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Two new *Agaue* species (Acari: Halacaridae) from Moreton Bay, Queensland, with a key to Australian species

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ABSTRACT

Two new species, *Agaue fuscata* and *A. lubrica*, are described. *Agaue fuscata* is characterised by its conspicuously brown cerotegument, the four dorsal setae on PE and short legs. *Agaue lubrica* is rather slender, its integument is almost smooth and the cerotegumental cover delicate; the PE bears three dorsal setae. A key to the Australian *Agaue* species is given. □ *Australia, Queensland, marine mites, descriptions, new species, key*

More than a century ago, Lohmann (1889) introduced *Agaue* to include the single type species, *Agaue parva* (Chilton, 1883). Other species were subsequently added. Viets (1927), when surveying and reorganising the halacarid genera, re-described the type of *Agaue parva* and the characters of *Agaue*, and erected *Agauopsis* for the species that had been erroneously placed into *Agaue*. These two genera, together with the majority of the other halacarid genera, were included in the just erected subfamily Halacarinae Viets, 1927.

Agaue proved to share numerous characters with *Halixodes* Brucker & Trouessart, 1900 and *Bradyagaue* Newell, 1971. Bartsch (1983) moved *Agaue* and *Bradyagaue* to the subfamily Halixodinae Viets, 1927, because of characters such as: the idiosoma and legs often bearing cerotegumental lamellae; a parallel-sided, slender gnathosoma with its two pairs of maxillary setae inserted adjacently near the basis of rostrum; a long rostrum with pair(s) of barbs at its apex; the seta on P-3 in dorsal position; the chelicerae slender and bearing large tines at their claws; the legs slender and their tibiae with smooth ventral setae, none of the setae pectinate or spiniform; the solenidion on tarsus I in dorsolateral, on tarsus II in dorsomedial position; the generally large fossa membranes on the tarsi; the large paired claws. The Halixodinae had previously included

only the two genera *Halixodes* and *Parhalixodes* Laubier, 1960 (Laubier 1960).

However the descriptions of many new halacarid species has increased the knowledge of intra-generic variations, and the range of character states has proved to be larger than expected. Characters thought to be unique to *Agaue* and other halixodines (e.g. the cerotegumental membranes) were also found in genera of other subfamilies. As there was no longer a unique combination of synapomorphies to justify a subfamilial separation of these four genera, the subfamily Halixodinae was abandoned and *Agaue* was returned to the Halacarinae (Bartsch 1998). Even so, the Halacarinae is not a natural unit, but includes genera with a variety of characters, and is in need of a reorganisation.

Three species of *Agaue* were present in samples taken at the low water mark around North Stradbroke Island, Queensland, two species in samples from Amity Point, *Agaue galatea* Otto, 1999 and *A. lubrica* sp. nov., and one species from Point Lookout, *Agaue fuscata* sp. nov.

MATERIAL AND METHODS

The specimens described were collected from the northern end of North Stradbroke Island, in Moreton Bay, a large sheltered embayment adjacent to Brisbane and south of the tropical

Great Barrier Reef (see Davie 2004, for general overview). Various substrata, algae, colonial organisms, sediment, were sampled from the upper tidal to just beneath the low water edge. The samples were washed with a jet of water over a 100 μm sieve. The material retained in the sieve was scanned for halacarid mites. The mites were cleared in lactic acid and mounted in glycerine jelly. The illustrations were prepared with help of a drawing tube. The holotypes and a voucher specimen are deposited in the Queensland Museum, Brisbane (QM).

Abbreviations used in the descriptions: AD, anterior dorsal plate; ads, adanal setae; AE, anterior epimeral plate; ds-1 to ds-5, first to fifth pair of dorsal idiosomal setae, numbered from anterior to posterior; GA, genitoanal plate; GF, genital foramen; GO, genital opening; OC, ocular plate(s); P-2 to P-4, second to fourth palpal segment; pas, parambulacral seta(e); PD, posterior dorsal plate; PE, posterior epimeral plate(s); pgs, perigenital setae. The legs are numbered I to IV. The position of a seta or gland pore is given in a decimal system, with reference to the length of a plate, from its anterior to posterior margin.

SYSTEMATICS

Agauë Lohmann, 1889

Type Species: *Halacarus parvus* Chilton, 1883.

Diagnosis. *Idiosoma*. With cerotegument, generally forming membranes or lamellae. One pair of gland pores each on or lateral to AD, on OC and PD. PE with one to three dorsal setae anterior to leg III, and zero to one setae anterior to leg IV. Female GA with 3–15 (rarely more) pairs of pgs. Male GA with more than 80 pgs densely arranged around GO; genital sclerites with five pairs of spur-like sgs.

Gnathosoma. Generally slender. Tectum with scaliform lamella. Rostrum almost parallel-sided. Maxillary setae inserted close together. Rostral setae minute, one pair spur-like or divaricate. Palps four-segmented. P-3 short, usually with one distodorsal bristle; that seta slender or flattened. P-4 with three setae in basal whorl (rarely situated in apical half of segment), one seta in about middle of segment, and one setula and two spurs at its tip. Chelicerae slender, cheliceral claw with few but strong teeth.

Legs. Often with cerotegumental lamellae. Genua shorter than telofemora and tibiae. Tibiae cylindrical or clavate, with four to six smooth ventral setae. Tarsi with large membranes of claw fossae. Tarsus I with one ventromedial seta, tarsi II to IV without such setae. Tip of tarsus I with cluster of 10–30 ventral eupathidia. Paired claws large, median claw minute.

Agauë fuscata sp. nov.

(Figs 1, 2)

Material Examined. HOLOTYPE, QM-S83653, ♀, Frenchmans Beach, Point Lookout, North Stradbroke I., Queensland (c. 27°26'S, 153°33'E), *Halimeda* sp. (Chlorophyta), in tidal rock pool, 23.02.2005, I. Bartsch.

Diagnosis. Length of idiosoma 485 μm . Dorsal plates with delimited cerotegumental costae, these costae of brown colour. AD wider than PD. Corneae small. PE with three dorsal setae anterior to insertion of leg III and one seta anterior to leg IV. Female GA with 16 small pgs around GO. Ovipositor extending beyond GA. Gnathosoma 0.34 times of length of idiosoma, 1.7 times longer than wide. Length of rostrum 2.3 times that of gnathosomal base. Legs short, length of telofemora II and III about twice their height. Tibiae not markedly club-shaped. Tibiae I to IV with four ventral setae each. Claws with tines on accessory process and shaft.

Description. *Female*. Idiosomal length 485 μm , width 309 μm . Cerotegumental costae of dorsal plates rather smooth, of brown colour, without sculpturing. Plates with areolae with numerous deep pores, else surface of dorsal plates smooth. Length of AD (without anterior lamella) 155 μm , width 164 μm , plate widest at the level of gland pores. AD with pair of longitudinal cerotegumental costae, about 50 μm in width, and a transverse anterior cerotegumental area (Fig. 1A). Integument along lateral margin of AD with deep pores. Markings from muscle attachment small and in posterior half of plate. Length of OC 97 μm , width 75 μm . Plate with two very small corneae; lateral margin with pore canaliculus followed by gland pore. Integument with deep pores both along lateral and medial margin. Length of PD 264 μm , width 157 μm ; pair of cerotegumental costae about 45 μm wide; with numerous deep pores on either side of cerotegumental costae. Pair of gland pores at 0.9 relative to

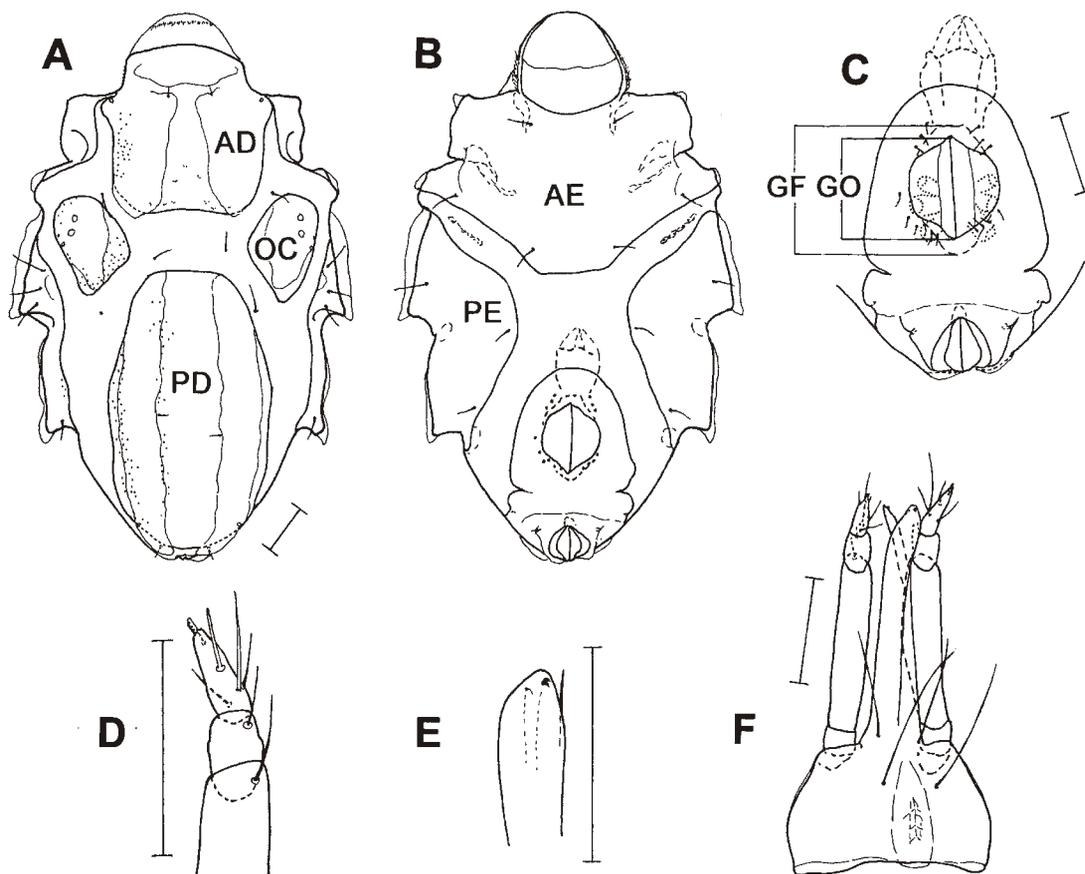


FIG. 1. *Agaue fuscata* sp. nov., holotype ♀: **A**, Idiosoma, dorsal (margin of plates in finely broken line when obscured by cerotegument); **B**, idiosoma, ventral; **C**, genitoanal plate and ovipositor; **D**, end of palp, dorsolateral; **E**, tip of right half of rostrum, ventral; **F**, gnathosoma, ventral. (AD = anterior dorsal plate; AE = anterior epimeral plate; GF = genital foramen; GO = genital opening; OC = ocular plate; PD = posterior dorsal plate; PE = posterior epimeral plate) Scale bar = 50 μm .

length of PD. All dorsal setae small, without cerotegumental cover. Pair of ds-1 smaller than following setae and inserted in anterior margin of pair of cerotegumental costae. Pairs of ds-2, ds-3 and ds-4 within striated integument; ds-5 on PD. Pair of ads on anal plate, obscured by cerotegument of PD.

Surface of ventral parts of plates with delicate, minutely reticulate and filamentous cerotegumental cover, margins of ventral plates with thick, smooth cerotegument. Ventral setae short, slender. Length of AE 150 μm , width 282 μm ; its posterior margin truncate (Fig. 1B). Plate with three pairs of setae. Epimeral processes lamellar, with numer-

ous filaments. Length of PE 235 μm ; with seven setae, namely three dorsal setae anterior to insertion of leg III, one dorsal seta anterior to leg IV and three ventral setae. Length of GA 180 μm , width 120 μm ; anterior margin rounded. GF constricted by thin lamellae. Length of GO 65 μm , width 55 μm . With 16 very short pgs around GO; no setae in or near anterior margin of GA (Fig. 1C). Interval between anterior margin of GA and GO 0.5 times length of GO, distance from GO to end of anal sclerites 1.3 times the length of GO. Ovipositor extending beyond margin of GA.

Length of gnathosoma 167 μm , i.e. 0.34 of idiosomal length; width 97 μm . Rostrum about 2.3

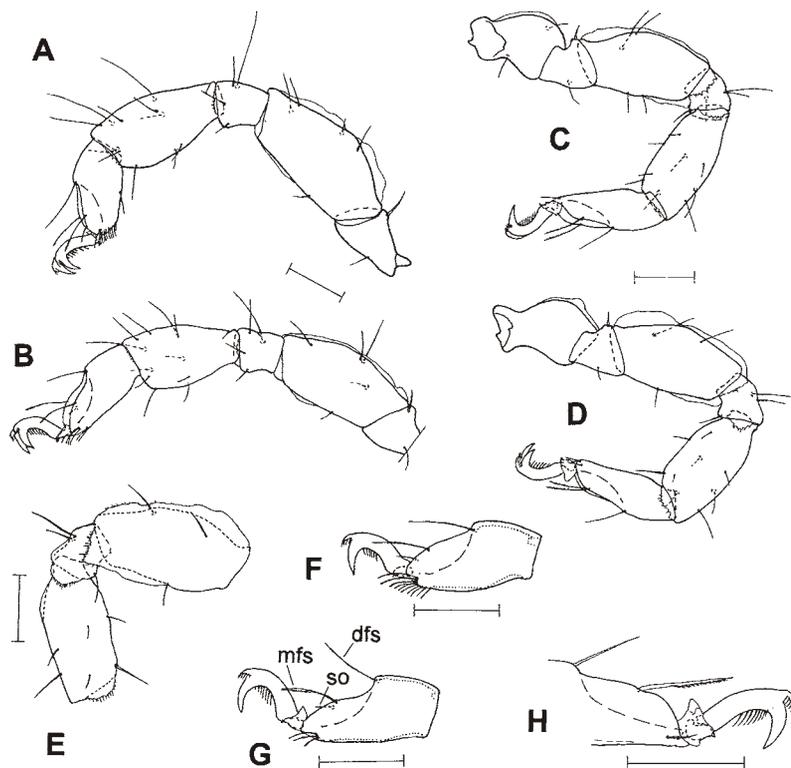


FIG. 2. *Agaue fuscata* sp. nov., holotype ♀: **A**, Basifemur to tarsus I, medial; **B**, basifemur to tarsus II, medial; **C**, leg III, medial; **D**, leg IV, medial; **E**, telfemur, genu and tibia IV, lateral (outline of segments in broken line when obscured by cerotegument); **F**, tarsus I, lateral (medial setae and claw omitted) (dotted lines indicate thickness of integument); **G**, tarsus II, medial (lateral fossary seta, parambulacral setae and claw omitted); **H**, tip of tarsus IV, medial (lateral fossary and parambulacral seta omitted). (dfs = dorsal fossary seta; mfs = dorsomedial fossary seta; so = solenidium) Scale bar = 50µm.

times longer than gnathosomal base. Tectum scaliform, arched. Basal pair of maxillary setae slightly longer than following pair of setae (Fig. 1F). Rostral sulcus extending almost to base of rostrum. Tip of rostrum with pair of minute bidentate spurs and delicate setulae (Fig. 1E). Dorsal setae on P-2 and P-3 slender, smooth, more slender than dorsal seta of basal whorl of P-4 (Fig. 1D). P-4 with three basal setae, an eupathid lateral seta in middle of segment and a wide setula and two spurs apically.

Legs short, wide. Length/height ratio of telfemora I to IV: 2.3, 2.1, 2.0, 2.0. All telfemora longer than tibiae (Fig. 2A-D). Telfemora with cerotegumental cover, i.e. two dorsal cerotegumental ridges which extend along medial and

lateral flank to ventral flank. Dorsal ridges slightly thicker than ventral cerotegument, and thicker on telfemora III and IV than on telfemur II. Telfemora, genua and tibiae with thin articular lamellae of cerotegument; lamellae along their distal margin with delicate filaments (Fig. 2E). Tarsi with large fossa membranes. Leg chaetotaxy (solenidia and pas included): leg I, 1, 2, 5, 4, 11, 24; leg II, 1, 2, 5, 4, 11, 10; leg III, 2, 2, 3-4, 4, 9, 5; leg IV, 0, 2, 3, 3, 9, 5. Dorsal seta on basifemora III and IV wider than ventral seta. Ventromedial setae of tibiae remarkably short and delicate. Dorsomedial and -lateral fossary setae of tarsi slightly widened and plumulose. Tarsus I with one ventromedial seta in about middle of segment and cluster with 19 eupathidia at its apex

(pas included); solenidion on dorsolateral fossa membrane (Fig. 2F), its length 14 μm . Solenidion on tarsus II in medial fossa membrane (Fig. 2G), length 9 μm ; apex of tarsus II with pair of eupathidia and doubled pas. Tarsi III and IV each with pair of short pas.

Paired claws large; central sclerite with minute dent-like process. Paired claws with large accessory process. Process with tines; shaft of claws with about eight large and some smaller tines (Fig. 2H).

Remarks. *Agauae fuscata* is characterised by its brown, smooth cerotegument on the idiosoma and legs, the four dorsal setae on the PE, three anterior to the insertion of leg III, one immediately anterior to that of leg IV, and the tarsi with coarse tines both on the accessory process and claw shaft. Eleven named species of *Agauae* had to date been recorded from Australian shores, namely, *A. aliena* Otto, 1999, *A. bella* Otto, 1999, *A. brevipes* Bartsch, 1999, *A. circellaris* Bartsch 1999, *A. galatea* Otto, 1999, *A. hispida* (Lohmann, 1893), *A. reichelti* Otto, 1999, *A. scita* Bartsch, 1999, *A. similis* Bartsch, 2007, *A. subglabra* Bartsch, 1999, and *A. tenuipes* Bartsch, 1999. *A. brevipes* and *A. tenuipes* share the just mentioned characters but the cerotegument lacks the intense brown colour present in *A. fuscata* and their AD is more slender than their PD whereas in *A. fuscata* the AD is wider than the PD.

Posterior epimeral plates with four dorsal setae and claws with tines on the accessory process and the shaft are characters present also in *A. californica* (Hall, 1912), *A. setalis* Newell, 1984, and *A. variabilis* MacQuitty, 1984. *Agauae californica* and *A. variabilis* are species of the eastern Pacific, present from Mexico to Oregon, the former as far as to Washington (Hall 1912; MacQuitty 1984), records of *A. setalis* are from Western Antarctica (Newell, 1984). The cerotegument on the dorsal plates and the telofemora of *Agauae californica* and *A. variabilis* is not smooth, as in the Australian species, but panelled. The AD of *A. fuscata* is wide, the posterior half of the plate rectangular, whereas the opposing margins of AD and PD are ovate in *A. variabilis* and arched in *A. californica* and *A. setalis*. In that latter species the cerotegumental areolae of the AD are faint and converging.

Etymology. The specific name is derived from *fuscatus* (Latin), in reference to its dark colour.

Agauae lubrica sp. nov.
(Figs 3, 4)

Material Examined. HOLOTYPE, QM-S83654, ♀, Amity Point, North Stradbroke I., Qld (c. 27°25'S, 153°26'E), amongst corallines and other red algae growing on stones, low water edge, 20.02.2005, I. Bartsch.

Diagnosis. Length of idiosoma 560 μm . Dorsal plates very delicately punctate, without areolae with deep pores. Cerotegumental cover almost inconspicuous. Dorsal setae short. PE with three dorsal setae anterior to insertion of leg III, none anterior to leg IV. Female GA with 27 pgs, situated around GO and along anterior margin of GA. Gnathosoma long and slender, almost half length of idiosoma. Rostrum almost twice length of gnathosomal base. Tibiae slender, cylindrical. Tibiae I, III and IV with four ventral setae. Telofemora at least three times longer than high. Claws with accessory process, otherwise smooth.

Description. *Female.* Idiosomal length 560 μm , width 320 μm . Cuticle of dorsal plates delicately punctate, at low magnification almost smooth; areolae with scattered deep pores lacking; cerotegumental cover delicate. Integument between plates finely striated. Length of AD 165 μm , width 184 μm ; anterior margin truncate, with delicate lamella; posterior margin arched. Markings of internal muscle scars distinct, arranged in shape of a triangle. Pair of gland pores in lateral margin of AD on tiny cones (Fig. 3A). Length of OC 100 μm , width 65 μm ; slightly raised corneal area with two small corneae, eye pigment beneath corneae, and a gland pore on small cone posterior to cornea. Interval between gland pore and cornea twice the latter's diameter. Pore canaliculus immediately lateral to posterior cornea, anterior to gland pore. Length of PD 300 μm , width 184 μm ; anterior margin truncate. With pair of very faint cerotegumental costae; integument beneath cerotegument delicately punctate. Pair of gland pores at 0.9. All dorsal setae small, without conspicuous cerotegumental cover. Pair of ds-1 on AD, slightly anterior to level of gland pores. Pairs of ds-2 to ds-4 within striated integument. Pair of ds-5 minute, at 0.5 relative to length of PD, that equals level with insertion of leg IV. Pair of ads in margin of anal plate.

Ventral plates delicately dotted. Length of AE 175 μm , width 284 μm ; with three pairs of setae. Length of PE 224 μm ; with three ventral and

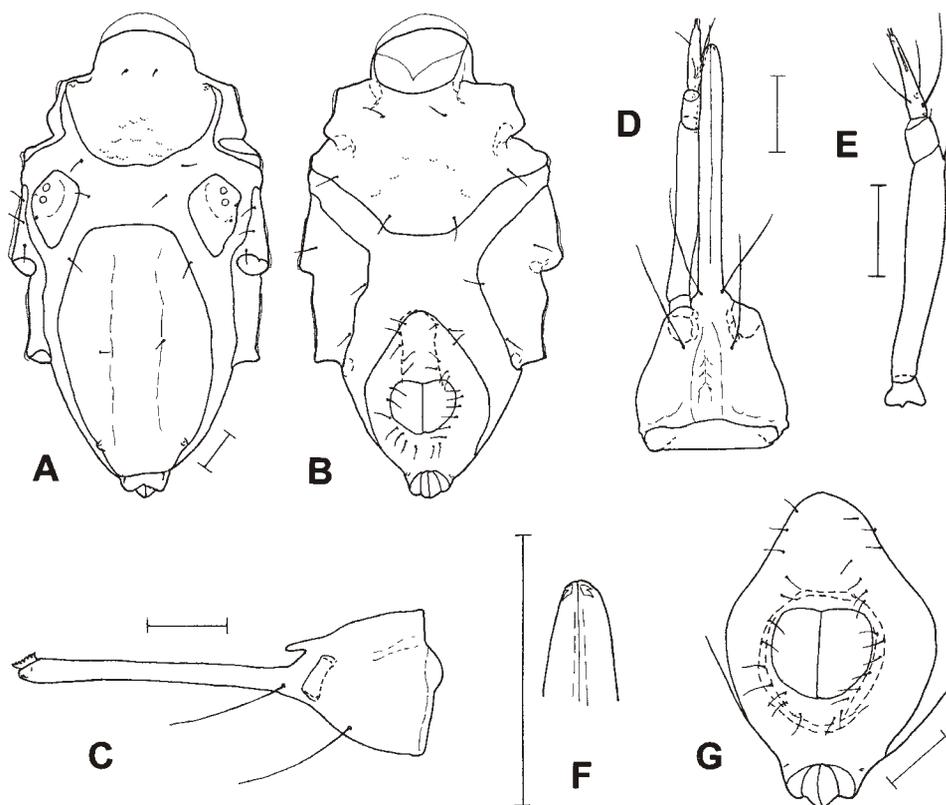


FIG. 3. *Agaue lubrica* sp. nov., holotype ♀: **A**, Idiosoma, dorsal; **B**, idiosoma, ventral; **C**, gnathosoma, lateral; **D**, gnathosoma, ventral; **E**, palp, lateral; **F**, tip of rostrum, ventral; **G**, genitoanal plate. Scale bar = 50 μ m.

three dorsal (marginal) setae, the latter anterior to insertion of leg III; no dorsal seta anterior to insertion of leg IV. PE hardly extending beyond insertion of leg IV. Length of GA 222 μ m, width 150 μ m; anterior margin ovate (Fig. 3B). Length of GF 90 μ m, width 80 μ m, constricted by lamellae, accordingly GO smaller than GF, length 60 μ m, width 72 μ m. GO almost in middle of GA (Fig. 3G); distance from GO to anterior margin of GA equalling 1.3 times length of GO; distance from posterior margin of GO to end of anal cone 1.2 times length of GO. In all, 12 and 15 pgs in either half of GA or immediately outside the plate; 8 and 11 of pgs situated close to GO. Subgenital setae lacking. Ovipositor reaching till end of GA.

Length of gnathosoma 264 μ m, width 100 μ m, i.e. almost half of idiosomal length. Integument of gnathosomal base delicately punctate. Rostrum

slender, length 177 μ m, almost twice length of gnathosomal base. Two pairs of maxillary setae almost equal in length (Fig. 3C); distal pair of setae separated from basal pair by more than distance between that latter pair (Fig. 3D). Tectum scaliform. One pair of rostral setae, at tip of rostrum, in form of divaricate spurs (Fig. 3F), the other pair small, delicate and in lateral margin of rostrum. P-2 with slender dorsal seta; P-3 with slender, short dorsal seta (Fig. 3E). Length of P-4 about three times that of P-3; three setae in basal third of segment; one lateral eupathid seta in about middle of P-4; apically with two spurs and one setula.

Segments of legs cylindrical, tibiae not clavate (Fig. 4A–D). Telofemora I and II longer than tibiae. Telofemora I to IV about 3.5, 3.3, 3.4, 3.1 times longer than high, respectively. Telofemora

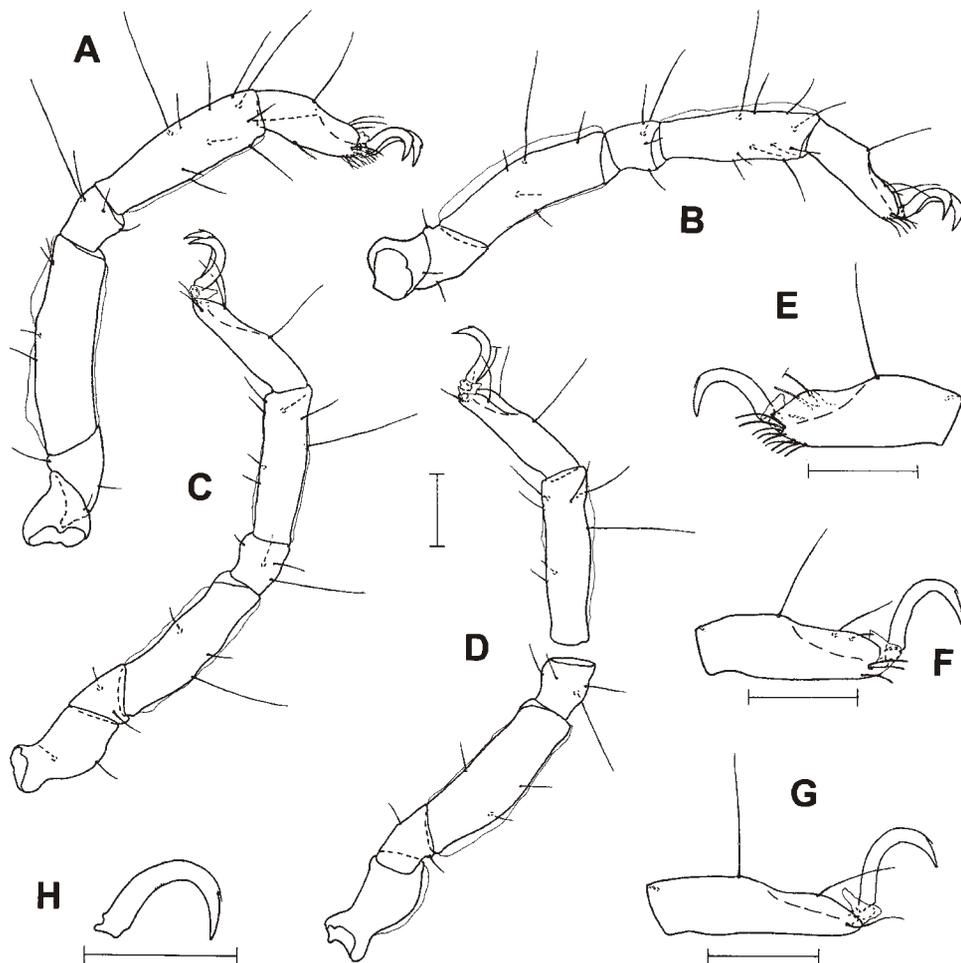


FIG. 4. *Agauae lubrica* sp. nov., holotype ♀: **A**, Leg I, medial; **B**, leg II, medial; **C**, leg III, medial; **D**, leg IV, medial; **E**, tarsus I, lateral (medial setae and claw omitted); **F**, tarsus II, medial (lateral fossary seta, parambulacral setae and claw omitted); **G**, tarsus III, lateral (medial setae and claw omitted); **H**, claw II, inner flank. (A–D, telofemora and tibiae with cover of debris instead of distinct cerotegumental lamellae) Scale bar = 50 μm .

with cover of debris (Fig. 4A–D); distinct cerotegumental ridges or lamella lacking. All tarsi with large fossa membranes. Leg chaetotaxy (solenidia and pas included): leg I, 1, 2, 4, 4, 11, 19; leg II, 1, 2, 5, 4, 10, 10; leg III, 2, 2, 3, 4, 7, 5; leg III, 0, 2, 3, 4, 7, 5. No ventral seta on telofemur I; telofemora II to IV with one ventral seta each. Each of tibiae I, III and IV with four ventral setae; tibia II with two ventral, two ventrolateral and two ventromedial setae. Tarsi I to IV with three long dorsal setae, of these the two apical setae paired, inserted on fossa membranes. Solenidion

on tarsus I 12 μm long, on dorsolateral fossa membrane (Fig. 4E). Solenidion on tarsus II on dorsomedial fossa membrane (Fig. 4F), its length 9 μm . Tarsus I with one ventromedial seta and an apical cluster with 14 eupathid setulae, pas included. Tarsi II to IV without ventral setae. Apex of tarsus II with pair of eupathidia and doubled pas, six setae in all. Tarsi III (Fig. 4G) and IV each with pair of tapering pas.

Claws of all tarsi with accessory process; shaft of claws apparently smooth though, at high magnification, about five delicate tines seen on

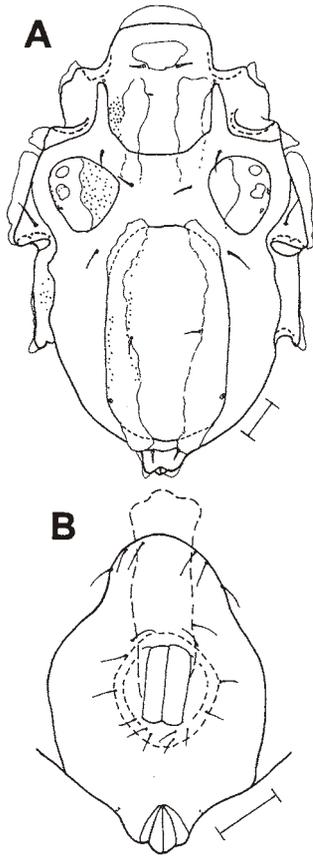


FIG. 5. *Agaue galatea* Otto, 1999, ♀: **A**, Idiosoma, dorsal (margin of PD in finely broken line when obscured by cerotegument); **B**, genitoanal plate and ovipositor. Scale bar = 50 μm .

inner flank of claws II to IV (Fig. 4H). Central sclerite without claw-like process.

Remarks. *Agaue lubrica* has slender legs with cylindrical tibiae and there are three dorsal setae on the PE anterior to the insertion of leg III. The same combination of characters is found in *A. brevipes*, *A. circellaris*, *A. fuscata*, *A. similis*, *A. subglabra*, and *A. tenuipes*. The other *Agaue* species known from Australia have a single dorsal seta on the PE and the tibiae are club-shaped. The six species just mentioned have distinct cerotegumental costae whereas in *A. lubrica* the cerotegument is faint. Females of *A. brevipes*, *A. fuscata*, *A. similis*, and *A. tenuipes* have the GO in the anterior half of the GA, but in *A. lubrica* the GO is in the middle of the GA. In *A. subglabra*

the ds-3 stand close together relative to their distance to the OC, there are no setae in the anterior part of the female GA and the ovipositor extends distinctly beyond the level of the anterior margin of the GA; in *A. lubrica* the interval between the pair of ds-3 is larger than that between the ds-3 and the margin of the OC, in the female there are several setae near the anterior margin of the GA, and the ovipositor extends to, but not beyond, the anterior margin of the GA. *A. circellaris* is much larger than *A. lubrica*, has prominent cerotegumental lamellae, a very slender gnathosoma, and six ventral setae on tibiae I, III and IV.

Other superficially similar species are *A. insigninata* Bartsch, 1979, *A. longiseta* Newell, 1951, *A. magellanica* Newell, 1951, *A. marginata* Viets, 1950, *A. setalis* Newell, 1984, and *A. variabilis* MacQuitty, 1984, but in all these species the cerotegumental lamellae and the ornamentation of the plates are more conspicuous than in *A. lubrica*. Worldwide, 44 *Agaue* species are known (Bartsch 2004, 2007, present new records; Chang & Chatterjee 2006).

Etymology. The specific name is derived from *lubricus* (Latin), smooth or slippery, referring to its almost smooth integument.

Agaue galatea Otto, 1999

(Fig. 5A, B)

Agaue galatea Otto, 1999: 276–278, figs 5A–D, 6A–D.

Material Examined. QM-S83655, ♀, Amity Point, North Stradbroke I., Qld (c. 27°25'S, 153°26'E), amongst small hydrozoans and bryzoans on stones, mid-tide, 12.02.2005, I. Bartsch.

Diagnosis. Length of idiosoma 545 μm . Idiosoma and legs with smooth cerotegument; AD with unpaired transverse and pair of parallel-sided longitudinal lamellae. Plates with areolae with canaliculi. Dorsal idiosomal setae with cerotegument. PE with single dorsal seta. Female GA with 19 pgs. Ovipositor extending beyond GA. Length of gnathosoma 2.2 times its width and length of rostrum about twice that of gnathosomal base. Integument of gnathosomal base with coarse porosity. Basal pair of maxillary setae longer than following pair. Tibiae clavate. Telofemora 2.7–3.1 times longer than high. Leg chaetotaxy, from trochanter to tarsus (solenidia and pas included): leg I, 1, 2, 5, 5, 12, 22; leg II, 1,

2, 5, 5, 9–10, 11; leg III, 2, 2, 3, 3, 8, 5; leg IV, 0, 2, 3, 3, 7, 5. Tibiae I to IV with 6, 4, 4, 4 ventral setae. Claws with accessory process and five to six tines at the claw shaft.

Supplementary Description. *Female.* Idiosomal length 542 μm . AD with transverse and pair of longitudinal cerotegumental areas; PD with pair of costae extending slightly beyond anterior margin of PD. Plates with areolae with deep pores (Fig. 5A). On AD deep pores along posterolateral portion of plate, on OC scattered deep pores along lateral margin but numerous in medial part, medial to cerotegumental cover, on PD two narrow lines with deep pores on either side of cerotegumental costae. PE with deep pores between insertions of legs III and IV, close to dot with cerotegument. Striated integument with delicate cerotegumental cover. Pore canaliculus in lateral margin of OC at the level of posterior cornea but more or less obscured by pores. Posterior cornea not distinctly delimited, interval between cornea and gland pore equalling about diameter of cornea. Pair of ds-5 on PD at 0.5. In female GO in middle of plate (Fig. 5B), distance to anterior margin of GA equalling 1.4 times length of GO, distance to tip of anal sclerites 1.7 times. GA with 19 pgs.

Length of gnathosoma 195 μm , width 90 μm , i.e. 2.2 times longer than wide and 0.36 of idiosomal length. Length of rostrum 130 μm or twice that of gnathosomal base. Basal pair of maxillary setae at least three times length of following pair. Rostral sulcus extending to that pair of maxillary setae.

Telofemora I and II longer than these legs tibiae, telofemora III and IV shorter than tibiae. Length/height ratio of telofemur I 3.1, that of telofemora II to IV 2.7–2.8. Dorsal cerotegumental cover of telofemora less than 1/3 of height of segment. Claws with accessory process and five to six tines at the claw shaft.

Remarks. When sorting at low magnification, *Agaue galatea* is similar to *A. fuscata* and *A. lubrica*, but its cerotegumental cover is pale, not as dense and brown as in *A. fuscata*, and more conspicuous than in *A. lubrica*. Other differences include: *A. galatea* has a single dorsal seta on the PE anterior to the insertion of leg III, while in *A. fuscata* and *A. lubrica* there are three dorsal setae anterior to leg III; the tibiae I of *A.*

galatea bear six ventral setae, but the tibiae I of *A. fuscata* and *A. lubrica* have four ventral setae; the dorsal plates of *A. galatea* and *A. fuscata* have areolae in which the integument is pierced by deep pores, but such areolae are lacking in *A. lubrica*.

In the specimen described by Otto (1999: fig. 5A) the ds-5 are situated at 0.7 instead of at 0.5 as in the specimen from North Stradbroke I., and the length of the rostrum is 1.4 times that of the gnathosomal base, instead of twice the gnathosomal base.

AGAUE IN AUSTRALIA

The first records of species of *Agaue* from Australia were published about a century ago (Lohmann 1893, 1909), and included a deutonymph of *A. hispida*, from off Sydney, and species similar to *A. chevreuxi* (Trouessart, 1889) and *A. panopae* (Lohmann, 1893) with records from Sydney and Shark Bay. Twelve species have since been described from Australia, six species from the southwestern coast (*A. brevipes*, *A. circellaris*, *A. tenuipes*, *A. scita*, *A. similis*, and *A. subglabra*) (Bartsch 1999a, b, 2007), and six from the eastern coast (*A. aliena*, *A. bella*, *A. fuscata*, *A. galatea*, *A. lubrica* and *A. reichelti* (Otto 1999; above described new species).

Agaue hispida was described on the basis of a single deutonymph. Its length, with the gnathosoma included, is 430 μm , which equals an idiosomal length of about 330 μm . The dorsal plates are ornamented with a reticulate cerotegument, the legs bear large honey comb-shaped cerotegumental lamellae, and the width of the lamellae on telofemora and tibiae is at least half the height of the relevant segment. The walls of the honey comb are drawn out into numerous points. The ds-3 are very long. The Australian species *A. aliena*, *A. bella*, *A. reichelti*, and *A. scita* also have large honey comb-shaped lamellae but the cerotegument does not show a reticulate pattern. Deutonymphs in general have less developed cerotegumental ornamentation and smaller lamellae than their adults, but the situation in adults cannot definitely be predicted on the basis of nymphal characters.

The identity of the Australian species recorded under the names *A. panopae* and *A. chevreuxi*

(Trouessart, 1889) is unknown. Material of *A. panopae* from off Sydney was mentioned in the original description (Lohmann 1893: 72), but the specimen illustrated and the first mentioned locality is from off the Cape Verde Islands and, accordingly, that specimen and locality should be regarded as the type and type locality of *A. panopae*. According to present knowledge of distribution, one may expect different species of *Agauae* to occur in the Atlantic and Pacific Oceans. Lohmann (1893: pl. 4, fig. 9) presented a ventral aspect of a female from off Sydney, that Australian specimen may be closely related or conspecific with *A. galatea*; though the given length of the idiosoma (350–420 μ m) and the dorsal aspect of the gnathosoma (pl. 3, fig. 8), with a short, wide seta on P-3, do not agree with the characters found in *A. galatea*. The type locality of *A. chevreuxi* is Le Croisic at the French Atlantic coast (Trouessart 1889). Both *A. chevreuxi* and *A. panopae* are wide-spread in the warm-temperate Atlantic and the Mediterranean (Lohmann 1893; Viets 1940; Mari & Morselli 1990), the former also in the Black Sea (Bartsch 1998).

The following key includes the twelve *Agauae* species definitely known from Australia, *A. aliena*, *A. bella*, *A. brevipipes*, *A. circellaris*, *A. fuscata*, *A. galatea*, *A. lubrica*, *A. reichelti*, *A. scita*, *A. similis*, *A. subglabra*, and *A. tenuipes*, but excludes *A. hispidula* which is known only by its deutonymph.

Key to Adults of Australian Species of *Agauae*

1. Rostrum more than three times length of gnathosomal base. P-4 with whorl of setae in distal quarter. *A. circellaris*
 - Rostrum less than 2.5 times length of gnathosomal base. P-4 with whorl of setae in basal two-thirds. 2
2. Rostrum and palps short, not longer than gnathosomal base. First pair of gland pores and dorsal setae on dorsal portion of AE. *A. scita*
 - Rostrum and palps long and slender, more than 1.5 times length of gnathosomal base. First pair of gland pores and dorsal setae on AD. 3
3. PE with three or four dorsal setae, three setae anterior to insertion of leg III, zero or one seta anterior to leg IV. 4
 - PE with single dorsal seta anterior to insertion of leg III. 9
4. Claws with J-shaped pecten with numerous tines along the claw shaft. PE with dorsal seta anterior to insertion of leg IV. In females distance between anterior margin of GA and GO less than length of GO 5
 - Claws with zero to six small tines in middle of claw shaft. PE without dorsal seta anterior to insertion of leg IV. In females distance between anterior margin of GA and GO equalling at least length of GO. 8
5. Telfemora slender, length of telfemora III and IV at least 2.7 times their height. 6
 - Telfemora III and IV less than 2.5 times their height. 7
6. Length of telfemora III and IV more than three times their height. *A. tenuipes*
 - Length of telfemora III and IV about 2.7–2.8 times their height. *A. similis*
7. AD wider than PD. Cerotegument of conspicuously brown colour. *A. fuscata*
 - PD wider than AD. Cerotegument pale. *A. brevipipes*
8. Cerotegumental costae on AD in shape of inverted V. Pair of ds-3 situated close together, interval between setae same or less than their distance to margin of OC. Shaft of claws III and IV with four to six tines. *A. subglabra*.
 - AD without such cerotegumental costae. Interval between setae ds-3 more than twice the distance to margin of OC. Shaft of claws III and IV apparently smooth. . . . *A. lubrica*
9. Cerotegumental cover on idiosoma and legs plain, without conspicuous texture. *A. galatea*
 - Cerotegumental cover on idiosoma and legs large and of filamentous texture. 10
10. Telfemora with large dorsal cerotegumental lamellae but inconspicuous ventral lamellae. Tibiae without lamellae. *A. aliena*
 - Dorsal and ventral lamellae of telfemora large, almost equal in height. Tibiae with lamellae. 11
11. P-3 with dorsal seta. Corneae removed from margins of OC, their diameter less than 1/6 of length of OC. In females distance from anterior margin of genital foramen to that of GA almost twice length of foramen. *A. bella*
 - P-3 without seta. Corneae close to margin of OC, their diameter about 1/3 of length of

OC. In females interval between anterior margin of genital foramen and that of GA somewhat more than length of foramen.

..... *A. reichelti*

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