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

By J. C. OTTO* and I. BARTSCH**

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.


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 décrites, 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 (BOUDREAU & DOSE, 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 eupatidia. 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**


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, Rossers 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 posteromeral 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: *Tropilacarus spio* sp. nov., female.

1. Dorsal idiosoma; scale bar = 100 μm. 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. Telofemora I and II and to lesser extent telofemur 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
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.

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**Figs 3-5: Tropiha/acarus sp. nov., adult.**

3. — Genital opening of male; scale bar = 50 \( \mu m \). 4. — Ventral gnathosoma of female; scale bar = 100 \( \mu m \). 5. — Cheliceral claw of female; scale bar = 25 \( \mu m \). Abbreviations: GB, gnathosomal base; Ro, Rostrum; *pgs*, perigenital setae; *sgs*, subgenital setae.
Figs 6-9: *Trophilacarus spio* sp. nov., female.

6. — Leg I, lateral view; scale bar = 100 μm. 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 μm. 11. — Tarsus II, lateral view, same scale as Fig. 10. Abbreviations: *pas*, parambulacral setae; *ω*, solenidion.
**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.


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 parambculral setae. The latter are present in species of the halacarine genera Bathyalacarus, 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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