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Lepidepecreellidae fam. nov. (Crustacea: Amphipoda: Lysianassoidea) in Australian waters

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Abstract

The new lysianassoid amphipod family Lepidepecreellidae is established and the genus *Lepidepecreella* is reported from Australian waters for the first time. The new species *Lepidepecreella nellae* **sp. nov.** is described.

Key words: Crustacea, Amphipoda, Lysianassoidea, Lepidepecreellidae, *Lepidepecreella*, Australia, taxonomy, new family, new species

Introduction

The monotypic lepidepecreellids are a wide-spread group of 11 species. Only two species are known from the northern hemisphere: *Lepidepecreella cymba* (Goës, 1866) from the North Polar Sea and *L. charno* J.L. Barnard, 1966 from south-western North America. Five species are known from the Indo-West Pacific: *L. bidens* (K.H. Barnard, 1930) from northern New Zealand; *L. nellae* **sp. nov.** from eastern Australia; *L. sarcelle* Lowry & Stoddart, 1994 from southern New Caledonia; and two species from the south-western Indian Ocean: *L. pamanzi* Ledoyer, 1986 from Banc de Geyser and *L. tridactyla* Bellan-Santini, 1972 from the Prince Edward Islands (recorded by Branch *et al*. 1991). Five species are known from the Antarctic: *L. andeep* Berge, Vader & Lockhart, 2004; *L. ctenophora* Schellenberg, 1926; *L. emarginata* Nicholls, 1938; *L. ovalis* K.H. Barnard, 1932; and *L. tridactyla* Bellan-Santini, 1972. Species of *Lepidepecreella* are deep-sea amphipods, often living below 2000 m depth. The shallowest known species is *L. cymba* (Goës, 1866) from 10 to 380 m depth off Spitsbergen in the Barents Sea.

Berge *et al*. (2004) reviewed the the association between amphipods and echinoids. Among these associations only the lepidepecreellid *Lepidepecreella andeep* and the uristid *Euonyx chelatus* Norman, 1867 have been known to feed directly on a living host. Both species have well-developed first gnathopods (simple in *L. andeep* and chelate in *E. chelatus*) which could facilitate breaking the epidermis of an echinoid. *Euonyx chelatus* has very reduced mouthparts but *L. andeep* has well-developed setal-teeth on maxilla 1 and Berge *et al*. (2004) described considerable damage around the peristome of the echinoid where the amphipods attach. In other species of *Lepidepecreella* the first gnathopod is slender and weak with a minutely serrate posterior margin along the dactylus which could be used as a rasp. None of these species has been reported as an associate of echinoids.

Material and methods

The description was generated from a DELTA database (Dallwitz 2005) to the lepedepecreellid species of the world. **Bold** parts of the description are diagnostic characters. Material is lodged in Museum Victoria, Melbourne (MV). Standard abbreviations on the plates are: A, antenna; G, gnathopod; MD, mandible; MP, maxilliped; MX, maxilla; P, pereopod; T, telson; U, uropod.

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Lepidepecreellidae fam. nov.

Diagnostic description. ***Head*** exposed, **much deeper than long, not extending much below insertion of antenna 2**, without cheek notch. *Antennae* calceoli absent in male and female. *Antenna 1* callynophore present in male and female. *Antenna 2* peduncular article 3 without distal hook. ***Epistome and upper lip*** **fused**, **with proximal portion produced into large triangular keel**. *Mouthpart bundle* subquadrate or subconical. ***Mandible*** **incisors well developed**, symmetrical, left and right straight, smooth; right lacinia mobilis absent; accessory setal row with 5 or less robust setae, without distal setal tuft; molar vestigial or small, flap-like, weakly setose to asetose; palp present, inserted approximately midanteriorly. ***Maxilla 1*** inner plate without apical pappose setae; **outer plate with** (10–11) **setal-teeth in 7/4 arrangement**, setal-teeth large, setal-tooth 6 slender, setal-tooth 7 slender, setal-tooth 7 contiguous with setal-tooth 6; palp large, 1- or 2-articulate, without apical robust setae. ***Maxilla 2*** **inner plate subequal to or slightly shorter than outer plate**, without oblique row of facial setae. *Maxilliped* coxa and basis normal; outer plate present, medial setae vestigial or absent, without apical setae; palp 4-articulate, article 4 well developed.

Gnathopod 1 simple; coxa vestigial; ischium long (length 3–3.6 x breadth); merus and carpus not rotated; carpus elongate; propodus linear, elongate; **dactylus filiform**, rarely not so. *Gnathopod 2* coxa vestigial; propodus with palmate setae; dactylus minute. *Pereopods* all simple; distal spurs absent. *Pereopod 3* coxa large. *Pereopod 4* coxa with well-developed posteroventral lobe. *Pereopod 5* coxa posterior lobe much deeper than anterior lobe. *Pereopod 6* coxa posterior lobe much deeper than anterior lobe.

Uropod 2 inner ramus without constriction. ***Uropod 3*** **uniramous**. *Telson* entire.

Type genus. *Lepidepecreella* Schellenberg, 1926.

Generic composition. *Lepidepecreellidae* includes one genus: *Lepidepecreella* Schellenberg, 1926.

Remarks. Lepidepecreellids are difficult to categorise. Based on the 7/4 setal-tooth arrangement, the non-triturating, flap-like molar and the simple gnathopod 1 the group appear to be most similar to scopelocheirids, but gnathopod 1 in scopelocheirids is modified in a different way to that of lepidepecreellids and no scopelocheirids have an entire telson or vestigial first and second coxae.

Among the lysianassoids, aside from the lepidepecreellids, only cyphocarids, the cebocarid, cyclocarid and thoriellid groups and wandinids have vestigial first and second coxae. None of these groups have a non-triturating, flap-like molar, none have a well-developed posteroventral lobe on coxa 4, none have a uniramous third uropod and none have a 7/4 setal-tooth arrangement. Cyphocarids and wandinids have a 6/5 setal-tooth arrangement.

There is evidence to suggest that species of *Lepidepecreella* are highly derived epi-parasites on sea urchins with a world-wide distribution in the deep-sea. Their relationship to other lysianassoid family level groups is unresolved at this time.

Lepidepecreella **Schellenberg, 1926**

Lepidepecreella Schellenberg, 1926: 281. —Stephensen, 1931: 6. —Stephensen, 1935: 101. —Gurjanova, 1951: 279. —J.L. Barnard, 1969: 347. —Ledoyer, 1986: 774. —Barnard & Karaman, 1991: 494. —Lowry & Stoddart, 1994: 171.

Paracyclocaris K.H. Barnard, 1930: 321 (type species *Paracyclocaris bidens* K.H. Barnard, 1930).

Type species. *Lepidepecreella ctenophora* Schellenberg, 1926, monotypy.

Diagnosis. With the characters of the family.

Remarks. There is some doubt as to whether all species of *Lepidepecreella* have a uniramous uropod 3 with a large projecting spur on the peduncle or whether some have a biramous uropod 3. Stephensen (1931: 6) when synonymising *Paracyclocaris* K.H. Barnard, 1930 with *Lepidepecreella* commented that "... probably the single difference is uropod 3: with two rami (one very short) in *Lepidepecreella*, with one ramus in *Paracyclocaris*." Although Schellenberg (1926) depicted a biramous uropod 3 for *L. ctenophora* (the type species of *Lepidepecreella*) we have examined the type material and found that the supposed inner ramus is

not articulated and is really a projection of the peduncle. It is likely that other species which have been reported or illustrated as having a biramous uropod 3 (*L. cymba* and possibly *L. charno*) have this same condition.

Species composition. *Lepidepecreella* now contains 11 species: *L. andeep* Berge, Vader & Lockhart, 2004; *L. bidens* (K.H. Barnard, 1930); *L. charno* J.L. Barnard, 1966; *L. ctenophora* Schellenberg, 1926; *L. cymba* (Goës, 1866); *L. emarginata* Nicholls, 1938; *L. nellae* **sp. nov.**; *L. ovalis* K.H. Barnard, 1932; *L. pamanzi* Ledoyer, 1986; *L. sarcelle* Lowry & Stoddart, 1994; *L. tridactyla* Bellan-Santini, 1972.

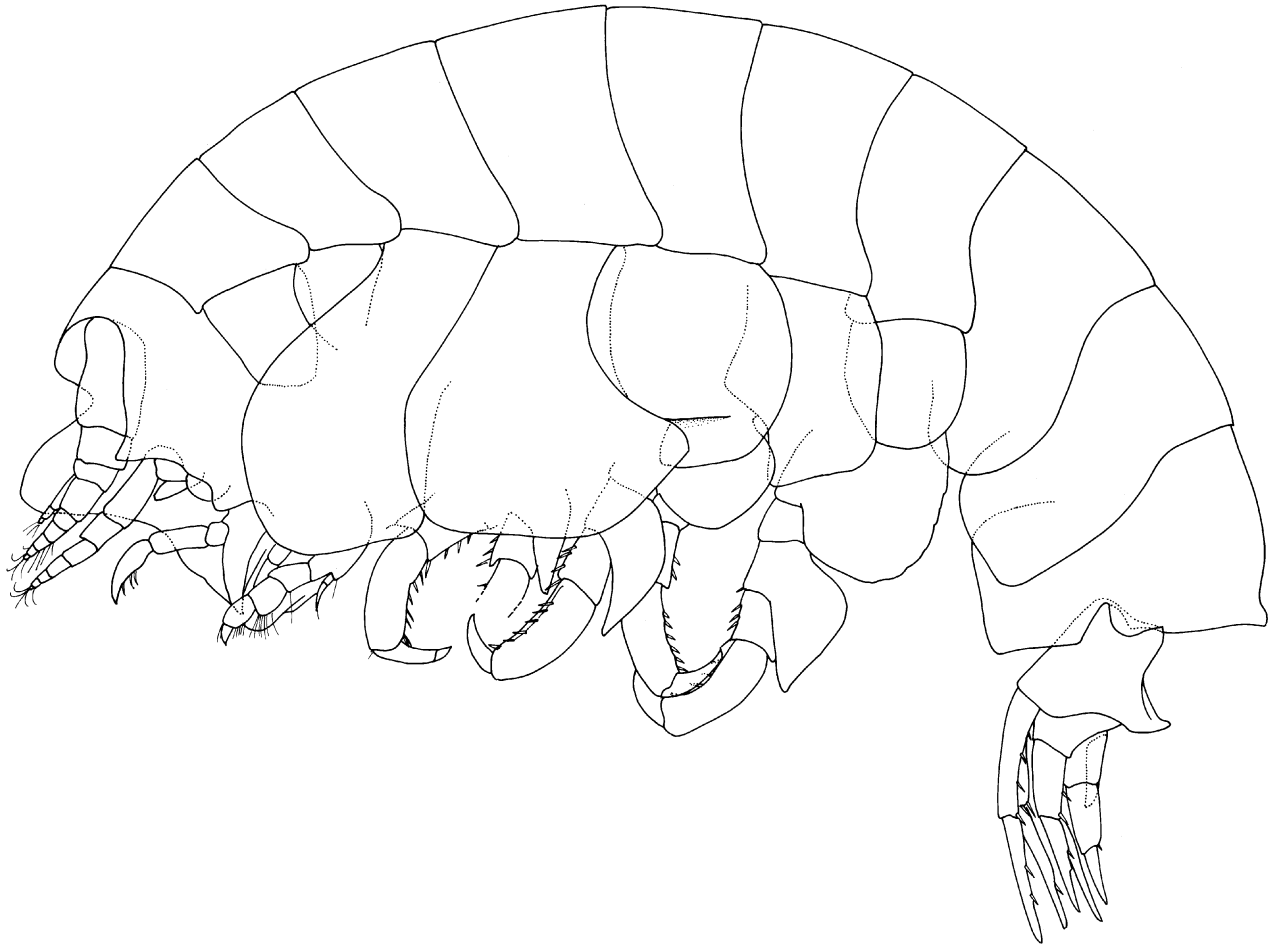

FIGURE 1. *Lepidepecreella nellae* **sp. nov.** Holotype, female, 3.5 mm, MV J60983.

Key to species of *Lepidepecreella*

1	Pereopod 5 basis linear	3
-	Pereopod 5 basis expanded posterodistally	2
2	Pereopod 5 basis posterodistal lobe extending about halfway along ischium	*L. sarcelle*
-	Pereopod 5 basis posterodistal lobe extending beyond ischium	*L. bidens*
3	Telson distally emarginate	*L. emarginata*
-	Telson distally straight	4
-	Telson distally convex	5
4	Uropod 3 peduncle subequal to ramus; ramus 1-articulate	*L. tridactyla*
-	Uropod 3 peduncle slightly longer than ramus; ramus with minute second article	*L. ctenophora*
5	Epimeron 3 posteroventral corner produced into a small spine	*L. ovalis*
-	Epimeron 3 posteroventral corner subquadrate	6
6	Pereopod 7 merus posterodistal lobe extending beyond carpus	7
-	Pereopod 7 merus posterodistal lobe not extending beyond carpus	8

7 Epistome and upper lip with a distinct notch between them; uropod 3 ramus with a minute second article ..... *L. cymba*
- Epistome and upper lip without a distinct notch between them; uropod 3 ramus 1-articulate ..... *L. nellae*
8 Gnathopod 1 dactylus regular, not styliform; carpus subequal to propodus ..... *L. andeep*
- Gnathopod 1 dactylus long, styliform; carpus shorter than propodus 9
9 Pereopod 7 basis posterodistal lobe extending beyond ischium; uropod 3 ramus 1-articulate ..... *L. charno*
- Pereopod 7 basis posterodistal lobe extending about halfway along ischium; uropod 3 ramus with minute second article ..... *L. pamanzi*

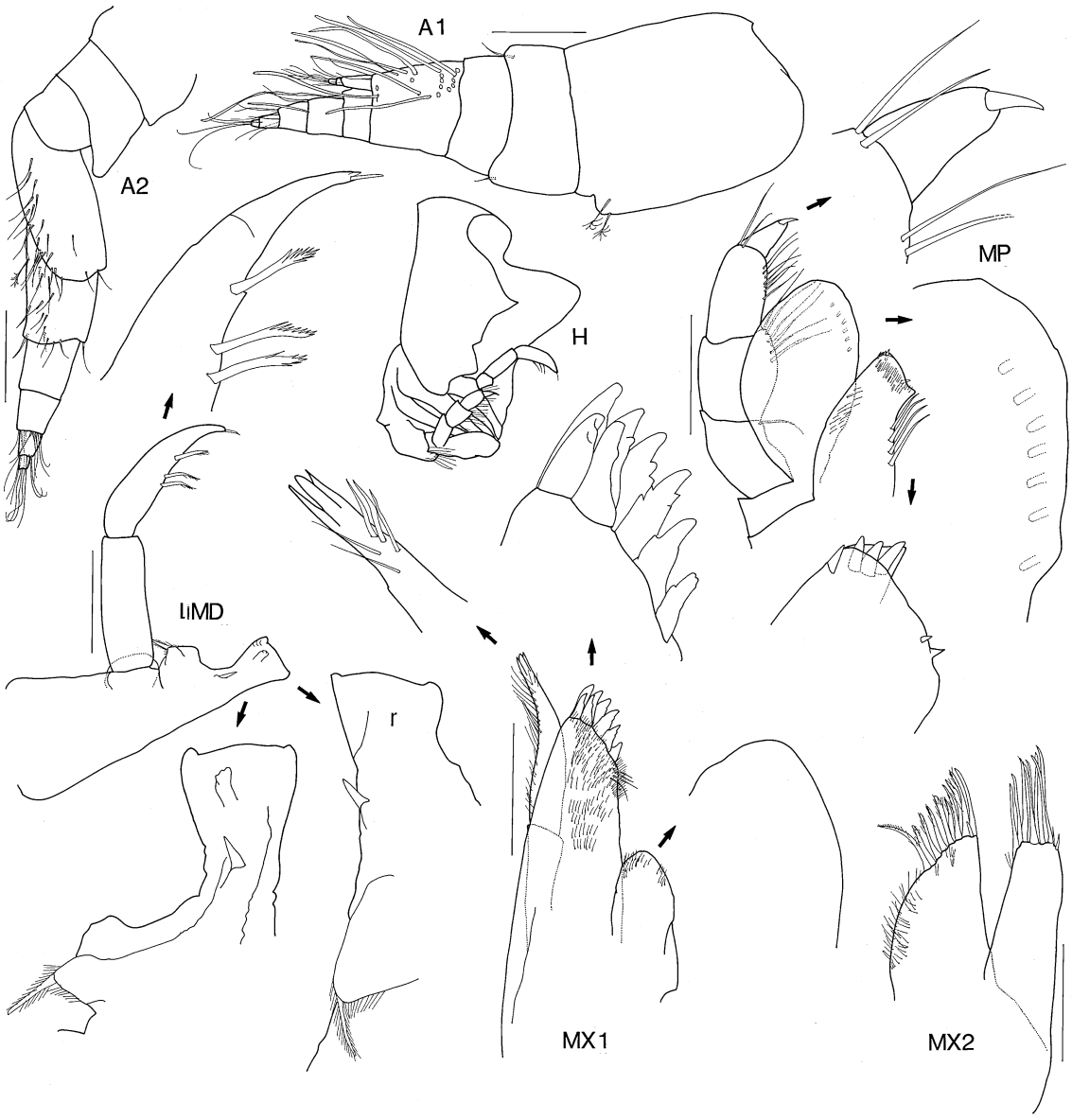

FIGURE 2. *Lepidepecreella nellae* **sp. nov.** Holotype, female, 3.5 mm, MV J60983. Scales represent 0.1 mm.

***Lepidepecreella nellae* sp. nov.**
(Figs 1–3)

Type material. HOLOTYPE, female, 3.5 mm, MV J60983, south of Point Hicks, Victoria, Australia, 38°21.90'S 149°20.00'E, 1000 m, WHOI epibenthic sled, 23 July 1986, G.C.B. Poore *et al.*, RV *Franklin*, stn SLOPE 32. PARATYPE, 1 partial specimen, MV J60981, south of Point Hicks, Victoria, Australia,

38°19.60'S 149°24.30'E, 930 m, rock, rubble, clay, sand, biogenic sediment, WHOI epibenthic sled, 23 July 1986, M.F. Gomon *et al.*, RV *Franklin*, stn SLOPE 33.

Type locality. South of Point Hicks, Victoria, Australia, 38°21.90'S 149°20.00'E, 1000 m depth.

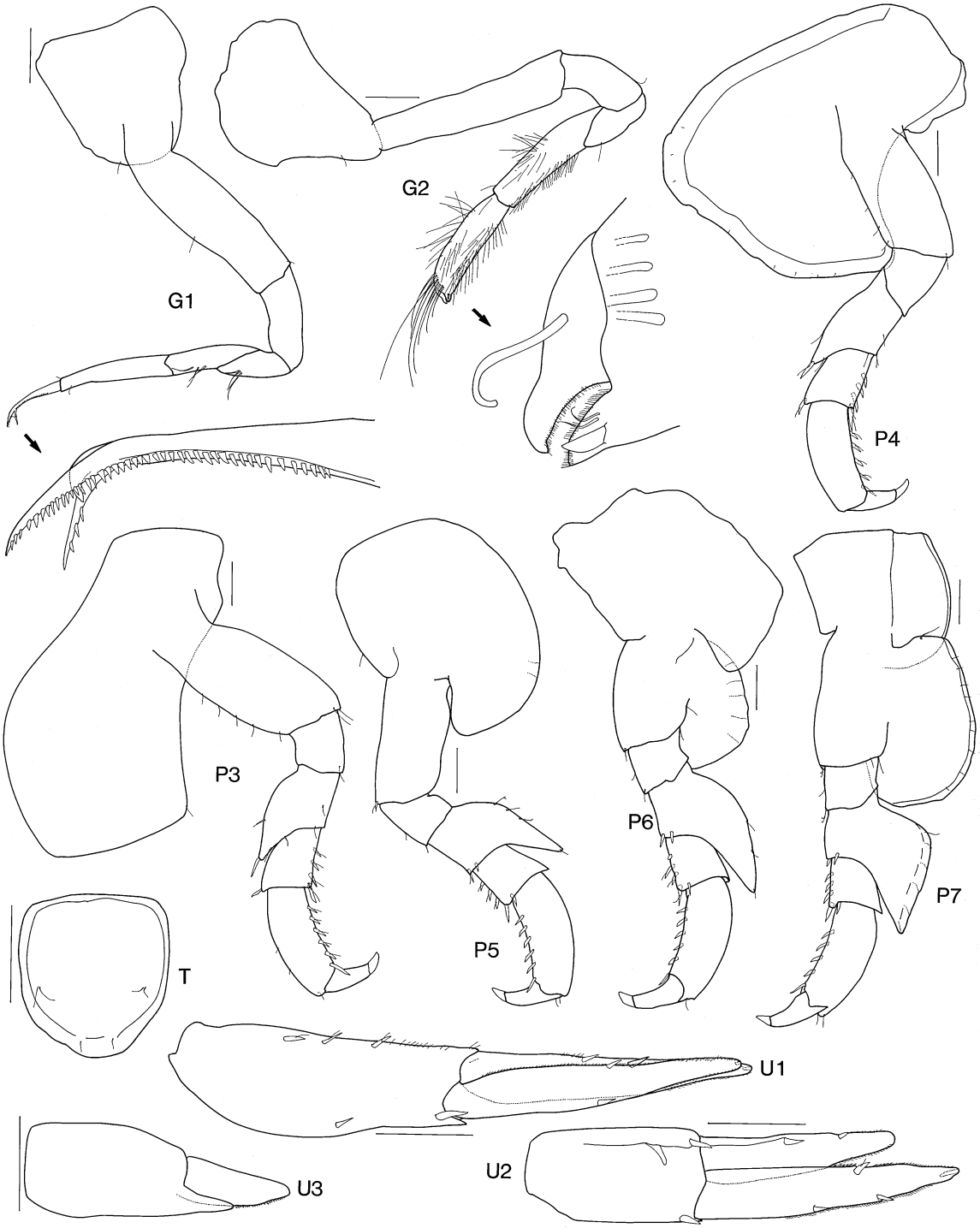

FIGURE 3. *Lepidepecreella nellae* **sp. nov.** Holotype, female, 3.5 mm, MV J60983. Scales represent 0.1 mm.

Etymology. The species is named for Nell Stoddart in honour of her good deeds and good spirit.

Diagnostic description. *Head* lateral cephalic lobe acute. *Epistome and upper lip* without a distinct notch between them. *Mandible* left lacinia mobilis peg-like. *Maxilla 1* outer plate with 10 setal-teeth (not all visible in fig. 2) in a modified 7/4 arrangement; palp 2-articulate. ***Maxilliped*** **palp article 2 about as long as broad**, length 1 x breadth. *Gnathopod 1* ischium long, length 3 x breadth; carpus shorter than (0.8 x) propodus; dactylus styliform. *Pereopod 5* basis linear, without posterodistal lobe; merus posterodistal lobe reaching to

about the end of carpus. *Pereopod 7* basis posterodistal lobe extending slightly beyond ischium; merus posterodistal lobe extending beyond carpus. *Epimeron 3* posterior margin minutely serrate; posteroventral corner subquadrate. ***Uropod 3*** **peduncle slightly longer than (1.5 x) ramus**; **ramus 1-articulate**. *Telson* longer than broad, length about 1.1 x breadth, distally convex.

Habitat. Living on rock, rubble, clay, sand, biogenic sediment.

Remarks. *Lepidepecreella nellae* and *L. tridactyla* appear to be sister taxa and probably had a common ancestor 60 mya when Australia and Antarctica were still joined as part of Gondwana. The species have similar pereopods 5 to 7. The maxillipedal palp of *L. nellae* is stouter than that of *L. tridactyla* and the apical margin of the telson is rounded not truncated as in *L. tridactyla*.

Distribution. South-eastern Australia in 930–1000 m depth.

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