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Corallihalacarus chilcottensis, a New Genus and Species of Marine Mite from the Coral Sea (Acarina: Halacaridae)

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ABSTRACT—A new species and genus of marine mite, *Corallihalacarus chilcottensis*, is described from Australia. It occurs in sandy deposits around Chilcott Island, some three hundred kilometres off the north-eastern Australian coast, and can be distinguished from other marine mite species by having a flexible neck between the idiosoma and the gnathosoma. Other unusual features of this species include a large median claw on each tarsus, rigid lamellae on legs III and IV, a very long apical palp segment and closely abutting, fused or overlapping idiosomal plates. The new genus is most closely related to *Mictognathus* Newell and the new subfamily Mictognathinae is established to accommodate both genera.

INTRODUCTION

Although more than 900 species of marine mite (Halacaridae) have been described, new species are still being discovered at a constant high rate. For example, a two week long collecting trip to Rottnest Island in Western Australia resulted in the discovery of more than 80 species of halacarids, from which 62 new species have so far been described (Bartsch 1992a, b, 1993a, b, c, d, 1994a, b, 1996a, b, 1997a, b). This clearly indicates that our knowledge of the halacarid fauna, in particular that of the southern hemisphere, is still rudimentary. A study of the halacarid fauna of Australia's Great Barrier Reef region and Coral Sea reefs is currently under way, from where only a single species of halacarid mite was previously recorded (Bartsch, 1996c). This study is still in an early stage. However, already more than 140 mostly new species have been discovered, and further species are expected. In a series of publications this fauna is now being documented. The present paper, which is part of this series, describes an unusual species found on remote Chilcott Island, three hundred kilometers off the northeastern Australian coast.

MATERIALS AND METHODS

Coral sand, collected by hand using SCUBA equipment, was washed in a bowl of water and the supernatant decanted through a 100 µm sieve. Mites retained in the sieve were cleared in lactic acid and mounted permanently in PVA (Boudreaux and Dosse, 1963). Drawings were made with a *camera lucida*. Holotype and paratype are deposited in the Museum of Tropical Queensland (Townsville, Australia). The measurements of the idiosoma include the ventral collar-like extension of the anterior epimeral plate. Abbreviations used in the description and illustrations are: AD, anterior dorsal plate; AE,

anterior epimeral plate; GA, genitoanal plate; GO, genital opening; OC, ocular plate; P-2, P-3, P-4, palp segments designated in series from second most basal to apical one; PD, posterior dorsal plate; PE, posterior epimeral plate; I-IV, leg I to leg IV; ads, adanal seta; ap, apodeme; co, collar; fs, fossary seta; gb, gnathosomal base; gp, gland pore; pas, single parambulacral setae; d-pas, doubled parambulacral setae; pc, pore canaliculus; pgs, perigenital setae; ro, rostrum; sgs, subgenital setae; vs, ventral seta on tarsus; ω, solenidion on tarsus.

RESULTS

Family Halacaridae Murray, 1877

Subfamily Mictognathinae subfam. nov.

Diagnosis: Dorsal plates overlapping; ventral plates closely abutting with no membranous cuticle between them or completely fused; anterior epimeral plate dorsally fused. Palps attached laterally, palp segment P-4 at least as long as P-2 and P-3 combined, with no more than one seta in proximal half; posterior pair of maxillary setae inserted on base of rostrum. Telfemora, genua and tibiae with elaborate articular lamellae. Tibiae of all legs with pair of ventral bipectinate setae. Claw fossae on all tarsi inconspicuous.

Type genus: *Mictognathus* Newell, here designated.

Remarks: Mictognathinae subfam. nov. is created here to accommodate *Mictognathus* Newell and *Corallihalacarus* gen. nov.

Corallihalacarus gen. nov.

Diagnosis: Dorsum and venter with closely abutting or fused dorsal and ventral plates. Anal opening positioned dorsal to genital opening, thus not visible in ventral view. Gnathosoma long and slender, connected to the idiosoma by a "neck" consisting of flexible membranous cuticle. Apical segment of palp longer than rest of palp, without a seta in proximal half. Legs slender; telfemora III and IV with rigid lamellae. All tarsi with paired claws and slightly shorter but heavier median claw.

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Type species: Corallihalacarus chilcottensis sp. nov., here designated.

***Corallihalacarus chilcottensis* sp. nov. (Figs. 1–9)**

Specimens examined: Holotype (S105139): female, Coral Sea (Queensland Plateau), Chilcott Island, 16.56.51S 150.00.40E, 14 September 1998, G. A. Diaz-Pulido, coarse sand at 10–15 m, on slope with algae, hydroids and rubble. Paratype (S105140): 1 female, data as for holotype.

Etymology: The name refers to the species' type locality.

Female: Idiosoma: Length 578–582 μ m (holotype 578); Dorsal and ventral plates finely punctate. AD with pair of setae and pair of gland pores at its rounded anterior margin, a pair of setae at the anterolateral corners of the plate and two pairs of apodemes in deeper cuticular layers (Fig. 1). OC tapering posteriorly; with two pores and a minute pore canaliculus laterally and several minute pore-like depressions medially. PD ovoid; with two pairs of setae and pair of gland pores. AD, OC, and PD in deeper layers separated from each other by a narrow strip of membranous cuticle. In upper layers PD anteriorly with a flat rim which overlaps the AD and obscures the membranous cuticle in deeper layers. AD with a similar rim on either side which overlaps with OC. Ventral plates separated only by a delicate furrow, not by membranous cuticle. AE anteriorly with a collar-like extension which is divided anteriorly into two overlapping lobes (Fig. 2); three pairs of ventral setae (one specimen with three ventral setae on one side, but only two setae on the other side); several conspicuous apodemes in deeper cuticular layers. Left and right parts of dorsal AE fused. PE dorsally fused to AE, with one dorsal and three ventral setae; anterior to dorsal seta with a foveate and punctate areola; posterior to areola smooth. GA with two pairs of pgs, one of these inserted anterior to GO the other pair at same level as GO. One pair of sgs on genital sclerites. Anal opening and GO both positioned caudally, anal opening dorsal to GO.

Gnathosoma: Slender; separated from idiosoma by membranous, flexible and wrinkled cuticle (Fig. 1). Gnathosomal base finely punctate, conspicuously elongated (Fig. 3). Rostrum slightly longer than gnathosomal base; with pair of fine setae at its base, a pair of setal sockets in anterior half (setae most likely broken off), and two pairs of minute setae at tip. Palps inserted laterally; four-segmented; P-2 with a seta anteriorly; P-3 without a seta; P-4 longer than rest of palp, with one slender seta in distal half and one short tapering seta and two short blunt setae apically. Cheliceral claw short, with several teeth.

Legs: Slender. Tibiae apically swollen (Figs. 4–7). Telfemora III and IV dorsally and ventrally drawn out into large rigid and spiky lamellae (Figs. 6, 7). In addition, telfemora, genua and tibiae with elaborate articular lamellae. Basifemora carrying cuticular spines, one on basifemora I and II, three on basifemur III and two on basifemur IV. Basifemora and telfemora I and II foveate (Figs. 4, 5). Chaetotaxy (trochanter-tibia): I 1-2-5-4-5, II 1-2-4-4-5, III 1-2-2-3-4, IV 1-2-2-3-4. All tibiae with pair of bipectinate setae; on

tibiae I, III and IV both bipectinate setae of subequal length, on tibia II one seta much longer than the other. Tarsi slightly curved; claw fossa short and inconspicuous. All tarsi with slender paired claws, and slightly shorter but heavier median claw. Paired claws with minute accessory process. Tarsus I with three dorsal setae, pair of doubled pas, pair of ventral setae, and dorsolateral solenidion (Fig. 8). Tarsus II with three dorsal setae, pair of pas singlets (the medial one slightly serrated), an unpaired ventral seta, and a dorsomedial solenidion (Fig. 9). Tarsus III with four dorsal setae (one of these obscured by the articular lamellae of the tibia, arrowed in Fig. 6), and pair of pas, of which the lateral one is spur-like. Tarsus IV with same complement of setae as tarsus III except with only three dorsal setae. The medial of the two distal fossary setae on tarsus II much finer than the lateral one.

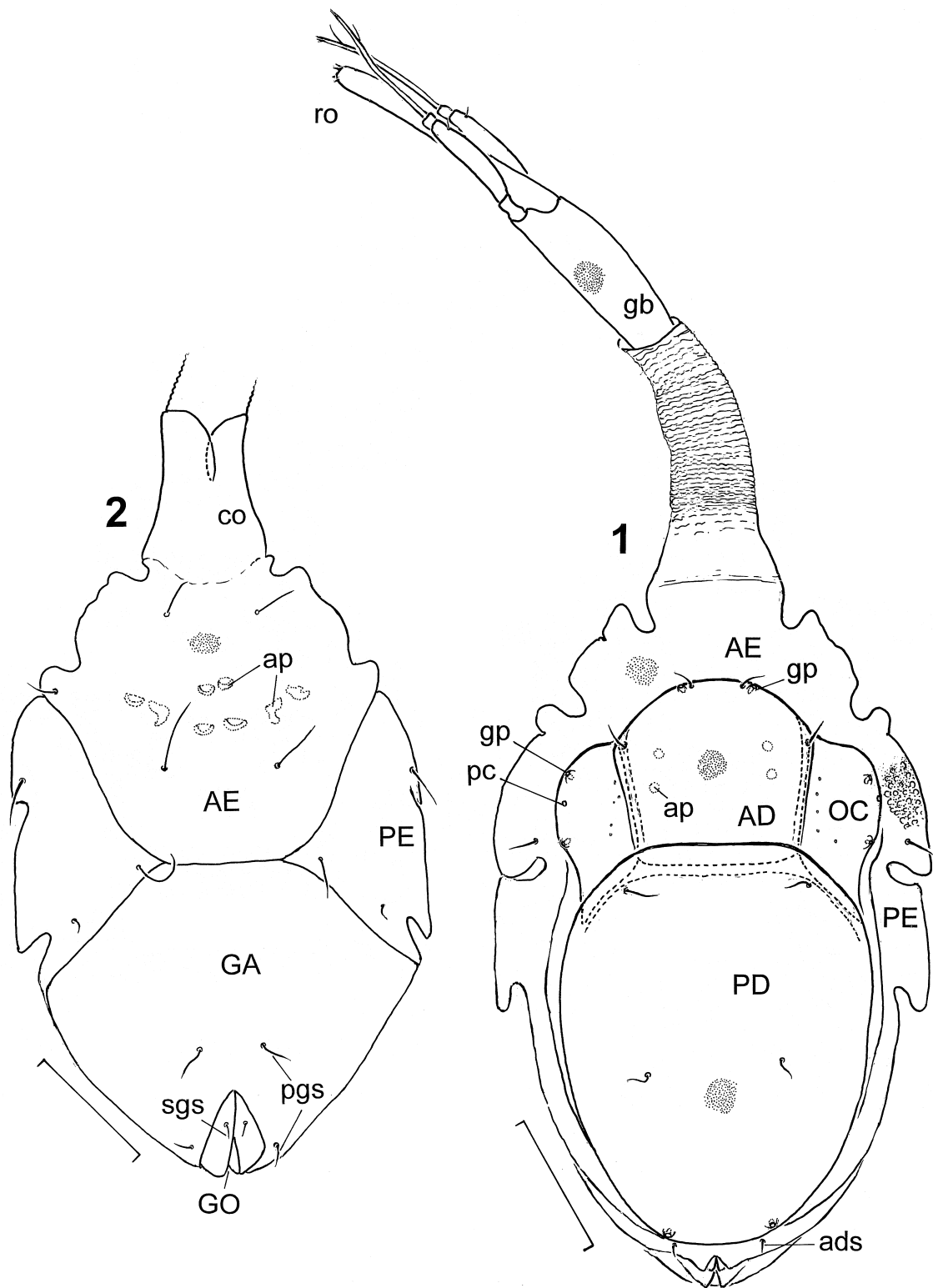
Male: Unknown.

Remarks: The most conspicuous character that distinguishes *Corallihalacarus chilcottensis* sp. nov. from all other known halacarids, is the presence of a membranous flexible “neck” between gnathosoma and idiosoma. It is unclear whether this “neck” is constantly exposed in the way it has been found on the holotype and paratype, or whether it can be retracted. Judging from the delicate nature of the membranous structure, which is in stark contrast to the otherwise well sclerotized idiosoma, it appears unlikely that the “neck” is constantly protruded. The wrinkles on the “neck” and the presence of an apically expandable collar into which the “neck” could be retracted, further supports this hypothesis. The purpose of the “neck” is currently unknown.

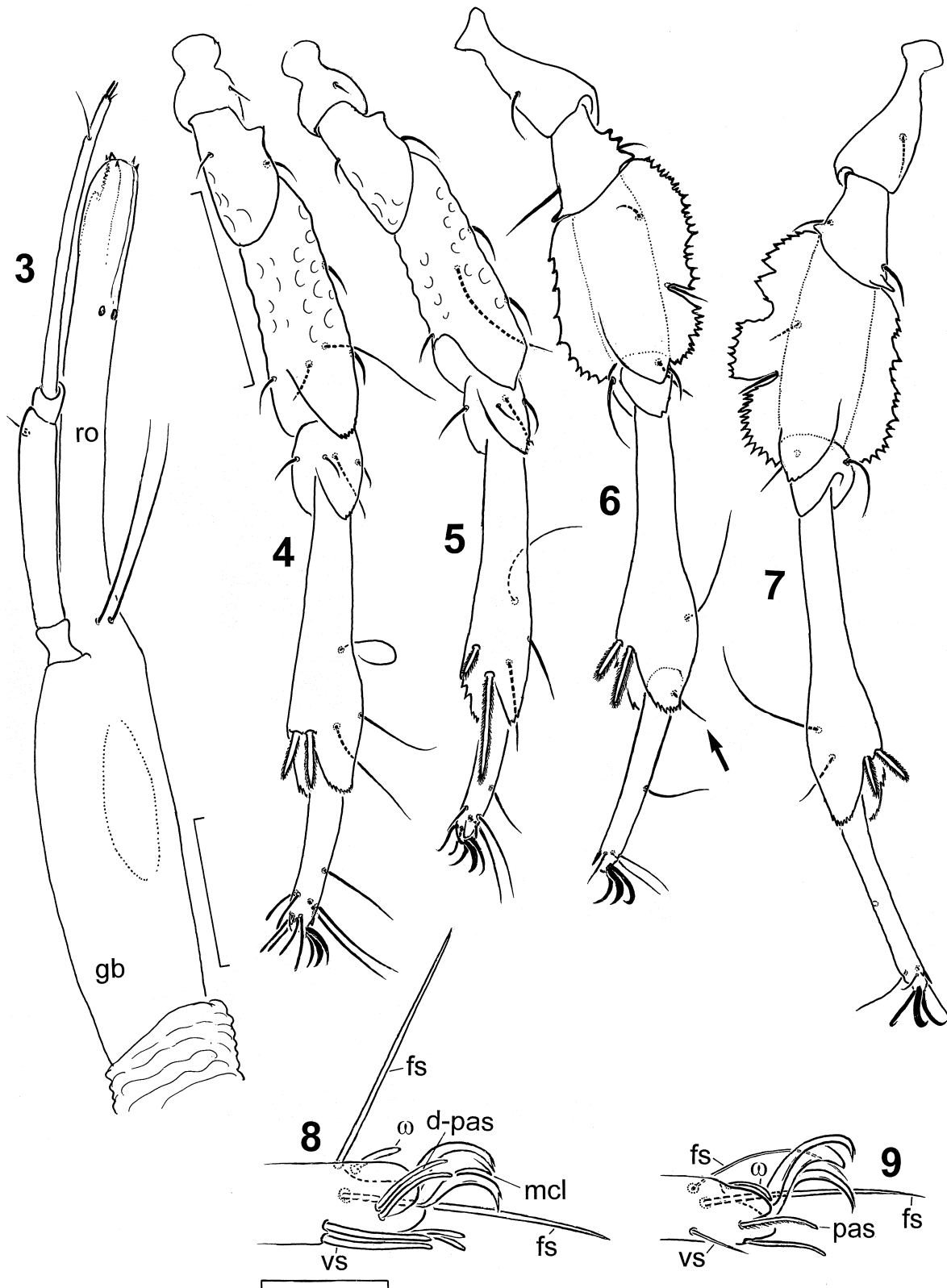
Other highly unusual characters of *C. chilcottensis* are the position of the anal opening dorsal to the genital opening, the presence of an enlarged median claw on the tarsi, the extremely elongated P-4 with no setae in the proximal half, and dorsal and ventral non-cerotegumental spiky lamellae on legs III and IV. Most of these characters are unique to this genus. The only exception is the enlarged median claw on the tarsi which otherwise occurs in the rhombognathine genus *Metarhombognathus* where it is most likely a convergence.

Several other unusual characters are not unique to *Corallihalacarus* but are shared with the genus *Mictognathus* which is known from two species (*M. werthelloides* Newell, 1984, and *M. secundus* Bartsch, 1992c). *Mictognathus* also has dorsally fused anterior epimeral plates, overlapping dorsal plates, closely abutting or fused ventral plates, elaborate articular lamellae on genua and tibiae, reduced claw fossae, a relatively long apical palp segment with only one seta in addition to the minute apical setae, and a pair of bipectinate setae on all tibiae. On basis of these similarities *Mictognathus* and *Corallihalacarus* are here regarded as each others closest relatives.

Mictognathus was previously placed in the Halacarinae (see Bartsch, 1992c; Abé, 1998), which is a very heterogeneous group as it has been used extensively to accommodate genera that simply cannot be assigned to any other subfamilies. However, to achieve a more homogenous sub-



Figs. 1–2. *Corallihalacarus chilcottensis* sp. nov., female: 1, Idiosoma and gnathosoma, dorsal view; 2, Idiosoma, ventral view. Scale bars = 100 μ m. AD, anterior dorsal plate; AE, anterior epimeral plate; GA, genitoanal plate; GO, genital opening; OC, ocular plate; PD, posterior dorsal plate; PE, posterior epimeral plate; ads, adanal seta; ap, apodeme; co, collar; gb, gnathosomal base; gp, gland pore; pc, pore canaliculus; ro, rostrum; pgs, perigenital seta; sgs, subgenital seta.



Figs. 3–9. *Corallihalacarus chilcottensis* sp. nov., female: 3, Gnathosoma, ventrolateral view (scale bar=50 μ m); 4, Leg I, ventromedial view (scale bar=100 μ m); 5, Leg II, ventromedial view (scale as Fig. 4); 6, Leg III, ventromedial view (scale as Fig. 4); 7, Leg IV, ventromedial view (scale as Fig. 4); 8, apical part of tarsus I, ventrolateral view (scale bar=25 μ m); 9, apical part of tarsus II, ventromedial view (scale as Fig. 8). d-pas, doubled parambulacral seta; fs, fossary seta; gb, gnathosomal base; mcl, median claw; pas, parambulacral seta; ro, rostrum; v, ventral seta; ω , solenidion.

family Halacarinae it appears beneficial to remove some of the more unusual genera from the Halacarinae if they can be assigned to other better defined subfamilies. As *Mictognathus* resembles *Corallihalacarus* more than any other halacarine genus it is here removed from the Halacarinae and together with *Corallihalacarus* placed in a new subfamily Mictognathinae.

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