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Revision of the Eurybrachidae (XVI). The Australian *Olonia rubicunda* (Walker, 1851): Description of the male, distribution and host plants (Hemiptera: Fulgoromorpha: Eurybrachidae)

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Abstract

The type species of the genus *Olonia* Stål, 1862, *O. rubicunda* (Walker, 1851), previously known from a single female, is redescribed from males and females, and the male genital characters are described and illustrated for the first time. A list of host plants, observations on the biology of the species and a distribution map are provided. An updated identification key to the species of *Olonia* is given. The species is polyphagous and distributed along the coast of southeast Queensland, from Brisbane to Clairview.

Keywords: Auchenorrhyncha, Australia, Fabaceae, Fulgoroidea, *Ipomoea*

Introduction

The family Eurybrachidae is a small, Old World family of planthoppers (Fulgoromorpha Evans, 1946) with 42 genera and 200 species, representing only 1.7% of the genera and 1.4% of the described species of Fulgoromorpha (BOURGOIN, 2020). With 15 genera and 53 species (25+% of the family) present and endemic in the country, eurybrachids represent a characteristic component of the planthopper fauna of Australia. Eurybrachidae are well known in Australia by their egg masses covered in white wax on trunks of *Eucalyptus* and *Acacia* as well as on other plants. The genus *Olonia* Stål, 1862 is one of the most speciose Australian Eurybrachidae genera with 12 species and was recently revised (CONSTANT, 2018) with the addition of 7 new species and several other taxonomic changes including the description of a new genus *Stalobrachys* Constant, 2018 to accommodate *Olonia alboapicata* (Jacobi, 1928). However, one issue was still pending as the type species of the genus *Olonia rubicunda* (Walker, 1851) was only known from a single female from Fraser Island. The best characters to separate *Olonia* from related genera and to distinguish between species within the genus are those of the male genitalia and it appeared important to find and associate some male specimens with the species holotype for an irrefutable support to the consistency of the genus and provide relevant characters to recognize the species. Two recent expeditions in southeast Queensland in December 2019 and March 2020 have allowed to collect and observe specimens of *O. rubicunda* and a few additional specimens were found in the Queensland Museum collection accessions.

The present paper aims to fully redescribe and illustrate *O. rubicunda*, including the male genitalia for the first time, compare it to the most closely related species and provide data on its distribution range and biology.

Material and methods

The collecting trips in December 2019 and March 2020 which allowed the collecting and observations of *O. rubicunda* were financed by Agriculture Victoria, the Operational Direction Taxonomy & Phylogeny of RBINS and the Leopold III Funds for the Exploration and Conservation of Nature (Belgium). Material was collected under the permit numbers WITK18701717-1 and WIF418701617 issued by the Queensland Department of Environment and Science and endorsed by the Entomological Society of Queensland.

The specimens were captured by sweeping or on sight, by slowly covering the insect with a transparent tube. Specimens were dry-mounted on cardboard triangles and one hind wing of a number of them glued on white rectangular cardboard with white glue and pinned under the corresponding specimen. The genitalia were extracted after boiling the abdomen for some minutes in a 10% solution of potassium hydroxide (KOH) at about 100°C. The pygofer was separated from the abdomen and the aedeagus dissected with a needle blade for examination in 70% ethanol. The whole was then placed in glycerine for preservation in a tube attached to the pin of the corresponding specimen.

For routine identification, the abdomen was removed and the genitalia directly examined. In this case, the dry abdomen was glued on a cardboard triangle, pinned under the specimen.

The description format follows CONSTANT (2018); the description of the wings venation follows BOURGOIN *et al.* (2015). The metatibiotarsal formula gives the number of spines on (side of metatibia) apex of metatibia/apex of first metatarsus/apex of second metatarsus. The photographs in the field were taken with a Sony DSC-H300 camera; those of the collection specimens and terminalia were taken with a Leica EZ4W stereomicroscope with integrated camera, stacked with CombineZ software and optimized with Adobe Photoshop CS3. The distribution map was produced with SimpleMappr (SHORTHOUSE, 2010).

The measurements were taken as in CONSTANT (2004) and the following abbreviations are used:

BF = maximum breadth of the frons

BT = maximum breadth of the thorax

BTg = maximum breadth of the tegmen

BV = maximum breadth of the vertex

BW = maximum breadth of the posterior wing

LF = length of the frons in midline

LM = length of the mesonotum in midline

LP = length of the pronotum in midline

LT = total length from anterior margin of vertex to apex of tegmina

LTg = maximum length of the tegmen

LV = length of the vertex in midline

LW = maximum length of the posterior wing.

Acronyms used for collections:

QM	=	Queensland Museum, Brisbane, Queensland, Australia
RBINS	=	Royal Belgian Institute of Natural Sciences, Brussels, Belgium
VAIC	=	Victorian Agricultural Insect Collection, Bundoora, Victoria, Australia.

Results

Order Hemiptera Linnaeus, 1758
Suborder Auchenorrhyncha Duméril, 1806
Infra-order Fulgoromorpha Evans, 1946
Superfamily Fulgoroidea Latreille, 1807
Family Eurybrachidae Stål, 1862
Subfamily Platybrachinae Schmidt, 1908
Tribe Platybrachini Schmidt, 1908

Genus *Olonia* Stål, 1862

Olonia STÅL, 1862: 488 (description in key; list of included species);
TYPE SPECIES: *Eurybrachys rubicunda* Walker, 1851, by subsequent designation in DISTANT 1906: 206.

Lyncilia STÅL, 1863: 248 (description);
TYPE SPECIES: *Lyncilia nobilis* Stål, 1863, by monotypy, synonymized by CONSTANT (2018).

DIAGNOSIS. Rather small-sized (6–12 mm), dark brown variegated with black and white, tegmina usually with a white marking along costal margin on nodal line and posterior wings usually with a white marking near externoapical angle, sometimes orange on disc. The genus can be recognized by the following set of characters:

(1) gonostyli strongly sclerotized and fused basally on about ⅓ of length;

(2) gonostyli divided into a centroventral and a laterodorsal parts;

(3) gonostyli with laterodorsal part with large lateral process projecting laterally and bearing dorsoapical, articulate, spoon-shaped process;

(4) aedeagus strongly reduced with dorsal portion of phallobase projecting dorsally as a spine or hook.

The genus shares the condition of possessing a spoon-shaped process on the gonostyli with the Australian genera *Chewobrachys* Constant, 2008, *Fletcherobrachys* Constant, 2006, *Hackerobrachys* Constant, 2006, *Maeniana* Metcalf, 1952, *Nirus* Jacobi, 1928, *Stalobrachys* Constant, 2018 and probably *Loisobrachys* Constant, 2008, the latter known from the unique female holotype, but differs from these genera by characters given by CONSTANT (2018).

SPECIES INCLUDED (12):

Olonia bourgoini Constant, 2018

Olonia danielsi Constant, 2018

Olonia guillaumei Constant, 2018

Olonia hochae Constant, 2018

Olonia marginata Distant, 1906

Olonia maura (Fabricius, 1775)

Olonia monteithi Constant, 2018

Olonia nobilis (Stål, 1863)

Olonia picea Kirkaldy, 1906

Olonia rubicunda (Walker, 1851)

Olonia rylandae Constant, 2018

Olonia soulierae Constant, 2018.

Identification key to the species of *Olonia*

Modified from CONSTANT (2018). Illustrations marked with * are found in CONSTANT (2018)

1. Process of the laterodorsal part of gonostyli bifid (*figs 30 D, 33 D) **2**

– Process of the laterodorsal part of gonostyli not bifid (*figs 5 D, 10 D, 19 D) **5**

2. Process of the centroventral part of gonostyli with several teeth apically (*fig. 30 C) ..... ***O. maura*** (Fabricius, 1775)

– Process of the centroventral part of gonostyli without teeth apically (*figs 33 C, 42 C) **3**

3. Processes of the laterodorsal part of gonostyli both curved and convergent apically, subequal in length and surpassing process of centroventral part in ventral view (*fig. 42 A, C–D); lateral process of gonostyli directed anteriorly (*fig. 42 C) ..... ***O. picea*** (Kirkaldy, 1906)

– Processes of the laterodorsal part of gonostyli slightly diverging or subparallel apically with ventral/central one straight, and not surpassing level of apex of process of centroventral part in ventral view (*fig. 33A, C–D; Fig. 3 A–C, F) **4**

4. Processes of the laterodorsal part of gonostyli in a nearly vertical plane, and projecting dorsally well above the centroventral part in lateral view (*fig. 33 A, C–D); anal tube more elongate, 2.3 times longer than wide in dorsal view (*fig. 33 B); phallus short and wide (*fig. 33 F); dorsal processes of periandrium strongly hooked dorsally (*fig. 33 E) ..... ***O. monteithi*** Constant, 2018

– Processes of the laterodorsal part of gonostyli in a nearly horizontal plane, and projecting posteroventrally under the centroventral part in lateral view (Fig. 3 A–D); anal tube less elongate, 1.9 times longer than wide in dorsal view (Fig. 3 E); phallus elongate (Fig. 3 I–J); dorsal processes of periandrium projecting posterodorsally (Fig. 3 G) ..... ***O. rubicunda*** Walker, 1851

5. Processes of the laterodorsal part of gonostyli surpassing processes of centroventral part in ventral view (*figs 19 C, 46 C) **6**

– Processes of the laterodorsal part of gonostyli shorter than processes of centroventral part in ventral view (*figs 5 C, 10 C, 37 C) **7**

6. Processes of the laterodorsal part of gonostyli strongly sinuate with central portion straight (*fig. 46 A, C) ..... ***O. rylandae*** Constant, 2018

– Processes of the laterodorsal part of gonostyli strongly and regularly curved ventrally (*fig. 19 A, C) ..... ***O. marginata*** Distant, 1906

7. Anal tube elongate and narrow, more than 3 times longer than broad, and with sides subparallel (*figs 5 B, 10 B) **8**

– Anal tube broader, less than 2.5 times longer than broad, and with sides curved (*figs 8 B, 37 B) **10**

8. Processes of the laterodorsal part of gonostyli falcate, broader at midlength and incurved (*fig. 5 A, C–D) ..... ***O. bourgoini*** Constant, 2018

– Processes of the laterodorsal part of gonostyli regularly narrowing from base to apex and not incurved (*fig. 10 A, C–D) **9**

9. Processes of the laterodorsal part of gonostyli curved laterally (*fig. 10 C–D); process of centroventral part of gonostyli with ventral margin convex in lateral view (*fig. 10 A) ..... ***O. guillaumei*** Constant, 2018

– Processes of the laterodorsal part of gonostyli curved ventrally (*fig. 13 C–D); process of centroventral part of gonostyli with ventral margin slightly concave in lateral view (*fig. 13 A) ..... ***O. hochae*** Constant, 2018

10. Anal tube with apical margin notched and lateral margins subparallel beyond epiproct (*fig. 48 B); process of centroventral part of gonostyli very elongate and narrow, more than 10 times longer than wide at mid-length in ventral view (*fig. 48 A, C) ..... ***O. soulierae*** Constant, 2018

– Anal tube with apical margin not notched and lateral margins not subparallel beyond epiproct (*figs 8B, 37B); process of centroventral part of gonostyli not very elongate and narrow, less than 10 times longer than wide at mid-length in ventral view (*figs 8A, C, 37A, C) **11**

11. Processes of the centroventral part of gonostyli incurved and slightly surpassing processes of lateroventral part in ventral view (*fig. 37C); anal tube regularly narrowing beyond epiproct (*fig. 37B) ..... ***O. nobilis*** (Stål, 1863)

– Processes of the centroventral part of gonostyli strongly hooked dorsally by apex and strongly surpassing processes of lateroventral part in ventral view (*fig. 8C); anal tube broadening beyond epiproct to 2/3 its length (*fig. 8B) ..... ***O. danielsi*** Constant, 2018

***Olonia rubicunda* (Walker, 1851)**

(Figs 1–7)

Eurybrachys rubicunda WALKER 1851: 391 [described].

Eurybrachys rubicunda — KIRKALDY 1906: 445 [listed as belonging to *Olonia*].

Olonia rubicunda — STÅL 1862: 488 [transferred to *Olonia*]. — DISTANT 1906: 206 [type-species of *Olonia*]. — METCALF 1956: 65 [catalogued]. — CONSTANT 2018: 10 [distribution map], 69 [redescription], fig. 44 [type illustrated].

non *Olonia rubicunda* — JACOBI 1928: 4 [(re)described from Kimberley district (erroneous, based on misidentified specimens)]. — LALLEMAND 1935: 675 [mentioned from Northern Territory (erroneous, based on misidentified specimens)].

DIAGNOSIS

(1) disc of hind wings without orange marking but sometimes with a yellow-brown one on disc (Figs 1 E, 2 E)

(2) pro- and mesofemora and tibiae largely black-brown (Figs 1 A–D, 2 A–D)

(3) anal tube of male obovate, narrowing at basal ⅓ (Fig. 3 E)

(4) centroventral part of gonostyli with strong, elongate process curved lateroventrally and pointed apically (Fig. 3 A, B)

(5) laterodorsal part of gonostyli strongly bifid, with processes in a nearly horizontal plane, and projecting posteroventrally under the centroventral part in lateral view (Fig. 3 A–B)

(6) medium size: 6.1–9.3 mm.

Dark females of *O. marginata* Distant, 1906 (CONSTANT, 2018, figs 15, 17, 20) are nearly impossible to separate from females of *O. rubicunda* and female material collected south of the recorded distribution of the first species and north of the recorded range of the latter should be identified only if males of the same collecting event are available.

ETYMOLOGY. The species epithet *rubicundus* (adj., Latin) means bright red. It refers to the colour of the abdomen of the species.

TYPE MATERIAL. AUSTRALIA: **Holotype** of *Eurybrachys rubicunda* Walker, 1851, ♀ (CONSTANT, 2018: fig. 44): [N.H., Sandy Cape /on the reverse/ 46 73] [Type] [22. *Eurybracbys* (sic!) *rubicunda*,] [Re-pinned on stainless] – left anterior and posterior, and right median legs glued on labels attached to the pin of the specimen, left tegmen missing (BMNH) coordinates of Sandy Cape: 24°43'46"S 153°12'30"E.

NOTE. N.H. on the first label stands for "New Holland", a former name for Australia.

ADDITIONAL MATERIAL. AUSTRALIA: Queensland:

3♂♂, 1♀, 3 nymphs: Mulambin, Emily Morgan Park, 23°11'22"S 150°47'31"E, 11.XII.2019, beach, sweeping *Ipomoea pes-caprae*, leg. J. Constant (1♂, 1♀, 3 nymphs: QM; 1♂: RBINS; 1♂: VAIC);

1♂, 6 nymphs: Emu Park, 23°15'19"S 150°49'45"E, 11.XII.2019, beach, sweeping *Ipomoea pes-caprae*, leg. J. Constant (1♂, 2 nymphs: QM; 2 nymphs: RBINS; 2 nymphs: VAIC);

1 nymph: same data as preceding, on *Canavalia sericea*, leg. L. Semeraro (QM);

3♂♂, 3♀♀, 6 nymphs: same location, 14.III.2020, on *Canavalia sericea*, leg. J. Constant & L. Semeraro, Leopold III Funds Expedition (1♂, 1♀, 2 nymphs: QM; 1♂, 1♀, 2 nymphs: RBINS; 1♂, 1♀, 2 nymphs: VAIC);

1 nymph: Emu Park, Haven Road, 23°14'15.6"S 150°49'21.4"E, 11.XII.2019, beach, sweeping *Ipomoea pes-caprae*, leg. J. Constant (QM);

1 nymph: Zilzie, 23°17'10"S 150°48'53"E, 11.XII.2019, beach, sweeping *Ipomoea pes-caprae*, leg. J. Constant (QM);

15♂♂, 10♀♀, 6 nymphs: Yeppoon, Lammermoor Beach, 23°10'01"S 150°46'55"E, 10.XII.2019, *Ipomoea pes-caprae*, leg. J. Constant, F. Martoni, M. Moir & L. Semeraro (5♂♂, 4♀♀, 2 nymphs: QM; 5♂♂, 3♀♀, 2 nymphs: RBINS; 5♂♂, 3♀♀, 2 nymphs: VAIC);

6♂♂, 4♀♀, 5 nymphs: same location, 13.III.2020, *Clitoria ternatea*, leg. J. Constant & L Semeraro, Leopold III Funds Expedition (2♂♂, 2♀♀, 3 nymphs: QM; 2♂♂, 1♀, 1 nymph: RBINS; 2♂♂, 1♀, 1 nymph: VAIC);

8♂♂, 8♀♀, 24 nymphs: Bargara, Nielson Beach, 24°48'21.1"S 152°27'23.4"E,8–9.III.2020, *Canavalia rosea*, leg. J. Constant & L. Semeraro, Leopold III Funds Expedition (3♂♂, 3♀♀, 8 nymphs: QM; 3♂♂, 2♀♀, 8 nymphs: RBINS; 2♂♂, 3♀♀, 8 nymphs: VAIC);

3♂♂, 5♀♀, 6 nymphs: Clairview, Baracrab campsite, 22°07'24.1"S 149°32'17.2"E, 15–16.III.2020, *Ipomoea pes-caprae* leg. J. Constant & L. Semeraro, Leopold III Funds Expedition (1♂, 2♀♀, 2 nymphs: QM; 1♂, 1♀, 2 nymphs: RBINS; 1♂, 2♀♀, 2 nymphs: VAIC);

2♂♂: Brisbane, 2.XII.1956, L. Sutherland, UQIC Reg. #43590 (QM).

MALE

Head (Fig. 1 A–D). Vertex slightly concave with anterior and posterior margins parallel, curved; medium to dark brown; obsolete median carina shortly marked along posterior margin, often absent; posterior carina and posterior portion of lateral carinae often marked with

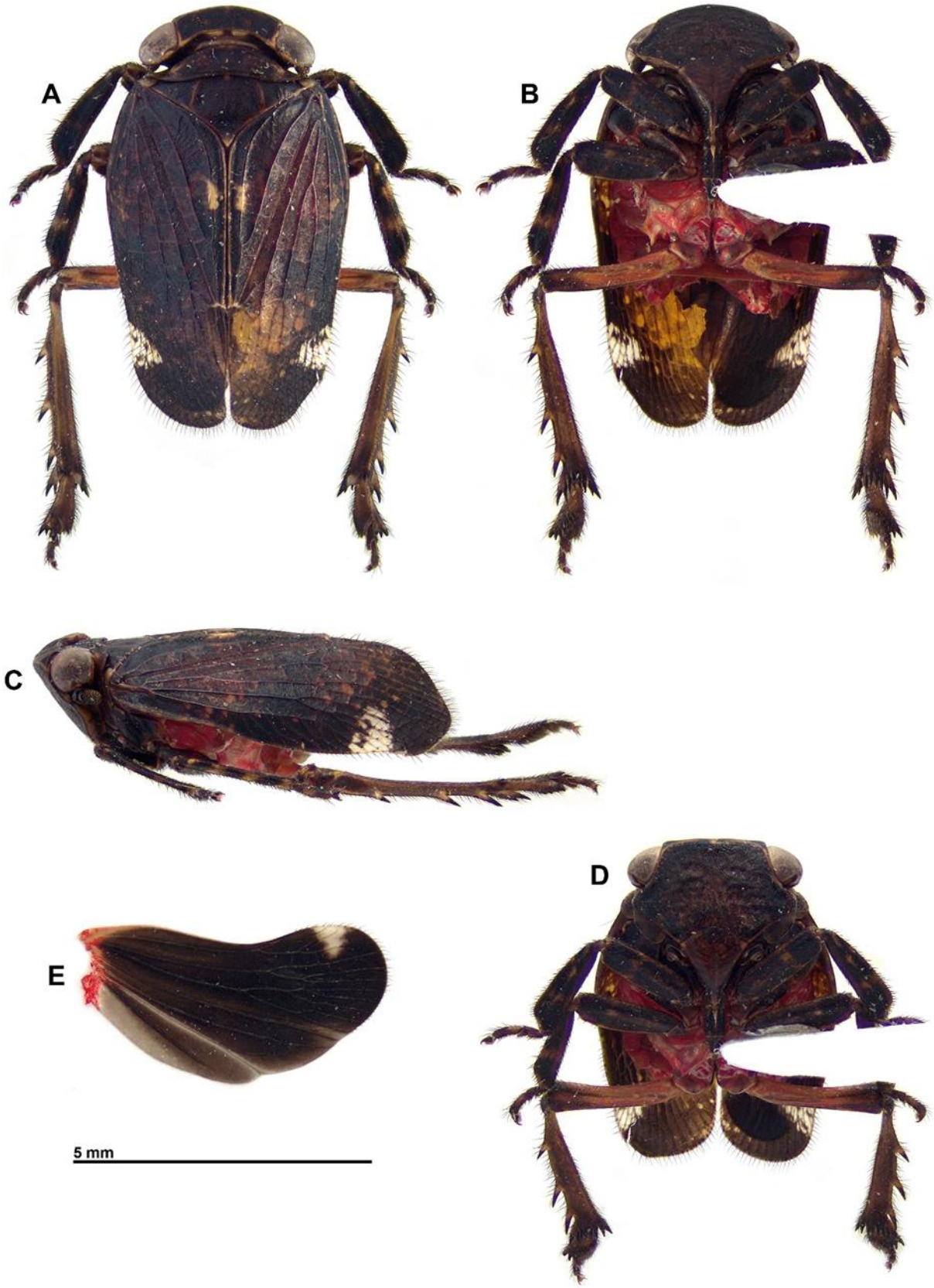

Fig. 1. *Olonia rubicunda* Walker, 1851, ♂ specimen from Lammermoor (QM). A, habitus dorsal view. B, habitus, ventral view. C, habitus, lateral view. D, habitus, perpendicular view of frons. E, posterior wing.

Fig. 2. *Olonia rubicunda* Walker, 1851, ♀ specimen from Lammermoor (QM). A, habitus dorsal view. B, habitus, ventral view. C, habitus, lateral view. D, habitus, perpendicular view of frons. E, posterior wing.

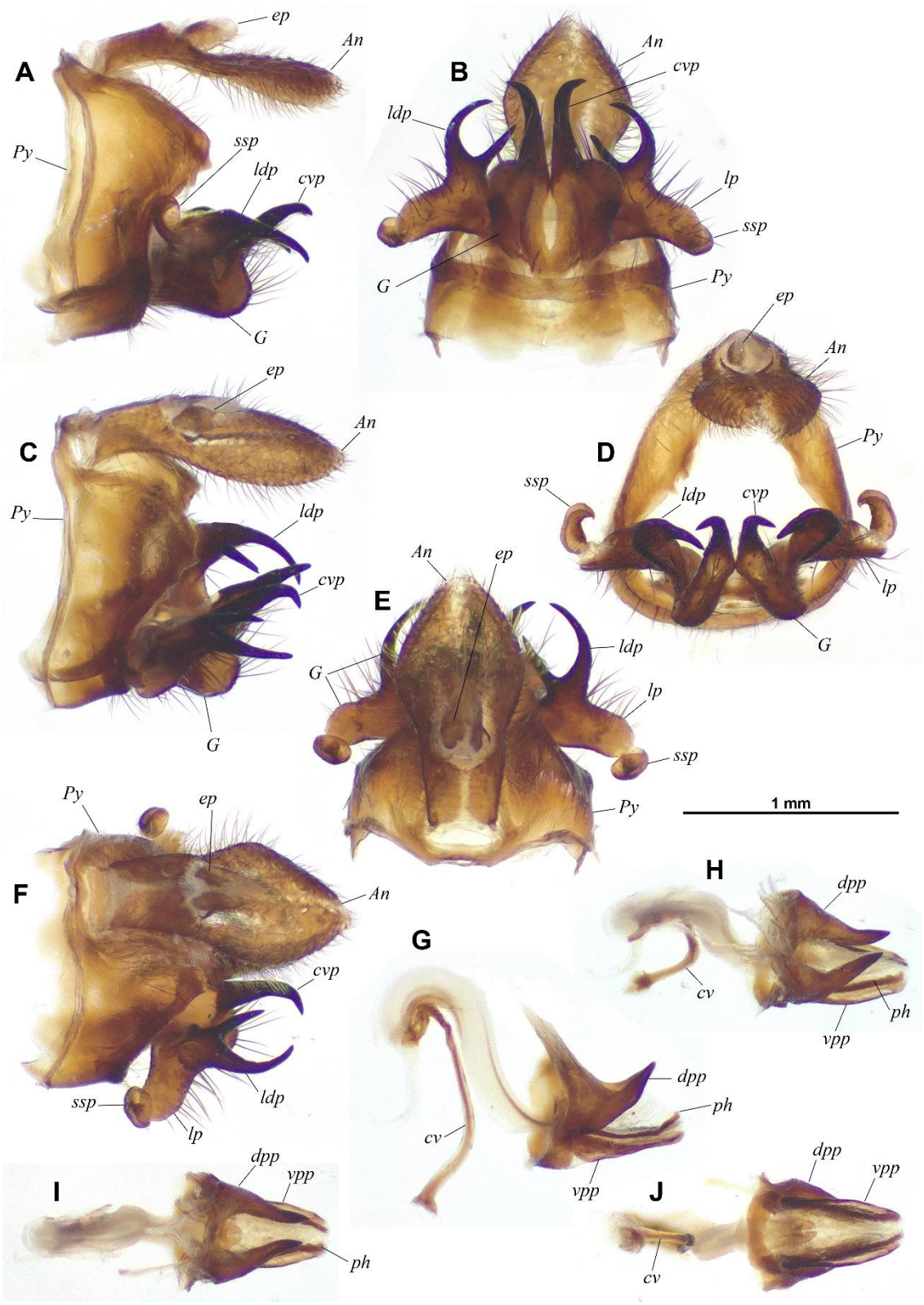

Fig. 3. *Olonia rubicunda* Walker, 1851, ♂ terminalia, specimen from Lammermoor (QM). A, pygofer, anal tube and gonostyli, lateral view. B, pygofer, anal tube and gonostyli, ventral view. C, pygofer, anal tube and gonostyli, laterodorsal view. D, pygofer, anal tube and gonostyli, caudal view. E, pygofer, anal tube and gonostyli, dorsal view. F, pygofer, anal tube and gonostyli, dorsolateral view. G, aedeagus, lateral view. H, aedeagus, laterodorsal view. I, aedeagus, dorsal view. J, aedeagus, ventral view. *An*: anal tube; cv: connective; *cvp*: centroventral part of gonostylus; *dpp*: dorsal portion of phallobase; *ep*: epiproct; *G*: gonostylus; *ldp*: lateroventral part of gonostylus; *lp*: lateral process of gonostylus; *ph*: phallus; *Py*: pygofer; ssp: spoon-shaped process; *vpp*: ventral portion of phallobase.

yellowish. Posterior part of head with yellowish markings. Frons uniformly coloured, medium to dark brown, sometimes darker at lateral angles. Clypeus elongate, entirely medium to dark brown with small paler spot at each side at frontoclypeal suture. Genae brown to black withyellowish markings along anterior margin behind lateral expansion of frons. Labium brown to black, surpassing mesocoxae. Antennae black-brown; scape short, ring-shaped; pedicel subcylindrical, slightly narrowing towards apex.

Thorax (Fig. 1 A–D). Pronotum medium to dark brown with irregular paler, yellowish markings; slightly wrinkled; 2 small impressed points on disc slightly marked. Lateral fields of prothorax coloured as pronotum. Mesonotum medium to dark brown variegated with darker zones on middle and sides; yellowish spot at apex of scutellum and in middle of anterior margin; median and peridiscal carinae weakly marked; median carina stopped before scutellum; peridiscal carinae marked with yellowish; slight impression before scutellum. Red ventrally. Tegulae yellowish to medium brown.

Tegmina (Fig. 1 A, C). Medium to dark brown; pale yellowish marking on vein A_1 at midlength of clavus; marked with dark brown or black along costal margin, more broadly so on posterior half, and along posterior margin. Often darker, median, irregular marking at apical 2/3; triangular white marking on costal margin on nodal line; some minute white spots at apicosutural angle. Costal and sutural margins subparallel; costal margin slightly sinuate; apical margin obliquely rounded.

Posterior wings (Fig. 1 E). Brown to dark brown, paler on anal area and progressively darker on apical half; often a yellow-brown marking at midlength between veins CuP and A1; triangular to somewhat rounded white marking at apicocostal angle, extending on 3–4 cells. Margin of anal area slightly sinuate; sutural margin with 1 slight cleft, cubital one nearly not marked.

Legs (Fig. 1 A–D). Pro- and mesocoxae black-brown, paler apically. Pro- and mesofemora black-brown to brown variegated with brown to yellowish. Pro- and mesotibiae medium to dark brown, with 3 paler, yellowish to pale brown, rings. Pro- and mesotarsi black-brown with basal half of third tarsomere paler. Anterior legs always darker than medium legs and with paler markings less visible. Metacoxae reddish; metafemora reddish with apex brown. Metatibiae brown, darker basally and towards apex, with 3 lateral spines paler basally, and 9 apical black-brown spines. Metatarsi brown with a ventral row of 6 black spines on first tarsomere. Metatibiotarsal formula: (3) 9/4/0.

Abdomen. Bright red with genital segments black-brown.

MALE GENITALIA (Fig. 3). Posterior margin of pygofer (*Py*) in lateral view strongly sinuate, strongly roundly projecting at dorsal 1/3, moderately broad ventrally (Fig. 3 A–C). Anal tube (*An*) spatulate, 1.9 times as long as broad, laterally constricted at level of epiproct (*ep*), slightly curved ventrally in lateral view; lateral margins slightly curved ventrally on apical 2/3; apical margin rounded (Fig. 3 A–F). Gonostyli (*G*) fused on basal half of length of centroventral part (*cvp*) and projecting posteriorly (Fig. 3 A–F). Centroventral part broad and dorsoventrally flattened on basal half, then narrowing into an elongate, curved, spinose process directed posterodorsally and slightly laterally, and ended in point curved laterally and slightly ventrally (Fig. 3 A–B). Laterodorsal part (*ldp*) of gonostyli strong and curved dorsocentrally, reaching about level of apex of centroventral part, bifid with a side and a central process elongate and pointed apically, and forming a C together, side process more curved and slightly longer than central one; lateral process (*lp*) elongate, longer than spoon-shaped process (*ssp*), projecting laterally and curved anteriorly (Fig. 3 B, D–F). Dorsal portion of phallobase (*dpp*) with hooked process on each side, progressively narrowing from base to apex, curved posterodorsally at

mid-length and with apex pointing centrally (Fig. 3 G–I). Ventral portion of phallobase (*vpp*) subrectangular with apical margin roundly truncate in dorsal view and not surpassing phallus (*ph*) (Fig. 3 G–J). Phallus dorsoventrally flattened, moderately elongate with apical marginroundly truncate (Fig. 3 G–J). Connective (*cv*) elongate and narrow, without tectiductus (Fig. 3 G).

FEMALE

Similar to male but with white spot on costal margin of tegmina at nodal line and white spot of posterior wings, reduced (Fig. 2).

BIOLOGY

Olonia rubicunda was found in December 2019 in several locations around Yeppoon, exclusively on *Ipomoea pes-caprae* (L.) R.Br. (Convolvulaceae) and mostly on plants growing in areas covered in grass on the first dunes along the beaches (Fig. 4 A–E). The conditions at that time were extremely dry and active sweeping of other plants, especially of *Vigna marina* (Burm.f.) Merr. (Fabaceae) did not yield any *Olonia* specimens. Adults and nymphs of all stages were found on *Ipomoea*, and some nymphs were found at Emu Park, on *Canavalia sericea* A. Gray (Fabaceae) growing on rocky cliffs along the seashore (Fig. F–H). In March 2020, the collecting was following heavy rains which allowed a lot of vegetation to grow. In the same location of Lammermoor Beach in Yeppoon (Fig. 5 A–D), where specimens were collected in Dec 2019, intensive search on *Ipomoea* plants did not reveal any *Olonia* specimens although adults and nymphs were found to be quite numerous on *Clitoria ternatea* L. (Fabaceae) growing among the grass. In Emu Park, adults and nymphs were found on *Canavalia sericea* (Fig. 5 F–G) while the specimens from Clairview were all on *Ipomoea pes-caprae* growing between grass. In Bargara, Nielson Beach, intensive sweeping of a promising area covered in *I. pes-caprae* between grass (Fig. 6 A) did not allow the collecting of any specimen, while specimens were found a few metres further in a dense habitat (Fig. 6 B–C) with *Canavalia rosea* (Sw.) DC. (Fabaceae) (Fig. 6 D–E), *Euphorbia cyathophora* Murray (Euphorbiaceae) (Fig. 6 D) and *Vitex trifolia* L. (Lamiaceae) (Fig. 6 F); from these three plant species however, only *C. rosea* can be confirmed as a food-plant of *O. rubicunda* which was found as adults and nymphs in a small area covered exclusively in this plant (Fig. 6 G–I).

The species is polyphagous and the current list of confirmed host-plants includes two families, Convolvulaceae with *Ipomoea pes-caprae* and Fabaceae with *Canavalia rosea*, *C. sericea* and *Clitoria ternatea*. It can be abundant in suitable habitats.

As adults and nymphs at all stages were found both in December and in March, it is possible that the species can be found all year round but this needs to be confirmed.

DISTRIBUTION. Australia: Southeastern Queensland, between Brisbane and Clairview.

Discussion

LONG TIME NO SEE

Olonia rubicunda was described some 169 years ago (WALKER, 1851) from a single female and not recorded since that time. Two recent expeditions in southeastern Queensland and the examination of specimens in the QM collections have proved that the species has a wide distribution range, is not rare in suitable habitats and can be found in places with strong human presence (e.g. Nielson Beach in Bargara, Emu Park, Baracrab campsite in Clairview). This illustrates the need for a greater focus on the taxonomic knowledge of the Australian planthopper fauna, and more generally the limited taxonomic capacity in Australia (TAXONOMY DECADAL PLAN WORKING GROUP, 2018).

Fig. 4. *Olonia rubicunda* Walker, 1851, habitat, Queensland. A–C, Yeppoon, Lammermoor Beach, 10.XII.2019. A, ♀ specimen, laterodorsal view. B, ♀ specimen, dorsal view. C, dune covered in *Ipomoea pes-caprae* and grass. D, Mulambin, Emily Morgan Park, 11.XII.2019, dune covered in *I. pes-caprae* and grass. E–H, Emu Park, 11.XII.2019. E, dune covered in *I. pes-caprae* and grass. F, *Canavalia sericea* growing on rocky area. G, *C. sericea* seedpot. H, nymph on *C. sericea*.

Fig. 5. *Olonia rubicunda* Walker, 1851, habitat, Queensland. A–D, Yeppoon, Lammermoor Beach, 13.III.2020. A, dune covered in *Ipomoea pes-caprae*, grass and *Clitoria ternatea*. B, *I. pes-caprae*, grass and *C. ternatea*, detail. C, grass covered with *C. ternatea*, detail. D, flowers of *C. ternatea*. E, Clairview, Baracrab campsite, 16.III.2020, dune covered in *Ipomoea pes-caprae* and grass. F–G, Emu Park, 14.III.2020. F, rocky area covered in *Canavalia sericea*. G, *C. sericea*, detail.

Fig. 6. *Olonia rubicunda* Walker, 1851, habitat in Queensland, Bargara, Nielson Park, 9.III.2020. A, dune covered in *Ipomoea pes-caprae* and grass. B, dune covered in *Canavalia rosea*, *Euphorbia cyathophora* and *Vitex trifolia*. C, *C. rosea*, *E. cyathophora* and *V. trifolia*. D, flowers of *C. rosea* and *E. cyathophora*. E, seedpot of *C. rosea*. F, flowers of *V. trifolia*. G, *O. rubicunda* ♀ on *C. rosea*. H, dense patch of *C. rosea*, detail. I, isolated dense patch of *C. rosea* with population of *O. rubicunda*.

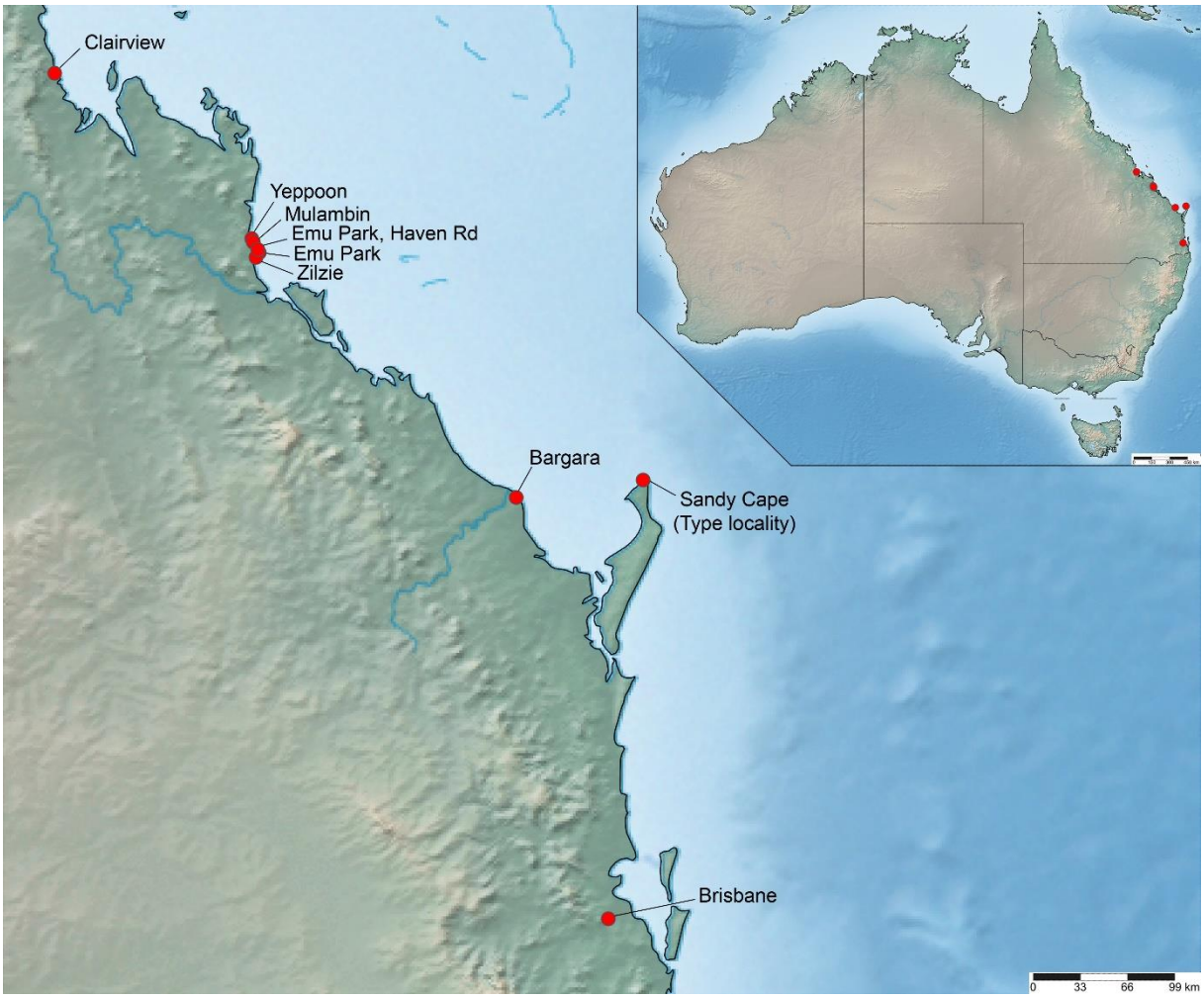

Fig. 7. *Olonia rubicunda* Walker, 1851, distribution map.

HOST PLANT ADAPTATION AND DISTRIBUTION

The species clearly appears to be polyphagous and seems able to adapt to local conditions rather easily by shifting to other host plant species, even belonging to another botanical family. Several observations showed that the species feeds on Fabaceae species in the genera *Canavalia* Adans. and *Clitoria* L. although in these locations (Yeppoon, Lammermoor Beach and Emu Park) under very dry condition and the unavailability of these apparently preferred food plants, the species can thrive on the Convolvulaceae *Ipomoea pes-caprae*. Interestingly, in dry conditions in December 2019, the species was only observed on *I. pes-caprae* despite the wide availability of a Fabaceae, *Vigna marina*. Moreover in Clairview, in the very green conditions of March 2020, all specimens were collected from *I. pes-caprae* and the other recorded Fabaceae hosts were not observed around, leading to the hypothesis that *Ipomoea* can be used both as a refuge and as a permanent host plant by *O. rubicunda*. The species is currently recorded only from coastal locations and more research is necessary to establish if and how far the species is present inland, and to find possible additional host plants.

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