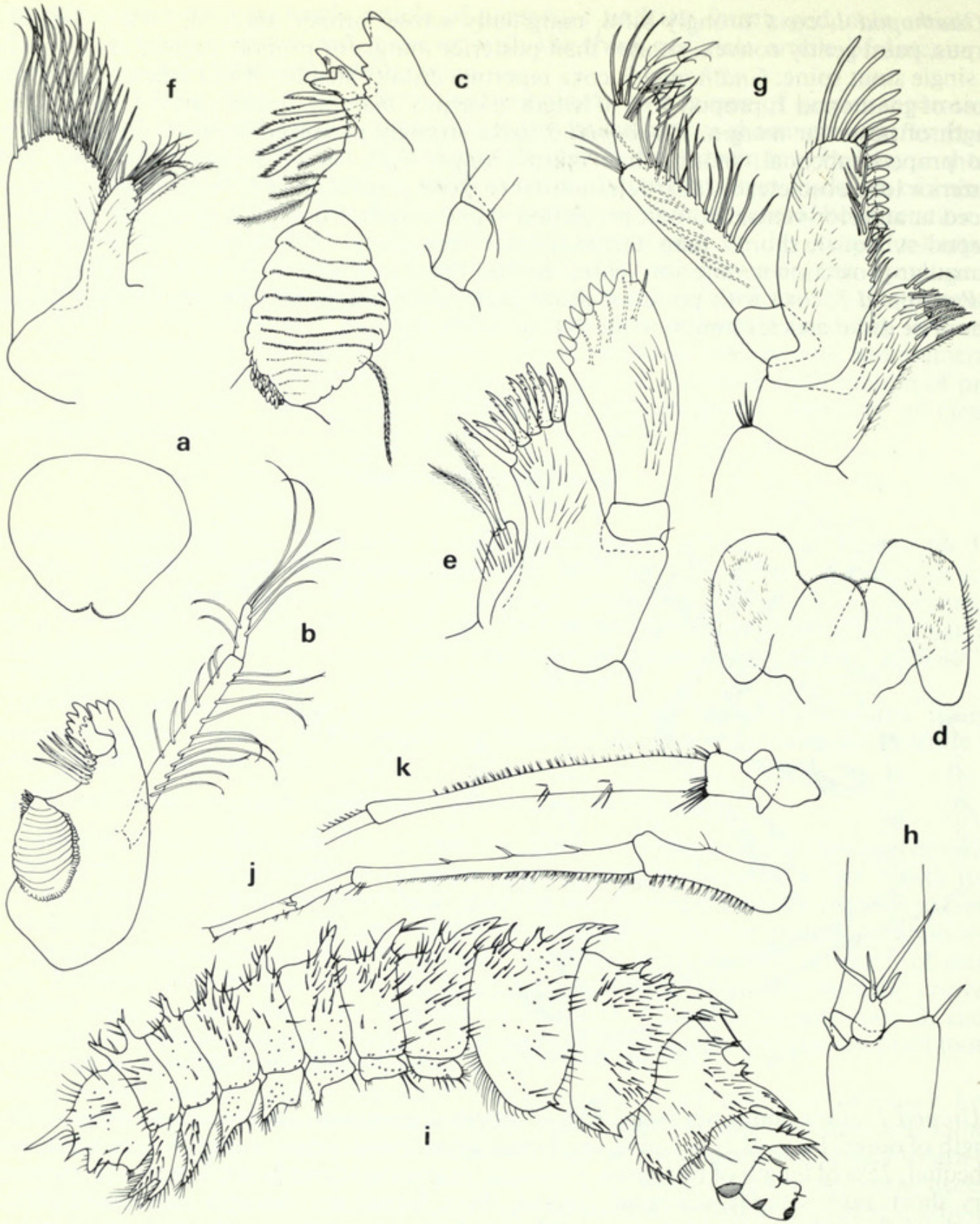

Fig. 2. *Lepechinella helgii* sp. nov. Holotype, female, 9 mm. (a) upper lip; (b) left mandible; (c) right mandible, detail; (d) lower lip; (e–f) maxillae 1 & 2; (g) maxilliped; (h) accessory flagellum. Allotype, male, 8 mm (i) body; (j–k) antennae 1 & 2.

REMARKS. Barnard (1973) has provided a phyletic key to the species of *Lepechinella*. *L. helgii* falls into the category characterized by strongly dentate peraeonites, a bidentate peraeonite 1, and a bifid coxa 1. Other species possessing these basic characters are *L. chrysotheras* Stebbing, 1908, *L. arctica* Schellenberg, 1926, *L. turpis* Barnard, 1967, *L. eupraxiella* Barnard, 1973 and *L. manco* Barnard, 1973. Most species of *Lepechinella* are known only from single localities and few specimens, and the nature and degree of intra-

specific variation is poorly understood. Because of or despite these limitations, the majority of species within the genus seem sufficiently distinct to be fairly readily separable. This is not true, however, of the six species in the *L. chrysotheras* group. All of these are closely similar in body morphology and differ only in small and rather subtle characters. Clarification of *L. chrysotheras, L. arctica* and *L. eupraxiella* and more material of the other species from additional localities will be required to understand the true nature of the components of this group.

The following analysis is based largely on characters of the dorsal armature, coxae, epimera and uropods. Peraeonite 7 in *L. helgii* has a strong accessory tooth anterior to the main dorsal tooth, thus resembling *L. turpis.* In *L. chrysotheras, L. arctica* and *L. manco* an accessory tooth is present, but small, being about 20% of the height of the main tooth rather than 50% as is the case in the other two species. Only in *L. eupraxiella* is there no trace of a tooth present. Two accessory teeth are present on pleonites 1–3 in *L. helgii, L. chrysotheras, L. manco* and *L. turpis.* The teeth are large in the first and last of these species, and smaller in the other two. *L. arctica* and *L. eupraxiella* have only a single accessory tooth on these segments. The apparent differences in pleonal armature apply only to adult individuals. In the present species, and in *L. turpis* if all Barnard's material is conspecific, small juveniles have either a single tooth moderately developed or both teeth vestigial.

The size and shape of the sinus above the posterior-distal tooth of epimeron 3 appears to offer a means of separating species in this complex, *L. eupraxiella* being particularly characteristic in this respect. *L. helgii* suggests that the situation is complex, however, as in this species sexual dimorphism occurs. The sinus of the female is much deeper and wider than in the male. The presence or absence of lateral rows of setae on the epimera is at present of doubtful value as a diagnostic character as the situation is poorly known for several species. In addition, the setae seem particularly vulnerable to abrasion. This is also a problem with the general body setation or spination. Only *L. helgii* and *L. manco* are known to be heavily armed in this respect.

With the exception of *L. turpis* all species have coxa 1 cleft about 25% of the length. Even in *L. turpis,* however, the difference is not clear cut, as presumed juveniles have a more deeply bifid coxa 1 than do adults. Coxa 3 is distinctly bifid in *L. chrysotheras, L. eupraxiella* and *L. manco.* In these three species the posterior lobe is acute though small, whereas in the other three species this lobe is vestigial and rounded or absent. *L. helgii* and *L. turpis* have the posterior-distal lobe of coxa 4 obsolete, whereas in the other four species it is acutely produced to a varying degree. The coxae of peraeopods 5–7 are rather uniform among all species except *L. eupraxiella.* In that species, coxa 5 is bifid with a very long acute anterior lobe and coxa 6 has the same lobe bent forward and strongly hooked.

Uropod 1 of *L. helgii* has the inner ramus only 65% as long as the outer ramus, whereas in *L. chrysotheras, L. arctica, L. turpis* and *L. manco* the rami are not markedly different in length. The condition in *L. eupraxiella* is obscure as the uropods of that species are poorly known. The rami of uropod 2 in *L. helgii* are subequal, in *L. chrysotheras* the outer ramus is a little shorter than the inner, while in *L. manco* the outer ramus is less than 70% of the length of the inner ramus.

Lepechinella grimi sp. nov.
(Figs. 4–6)

MATERIAL EXAMINED. Sta 7709 # 62 1 ♂ 11 mm, 1 ♀ 9 mm, 3 damaged specimens; Sta. 7709 # 66 1 juv. 4 mm; Sta. 7709 # 72 3 ♂ 8–12 mm, 1 ♀ 9 mm, 1 juv. 4 mm, 2 damaged specimens, HOLOTYPE ♂ B.M.(N.H.) reg. no. 1978: 235 [carcase and 3 microscope preparations], PARATYPES 1978: 236; Sta. 7709 # 73 1 ♀ 8 mm, 2 juv. 7–9 mm, 1 damaged specimen; Sta. 7709 # 85 2♂ 10 mm, 1 ♀ 9 mm, 1 juv. 5 mm.

Material from Sta. 7709 # 72 has been deposited in the collections of the Zoology Department of the British Museum (Natural History); the specimens from other catches are housed at the Institute of Oceanographic Sciences.

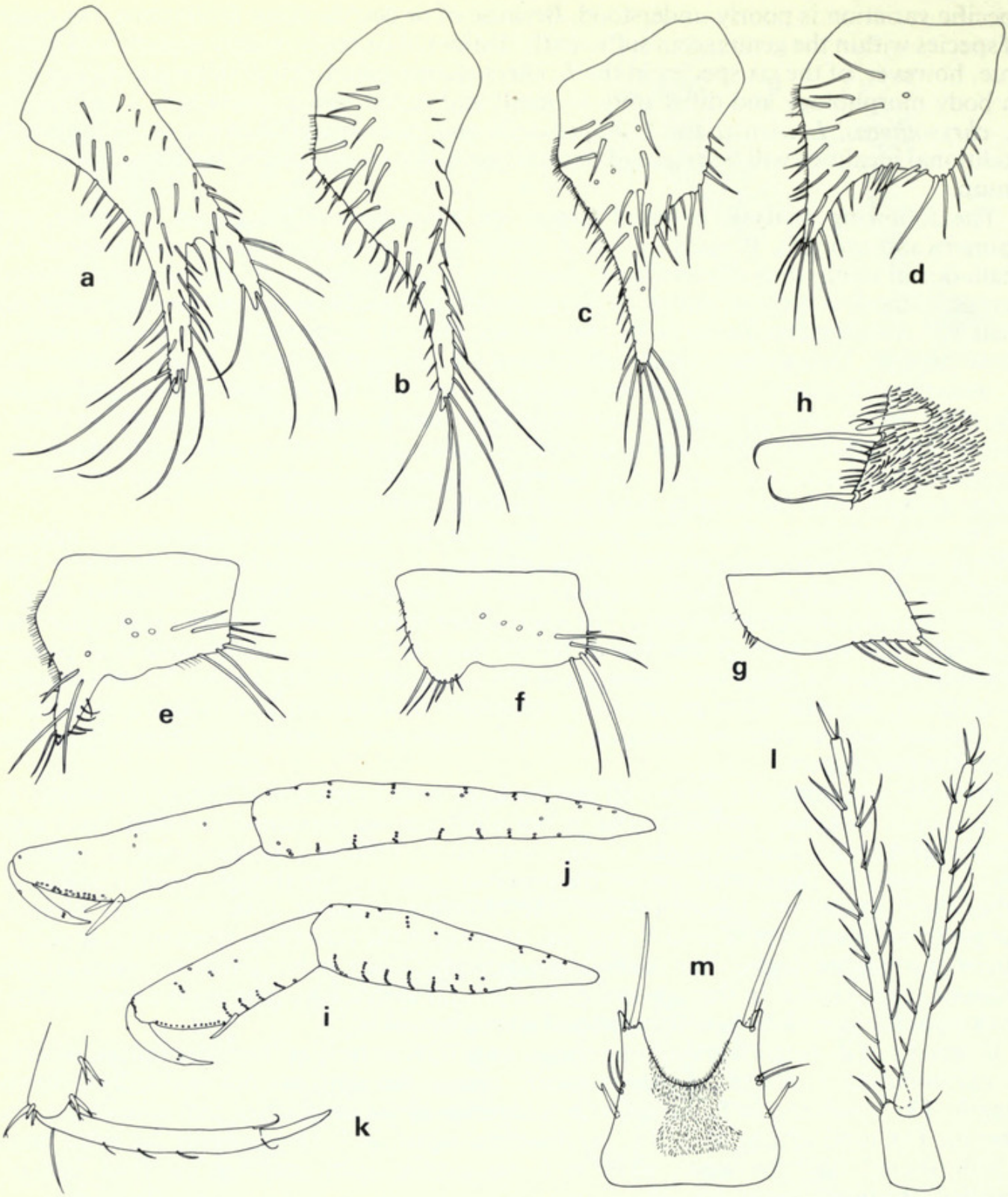

Fig. 3. *Lepechinella helgii* sp. nov. Holotype, female, 9 mm. (a–g) coxae 1–7; (h) coxa 3, detail; (i–j) gnathopods 1–2; (k) peraeopod 4, dactyl; (1) uropod 3; (m) telson.

ETYMOLOGY. Grim, second son of Burnt Njal.

DESCRIPTION. Holotype, male, 12 mm, from Sta. 7709 # 72. *Peraeon,* all segments dorsally dentate, teeth 15–20% of height of corresponding segments; peraeonite 1 with two upright teeth; peraeonites 2 and 3 each with single upright teeth; peraeonites 4–7, teeth carinate and posteriorly directed. *Pleon,* all segments dorsally carinate, each carina terminating in an acute, posteriorly directed tooth. *Epimera,* strongly convex posteriorly, each with well-developed posterior-distal tooth; epimera 1–2 with lateral setae. *Urosome,* segment 1

strongly produced posterior-dorsally, urosomite 3 with acute posterior tooth. *Body* setose and scabrous.

Head, setose, rostrum curved, 30% of length of first peduncle article of antenna 1; first cephalic tooth long, slender, 35% longer than rostrum; second cephalic tooth acute, 40% of length of first, separated dorsally from head margin by small sinus. *Antenna 1,* just longer than peduncle of antenna 2; first article of peduncle 25% of length of second; third article 17% of length of second; second and third articles with setal bundles posteriorly; accessory flagellum elongate, breadth 30% of length. *Antenna 2,* longer than body; third and fourth articles with setal bundles anteriorly; fifth article of peduncle very slender, longer than articles 1–4 combined; flagellum about as long as flagellum of antenna 1. *Upper lip,*

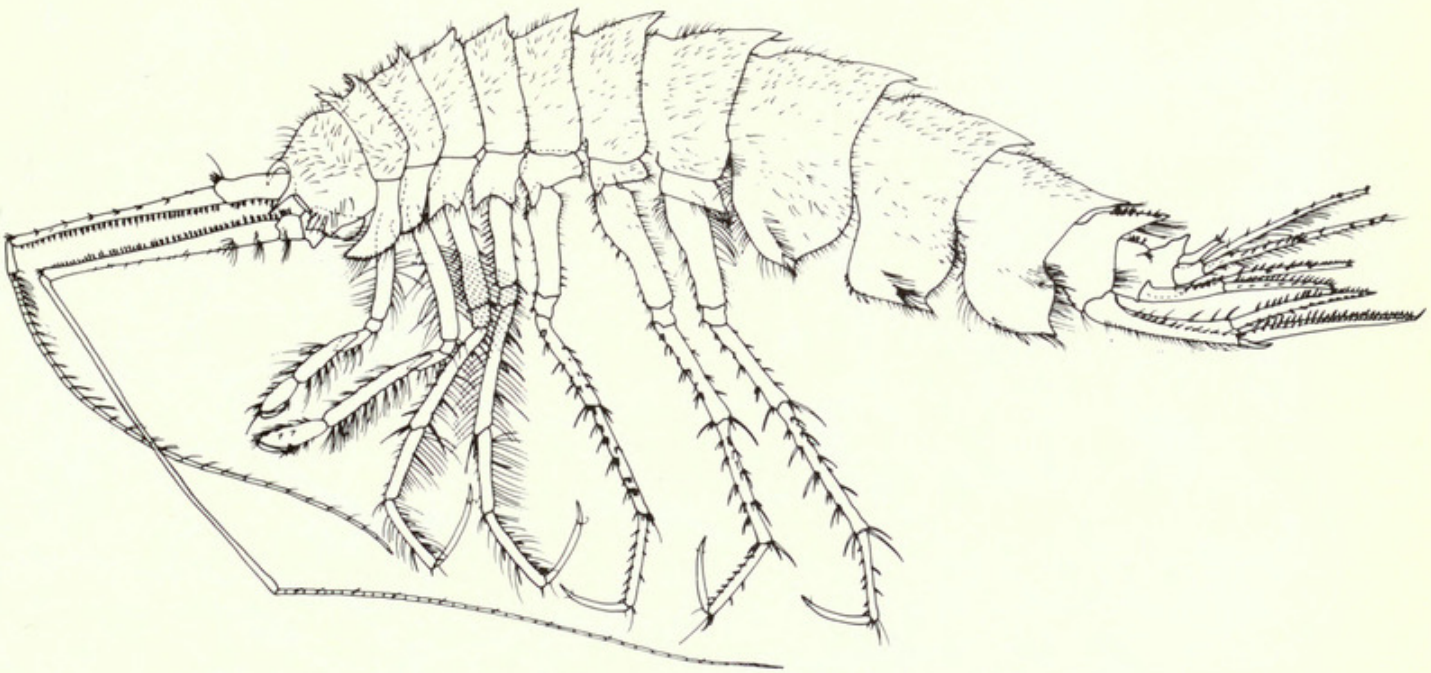

Fig. 4. *Lepechinella grimi* sp. nov. Holotype, male, 12 mm.

asymmetrically cleft, lobes rounded. *Mandible,* incisor process dentate; lacina mobilis of left mandible coarsely dentate, that of right mandible with two plates each with serrate cutting edge; molar triturative, armed with rows of very small teeth; palp just longer than body of mandible, article 1 30% of length of article 3, article 2 twice as long as article 3. *Lower lip,* inner lobes well developed. *Maxilla 1,* inner plate with two plumose setae; outer plate with ten dentate spine teeth; palp, second article distally expanded and obliquely truncate, distal margin with seven blunt spine teeth. *Maxilla 2,* inner plate narrower and slightly shorter than outer. *Maxilliped,* inner plate elongate, rather slender, bearing three blunt spine teeth distally; outer plate slender, seventeen stout spine teeth and setae on medial and distal margins; palp articles 3 and 4 subequal, together as long as article 2.

Gnathopod 1, coxa slipper-shaped, not bifid, convex distal margin serrate, anterior and distal margins armed with stout setae; propod stout, 65% of length of carpus, palm shorter than posterior margin. *Gnathopod 2,* coxa setose marginally, distally tapering, anterior margin convex, distal margin oblique and serrate; propod 55% of length of carpus, palm and posterior margin subequal. *Peraeopods 3–4,* coxae bifid, lobes acute, anterior lobe longer than posterior, anterior margin convex. *Peraeopod 5,* coxa anterior lobe as long as that of peraeopod 3, rounded posterior-distally. *Peraeopod 6,* anterior lobe of coxa weak, rounded, posterior distal angle of coxa just sub-acute. *Peraeopod 7,* coxa with acutely produced posterior-distal angle.

Uropod 1, outer ramus and peduncle subequal; inner ramus 80% of length of outer. *Uropod 2,* outer ramus 85% of length of inner. *Uropod 3,* peduncle very short; rami subequal, nearly five times length of peduncle, extending beyond uropod 2; outer ramus with minute

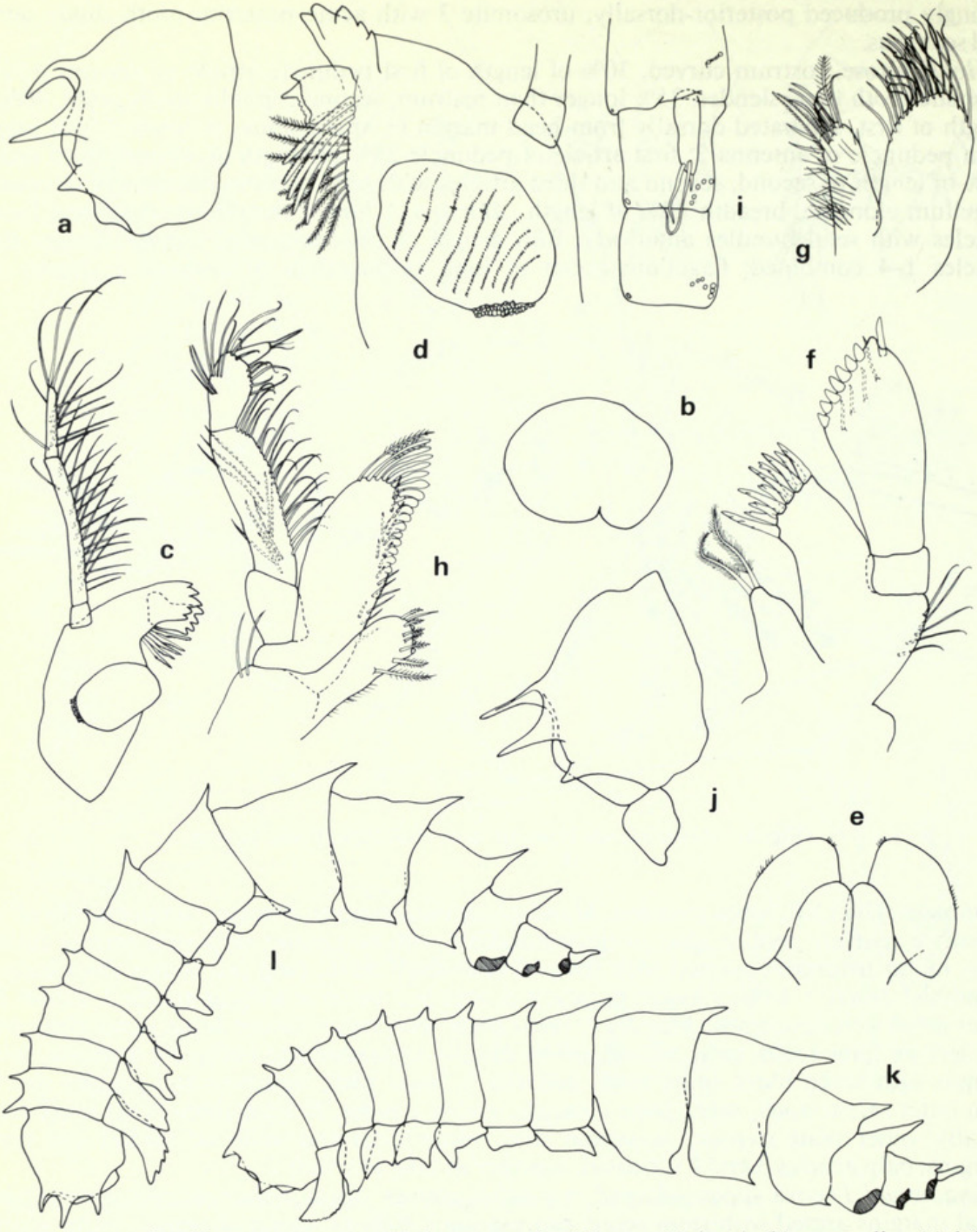

Fig. 5. *Lepechinella grimi* sp. nov. Holotype, male, 12 mm. (a) head; (b) upper lip; (c) left mandible; (d) right mandible, detail; (e), lower lip; (f–g) maxillae 1–2; (h) maxilliped; (i) accessory flagellum. Male, 11 mm. (j) head. Male, 8 mm. (k) body. Juvenile, 5 mm. (l) body.

second article. *Telson,* cleft 65% of length, lobes divergent, each with one long and two short spines subapically, apices acute.

VARIATION. Sexual dimorphism of a pattern apparently common to most if not all species of *Lepechinella* is manifest in the antennae and the dorsal carination (see p. 69). Sexually mature males have a large, sub-erect, conical tooth in urosomite 3. In females and sub-adult males this tooth is much smaller, and in juveniles is obsolete.

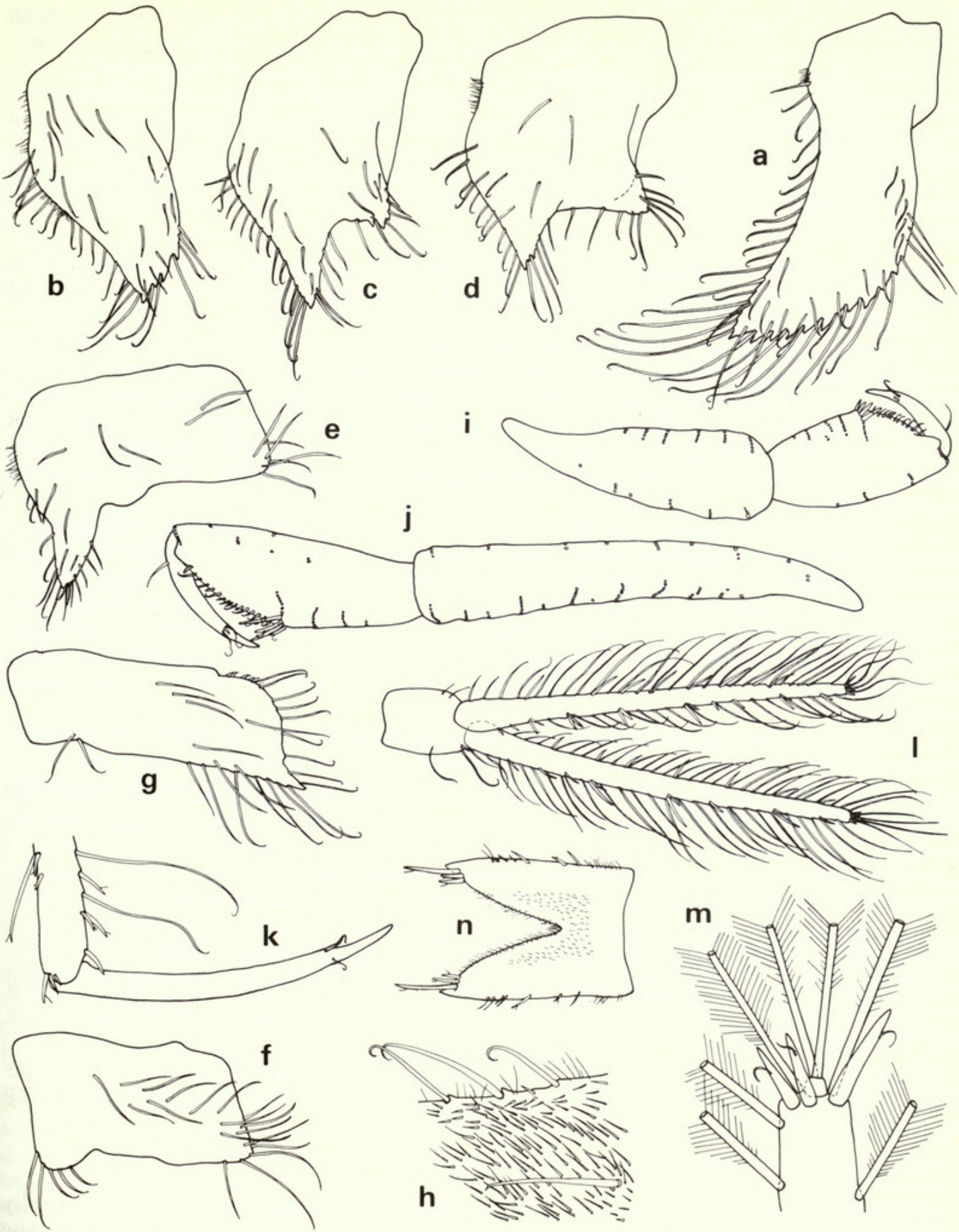

Fig. 6. *Lepechinella grimi* sp. nov. Holotype, male, 12 mm. (a–g) coxae 1–7; (h) coxa 3, detail; (i–j) gnathopods 1 & 2; (k) peraeopod 4, dactyl; (l) uropod 3; (m) uropod 3, detail; (n) telson.

The condition of the rostrum and cephalic teeth is very variable. No two specimens are exactly alike although the normal configuration would appear to be a first cephalic tooth acute and half or slightly less as long as the head excluding the rostrum, a straight or slightly deflexed rostrum about 80% of the length of the first cephalic tooth, and a triangular second cephalic tooth 40% of the length of the first. The short deflexed rostrum of the holotype may be a result of damage, as a slightly smaller, immature male has a straight rostrum equal in length to the first cephalic tooth.

Although urosomites 2 and 3 are rigidly fused to each other, the line of fusion is still apparent in some specimens. The number of distal serrations on the first two coxae increases with increasing size.

REMARKS. *L. grimi* is characterized by low teeth on peraeonites 1–4, peraeonite 1 with two teeth, coxa 1 distally not strongly bifid, and is thus related to *L. pangola* Barnard, 1962 and *L. occlo* Barnard, 1973.

L. pangola and the new species are of similar size and agree in the configuration of the coxae, but differ significantly in sufficient characters to justify separation. In contrast to *L. grimi, L. pangola* has rudimentary teeth on the anterior peraeonites, naked head, peraeon and pleon, epimera 1–2 with weakly convex posterior margins, epimeron 2 lacking facial setae, a short first cephalic tooth, peraeopods 5–7 with relatively short dactyls, the telson cleft less than 50% of its length, and the inner ramus of uropod 1 only 50% as long as the outer ramus.

L. grimi and *L. occlo* differ in that the latter has a body ornamentation consisting of sparse spines rather than dense setae, weakly convex posterior margins of epimera 1–2, a short first cephalic tooth, and a strong cusp at the anterior-ventral angle of the head. Further features which distinguish *L. occlo* are the relative lengths of the antennal peduncles, proportions of the fourth and fifth peduncle articles of antenna 2, short accessory flagellum, weakly cleft lower lip, low spine tooth counts on maxilla 1 palp and maxilliped outer plate, weakly bifid coxa 1, long oblique gnathopod palms, and relatively short, poorly setose uropod 3 rami.

L. grimi bears a strong resemblance to *L. huaco* Barnard, 1973 in characters pertaining to pleon, epimera, mouthparts, coxae and gnathopods. The two species are easily separable, however, by the condition of peraeonites 1–4. *L. huaco* has only a single tooth on peraeonite 1 and none on peraeonites 2–4.

Lepechinella skarphedini sp. nov.
(Figs. 7–9)

MATERIAL EXAMINED. Sta. 7709# 62 1 ♂ 8 mm, 1 ovig. ♀ 10 mm, 1 ♀ 9 mm; Sta. 7709# 72 4 ♂ 7–9 mm, 3 ovig. ♀ 10–11 mm, 4 ♀ 8–9 mm, 1 juv. 4 mm, HOLOTYPE ♂ B.M.(N.H.) reg. no. 1978: 237 [carcase and 3 microscope preparations], 11 PARATYPES 1978: 238; Sta. 7709# 73 14 ♀ 6–10 mm, 6 ovig. ♀ 8–11 mm, 9 ♀ 7–9 mm, 18 juv. 3–6 mm, 2 damaged specimens; Sta. 7709# 85 2 ♂ 8 mm, 1 ♀ 7 mm.

Material from Sta. 7709 # 72 has been deposited in the collections of the Zoology Department of the British Museum (Natural History); all other specimens have been retained at the Institute of Oceanographic Sciences.

ETYMOLOGY. Skarp-Hedin, eldest son of Burnt Njal.

DESCRIPTION. Holotype, male, 9 mm from Sta. 7709 # 72. *Peraeon,* all segments dorsally dentate, teeth 40–50% of height of corresponding segment; peraeonites 1–4 each with one upright tooth; peraeonites 5–7 carinate, teeth acute, posteriorly directed. *Pleon,* each segment dorsally carinate, carinae strongly produced posteriorly. *Epimera,* weakly to moderately convex posteriorly; each with prominent, acute, posterior-distal tooth. *Urosome,* first segment strongly produced dorsally, tooth reaching almost to base of telson; urosomite 3 acutely produced over base of telson. *Body,* rather sparsely setose, finely scabrous.

Head, sparsely setose; rostrum slightly curved, 30% of length of first peduncle article of antenna 1; first cephalic tooth about as long as rostrum; second cephalic tooth irregularly tapering to acute apex, length about 65% of first tooth. *Antenna 1,* about as long as head, peraeon and pleon combined; peduncle 35% of total length, subequal to peduncle articles 1–4 of antenna 2; article 1 60% of length of article 2, both articles bearing setal bundles posteriorly; accessory flagellum 30% of length of first article of primary flagellum, length twice width. *Antenna 2,* 1·4 times length of antenna 1; peduncle articles 3–4 with setal bundles anteriorly, article 5 very slender, 40% longer than articles 1–4 combined. *Upper lip,*

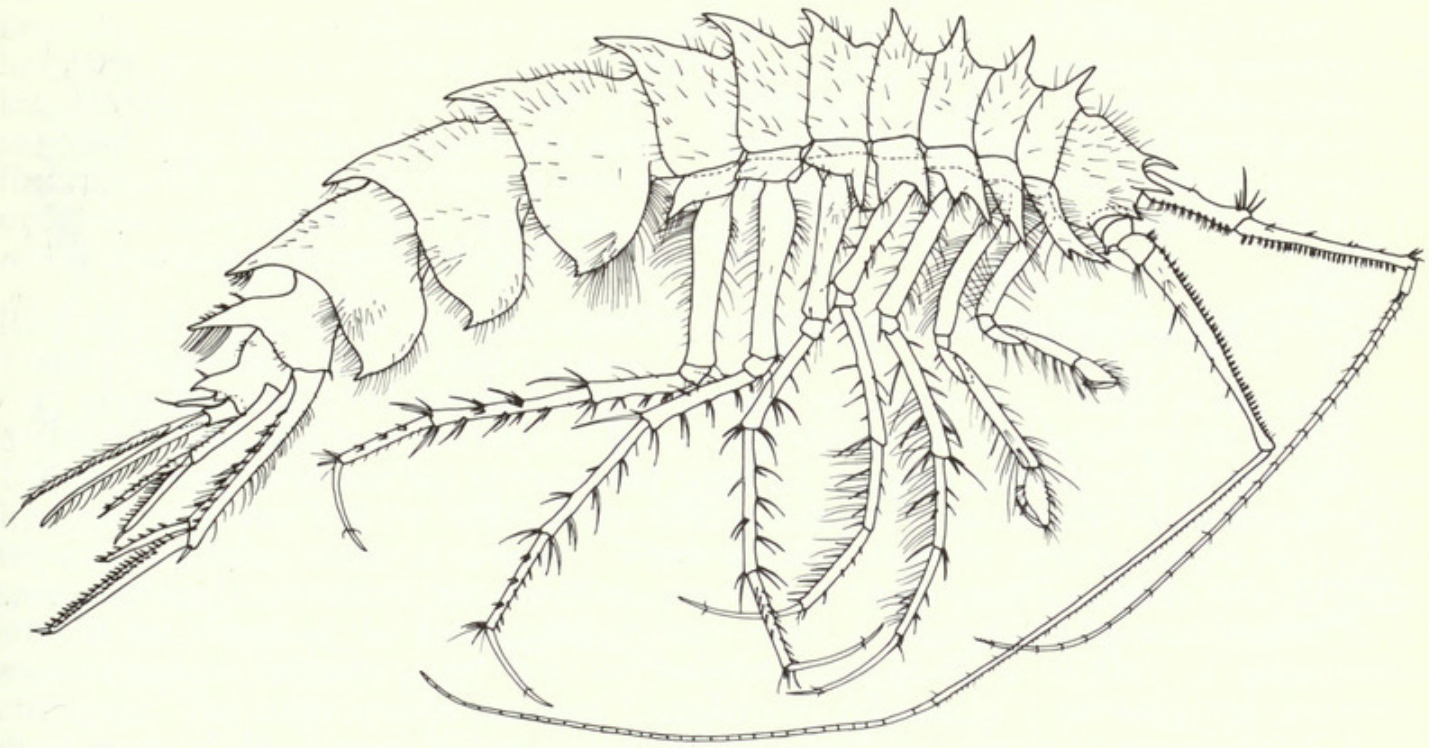

Fig. 7. *Lepechinella skarphedini* sp. nov. Holotype, male, 9 mm.

asymmetrically rounded. *Mandible,* incisor process blunty dentate; lacina mobilis of left mandible laminar, dentate, that of right mandible bluntly dentate, teeth in two rows; molar triturative; palp as long as body of mandible, article 1, short, 25% of second, article 3 60% of second. *Lower lip,* thick, fleshy, inner lobes broad. *Maxilla 1,* inner plate slender, with two curved plumose setae apically; outer plate with eleven stout dentate spine teeth distally; palp slender, second article long with seven blunt spine teeth on oblique distal margin. *Maxilla 2,* inner plate shorter and much more slender than outer, bearing setae on rounded apex and single stout plumose seta distally on medial margin; outer plate broadly rounded, apically setose. *Maxilliped,* inner plate rather slender; outer plate not broad, bearing six blunt spine teeth medially and five stout spines distally; palp slender, second article elongate, third and fourth articles subequal, unguis of dactyl as long as basal part.

Gnathopod 1, coxa bifid, anterior lobe longer and broader than posterior, marginally bearing long plumose setae; distal articles rather short and stout; rhomboidal propod about 65% of length of carpus, palm and posterior margin subequal. *Gnathopod 2,* coxa tapering distally, marginally setose, narrowly bifid, posterior lobe small; carpus slender; propod subtriangular, 45% of length of carpus, palm and posterior margin subequal. *Peraeopod 3,* coxa marginally setose, bifid, lobes acute, unequal, anterior the larger; merus and dactyl subequal, longer than carpus and propod. *Peraeopod 4,* coxa marginally setose, symmetrically bifid, lobes acute, shorter than anterior lobe of coxa 3; distal articles similar to those of peraeopod 3. *Peraeopod 5,* coxa with long, acute, setose ventrally directed anterior lobe; basal as long as corresponding article of peraeopods 3–4. *Peraeopod 6,* coxa a parallelogram, posterior-distal angle acute; basal longer than basal of peraeopod 5, equal to peraeopod 7. *Peraeopod 7,* coxa rounded anterior-distally, strongly and acutely produced posterior-distally.

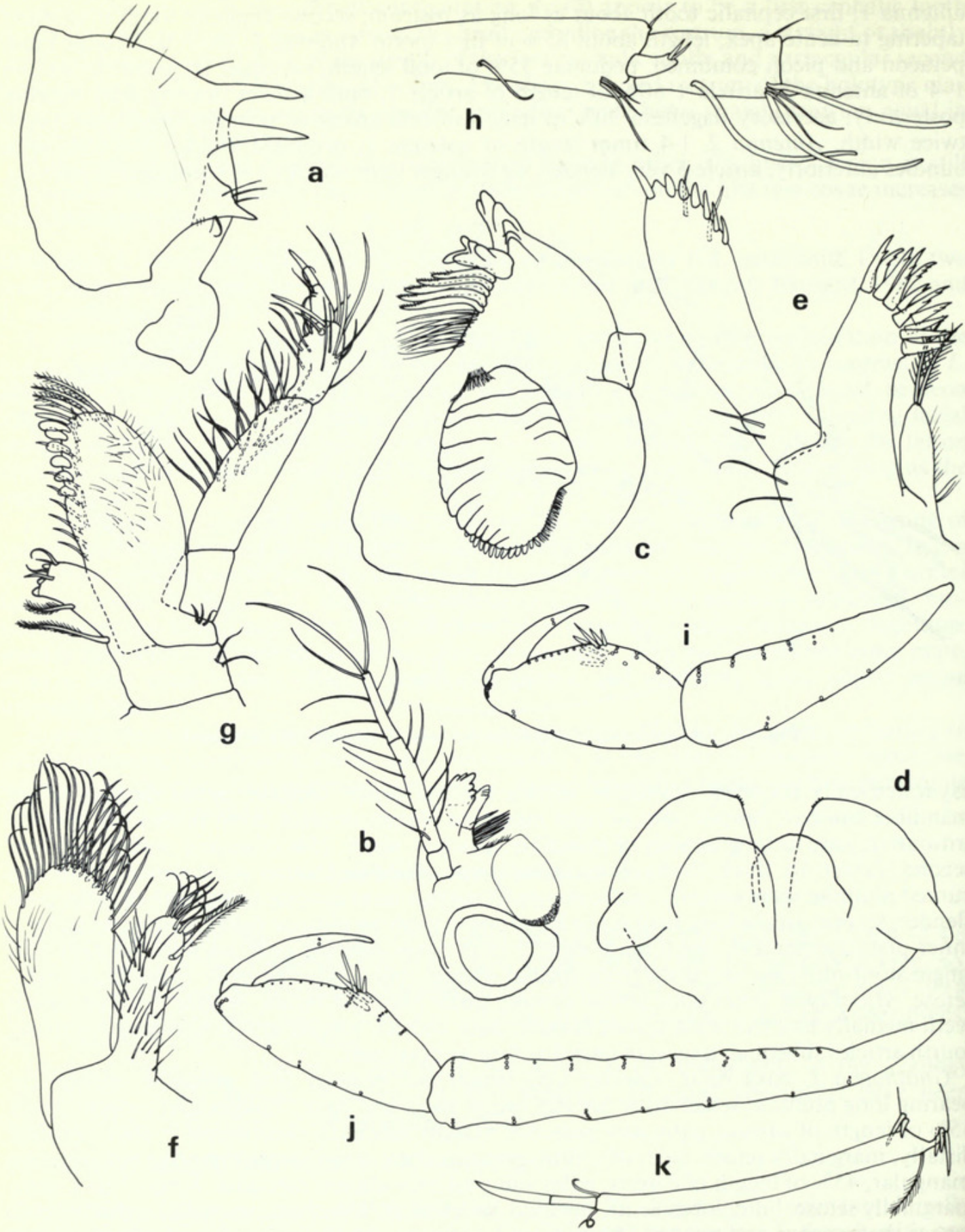

Fig. 8. *Lepechinella skarphedini* sp. nov. Holotype, male, 9 mm. (a) head; (b) left mandible; (c) right mandible, detail; (d) lower lip; (e–f) maxillae 1 & 2; (g) maxilliped; (h) accessory flagellum; (i–j) gnathopods 1 & 2; (k) peraeopod 4, dactyl.

Peraeopods 5–7, merus, propod and dactyl subequal, shorter than carpus.

Uropod 1, strongly spinous; peduncle bilaterally fringed with seta; outer ramus straight, 70% of length of peduncle; inner ramus more slender, 50% of length of outer. *Uropod 2,* short, spinose, not reaching extremity of inner ramus of uropod 1; rami subequal, 75% of length of peduncle. *Uropod 3,* not reaching extremity of uropod 1; peduncle very short, rami subequal, setose, outer with minute second article. *Telson,* setulose, rather narrow, cleft 60% of length, each apex bearing a long stout spine and a seta.

VARIATION. Sexual dimorphism of the kind apparently typical of the genus is found in the dorsal armature, and the setal armature of the antennal peduncles. The dorsal profile of juveniles, females and non-adult males is closer to that of *L. monocuspidata* than is the holotype, as the teeth are shorter, about 30% of the height of the corresponding segment, and less strongly carinate. The rostrum of *L. skarphedini* shows a considerable degree of variation, both in terms of length and shape. The length may be 55–100% of the length of the first cephalic tooth and the rostrum may be gently deflexed as it is in the holotype, straight or upturned. In extreme cases the profile of the head may resemble that figured for *L. monocuspidata* by Barnard (1961, Fig. 68).

REMARKS. *L. skarphedini* is characterized by prominent teeth on peraeonites 1–4, peraeonite 1 with a single tooth, and by the bifid coxa 1.

L. uchu Barnard, 1973 differs from the present species in that coxa 1 of the former is deeply bifid, the emargination between lobes being 40% of the total length of the plate. Coxa 2 is also deeply bifid and has anterior and posterior margins subparallel with the posterior lobe just more than half the length of the anterior lobe. *L. uchu* can also be distinguished by the enlarged outer ramus of uropod 1 which is longer than the peduncle even in juvenile specimens and the reduced inner rami of uropods 1–3 which are respectively 20%, 33% and 80% of the length of the corresponding outer rami. *L. skarphedini* is very similar to *L. monocuspidata* Barnard, 1961 but can be distinguished by a number of quantitative characters. The latter species has coxa 1 indistinctly bifid, coxa 2 not bifid, the posterior-distal teeth of the epimera either absent or very small, the dactyls of peraeopods 3–4 not longer than the corresponding propod, uropod 1 outer ramus distinctly thickened, and uropod 2 very small and barely reaching the distal extremity of the peduncle of uropod 1. Although these differences are mostly of a relatively trivial nature it seems advisable at present to regard the two entities as distinct species. More material from other localities and a greater knowledge of geographical variation may require a closer alignment of *L. skarphedini* and *L. monocuspidata.*

Lepechinelloides gen. nov.

DIAGNOSIS. *Body* with large processes located in dorsal midline, never subdorsally; cuticular spines raised on peg-like projections. *Urosome,* segments 2 and 3 coalesced. *Head,* lacking eyes, rostrum and cephalic teeth. Antenna 1, peduncle articles 2 and 3 subequal. *Mandible,* molar nontriturative; palp of one article. *Lower lip,* inner lobes fleshy, well developed. *Maxilla 1,* palp biarticulate; *Maxilliped,* palp with four articles. *Gnathopod 2,* unguis of dactyl elongate. *Peraeopods 3–4,* carpus elongate. *Uropod 1,* rami immensely long.

TYPE SPECIES. *Lepechinelloides karii* sp. nov.

REMARKS. Non-diverse peraeopods 5–7 place *Lepechinelloides* in the Dexamininae. The absence of rostrum and ocular lobes, and the immensely long uropod 1 are unique within this sub-family. The new genus and some species of *Lepechinella* are closely related, having in common elongate antennae, peraeopod and uropods, strongly developed dorsal teeth, spinous cuticle, and long acuminate coxae. *Lepechinelloides* can be distinguished from *Lepechinella* and *Paralepechinella* by the absence of rostrum and cephalic teeth, and the vestigial mandibular palp of the former. *Atylus* species are rostrate, possess ocular lobes, and

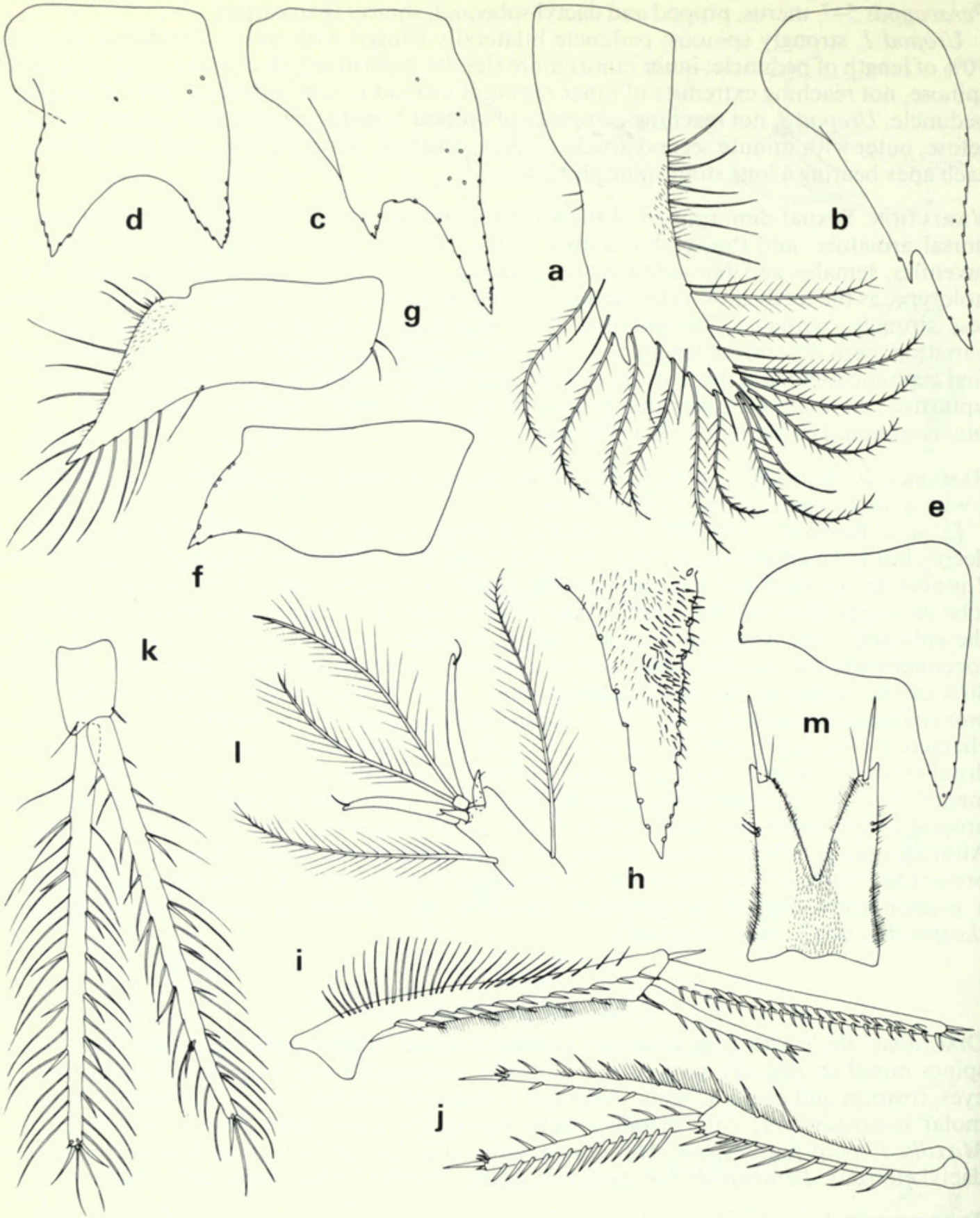

Fig. 9. *Lepechinella skarphedini* sp. nov. Holotype, male, 9 mm. (a–g) coxae 1–7; (h) coxa 3, detail; (i–k) uropods 1–3; (l) uropod 3, detail; (m) telson.

most have lower lips lacking inner lobes and other than uniarticulate mandibular palps. The remaining seven genera of the Dexamininae, *Dexamine, Tritaeta, Dexaminella, Delkarlye* Barnard, 1972, *Paradexamine, Syndexamine* and *Polycheria* are all oculate and all lack even a rudiment of the mandibular palp. In addition, the first six genera have a uniarticulate maxilla 1 palp, and the first four have triarticulate maxilliped palp.

Lepechinelloides karii sp. nov.

(Figs 10–12)

MATERIAL EXAMINED. Sta. 7709 # 62 3♂ 5–7 mm, 3 ♀ 6 mm, 2 juv. 2 mm; Sta. 7709 # 66 1 ♂ damaged, 1 ovig. ♀ 6 mm, 2 ♀ damaged; Sta. 7709 # 72 11 ♂ 6–7 mm, 3 ovig. ♀ 7–8 mm, 13 ♀ 4–8 mm, 7 juv. 3–4 mm, HOLOTYPE ♀ B.M.(N.H.) reg. no. 1978:239 [carcase and 4 microscope preparations], ALLOTYPE ♂ 1978: 240, 8 PARATYPES 1978:241; Sta. 7709 # 73 13 ♂ 4–8 mm, 3 ovig. ♀ 7–8 mm, 14 ♀ 5–8 mm, 11 juv. 2–4 mm; Sta. 7709 # 85 2 ♂ 7–8 mm, 1 ovig. ♀ 7 mm, 2 ♀ 5–7 mm, 1 juv. 4 mm.

Material not registered in the Zoology Department of the British Museum (Natural History) has been retained at the Institute of Oceanographic Sciences.

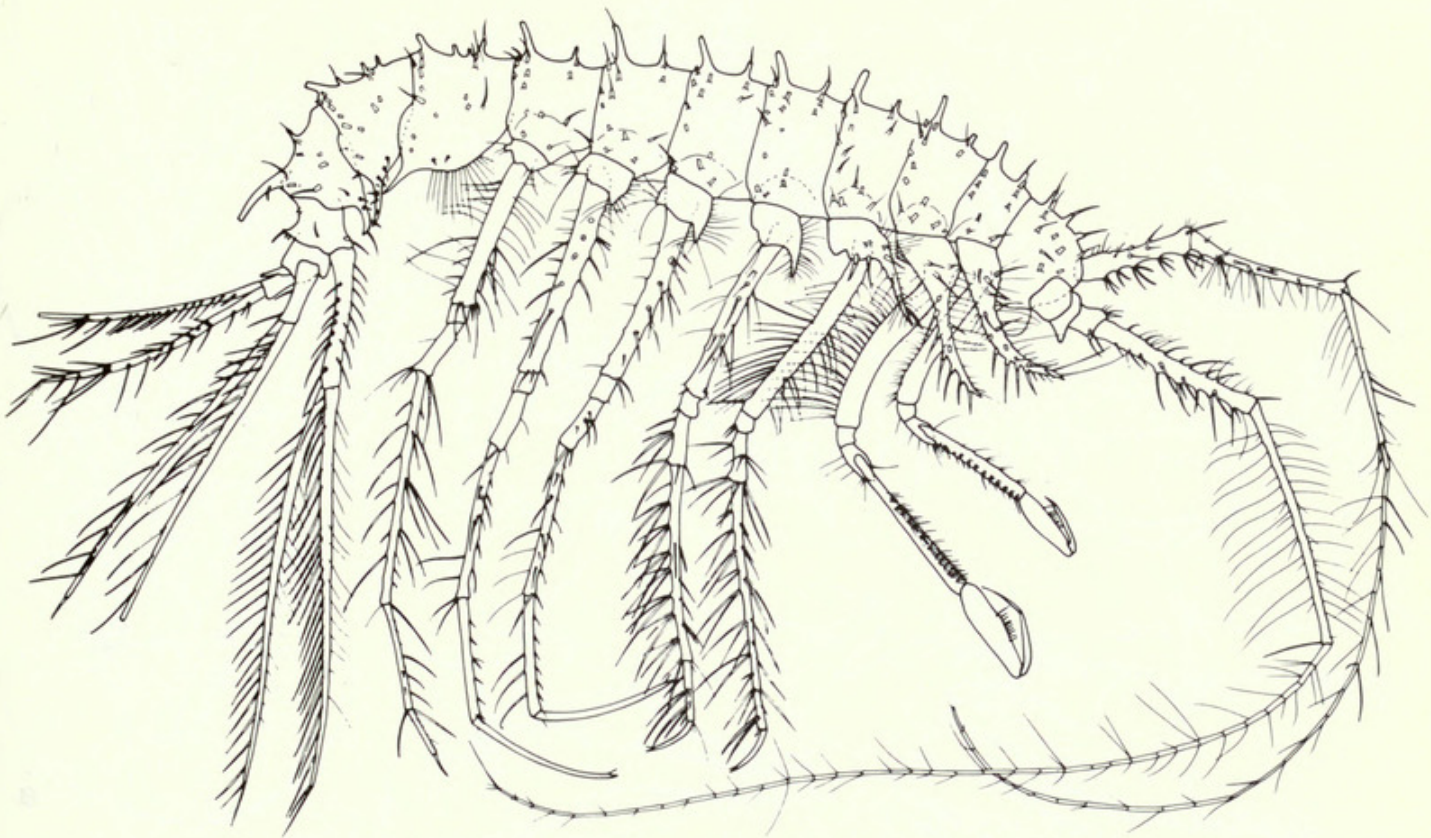

Fig. 10. *Lepechinelloides karii* gen. nov., sp. nov. Holotype, female, 8 mm.

ETYMOLOGY. Kari Solmundarson, husband of Helga, Burnt Njal's daughter.

DESCRIPTION. Holotype, female, 8 mm from Sta. 7709 # 72. *Peraeon,* each segment with upright, columnar projection dorsally close to posterior margin, a smaller peg-like tooth anterior to it, and lateral bosses dorsal to articulation with coxae. *Pleon,* each segment with a columnar projection in the mid-line close to posterior margin, that of pleonite 3 curved posteriorly; pleonites 1 and 2 with three dorsal accessory teeth, pleonite 3 with one. *Epimera,* first broadly rounded with long acute tooth posterior-ventrally; second and third with long curved tooth ventrally. *Urosome,* segments short; first with small, upright tooth posteriorly. *Body,* small peg-like projections each bearing an articulated spine scattered randomly on peraeonites, pleonites, head, coxae, peduncles of antennae and basal articles of peraeopods 3–7.

Head, subglobular, three peg-like projections in dorsal mid-line. *Antenna 1,* about as long as body; peduncle 60% length of filiform flagellum; accessory flagellum a single, elongate article. *Antenna 2,* peduncle rather longer than peduncle of antenna 1; flagellum as long as body. *Upper lip,* shallow, entire. *Mandible,* incisor process broad and laminar, multidentate; lacina mobilis of left mandible laminar, multidentate, of right mandible broad with accessory plate, both cutting edges complexly dentate; molar setose, non-triturative; palp vestigial,

Fig. 11. *Lepechinelloides karii* gen. nov., sp. nov. Holotype, female, 8 mm. (a) upper lip; (b) left mandible; (c) right mandible; (d) right mandible, lacina mobilis; (e) lower lip; (f–g) maxillae 1 & 2; (h) maxilliped; (i) accessory flagellum; (j–p) coxae 1–7; (q) telson.

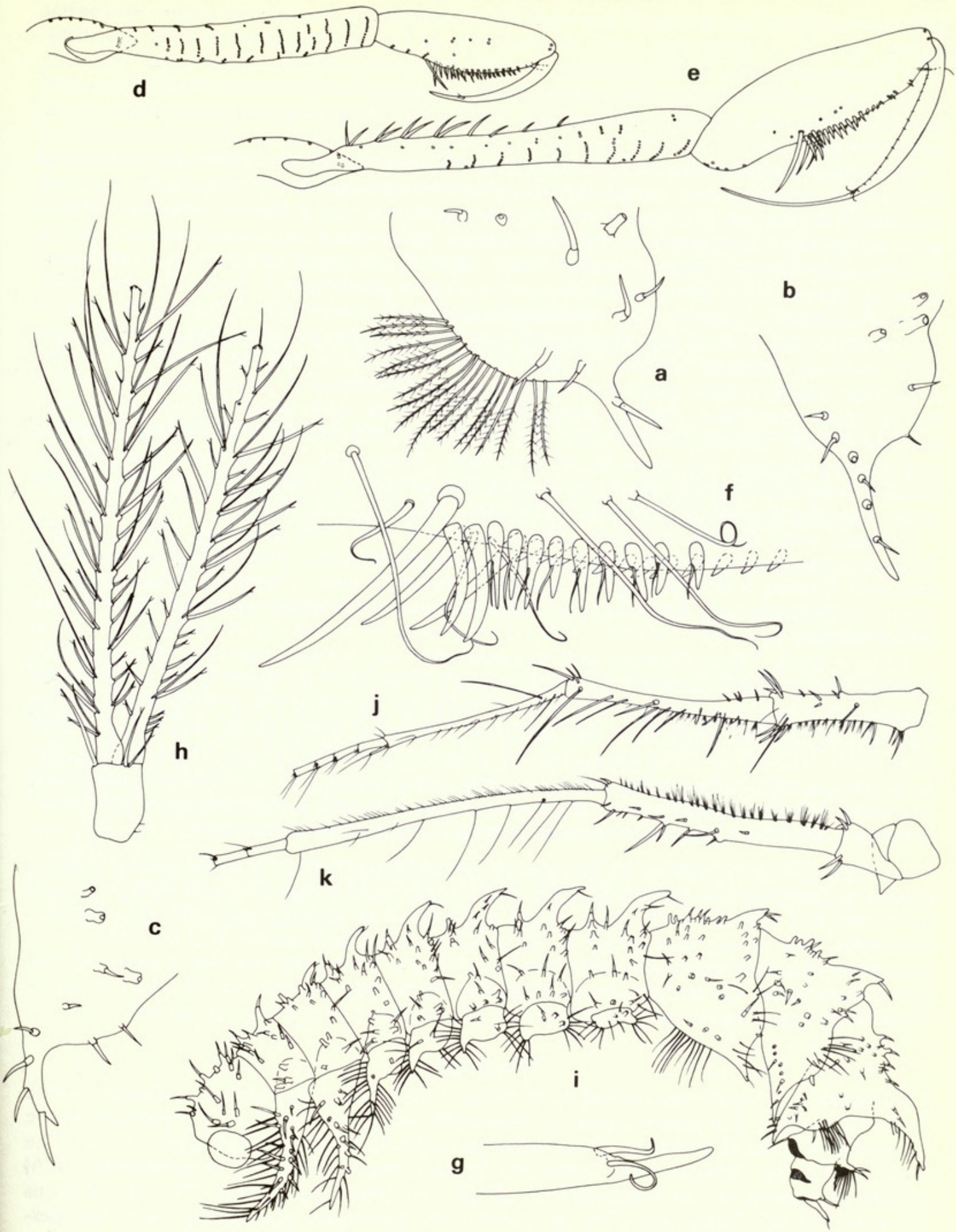

Fig. 12. *Lepechinelloides karii* gen. nov., sp. nov. Holotype, female, 8 mm. (a–c) epimera 1–3; (d–e) gnathopods 1 & 2; (f) gnathopod 2, detail of palm; (g) peraeopod 7, tip of dactyl; (h) uropod 3. Allotype, male 7 mm. (i) body; (j–k) antennae 1 & 2.

with two or three apical setae. *Lower lip,* inner lobes short, broad, outer lobes somewhat gaping. *Maxilla 1,* inner plate small, bearing only an apical seta; outer plate short bearing nine dentate or serrate spine teeth distally; palp poorly developed, second article tapering with three setae distally. *Maxilla 2,* plates short, outer broader than inner. *Maxilliped,* outer plate broadly oval, seventeen small spine teeth along medial margin; palp rather weak, articles linear.

Gnathopod 1, coxa elongate and strongly curved, apically acute, spinous and with basal boss, anterior and posterior margins bearing plumose setae; carpus elongate, slender, armed with ranks of plumose and pectinate setae; propod slender, oval, 60% of length of carpus, palm armed with short spines; dactyl 75% of length of carpus. *Gnathopod 2,* coxa similar to coxa 1 but less strongly curved; carpus slender, elongate, armed with ranks of plumose and pectinate setae; propod larger than that of gnathopod, 1, irregularly oval, 60% of length of carpus, palm spinose, limit marked by strong backwardly directed spine; dactyl as long as propod, curved with slender and enormously elongate unguis. *Peraeopod 3,* coxa thick with an elongate laminar projection anterior-distally bearing spines and setae; remaining articles linear; propod and dactyl short. *Peraeopod 4,* similar to peraeopod 3 except coxal projection shorter. *Peraeopods 5–6,* coxa with short laminar projection anterior-distally, posterior-distal angle subrectangular, bearing setae; merus short; carpus and dactyl subequal; unguis of dactyl very short. *Peraeopod 7,* coxa very small, weakly bilobed; basal shorter than basal of peraeopods 5–6; carpus 1·5 times as long as basal; propod longer than dactyl, both articles combined about 75% of length of carpus.

Uropods, rami slender, elongate, subequal, armed with setae and long slender spines. *Uropod 1,* immensely elongate, barely shorter than peraeopod 7; rami 2·75 times length of peduncle. *Uropod 2,* 80% of length of uropod 1; peduncle short. *Uropod 3,* 50% of length of uropod 1; peduncle very short. Telson, cleft 65%, lobes very slender each with three dorsal, sub-apical spines.

Allotype, male, 7 mm. *Peraeon,* each segment with long, curved posteriorly directed tooth dorsally, main tooth preceded by smaller peg-like projection; main teeth of posterior peraeonites longer and broader than those of anterior segments. *Pleon,* first two segments with several peg-like projections and posterior, triangular dorsal teeth; peraeonite 3 with three small projections and a large, hooked, posteriorly directed tooth. *Urosome,* first segment with upright, setose projection posteriorly; urosomite 3 with small dorsal projection. *Antennae,* subequal, nearly twice as long as body; first and second peduncle articles of antenna 1, and fourth peduncle article of antenna 2 with tufts of sensory setae.

VARIATION. The development of the typical male dorsal armature is more gradual than in species of *Lepechinella.* Immature males show a degree of broadening and hooking of the peraeonal and pleonal teeth prior to the acquisition of sensory setae on the antennal peduncles. The density and length of the cuticular armament varies. It is generally more prominent in larger individuals, with females tending to have fewer and longer pedestals and spines than males. On peraeonites particularly, the pedestal spines tend to occur in transverse bands spreading laterally from the main and accessory mid-dorsal projections.

Discussion

The genus *Lepechinella* was created by Stebbing (1908) for *L. chrysotheras,* and placed in the Paramphithoidae. The junior synonym *Dorbanella,* which Chevreux (1914) included in the Tironidae, was raised to familial status adjacent to the Atylidae by Schellenberg (1924). The family name was changed from Dorbanellidae to Lepechinellidae by Schellenberg (1926) on the realization of the congenericity of the two described species. The allied genus *Paralepechinella,* characterized by an enormously developed mandibular palp, was described by Pirlot (1933). Until Barnard (1970) placed the lepechinellids in the Dexaminidae, the Lepechinellidae was the only gammaridean family confined to bathyal and abyssal depths. Barnard also included the Atylidae, Prophliantidae and Anatylidae in his wider concept of the Dexaminidae. Two evolutionary lines were recognized; a prophliantin line to

include *Prophlias, Haustoriopsis, Sphaerophthalmus* and *Guernea,* and a dexaminin line containing the remaining genera.

The well attested similarity between *Atylus* and *Lepechinella* (Schellenberg, 1924; Barnard, 1970, 1973) and the close relation between the latter genus and *Paralepechinella* and *Lepechinelloides* suggest that this group of genera might justify the recognition of an atylin line within the Dexaminidae. The genera of this shallow-water to abyssal group have moderately to strongly modified ocular lobes (except in *Lepechinelloides* where these structures are completely absent), mandibular palps (except two or three aberrant *Atylus*) and biarticulate maxilla 1 palps. The three deep-water genera lack eyes. In contrast, the shallow-water, nestling dexaminins are oculate, show at most weakly modified ocular lobes, have uniarticulate maxilla 1 palps (except *Polycheria*), and lack any trace of mandibular palps.

Acknowledgements

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