

TROPIHALACARUS SPIO, A NEW GENUS
AND SPECIES OF HALACARIDAE (ACARINA: PROSTIGMATA)
FROM THE GREAT BARRIER REEF

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GREAT BARRIER REEF
HALACARIDAE
NEW GENUS
NEW SPECIES

ABSTRACT : *Tropihalacarus* gen. nov. is described to accommodate *Tropihalacarus spio* sp. nov. from Australia and the New Caledonian species *T. longirostris* (Bartsch), which was previously assigned to *Thalassacarus* Newell. The species *Tropihalacarus spio* sp. nov., of which the female, male and deutonymph are here described, was found in shallow, sandy deposits of the Great Barrier Reef. Characters by which *T. longirostris* and *T. spio* differ are listed.

GROSSES BARRIERE RIFF
HALACARIDAE
NEUE GATTUNG
NEUE ART

ZUSAMMENFASSUNG: *Tropihalacarus* gen. nov. wird beschrieben, um sowohl die Australische Art *Tropihalacarus spio* sp. nov. als auch die Neu-Kaledonische bisher in *Thalassacarus* Newell gestellte Art *T. longirostris* (Bartsch) aufzunehmen. Die Art *Tropihalacarus spio* sp. nov., hier anhand von Weibchen, Männchen und Deutonymphe beschrieben, wurde zwischen sandigem Sediment im Flachwasser des Großen Barriere Riffes gefunden. Merkmale, mit deren Hilfe *T. longirostris* und *T. spio* voneinander zu unterscheiden sind, werden aufgelistet.

LA GRANDE-BARRIERE
DE CORAIL,
HALACARIDAE
GENRE NOUVEAU
ESPÈCE NOUVELLE

RÉSUMÉ : *Tropihalacarus* gen. nov. est décrit pour les espèces *Tropihalacarus spio* sp. nov. d'Australie et *T. longirostris* (Bartsch) de Nouvelle-Calédonie auparavant attribuées à *Thalassacarus* Newell. L'espèce *Tropihalacarus spio* de laquelle les femelles, mâles et deutonymphes sont ici décrits, a été trouvée dans des sables de faible profondeur de la Grande Barrière de Corail. Les deux espèces *T. spio* et *T. longirostris* sont comparées et les critères distinctifs sont donnés.

INTRODUCTION

The halacarid fauna of Australia's tropical coast is poorly known. Three species of *Copidognathus* and one species of *Acarothrix* have been described from near Darwin (BARTSCH, 1997), and one species of *Copidognathus* is known from the Great Barrier Reef (BARTSCH, 1996). The present study is part of a larger project aimed at surveying the halacarid fauna of the

Great Barrier Reef in detail. Among the halacarids found is one that closely resembles *Thalassacarus longirostris* Bartsch, 1995, a species collected in New Caledonia. The assignment of the New Caledonian species to *Thalassacarus* Newell had been problematic, as the species differs from the type species of this genus in important aspects (BARTSCH, 1995). In the present paper, *T. longirostris* is removed from its uncertain assignment and a new genus is

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erected for it and the new species from the Great Barrier Reef.

METHODS

Sand and coral rubble were collected by the first author from various depths using SCUBA equipment. Mites were extracted by washing the substrates in a bowl of water and decanting the supernatant through a 100 µm sieve. Mites were cleared in lactic acid and mounted in PVA (BOUDREAUX & DOSSE, 1963). Drawings were made with the aid of a *camera lucida*.

Measurements are in micrometres (µm). Terminology follows BARTSCH (1993). Abbreviations used in the description and figures are: *AD*, anterodorsal plate; *AE*, anterior epimeral plate; *GA*, genitoanal plate; *GO*, genital opening; *OC*, ocular plate; *PD*, posterodorsal plate; *PE*, posterior epimeral plate; *P-1*, *P-2*, *P-3*, *P-4*, segments of palps designated from base of palp; I-IV, leg I to leg IV; *ds*, dorsal seta designated as *ds-1* to *ds-6* from anterior to posterior; *pas*, parambulacral setae; *pgs*, perigenital setae; *sgs*, subgenital setae.

Abbreviations for depositories: ANIC, Australian National Insect Collection (Canberra, Australia); MTQ, Museum of Tropical Queensland (Townsville, Australia); ZMH, Zoologisches Museum Hamburg (Hamburg, Germany).

Genus *Tropihalacarus* gen. n.

Type species: *Tropihalacarus spio* sp. nov.; here designated.

Diagnosis (Adult)

Idiosoma slender. Dorsum with well developed plates *AD*, *OC*, and *PD* and six pairs of setae, of which the posteriormost is situated dorsally on the anal cone. *OC* with two gland pores. Venter with plates *AE*, *PE* and *GA*. *AE* with three pairs of setae, *PE* with one dorsal and three ventral setae. Female *GA* with three pairs of *pgs*. Gnathosoma elongate. Palps four-segmented; *P-2* with one dorsal seta; *P-3* with minute medial spinelet; *P-4* with three setae in basal whorl. Tibia I with four ventral setae, tibiae II and III each with three ventral setae and tibia IV with

two ventral setae; ventromedial setae of tibiae II and III bipectinate. Tarsus with numerous ventral eupathidia. Solenidion of tarsus I on dorsolateral membrane of claw fossa, on tarsus II on medial membrane.

Tropihalacarus spio sp. nov.

(Figs 1-13)

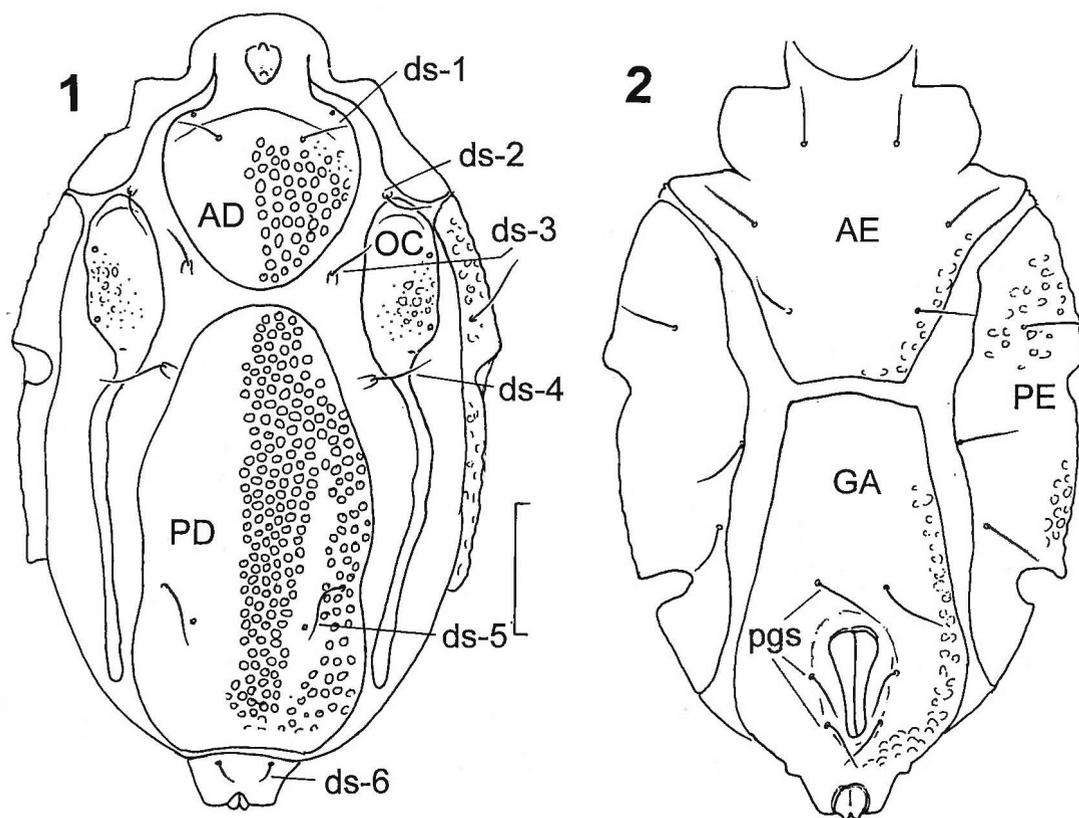
Material examined

Holotype. Female, Great Barrier Reef Marine Park, 19° 20.12'S, 149° 02.85'E, Elizabeth Reef, 25 Dec. 1997, J. C. OTTO coll., coarse sand & rubble at 3 m (MTQ).

Paratypes. 2 females, 2 males, 2 deutonymphs, data as for holotype (1 female, 1 male and 1 deutonymph in ZMH, others in MTQ; 1 female, Great Barrier Reef Marine Park, 18° 26.36'S, 146° 42.24'E, Bramble Reef, 9 April 1998, J. C. OTTO, coarse sand at 5 m (MTQ); 2 males, 1 female, Rosser Reef, ca. 15°37' S 145°33' E, 8 Oct. 1998, sand at 2 m (all in MTQ except 1 male in ANIC).

FEMALE

Idiosoma. 570-648 long. Striated integument with setae *ds-2*, *ds-3*, *ds-4* (Fig. 1). *AD* with a conspicuous cone-like swelling carrying a small protuberance anteriorly and posteriorly; posterolateral to swelling with pair of gland-pores and posteromedial to these pair of *ds-1*; between *ds-1* and gland pores with a transverse crease; posterior to setae *ds-1* with distinct foveae; scattered canaliculi directly posterolateral of *ds-1*. *OC* with a long and narrow tail extending beyond insertions of legs *IV* (Fig. 1); main anterior part with two pores; cuticle between pores with faint foveae and fine canaliculi; eye pigment present, but cornea absent. *PD* longer than half the length of idiosoma (Fig. 1); with distinct foveae except for pair of smooth costae. Costae in some specimens extending over half the length of *PD*, in other specimens over the entire length of *PD*; with pair of gland pores posteriorly. Seta *ds-5* inserted anterolateral to pores in posterior half of plate. *PD* slightly concave at level of *ds-5*. Adanal setae (*ds-6*) on anal cone in dorsal position. *AE* with faint foveae along lateral margins



FIGS 1-2: *Tropihalacarus spio* sp. nov., female.

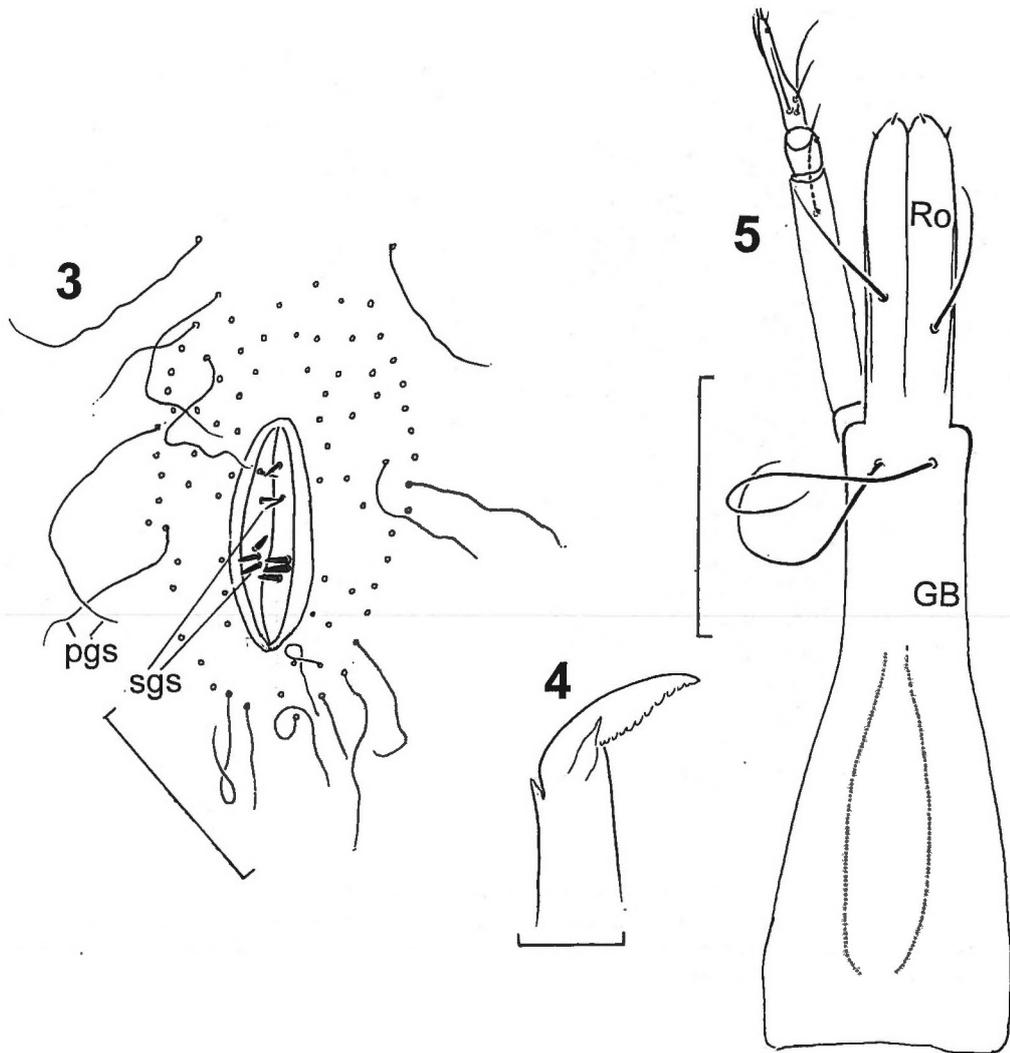
1. — Dorsal idiosoma; scale bar = 100 μ m. 2. — Ventral idiosoma; same scale as Fig. 1. Abbreviations: *AD*, anterodorsal plate; *AE*, anterior epimeral plate; *OC*, ocular plate; *PD*, posterodorsal plate; *PE*, posterior epimeral plate; *ds-1* to *ds-6*, dorsal setae numbered in sequence from anterior to posterior; *pgs*, perigenital setae.

(Fig. 2), with three pairs of setae as illustrated; posterior margin truncate to slightly concave. *PE* with foveae, one dorsal and three ventral setae (Figs 1, 2). *GA* longer than *AE* (Fig. 2); truncate to slightly convex anteriorly; with faint foveae along outer margin; three pairs of *pgs*, the anteriormost pair distinctly anterior of *GO*.

Gnathosoma. Base of gnathosoma longer than twice the length of rostrum (Fig. 5); with pair of setae anteriorly; pierced by fine canaliculi throughout. Rostrum with one pair of setae proximally and two pairs of small spines at tip. Palp segment *P-2* with one dorsal seta, *P-3* with a tiny spinelet medially, barely visible even under oil-immersion. *P-4* with three basal setae, a distolateral seta and apically with one minute seta, two spurs and a minute spinelet (barely visible

even under oil immersion). Cheliceral claw with a series of blunt teeth (Fig. 4).

Legs. Slender (Figs 6-9); integument with delicate canaliculi, in particular on lateral flanks (Figs 6, 8, 9). Chaetotaxy (trochanter-tibia): I 1-2-3-5-10, II 1-2-4-5-8, III 1-2-3-3-6, IV 0-2-3-3-5. Two setae on each of tibiae II and III bipectinate (Figs 7-8). Genu I and tibia I each with one dorsal seta more delicate than other setae on segments. Telfemora I and II and to lesser extent telfemur III with two dorsal cuticular projections (Figs 6-8). Tarsus I with three dorsal setae and one ventral seta, relatively long blunt solenidion on lateral membrane of claw fossa and ca. ten pairs of *pas* (Fig. 10). Tarsus II with three dorsal fossary setae (one distinctly more proximal than the other), relatively long solenidion on medial membrane of claw



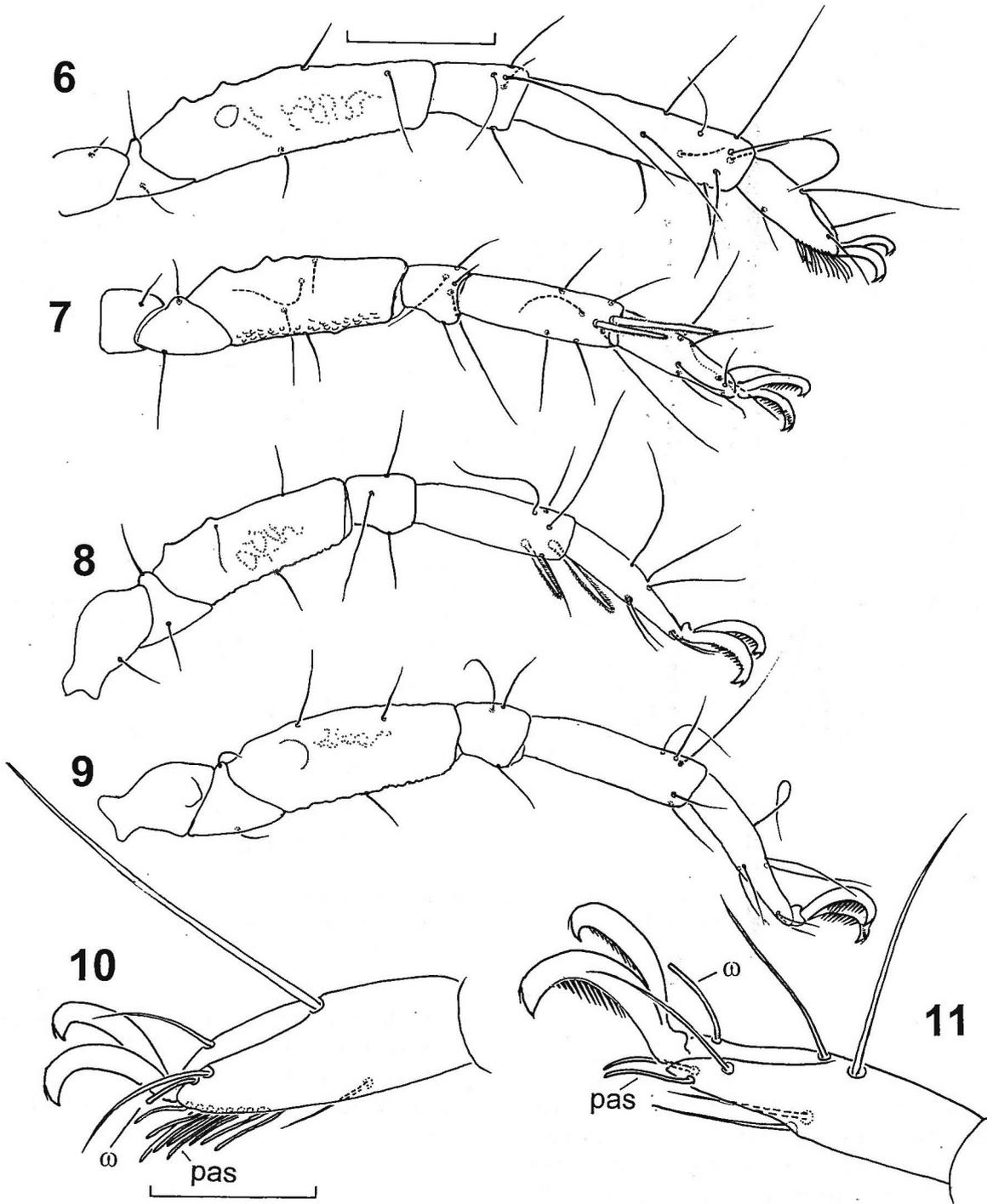
FIGS 3-5: *Tropihalacarus spio* sp. nov., adult.

3. — Genital opening of male; scale bar = 50 μ m. 4. — Ventral gnathosoma of female; scale bar = 100 μ m. 5. — cheliceral claw of female; scale bar = 25 μ m. Abbreviations: GB, gnathosomal base; Ro, Rostrum; pgs, perigenital setae; sgs, subgenital setae.

fossa, two ventral setae and pair of single *pas* (Fig. 11). Tarsi III and IV with three dorsal setae, two ventral setae and pair of single *pas* (Figs 8-9). All tarsi with paired claws, but without empodium. Paired claws on tarsus I with smooth shaft and accessory process (Fig. 10), on tarsi II-IV with conspicuous pectines along shaft and with small accessory process (Fig. 11).

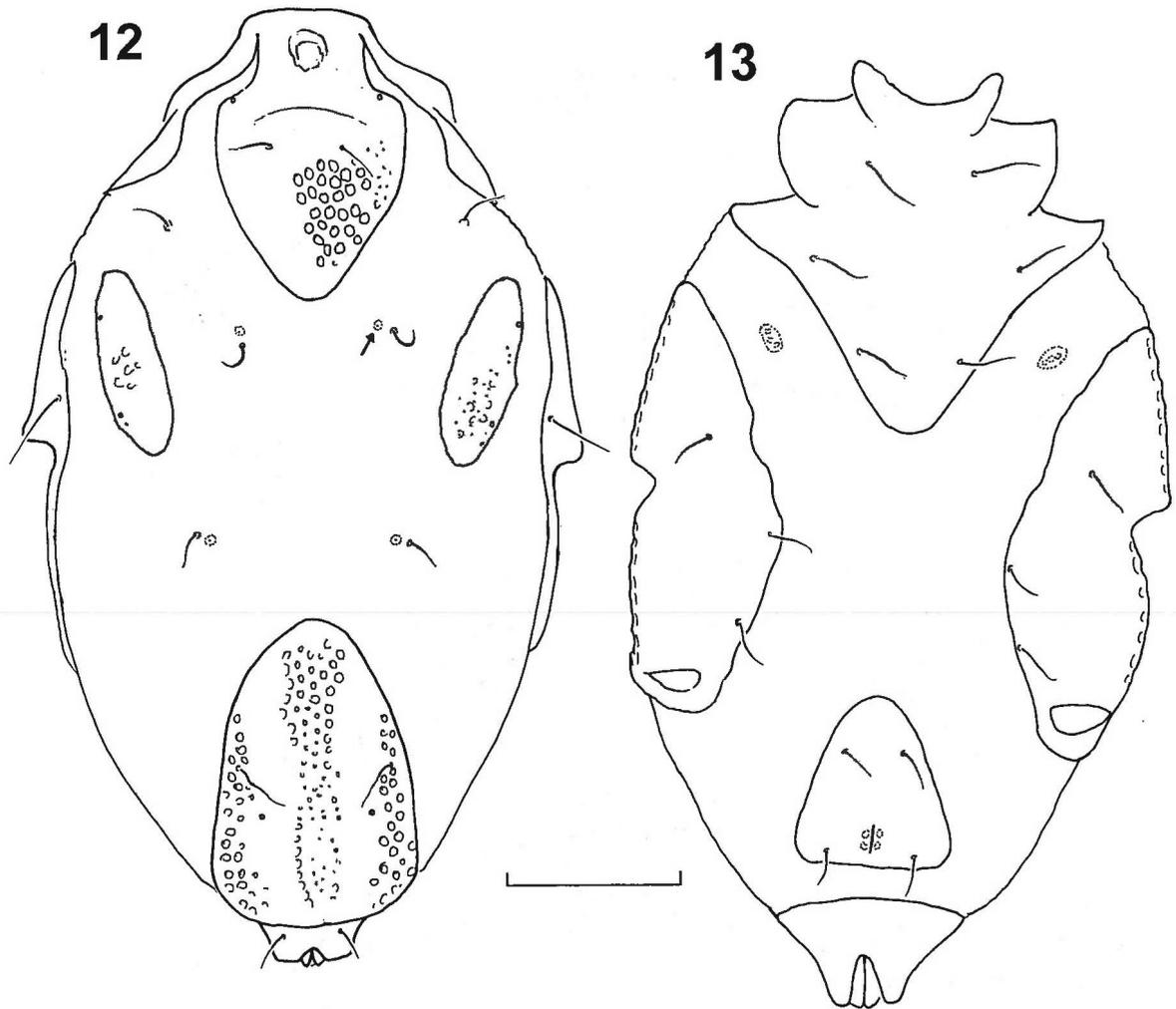
MALE

As described for female, except the following:
Idiosoma. Length 570-613. *GO* surrounded by ca. 80-100 fine *pgs* (Fig. 3); five pairs of *sgs* arranged in an anterior group of two pairs and a posterior group of three heavier pairs.



Figs 6-9: *Tropihalacarus spio* sp. nov., female.

6. — Leg I, lateral view; scale bar = 100 μ m. 7. — Leg II, medial view. 8. — Leg III, lateral view. 9. — Leg IV, medial view. All legs to same scale (Fig. 6). 10. — Tarsus I, lateral view; scale bar = 50 μ m. 11. — Tarsus II, lateral view, same scale as Fig. 10. Abbreviations: *pas*, parambulacral setae; ω , solenidion.



FIGS. 12-13: *Tropihalacarus spio* sp. nov., deutonymph.
12. — Dorsal idiosoma. 13. — Ventral idiosoma. Scale bar = 100 μ m.

DEUTONYMPH

As described for female, except the following:

Idiosoma. Length 552-568. Dorsal plates and setae *ds-2*, *ds-3*, and *ds-4* widely separated by striated cuticle (Fig. 12); setae *ds-3* and *ds-4* inserted next to small platelet with a central canaliculus (arrow in Fig. 12). *AD* posteriorly more pointed than in female. *OC* without tail-like extension. *PD* without constriction; *ds-5* inserted about half way along plate. *AE* posteriorly pointed; without foveae (Fig. 13). *PE* with inconspicuous lateral foveae. *GA* shorter than in

female; lacking foveae; with two pairs of setae (one specimen with one anterior pair of setae and single posterior seta only).

Legs. Tibia I with nine setae, tibia II with seven setae.

COMMENTS

Tropihalacarus spio can be distinguished from the only other known species of *Tropihalacarus*, *T. longirostris* (Bartsch) comb. n. (see below), by possessing a

cone-like swelling on the *AD*, the tail-like posterior extension of the *OC* being about twice as long as the anterior part instead being of equal length, having one pair of setae on the rostrum and one pair on the gnathosomal base, instead of both pairs on the rostrum, and by having two ventral setae on tarsi III and IV, which are both lacking in *T. longirostris*.

Tropihalacarus longirostris (Bartsch) comb. n.

Thalassacarus longirostris Bartsch, 1995: 168.

COMMENTS

BARTSCH (1995) placed this species temporarily in *Thalassacarus*, but expressed doubts as to whether it was assigned correctly. It differs from the type species of *Thalassacarus*, *T. commatops* Newell, 1949, by a number of characters which are usually fairly constant within genera. For example, the adanal setae are not situated ventrolateral to the anal papillus as in *T. commatops* but dorsally, the teeth on the cheliceral claw are not as prominent as in *T. commatops* and legs II and III possess two bipectinate setae, while in *T. commatops* the only bipectinate seta is inserted on tibia I. The most conspicuous difference between *T. longirostris* and *T. commatops* is the lack of the elongated gnathosomal base in the latter. Thus, the previous assignment of *T. longirostris* to *Thalassacarus* appears unsatisfactory since it resulted in broadening the definition of this genus to the extent that it became poorly defined. The discovery of *Tropihalacarus spio* n. sp., which is more similar to *T. longirostris* than *T. commatops* is, now makes it possible to remove *longirostris* from its uncertain assignment and to assign it to the better defined genus *Tropihalacarus*.

REMARKS

Other halacarine genera with slender idiosoma and legs, elongate gnathosoma, and well developed dorsal and ventral plates are *Arhodeoporus*, *Camactognathus* and *Winlundia*. In contrast to *Tropihalacarus*, tarsus I of these genera possess 1-3 ventral setae but

no clusters of eupathid parambulacral setae. The latter are present in species of the halacarine genera *Bathyhalacarus*, *Halacarellus* and *Thalassacarus*, but these genera differ from *Tropihalacarus* in lacking the pairs of blunt bipectinate setae on tibiae II and III.

An exceptionally long gnathosomal base, although not as conspicuous as in *Tropihalacarus*, is also known for *Winlundia forcipata* Newell, 1984, *Camactognathus grossipes* Newell, 1984, and *Copidognathus gulatus* Newell, 1984. NEWELL (1984) believed that this phenotype was restricted to the eastern Pacific and wondered whether environmental conditions unique to the eastern Pacific may be responsible. The presence of a long gnathosomal base in the two *Tropihalacarus* species from New Caledonia and Australia clearly rules out Newell's hypothesis. It appears most likely that the elongated gnathosomal base is an adaption to a particular habitat or food source or a combination of both and as such may have evolved several times convergently.

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REFERENCES

- BARTSCH (I.), 1993. — Synopsis of the Antarctic Halacaroida (Acari), 176 pp., Koenigstein : Koeltz Scientific Books.
- BARTSCH (I.), 1995. — A new *Thalassacarus* species from New Caledonia (Halacaridae, Acari). — Entomol. Mitt. zool. Mus. Hamburg, 11: 167-174.
- BARTSCH (I.), 1996. — Halacaridae (Acari) from the Great Barrier Reef. Description of a new species of *Copidognathus*. — Proc. R. Soc. Vic., 108: 57-62.

- BARTSCH (I.), 1997. — Copidognathinae (Halacaridae, Acari) from northern Australia; description of four new species. — In: J. R. HANLEY, G. CASWELL, D. MEGIRIAN & H. K. LARSON (eds) Proceedings of the Six International Marine Biological Workshop. The marine flora and fauna of Darwin Harbour, Northern Territory, Australia. Museums and Art Galleries of the Northern Territory and the Australian Marine Sciences Association, Darwin: 231-243.
- BOUDREAUX (H. B.) & DOSSE (G.), 1963. — The usefulness of new taxonomic characters in females of the genus *Tetranychus* Dufour (Acari: Tetranychidae). — *Acarologia*, **5**: 13-33.
- NEWELL (I.M.), 1949. — New genera and species of Halacaridae (Acari). — *Am. Mus. Novit.*, **1411**: 1-22.
- NEWELL (I.M.), 1984. — Antarctic Halacaroidea. — *Antarct. Res. Ser.*, **40**: 1-284.