

## Two new genera of terrestrial isopods (Crustacea: Isopoda: Oniscidea) from north-western Western Australia

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### Abstract

Oniscidea collected from the Kimberley region and Barrow Island, Western Australia belong to the families Ligiidae, Olibrinidae, Philosciidae and Armadillidae. The family Olibrinidae is recorded for the first time from Australia. Two new genera of Armadillidae, *Kimberleydillo* gen. nov. and *Barrowdillo* gen. nov., and two new species, *Kimberleydillo waldockae* sp. nov. and *Barrowdillo pseudopyrgoniscus* sp. nov., are described.

### Introduction

This publication deals with the specimens of terrestrial isopods collected during the months of August and September 1991 from cave and non-cave habitats by Ms J.M. Waldock and Dr W.F. Humphreys from Barrow Island. Specimens prefixed WAM are lodged in the Western Australian Museum, those prefixed DH are in the personal collection of the author.

### Systematics

#### Family Ligiidae Brandt and Ratzeburg, 1831

##### Genus *Ligia* Fabricius, 1798

##### *Ligia exotica* Roux, 1828

*Ligia exotica* Roux, 1828, pl.13, fig.9; Roman, 1977: 119, figs 6-7.

*Megaligia exotica* Verhoeff, 1926: 348; Van Name, 1936: 48.

#### Material examined

Barrow Island, Wapet camp, 20°50'8"S, 115°25'0"E, beach beneath stones, 6 September 1991, W.F. Humphreys and B. Vine, (WAM 126-91), female.

#### Remarks

This cosmopolitan species is the most widely distributed in the world, except Europe. In Australia, in spite of the fact that most records of *Ligia* have been assigned (Green 1962: 83) to *Ligia australiensis* Dana, 1853, it seems that this species is limited to the south-eastern and southern coasts of Australia from New South Wales to South Australia and in Tasmania (Green 1974: 238). The other records should be assigned to *Ligia exotica*.

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**Family Olibrinidae Budde-Lund, 1913**

**Genus *Olibrinus* Budde-Lund, 1913**

***Olibrinus* sp.**

**Material examined**

Barrow Island, Wapet camp, 20°50'8"S, 115°25'0"E, beach beneath stones, 6 September 1991, W.F. Humphreys and B. Vine, WAM 127-91, 1 ovigerous female.

**Diagnosis**

This species is elongated, with long antenna, the flagellum of which is multiarticulate. The pleon is narrower than the pereon. Frontal line is absent, but a supra-antennal line is present. Pleopod exopodites 1 and 2 without respiratory area.

**Description**

Small elongated animal of 5.2 mm x 1.6 mm. The colour whitish to the naked eye, but magnified (x18), a thin network of pale brown is apparent, thicker on cephalon. A brown spot present on the ventral face of the meros on every pereopod. Eyes reduced, each with five ommatidia embedded in a black pigmentary spot. Pleon narrow with apex of epimera visible from above. Pleotelson triangular and wider than long. Uropods with long protopodites; insertion of endopodite on projection of the bottom of the protopodite.

**Remarks**

This is the first record of the family Olibrinidae in Australia. Roman (1977) gave an account of the different species of *Olibrinus* with their distribution. This was discussed again by Taiti and Ferrara (1991) who placed the Japanese genus *Marinoniscus* as a synonym of *Olibrinus*. Six of the ten described species come from the shores of the Indian Ocean; the three remaining species are from Japan and one from Hawaiian Islands. The Barrow Island specimen may well be of an undescribed species but, an adequate description cannot be presented from a single female specimen.

**Family Philosciidae Vandel, 1952**

**Genus *Laevophiloscia* Wahrberg, 1922**

***Laevophiloscia yalgoonensis* Wahrberg, 1922**

*Philoscia (Laevophiloscia) yalgoonensis* Wahrberg, 1922: 130.

*Laevophiloscia yalgoonensis* Vandel, 1973: 90.

**Material examined**

Barrow Island, Western Australia. Cave B1, W.F. Humphreys and B. Vine, 5 September 1991, WAM 111-91, 4 males and WAM 112-91, 5 females; W.F. Humphreys and B. Vine, 6 September 1991, WAM 114-91, 1 female; W.F. Humphreys and B. Vine, 10 September 1991, WAM 121-91, 1 male and 2 females; W.F. Humphreys and B. Vine, 10 September 1991, WAM 122-91, 1 male; W.F. Humphreys and B. Vine, WAM 123-91, 4 males and 5 females; W.F. Humphreys and B. Vine, 12 September 1991, WAM 124-91, 1 male. Cave B3, W.F. Humphreys and B. Vine, 12 September 1991, WAM 125-91, 1 male and 1 female.

## Remarks

This species was redescribed by Vandel (1973). It is common in Western Australia, being found both epigean and in caves. It is probably a recent entry into caves as specimens living in caves hardly differ from outside forms.

## Family Armadillidae Brandt and Ratzeburg, 1831

### Genus *Kimberleydillo* gen.nov.

#### Type species

*Kimberleydillo waldeckae* sp. nov., herein designated.

#### Diagnosis

Unable to conglobate with dorsal surface not strongly but regularly curved, suggesting *Clylisticus* habit; neither schisma nor peraeon ventral lobes. Flagellum of antenna 2-jointed. Five pairs of pseudotracheae and uropod protopodite flattened and situated between sides of telson and epimera of pleon segment 5. Telson with trapezoidal proximal part and subrectangular distal part; apex slightly rounded.

#### Remarks

The fact that this genus is unable to conglobate and all the interlocking structures are absent, places this genus in the subfamily Australiodillinae Vandel, 1973 with the genera *Australiodillo* Verhoeff, 1926 and *Neodillo* Dalens, 1990. *Kimberleydillo* is, however, distinct from these genera by the dorsal surface being regularly curved, while the margins are more or less extended horizontally in *Australiodillo* and *Neodillo*. In addition the pleotelson is indented in *Australiodillo* and entire in *Kimberleydillo*. The antennulae seem four jointed in *Neodillo* and three jointed in *Kimberleydillo*. The reduced pigmentation, the translucence of tegument and the lengthening of the antenna seem to be steps towards troglomorphy.

### *Kimberleydillo waldeckae* sp.nov.

Figures 1-9

#### Holotype

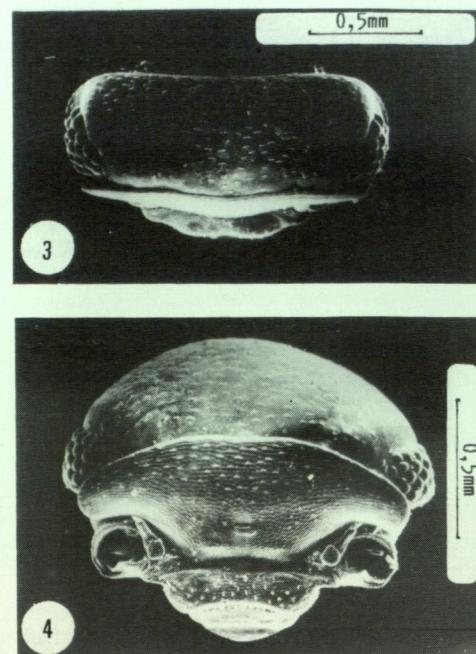
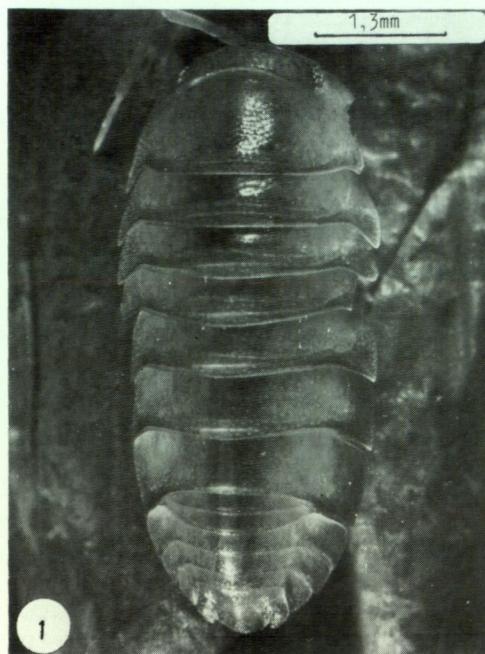
Tunnel Creek, 17°37'S, 125°09'E, Kimberley, Western Australia, dark zone on calcite extrusion; Ms J. M. Waldock, 11 August 1991, WAM 128-91, female.

#### Paratypes

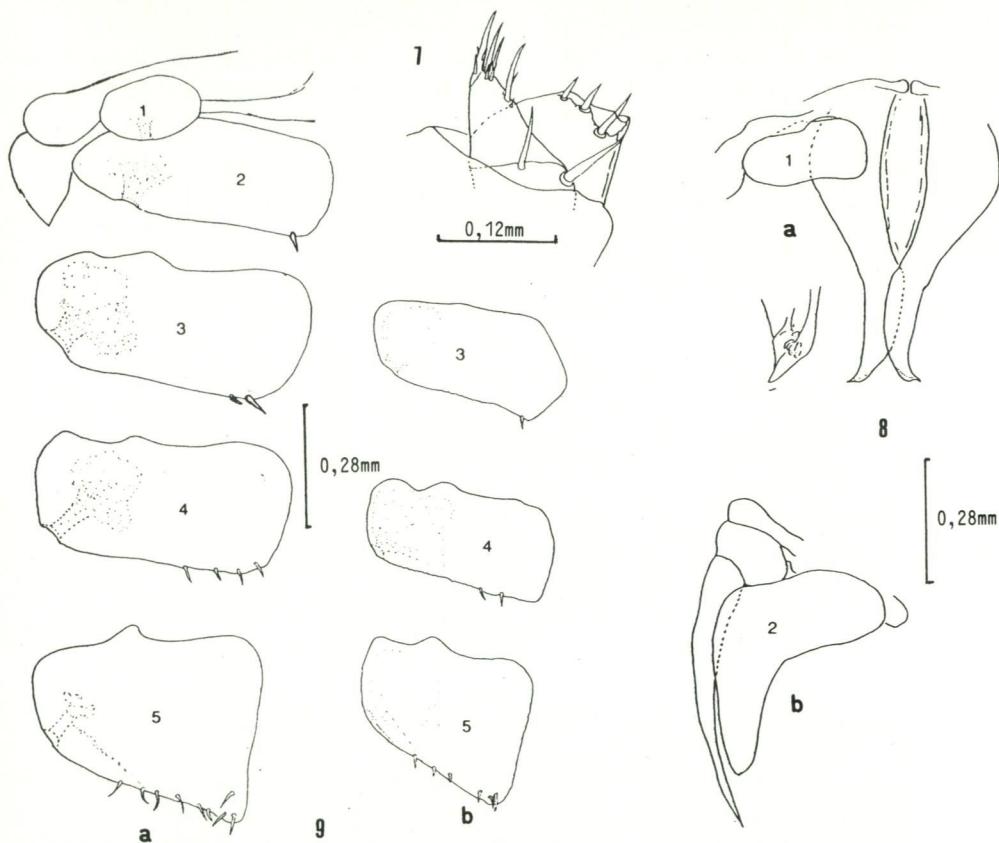
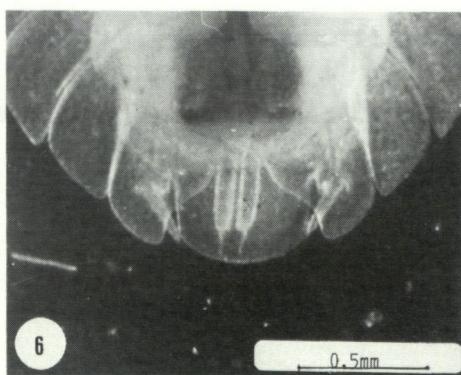
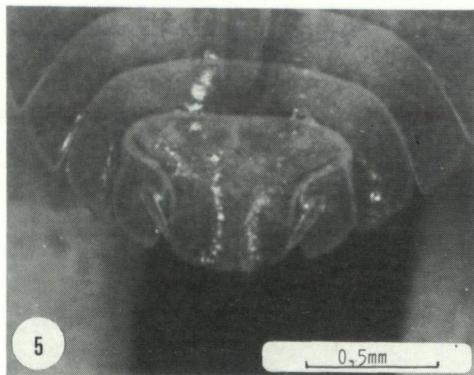
Tunnel Creek, Kimberley, Western Australia, dark zone on calcite extrusion; Ms J. M. Waldock, 11 August 1991, WAM 129-91, 1 male and WAM 130-91, 1 female, DH: 1 female.

#### Diagnosis

Lateral parts of posterior margin of peraeon segments sinuated but gradually less from anterior to posterior segments. Telson with apex not indented.



**Figures 1-4** *Kimberleydillo waldochae* sp.nov., 1, whole animal in dorsal view; 2, whole animal in lateral view; 3, cephalon in dorsal view (S.E.M.); 4, cephalon in frontal view (S.E.M.).



**Figures 5-9** *Kimberleydillo waldochae* sp.nov., 5, pleotelson in dorsal view; 6, pleotelson in ventral view; 7, right maxilliped; 8, first (8a) and second (8b) male pleopods; 9: female (9a) and male (9b) exopods of pleopods.

## Description

Small, the holotype, which is the largest specimen, is 5.9 mm x 2.6 mm; the smallest, the male, is 3.8 mm x 1.5 mm. On a greyish and more or less translucent background a brown-grey network stands out clearly when magnified (x18), more dense on the posterior margin of each peraeon segment.

Black eyes each with 13 to 16 ommatidia. Frontal line uninterrupted and straight, protruding slightly above the vertex. Face smooth, slightly convex, without outline of shield. Posterior margins of peraeon segments I-II distinctly sinuated. Lateral margins of peraeon segment I thin. No interlocking structures. Lateral margins of pleon segment 5 slightly divergent. Tegument smooth. A1 3-jointed with distal article slender bearing 4 to 5 aesthetascs toward apex. A2 with 2-jointed flagellum, the distal segment being twice as long as the first. Total length of the antennae/total length of body = 0.80. Md with simple molar penicil. Mx1 with apparently only 9 teeth; penicils of the inner branch spindle-shape elongated. Peraeopods long and slender. Uropod with long exopodite. Five pairs of pseudotracheae with an invagination on every one of the pleopod exopodites. The female has the first pleopod exopodite reduced to the respiratory area; the exopodites progressively increase in size from the first to the fifth.

## Distribution

Known only from the dark zone of a cave.

## Derivation of name

The generic name alludes to the type locality, the epithet honours Ms J. M. Waldock, the collector.

## Genus *Barrowdillo* gen.nov.

### Type species

*Barrowdillo pseudopyrgoniscus* sp. nov., herein designated.

### Diagnosis

Endoantennal conglobation. Epimera horizontal. Flagellum of antenna 2-jointed. Schisma absent on the peraeon epimeron I. Four pairs of pseudotracheae. Only four pleopod exopodites (1st-4th) are visible and interdependent among themselves. Uropod protopodite flattened and acute. Pleotelson hour-glass-shaped.

### Remarks

The structure of the pleopod exopodites which are found in this genus are, among all Oniscidea, only known in the sub-family Buddelundiinae Verhoeff, 1926. Until now, this subfamily was represented only by the single genus *Buddelundia* Michaelsen, 1912. The ornamentation and, above all, the epimera extending horizontally and the absence of a schisma in peraeon epimeron I distinguish the new genus *Barrowdillo* from *Buddelundia*. The lack of a schisma, the high frontal lamina and the sharply protopodite of uropods seem to be primitive characters for an Armadillidae, but spherical conglobation, ornamentation and reduction of endopodites and exopodites of uropods are synapomorphies.

***Barrowdillo pseudopyrgoniscus* sp.nov.**

Figures 10-20

**Holotype**

Barrow Island, Western Australia; cave B3, 20°48'1"S, 115°21'7"E, W.F. Humphreys and B. Vine, 4 September 1991, WAM 108-91, male.

**Paratypes**

Barrow Island, Western Australia; cave B3, W.F. Humphreys and B. Vine, 4 September 1991, WAM 109-91, 1 female; DH, 1 female; W.F. Humphreys and B. Vine, 7 September 1991, WAM 116-91, 1 male and WAM 117-91, 1 female; cave B2, W.F. Humphreys and B. Vine, 7 September 1991, WAM 119-91 and 120-91, 2 females; DH, 1 male.

**Diagnosis**

Dorsum with distinct ornamentation. Lateral margins of the body parallel; spherical conglobation. Frontal lamina straight, without medial incision and raised well above the vertex. Interlocking structures on the seven peraeopod segments.

**Description**

Holotype specimen 9.6 mm x 4.8 mm. Dorsal surface convex but the epimera of peraeon and pleon, and the telson are splayed out horizontally. Cephalon, peraeon, pleon and pleotelson with developed tubercles arranged in alternate rows (3 on the cephalon, 3 on the protergite and 4 on metatergite of the first pereon, 3 on the next peraeon segments, 1 on pleon segments 3-5 and 3 tubercles on the pleotelson).

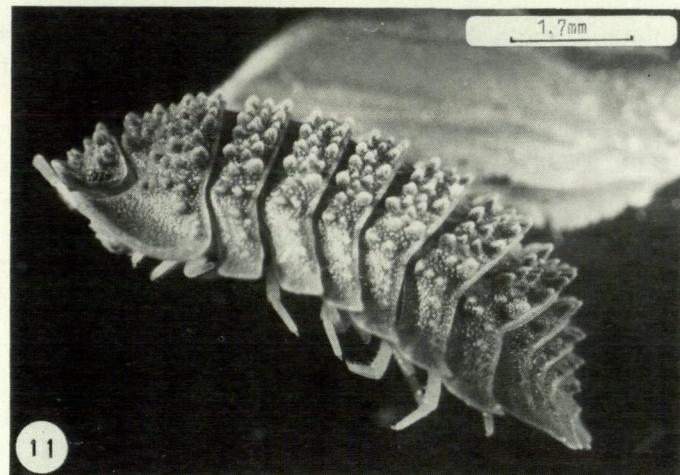
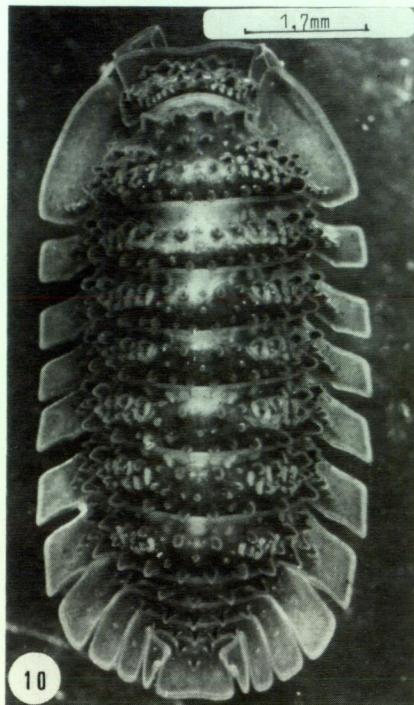
Cephalon with frontal lamina protruding above the vertex. Black and small prominent eyes each with 12-13 ommatidia, not joined. Peraeon segment I with an endolobe on the internal face of epimeron. On the same face of peraeon segment II a tooth shaped internal lobe. On third and fourth peraeon segments the interlocking structures are inconspicuous, better marked from V to VII segments, but missing on pleon segments. A1 3-jointed with 6-7 aesthetascs subapically situated. Short and stocky antenna, with 2-jointed flagellum, the distal article being three times length of the first. Mandible with simple molar penicil, and a wisp of six or seven small penicils between lamina mobilis and molar penicil. Maxillula with inner branch rounded at the apex, bearing 2 long penicils, outer branch with 4+6 teeth. Maxilliped with stout thorn on the endite. Peraeopods with reduced dactylos. Uropod with protopodite becoming sharp at the apex, with reduced endopodite and minute exopodite. Second pleopods of male with endopodites curved distally.

**Distribution**

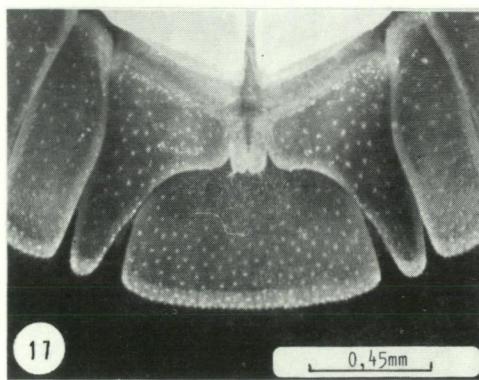
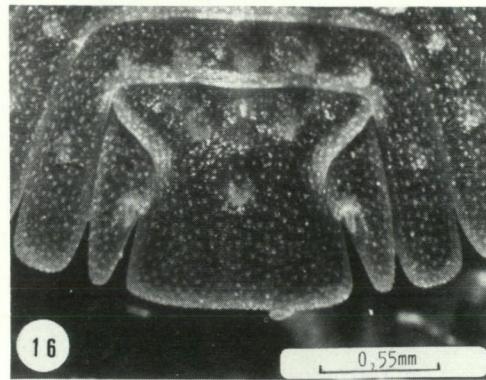
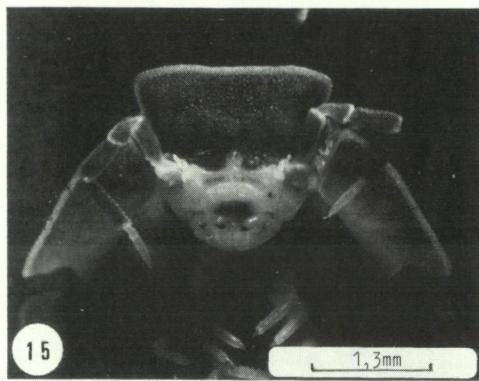
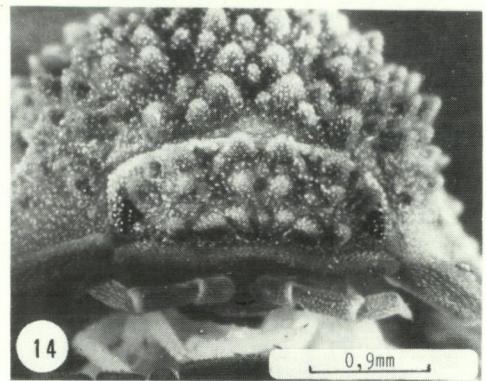
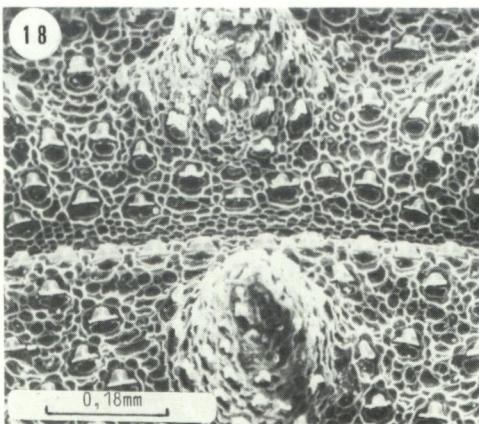
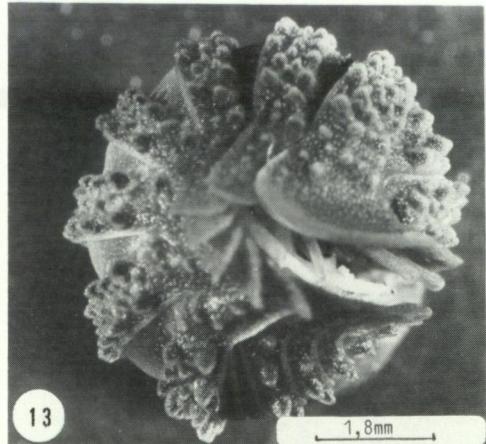
This species is known only from two caves in Barrow Island, but it is not a troglobite and probably also lives outside caves.

**Derivation of name**

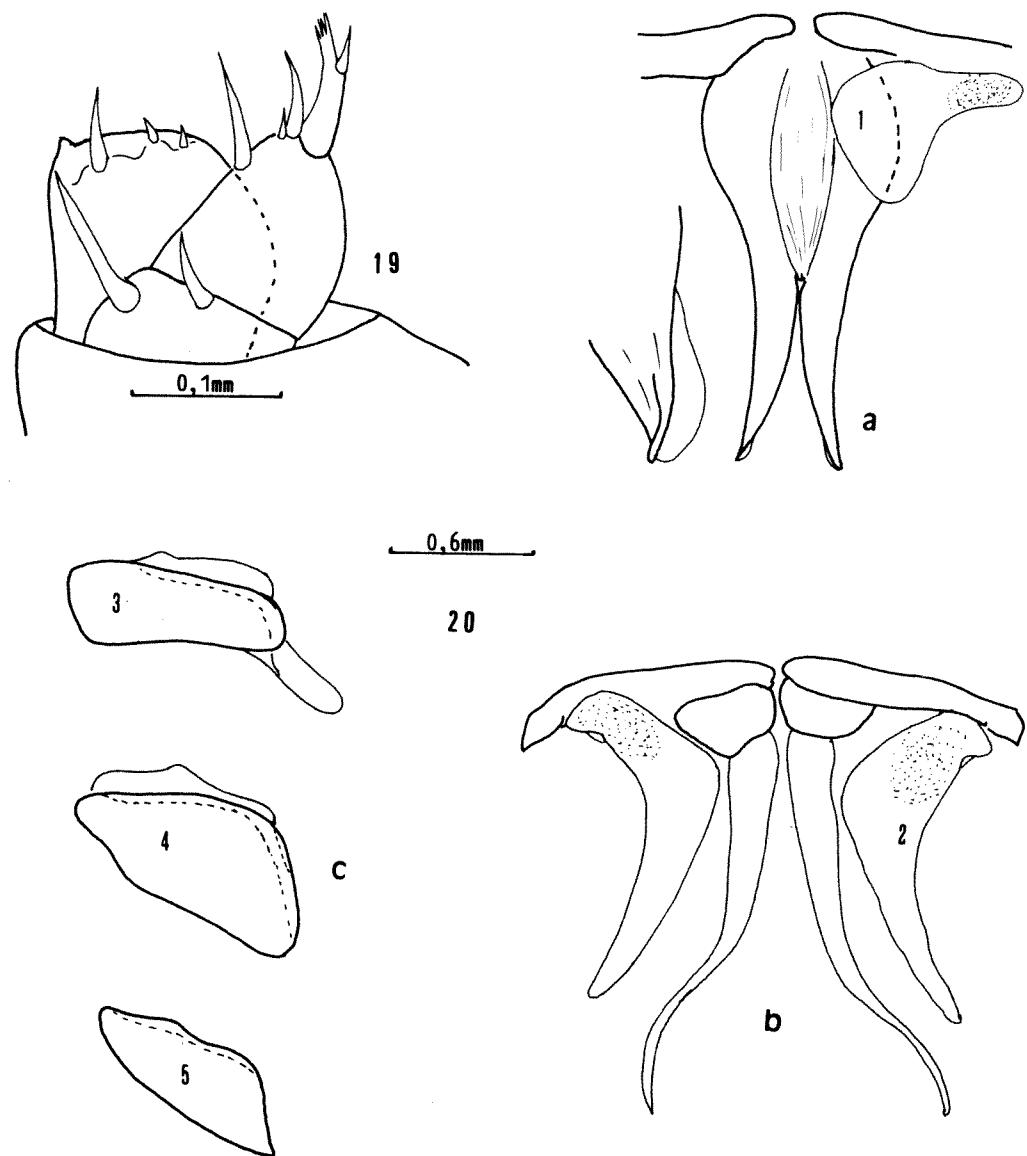
The name of the genus is derived from its place of discovery and the name of the species in an allusion to *Pyrgoniscus* which is similar in appearance.



**Figures 10-12** *Barrowdillo pseudopygoniscus* sp. nov., 10, whole animal in dorsal view; 11, whole animal in lateral view; 12, whole animal in ventral view.



**Figures 13-18** *Barrowdillo pseudopygonicus* sp.nov., 13, whole animal rolled in lateral view; 14, cephalon in dorsal view; 15, cephalon in frontal view; 16, telson in dorsal view; 17, telson in ventral view; 18, dorsal tegumentary surface of the third pleonite (S.E.M.).



**Figures 19-20** *Barrowdillo pseudopyrgoniscus* sp.nov., 19, left maxilliped; 20, first (20a) and second (20b) male pleopods, and exopods (20c) of third, fourth and fifth pleopods; the fifth male exopod is not visible on the whole animal, being completely covered and hidden by the fourth.

### Acknowledgements

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### References

Brandt, J.F. (1833). Conspectus Monographiae Crustaceorum Oniscodorum Latreillii. *Bull. Soc. imp. Nat. Moscou* 6: 171-193.

Brandt, J.F. and Ratzeburg, J.T.C. (1831). Isopoda, in *Medizinische Zoologie oder) Getrue Darstellung und Beschreibung der Thiere die in der Arzneimittelkunst in Betracht Kommen*, Berlin, 2(1-3): 70-84.

Budde-Lund, G. (1912). Oniscoidea, nach gelassenes Fragment. *Die Fauna Südwest-Australien. Ergebnisse der Hamburger südwest-australischen Forschungsreise 1905 herausgegeben von Prof. Dr W. Michaelsen und Dr R. Hartmeyer*. Jena, 4(2): 17-44.

Budde-Lund, G. (1913). The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the leadership of Mr J. Stanley Gardiner (IV, n° XXII). Terrestrial Isopoda particularly considered in relation to the distribution of the southern Indo-pacific species. *Trans. Linn. Soc. Lond. (Zoology)*, 15: 367-394.

Dalens, H. (1990). Les Australiodillinae Vandel, 1973 (Isopoda, Oniscoidea): révision des espèces connues et description d'un nouveau genre et d'une nouvelle espèce de Papouasie-Nouvelle Guinée. *Bull. Soc. Hist. nat., Toulouse* 126: 25-34.

Dana, J.D. (1853). Crustacea, in "United States Exploring Expedition during the Years 1838, 1839, 1840, 1841, 1842 under the Command of Charles Wilkes, U.S.N.", 13(2): 691-1618.

Fabricius, J.C. (1798). *Supplementum Entomologiae Systematicae*. Hafniae, 1-572.

Green, A.J.A. (1961). A study of Tasmanian Oniscoidea (Crustacea: Isopoda). *Aust. Jl Zool.* 9: 258-364.

Green, A.J.A. (1962). Records of the occurrence in Australia of *Ligia exotica* Roux (Crustacea, Isopoda, Oniscoidea). *Pap. Pro. R. Soc. Tas.* 96: 83-85.

Green, A.J.A. (1974). Oniscoidea (Terrestrial Isopoda), in *Biogeography and Ecology in Tasmania*, W.D. Williams (ed.), 229-249. W. Junk, The Hague.

Roman, M.L. (1977). Les Oniscoïdes halophiles de Madagascar (Isopoda, Oniscoidea). *Beaufortia*, 26(334): 107-152.

Roux, P. (1828). *Crustacés de la Méditerranée et de son littoral*. Paris et Marseille (ouvrage non paginé) pl.13, figs 1-9.

Taiti, S. and Ferrara, F. (1991). Terrestrial Isopods (Crustacea) from the Hawaiian Islands. *Bishop Mus. Occ. Pap.*, 31: 202-227.

Vandel, A. (1952). Etude des Isopodes terrestres récoltés au Venezuela par le Dr G. Marcuzzi suivie de considérations sur le peuplement du Continent de Gondwana. *Mem. Mus. Civ. Stor. Nat. Verona* 3: 59-203.

Vandel, A. (1973). Les Isopodes terrestres de l'Australie. Etude systématique et biogéographique. *Mém. Mus. natl Hist. nat. sér. A. Zool.*, 82: 1-171.

Van Name, W.G. (1936). The American land and fresh-water isopod Crustacea. *Bull. Amer. Mus. Nat. Hist.* 71: 1-535.

Verhoeff, K.W. (1926). Isopoda terrestria von Neu-Caledonien und den Loyalty Inseln. In Sarasin, F. and Roux, J. *Nova Caledonia*, Zool., 4(2): 243-366.

Wahrberg, R. (1922). Terrestre Isopoden aus Australien. *Arkiv för Zool.* 15(1): 1-298.