

SOLVING THE MYSTERY OF THE “HOBART GOLD” – THE IDENTITY AND REDESCRIPTION OF THREE TASMANIAN LEAF BEETLE SPECIES OF THE GENUS *PAROPSISTERNA* MOTSCHULSKY, 1860 (COLEOPTERA: CHRYSOMELIDAE: CHRYSOMELINAE)

by David W. de Little, Chris A.M. Reid and Martin Lagerwey

(with six plates)

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Three Tasmanian species of leaf beetles, belonging to the *nobilitata* species-group of *Paropsisterna* Motschulsky, 1860, are identified and redescribed: *P. hectica* (Boisduval, 1835); *P. simsoni* (Blackburn, 1899); and *P. vittata* (Blackburn, 1899). *Paropsisterna hectica* is a senior synonym of *P. aurea* (Blackburn, 1899) (new synonym). A neotype is designated for *P. hectica*, and lectotypes designated for *P. aurea*, *P. simsoni* and *P. vittata*. *Paropsisterna vittata*, described from alpine Victoria, is identified in Tasmania for the first time, and its similarity to *P. selmani* Reid & de Little, 2013 noted. The brilliant living colours of the adults are illustrated. *Paropsisterna simsoni* (the “Hobart Gold”) is shown to be a valid species and not an immature form of *P. aurea* as previously suggested.

Key Words: taxonomy, forestry, Tasmania, Australia, paropsine.

INTRODUCTION

The genus *Paropsisterna* Motschulsky, 1860, as re-defined by Reid (2006) and containing some 120 species, is distributed throughout Australia with some species also in New Guinea and Timor (Mohamedsaid 2009). De Little (2011) listed 17 identified species occurring in Tasmania and a further four unidentified species.

Motschulsky’s division of *Paropsis* Olivier, 1807 into several genera was ignored by the major reviser of the Australian paropsines, Thomas Blackburn, who treated them all as *Paropsis* species. Blackburn (1899) recognised a group of approximately 50 species which are brightly coloured in life, but lose colouration after death, fading to a uniform dull light brown, as a sub-group within *Paropsis* for which Weise (1901) proposed the generic name *Chrysophtharta*. Reid (2006) synonymised *Chrysophtharta* with *Paropsisterna* due to the lack of consistent diagnostic characters separating them. Most species formerly placed in *Chrysophtharta* are provisionally referred to as the “*nobilitata* species-group of *Paropsisterna*” (Reid & de Little 2013). The taxonomy of this group is very confused due to colour pattern loss after death and the dearth of consistent morphological characters; however, sculpture of the male genitalia is usually diagnostic (Reid & de Little 2013, Nahrung *et al.* 2020).

Paropsisterna is of economic significance due to several species being recognised as significant pests of *Eucalyptus* species by the forestry industry, both in Australia (de Little 1989) and overseas, where four species have become introduced pests (Simmul & de Little 1999, Nahrung *et al.* 2020). Notable among these is *Paropsisterna selmani* Reid & de Little 2013 introduced into Ireland, where it

attacks eucalypts cultivated for the floristry industry (Reid & de Little 2013, Fanning & Baars 2014). This species, formerly rare in its native Tasmania, is now recognised as a significant pest of the introduced *Eucalyptus nitens*, a species widely planted in Tasmania by the forestry industry (Elek & Patel 2016).

De Little (1979), in his studies of the ecology of Tasmanian eucalypt defoliating paropsines, identified two brilliantly coloured species as *Paropsisterna aurea* (Blackburn, 1899) and *P. simsoni* (Blackburn, 1899) using Blackburn’s (1899) key and descriptions. The elytra of these species when alive have extremely variable but diagnostic colouration consisting of brilliantly shining golden, green, pink or red figuration which fades on death. Blackburn’s hand-written labels attached to the series of five *P. simsoni* syntypes (NHML and SAM, abbreviations below) refer to the “Hob.[art] gold immature”. British chrysomeline taxonomist Brian Selman, who examined these syntypes, suggested that since they were all labelled “immature” and therefore paler than, but otherwise superficially similar to, Blackburn’s *P. aurea* syntypes, *P. simsoni* was a junior synonym of *P. aurea* (Selman pers. comm. to de Little 1980).

We have re-examined Blackburn’s syntypes and additional material in SAM, AMS and TMAG (abbreviations below). *Paropsisterna aurea*, described from Tasmania, is here shown to be conspecific with the species currently identified on the mainland as *P. hectica* (Boisduval, 1835). The species incorrectly identified by de Little (1979) as *P. simsoni* is here shown to be *P. vittata* (Blackburn, 1899), originally described from alpine Victoria. Murphy (2006) incorrectly identified Tasmanian *P. vittata* as *P. hectica*. *Paropsisterna simsoni* (the “Hobart Gold”) is found to be the previously

unidentified species provisionally labelled “*Chrysophtharta* sp. Ch8” by de Little (1979). The three hitherto confused valid species occurring in Tasmania (*P. hectica*, *P. simsoni* and *P. vittata*) are here redescribed and appropriate type material designated. Examination of *P. vittata* shows the species to be closely allied with *P. selmani*.

Lectotypes have been designated when required, according to the rules of the ICZN (<http://iczn.org/articles/73> and 74) to fix the taxonomy and avoid any ambiguity in interpretation of these similar species.

MATERIAL EXAMINED

Abbreviations:

AMS: Australian Museum, Sydney, Australia
ANIC: Australian National Insect Collection, Canberra, Australia
NHML: Natural History Museum, London, United Kingdom
SAM: South Australian Museum, Adelaide, Australia
TMAG: Tasmanian Museum and Art Gallery, Hobart, Australia

TAXONOMY

Paropsisterna Motschulsky, 1860

Type species: *Notoclea sexpustulata* Marsham, 1808, by original designation.

A key identifying the genus *Paropsisterna* in Australia, revised generic description and full generic synonymy are provided by Reid (2006). The species re-described below are typical members of the *Paropsisterna nobilitata* species-group.

Paropsisterna nobilitata species-group

This group, consisting of most of the species formerly placed in *Chrysophtharta* (Weise 1901), is distinguished within *Paropsisterna* by: mesoventral process excavate anteriorly and posteriorly; dorsal colour in life often bright, shining or metallic but fading to brown after death; first instar larvae without long setae.

Paropsisterna hectica (Boisduval, 1835)

(plates 1A, 1B, 2A, 2B, 2C, 3)

Paropsisterna hectica: Boisduval 1835: 569 (type locality: New Holland)

Chrysophtharta hectica: Weise 1916: 164

Paropsisterna hectica: Reid 2006: 116

Paropsisterna aurea: Blackburn 1899: 497 (type locality: Hobart, Tasmania); new synonym

Material examined

Types. Neotype of *Paropsisterna hectica* (this designation): ♀/TMAG F122796; Hobart, Mt. Nelson. 42.979S x 147.329E. Beating coll. D. W. de Little 14 Jan 2022/Neotype *Paropsisterna hectica* Boisduval des. de Little, Reid & Lagerwey 2022 (TMAG). Lectotype of *P. aurea* (this designation): ♂/Type [printed circular NHML label]/6126 Hob.[art] T. [Blackburn's handwriting]/Blackburn coll. 1910–236/Lectotype *Paropsisterna aurea* (Blackburn) des. de Little, Reid & Lagerwey 2022 (NHML). Paralectotypes (4): ♀/Hob.[art]/*Paropsisterna aurea* Blackb./17424/Paralectotype *Paropsisterna aurea* (Blackburn) des. de Little, Reid & Lagerwey 2022 (SAM); ♂, 2♀/Hob.[art]/*Paropsisterna aurea* Blackb./Paralectotype *Paropsisterna aurea* (Blackburn) des. de Little, Reid & Lagerwey 2022 (SAM).

Other material. Australia: 1/*Paropsisterna aurea* Blackb [Blackburn's handwriting]/(AMS); **Australian Capital Territory:** 1/Mt Gingera *Eucalyptus pauciflora* 23.i.1985 C Reid/(AMS); 2/summit Mt Ginini, Brindabella Ra, c1750m, 35.31S 148.46E, Snowgum Woodland, 17.xii.2006, C Reid/(AMS); **New South Wales:** 1/NSW/(AMS); 1/'4617 A7–8' [Blackburn's handwriting?]/(AMS); 3/Dead Horse Gap, Kosciusko NP, 36:31S 148:15E 1570m, 27.i–4.ii.2014 U Lallu/(AMS); 1/Kosciusko, Helms 1893/(AMS); 1♂/Kosciusko NP, N slopes Mt Stilwell, 1800–1900 m 36:28:05S 148:19:45E Snowgum Woodland, Snowgum 5–6.i.2006 C Reid/(AMS); 3/Kosciusko NP, Mt Stilwell Track, 36:26S 148:19E, 1865m, on Snowgum, 24–28. xii.2017 C Reid/(AMS); 1/Thredbo YHA, Kosciusko NP, 36:30S 148:18E 1410m 27.i–4.ii.2014 U Lallu/(AMS); ♂/TMAG F97719/Crackenback, Alpine Way, NSW; -36.447, 148.496; Beating *E[ucalyptus] pauciflora*; Coll. M. Lagerwey 05 Mar 2018/(TMAG); 2♂/TMAG F40342; F97727, Crackenback, Alpine Way, NSW, -36.447, 148.496, Beating *E[ucalyptus] pauciflora*, Coll. M. Lagerwey 05 Mar 2018/(TMAG); ♀/Mt Kosciusko Holms 1893/metall.colour as *citrinalhectica*, Boisd./ (SAM); **Tasmania:** 2/Tasmania [Master's handwriting]/(AMS); 1/Blackwood Ck, 12.i.1994 LD Buddle/(AMS); 4/ Lake St Clair 13.i.1937 G & C Davis/(AMS); 1/Parratah, Blackwood/(AMS); 2/5k S Strahan airfield, 42:10:58S 145:16:45E, *Euc. nitida* (mallee form) in open heath, 16m, 8–13.xi.2010 C Reid/(AMS); 2/Wadamanna 11.i.1994 LD Buddle/(AMS); 4♂/ -42.0517, 146.3354, GDA94, South of Kenneth Lagoon, “Skullbone Plains”, Tasmania, 27 Feb 2012, [col.] D. W. de Little/TMAG F6130, F6129, F6132, F6131, *Paropsisterna hectica* Det. D. de Little, 2020/(TMAG); ♂, ♀/ -40.0612, 148.0886, GDA94, Leventhorpe Gully, Flinders Island, Tasmania, 23 Mar 2014, [col.] D.W. de Little/TMAG F6719, F6724, *Paropsisterna hectica* Det. D. de Little 2020/(TMAG); ♀/Hobart 91–88/*Chrysophtharta aurea* Blkb./Exchange ex

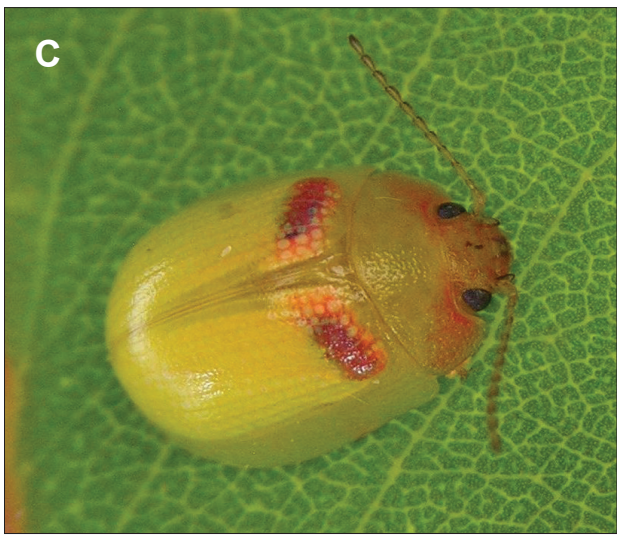
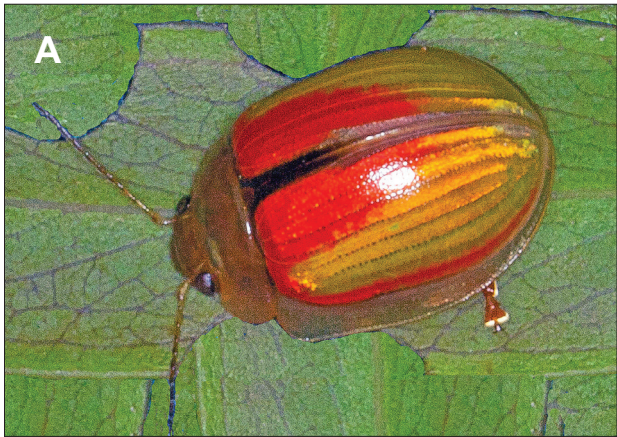




PLATE 2 — Aedeagi of *Paropsisterna* species. **A.** *P. hectica*, New South Wales (TMAG F97719). **B.** *P. hectica*, Tasmania (TMAG F6130). **C.** *P. aurea* Lectotype, Tasmania (NHML).

BM(NH)/(ANIC); ♂/Maggs Mt. Hut, 11.xi.1975, R. H. Green on eucalypt ex Launceston Museum/*C. aurea* det C. R.[eid] 1985/(ANIC); ♀/TAS, “Surrey Hills”, Bunkers Road, -41.37, 145.68, 27 Nov 1974, [col.] D.W. de Little/TMAG F14997, *Paropsisterna hectica*, Det. D. de Little, 2015/*Eucalyptus nitidal*(TMAG); **Victoria:** 3/ 2k NW Anglesea 38:23S 144:08E *Euc pauciflora* 35m i.2015 M Lagerwey[sic]/(AMS); 3/Mt Buffalo, 4400ft, 19.xii.1933 A Musgrave/(AMS); 1/Mt Buffalo NP, Kowan Plains nr Mt Buffalo Lodge, ex *E pauciflora*, 12.i.2001 D Dobrosak/(AMS); 2/Mt Buffalo NP, path to Dixons Falls, c1475m, 36:46:02S 146:47:21E, *Euc pauciflora*, 15.xi.2010 C Reid/(AMS); 1/Mt Buffalo NP, path to Dixons Falls, c1475m, 36:46:28S 146:47:40E, *Euc pauciflora*, 28.xi–2.xii.2011 C Reid/(AMS); 3/Mt St Bernard Hospice, 19.xii.1933 A Musgrave/(AMS); ♀/TMAG F40343 VIC. Anglesea, Bald Hills Rd -38.378, 148.496, Reared D. de Little, 24 Jan 2019/*Paropsisterna hectica* (Boisduval, 1835), Det. D. de Little, 2019/(TMAG).

Diagnosis. Live adult with disc of elytra uniformly bright golden yellow (pl. 1B) or pale green sometimes with scarlet colour at base and extending variably to apex (pl. 1A); dead and live adults with black pigmentation at base of head medially drawn backwards in V-shape; pronotal anterior angles rounded, discal puncturation much finer than marginal puncturation; elytral seriate puncturation fine and regular, interstitial puncturation finer; ventrites of dead specimens variably pale brown to black (pl. 3);

femora sometimes with dark mark distally; middle third of penis broadest in ventral view, narrowing smoothly to a truncate apex with small mucron apex, with a diagnostic everted loosely coiled and apically thickened flagellum (pl. 2A, B, C).

Description. Adult. Length: ♂, 7–8 mm ♀, 8.5–9.5 mm; body broadly ovate (length to width ratio 1.3) and convex (length to height ratio 2.3), with highest point at about half body length; head slightly wider than half pronotal width; elytra at anterior angles 1.3x pronotal width. Colour pattern of mature live beetle translucent pale brown head black at base with pigmentation drawn back centrally in a shallow V shape towards base, eyes black, antennomeres 7–11 dark brown, pronotum pale brown, legs pale brown, black patch at distal end of femur, scutellum dark brown, elytral suture black for one-third of its length to nearly entire length from base to apex, elytral disc of mature adults with sulcate appearance, the sulcations corresponding to rows of seriate puncturation, variable bright pale green, yellow or rosy gold, sometimes with bright vermilion colour extending variably from base of elytra towards apex and obliterating sulcate appearance, being more extensive adjacent to elytral suture and sometimes discal margin, elytral disc of teneral adults clear green-yellow-gold; elytral margins translucent. Colour of dead mature beetle entirely yellow-brown except base of head black, thoracic and abdominal ventrites variably brown to black. Pubescence: head with depressed areas adjacent to eyes with erect setae,



PLATE 3 — Ventral colouration of *Paropsisterna hectica* showing variation in specimens collected from neotype locality, Mt Nelson, Hobart, Tasmania.

two long setae projecting anteriorly from sides of apical margin of clypeus; rest of head, all of pronotum (including hypomera) and elytra (including epipleura) glabrous; prosternum glabrous except setose anterior margin and apex of prosternal process; mesepimera and mesoventrite glabrous except process; metanepisterna, metaventrite glabrous; abdominal ventrites glabrous except lateral margins and apex ventrite V densely setose; antennomeres 4–11 with smooth impunctate midline and raised setae either side of this; femora almost glabrous; tibiae setose, densely towards apices; ♂ with ovate pads of spatulate setae on pro-, and meso- first-tarsomeres.

Head: eyes small, separated by about 4x greatest widths; frontoclypeus irregularly punctured, with mixed large (slightly larger than eye facets) and small (slightly smaller than eye facets) punctures, often coalescent in small pits, densely and finely punctured in depressed areas adjacent to eyes, more evenly sized and not coalescing at base of head (in black area); interspaces finely microreticulate; antennae about half body length, all antennomeres elongate, 2 shortest, 11 longest; 1 and 3 almost as long as 11, 4–11 distinctly flattened, 5–10 slightly asymmetric; labrum microreticulate, finely and sparsely punctured, apex shallowly concave; securiform apical maxillary palpomere broader in ♂, with sharper lateral angles.

Thorax: pronotum strongly transverse, width c. 2.3x length, posterior angles broadly rounded, anterior angles strongly produced and bluntly rounded; pronotal margins entirely finely beaded; disc of pronotum (area behind

vertex) punctured at head but punctures and interspaces larger, punctures increasing in size and conflation towards sides of pronotum which are rugose with irregular slightly ridged intervals; pronotal surface shining with scattered micropunctures; prosternum with elevated smooth ridge along midline commencing at anterior margin, posteriorly bifurcating to follow lateral margins of process (middle of process depressed); prosternal process elongate spatulate, reaching well beyond posterior margins of procoxae; scutellum elongate semi-ovate, strongly micropunctured; elytra broadest at about middle, but with laterally prominent obtuse anterior angles (about 100°); humeri prominent, at about 3/5 width from suture to lateral margin; scutellary striole strongly punctured, 9 distinct striae, striae punctures slightly larger than those on pronotal disc, striolar and striae punctures linearly and regularly placed; striae 4 and 5 anastomosed well before apex, striae 2, 3 and 6–8 anastomosing closer to apex, then merging with striae 1 and 9 in large irregular punctures at elytral apex; intervals 1–9 and strip outside stria 9 with scattered fine punctures, similar to pronotal disc; slightly reflexed outer margins of elytra with broad strongly punctate area, punctures more evenly spread and larger than on pronotal disc; mesoventrite deeply hollowed anteriorly to accommodate prosternal process, small tubercle either side of hollow; mesoventrite process strongly elevated, anterior face deeply concave and posterior face (apex) deeply concave; metaventrite smooth except finely wrinkled and punctate in lateral angles, process flat or slightly elevated; inner margins

of protibiae slightly concave before apex; apical third of meso- and metatibiae with dorsal seta-fringed excavation to accommodate tarsi; male pro- and meso- first tarsomeres ovate, female elongate-triangular; claws with acute tooth on middle of ventral surface.

Abdomen: ventrites I–IV shining but finely microreticulate, close and finely punctured at base, wrinkled at sides, with sparse fine punctures elsewhere; ventrite V as I–IV, but without lateral wrinkles and more closely punctured, with subapical transverse setose groove in both sexes; apex of male ventrite V truncate with slight median convexity, apex of female broadly convex; middle third of penis expanded in ventral view, apex squarish with rounded corners and central bluntly pointed triangular tip with a diagnostic everted and loosely coiled, apically thickened flagellum.

Larva. Four larval instars (L1–4). Head capsule widths: L1: 0.9 mm; L2: 1.2 mm; L3: 1.5 mm; L4: 2.0 mm. L4 maximum length 15 mm. L1–4 with smooth head capsule (without papillae), relatively long setae, up to 2x length of tarsungulus in L1, and narrow abdomen tapering towards apex. Larval instars becoming progressively paler to yellowish green L4 but retaining black body tubercles.

Egg. Elongate-oval, length 2.8 mm, width 1.1 mm, chorion tuberculate, mauve-brown. Deposited singly or in rows end-to-end on foliage.

Notes. Boisduval's (1835) *Paropsis hectica* type is lost and his brief description, "pale yellow, smooth, elytra very feebly marked with punctured striations; underside the same colour" (authors' translation), although fitting this species, is not diagnostic. The description may have referred to a female, this sex often having less ventral black pigmentation than males. Mainland specimens generally have darker ventral colouration than Tasmanian specimens. The specimen would have been long dead and therefore straw-coloured, having lost its striking live colouration. The collection data are "New Holland, collection of M. Dejean". The Dumont d'Urville *Astrolabe* expedition 1826–9, on which this species was collected, made landfall at several Australian locations, viz: King George's Sound, Western Australia, Westernport, Victoria; Jervis Bay, NSW; Port Jackson, NSW; and Hobart, Tasmania (Musgrave 1932). Of these locations, only Hobart, Tasmania, falls within today's known distribution range of *P. hectica*/*P. aurea*, and it is also the only known location where females have a pale venter (pl. 3). It is uncertain whether the locality designation "New Holland" was meant to include Tasmania or not; Boisduval (1835) occasionally specifying "Tasmanie" or Van Diemen's Land as localities for new species he described; however, localities of all "Astrolabe" specimens described from Dejean's collection are simply designated "New Holland".

Chapuis (1877) provided a more detailed description of *P. hectica* giving Tasmania and Victoria as occurrence localities. He also described the ventral colour as black with abdomen and legs red-brown, apex of femora marked with black but sometimes (mainly the female) with the legs yellowish red-brown.

Blackburn (1899) commented on this species based on Chapuis' (1877) description, stating that: "the type

(assuming Dr. Chapuis' identification to be correct, I have an example named by that learned author) occurs in New South Wales, but in my experience is rare. Its special characteristics consist in the under surface, legs and antennae being entirely of pale brown colour" (Blackburn 1899, p. 499). Blackburn noted that the species was highly variable with "races" in New South Wales (rare), alpine Victoria and South Australia. A Tasmanian form was described as a separate species, *P. aurea* (Blackburn 1899), based on its brilliant golden yellow gloss when live and the strong black pigmentation of the elytral suture.

Examination of living and dead specimens from New South Wales and Victoria (generally referred to "*hectica*") and Tasmania (generally referred to "*aurea*"), including Blackburn's type material, together with dissection and examination of the penis, and the rearing of immature stages of both Tasmanian and mainland Australian forms, has led to the conclusion that there is only one species. The colour of live adults is quite variable, ranging from the brilliant yellow gloss of "*aurea*" to the elytral disc being suffused with a bright vermillion red during diapause, that disappears from the elytral apex towards the base and suture to reveal a brilliant yellow, lime green or rosy gloss as the beetles emerge in spring and become sexually active. Ventral black pigmentation is variable (pl. 3) with males generally having more than females, some of which are entirely pale.

We have selected a female with pale venter collected near Hobart, Tasmania, as the neotype of *Paropsis hectica*, in the belief that despite Blackburn's (1899) statement to the contrary, and the original location being given as simply "New Holland", the original specimen described by Boisduval (1835) was in all probability collected in the vicinity of Hobart between 18 December 1827 and 5 January 1828, while the *Astrolabe* was in dock there (Musgrave 1932).

The larvae are quite distinct from larvae of other related ("*nobilitata* group") species, being more elongate (lanceolate) in form, having a smooth surfaced head, and with well-defined sclerites bearing relatively long setae.

Paropsisterna hectica is a common species throughout Tasmania where it is often found on *Eucalyptus amygdalina*, *E. pulchella*, *E. nitida*, *E. coccifera* and *E. pauciflora*. On mainland Australia it is usually associated with *E. pauciflora*.

***Paropsisterna simsoni* (Blackburn, 1899)**

(plates 1C, 1D, 4A, 4B, 5A, 5B, 5C)

Paropsis simsoni: Blackburn 1899: 500

Chrysophtharta simsoni: Weise 1916: 165

Paropsisterna simsoni: Reid 2006: 116

Material examined

Types. Lectotype (this designation). ♂/6452 Hobart, T.[asmania] [Blackburn's handwriting]/ ? Hob.[art] gold immature/*Paropsis simsoni* Blackb./Blackburn coll. 1910_236/Type [printed circular NHML label]/Lectotype *Paropsis simsoni* Blackburn, 1899, des. de Little, Reid &

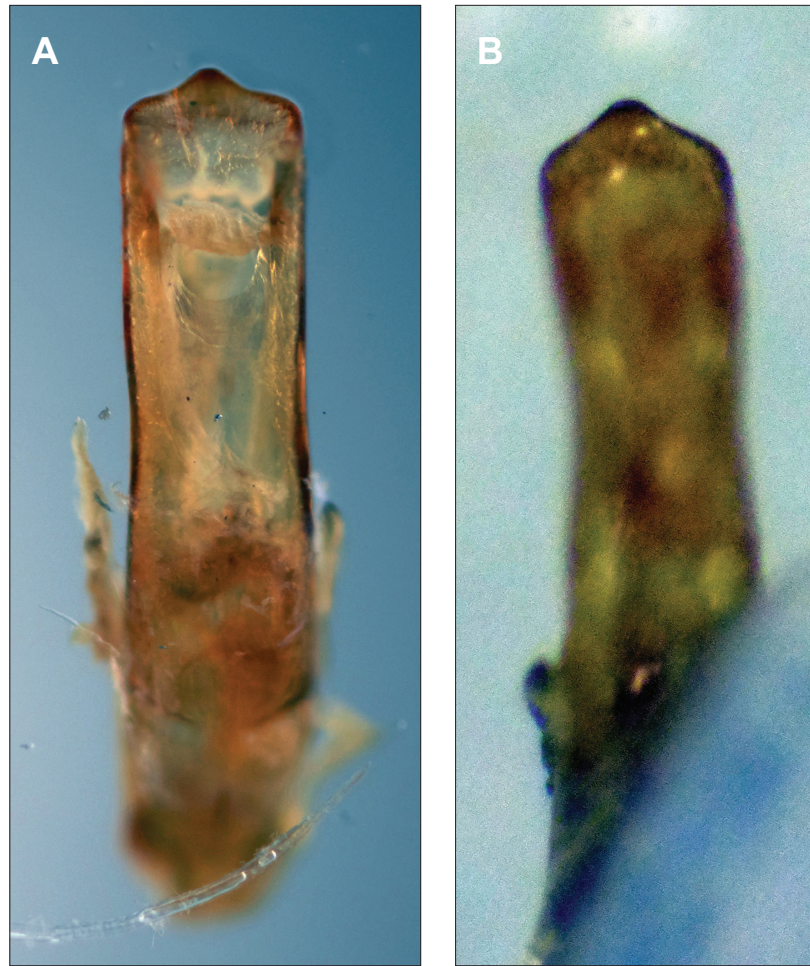


PLATE 4—Aedeagi of *Paropsisterna simsoni*. A. Tasmania (TMAG F014941). B. Lectotype, Tasmania (NHML).

Lagerwey 2022/ (NHML) (pl. 5A). Paralectotypes. ♂, 3♀/ *Paropsis simsoni* Blackb./6542 Hob.[art]/17426, J25160, Tasmania/“suffused with met.[allic] pale gold with a suspicion of green in shimmer of citrine like [?] & costate? Hob.[art] gold immature” [Blackburn’s handwriting]/Paralectotype *Paropsis simsoni* Blackburn, 1899, des. de Little, Reid & Lagerwey 2022/ (SAM) (pl. 5C).

Other material. Tasmania. 2♂/Tas. Surrey Hills, Mayday Road, -41.47, 145.8, 11 Jan 1977, DW de Little/ Habitat description: *Eucalyptus gunnii* /TMAG F014940, F0149541, *Paropsisterna simsoni* Det. DW de Little 2020/ [TMAG], ♂/Tas. Vale of Belvoir, road in NE corner, -41.6404, 145.90753, 14 Mar 2010, DW de Little/ Habitat description: foliage of *Eucalyptus nitida*/TMAG F013377, *Paropsisterna simsoni* Det. DW de Little, 2020/ [TMAG]; ♂/Tas. Maria Is., Darlington B[ea]ch, -42.5799, 148.0643, Hand coll. S.J. Grove 10 Feb. 2019/TMAG F097848, *Paropsisterna simsoni* Det. DW de Little, 2020/ [TMAG]; ♀/ -38.9833, 148.1883, Middle Patriarch, Flinders Island, Tasmania, Australia, 24 Mar 2014, R. Raven/litter/TMAG F006751, *Paropsisterna simsoni*, Det. D.W. de Little 2020/[TMAG]; ♀/Tas. Steppes, Blackburn Creek, -42.16, 146.932, 21 Aug 1974, DW de Little/leaf

litter/ TMAG F014915, *Paropsisterna simsoni*, Det. DW de Little 2020/[TMAG]; ♀/Tas. Woodsdale, Swanwick forestry coupe SW0488, -42.54135, 147.6552, Hand collection R. Bashford, 12 Dec 1979/TMAG F020154, *Paropsisterna simsoni*, Det. DW de Little, 2020 [TMAG].

Diagnosis. Live adult with disc of elytra yellow-green with paler yellow tessellations and a basal broad maroon band variably extended backwards laterally and adjacent to suture (pl. 1C, D); live and dead adult with no black pigmentation at base of head; pronotum anterior angles sharp, greater than or equal to 90°, discal puncturation much finer than marginal puncturation; elytral seriate puncturation moderately coarse and regular, interstitial puncturation much finer; ventrites and legs of dead specimens uniformly pale straw-yellow; apical third of penis broadest in lateral view slightly expanding towards shoulders with bluntly triangular apex (pl. 4A, B).

Description. Adult. Length: ♂, 7.5–8.5 mm ♀, 8–9 mm; body broadly ovate (length to width ratio 1.3) and convex (length to height ratio 2.5), with highest point at about half body length; head slightly wider than half pronotal width; elytra at anterior angles 1.3x pronotal

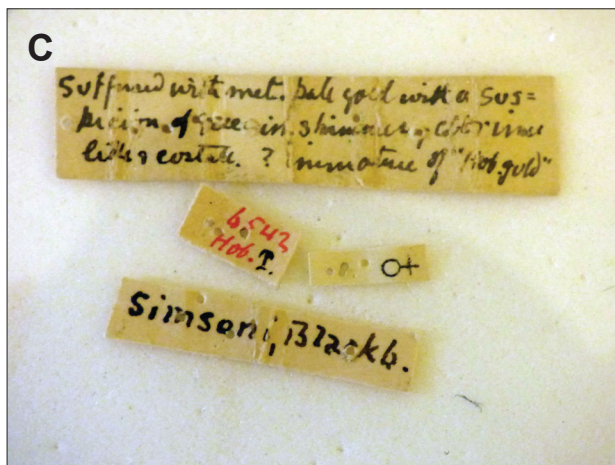
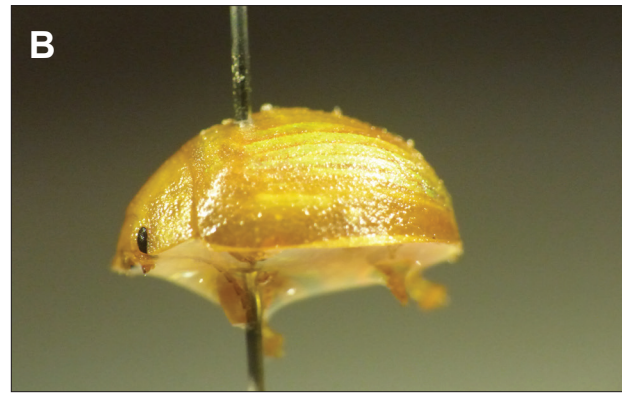


PLATE 5 — The “Hobart Gold” version of *Paropsisterna simsoni*. **A.** Lectotype (NHML). **B.** dried specimen after soaking in ethanol and water solution. **C.** label in Blackburn’s handwriting from a paralectotype (SAM).

width. Colour pattern of mature live beetle: translucent pale green head with black eyes surrounded by mauve red colouration, antennomeres 4–11 dark brown, pronotum pale green with variable mauve-red colouration at lateral margins, legs pale yellow green, scutellum green, elytral suture and margins pale green, elytral disc of mature adults variable yellow-green with paler tessellations and mauve-red bars at base sometimes extending less intensely over disc particularly adjacent to suture, elytral disc of teneral adults as for mature adults but paler and with less mauve red colouration. Colour of dead mature beetle; entirely yellow-brown. Pubescence: head with depressed areas adjacent to eyes with erect setae, two long setae projecting anteriorly from sides of apical margin of clypeus; rest of head, all of pronotum (including hypomera) and elytra (including epipleura) glabrous; prosternum glabrous except setose anterior margin and apex of prosternal process; mesepimera and mesoventrite glabrous except process; metanepisterna, metaventrite glabrous; abdominal ventrites glabrous except lateral margins and apex ventrite V densely setose; antennomeres 4–11 with smooth impunctate midline and raised setae either side of this; femora almost glabrous; tibiae setose; antennomeres 4–11 with smooth impunctate midline and raised setae either side of this; femora almost glabrous; tibiae setose, densely towards apices; ♂ with ovate pads of spatulate setae on pro- and meso- first tarsomeres.

Head: eyes; small, separated by c. 4x greatest widths; frontoclypeal suture broadly rounded; frontoclypeus; irregularly punctured, with mixed large (slightly larger

than eye facets) and small (slightly smaller than eye facets) punctures, often coalescent in small pits, densely and finely punctured in depressed areas adjacent to eyes, more evenly sized and not coalescing at base of head; interspaces finely microreticulate; antennae; c. half body length, all antennomeres elongate, 2 shortest, 11 longest; 1 and 3 almost as long as 11, 4–11 distinctly flattened, 5–10 slightly asymmetric; labrum microreticulate, finely and sparsely punctured, apex shallowly concave; securiform apical maxillary palpomere broader in ♂, with sharper lateral angles.

Thorax: pronotum strongly transverse, width c. 2.3x length, posterior angles broadly rounded, anterior angles strongly anteriorly produced and rounded, pronotal margins entirely finely beaded; disc of pronotum (area behind vertex) punctured at head but punctures and interspaces larger, punctures increasing in size and conflation towards sides of pronotum which are rugose with irregular slightly ridged intervals; pronotal surface shining with scattered micropunctures; prosternum elevated as smooth ridge along midline, posteriorly bifurcating to follow lateral margins of process (middle of process depressed); prosternal process elongate spatulate, reaching well beyond posterior margins of procoxae; scutellum elongate semi-ovate, strongly micropunctured; elytra broadest at about middle, but with laterally prominent obtuse anterior angles (c. 120°); humeri prominent, at about 3/5 width from suture to lateral margin; scutellary striae strongly punctured, 9 distinct striae, striae punctures as large as on pronotal disc,

regularly and linearly placed; striae 4 and 5 anastomosed well before apex, remaining striae merging in large irregular punctures closer to elytral apex; intervals 1–9 and strip outside stria 9 with scattered mixed punctures, similar to pronotal disc; slightly reflexed outer margins of elytra with broad strongly punctuate area, punctures more evenly spread and larger than on pronotal disc; mesoventrite deeply hollowed anteriorly to accommodate prosternal process, small tubercle either side of hollow; mesoventrite process strongly elevated, anterior face deeply concave and posterior face (apex) deeply concave; metaventrite smooth except finely wrinkled and punctuate in lateral angles, process flat or slightly elevated; inner margins of protibiae slightly concave before apex; apical third of meso- and metatibiae with dorsal seta-fringed excavation to accommodate tarsi; male pro- and meso- first tarsomeres ovate, female elongate-triangular; claws with acute tooth on middle of ventral surface.

Abdomen: ventrites I–IV shining but finely microreticulate, close and finely punctured at base, wrinkled at sides, with sparse fine punctures elsewhere; ventrite V as I–IV, but without lateral wrinkles and more closely punctured, with subapical transverse setose groove in both sexes; apex of male ventrite V truncate with slight median convexity, apex of female broadly convex; penis in dorsal view parallel-sided from middle to obtuse-angled apex with large blunt mucron, medially broadly grooved on apical half; in lateral view slightly concave at middle, then tapering to strongly recurved mucron; flagellum not exerted.

Larva. Four larval instars (L1–4). Head capsule widths: L1: 0.8 mm; L2: 1.1 mm; L3: 1.6 mm; L4: 2.0 mm. L4 maximum length approximately 12 mm. All instars pale yellowish-green, L1 neonate mandibles, eye-spots, tarsi, egg-bursters, lateral tubercles and sclerotic plates of terminal abdominal tergites infuscate; L4 mandibles, eyespots, claws infuscate.

Egg. Elongate-oval, length 2.7 mm, width 0.9 mm, chorion tuberculate, pale green, deposited in a side-by-side raft of 5–10 on leaf lamina.

Notes. Blackburn (1899) described *Paropsis simsoni* from Tasmania. He placed it close to *P. hectica* in his key and description but distinguished it by its less shiny (nitid) appearance and different colouring: "in dried examples the whole insect pale testaceous, in living ones the disc of the elytra suffused with a rosy or golden-rosy metallic gloss" (Blackburn 1899, p. 500). Blackburn's hand-written notes attached to the type series of specimens describe this species as the "Hob. [art] gold" (pl. 5C).

In his introduction to this group of species, Blackburn (1899, p. 482) mentions the importance of knowing "something of the colours and markings of the living insect". Based in Adelaide as he was at that time, most of the specimens he would have received from the more remote regions of Australia would have been dead with colours faded by the time they reached him. Immersion of such specimens in benzine or water was found to "revive the colours of a mature specimen sufficiently for the purpose (of description)".

Living specimens of *Paropsisterna simsoni*, however, could not be described as having a "golden-rosy metallic gloss". They are non-metallic pale green with the elytral disc a paler yellow flecked with whitish tessellations and a basal maroon bar which is sometimes drawn backwards adjacent to the suture. Dead specimens are uniformly pale yellow.

In soaking dead specimens in a weak solution of ethanol to soften them for genital dissection we found that the elytra took on the "golden-rosy gloss" described by Blackburn (pl. 5B). This characteristic, together with comparison of the dissected penis of the here designated lectotype with more recently collected specimens, together with other characteristics led us to the identification of de Little's (1979) "*Chrysophtharta* sp. Ch8" as *Paropsisterna simsoni*.

Blackburn (1899) based his description of *Paropsis simsoni* on five syntypes all collected at Hobart, Tasmania, four of which are held by SAM and one male, genitalia dissected, by NHML. We here designate the male held by NHML as the lectotype.

Paropsisterna simsoni is a relatively common species throughout Tasmania, including King Island and Flinders Island, where it occurs on a wide range of eucalypt species, though never in large numbers. The larvae are uniformly pale green.

Paropsisterna vittata (Blackburn, 1899)

(plates 1E, 1F, 6A, 6B, 6C)

Paropsis vittata: Blackburn 1899: 508

Chrysophtharta vittata: Weise 1917: 133

Paropsisterna vittata: Reid 2006: 117

Material examined

Types. Lectotype (this designation): ♂ of carded ♂ and ♀ pair, marked 'T' on card by Blackburn/4612 Al. [= Australia]. [in red on card, Blackburn's handwriting]/Blackburn coll. 1910–236/Type [printed NHML circular label]/*Paropsis vittata* Blackb. [Blackburn's handwriting]/Lectotype *Paropsis vittata* Blackburn, 1899 des. de Little, Reid & Lagerwey 2022/(NHML). Paralectotypes (3): ♀ of carded ♂ and ♀ pair/4612 Al. [= Australia]. [in red on card, Blackburn's handwriting]/Blackburn coll. 1910–236/Type/ *Paropsis vittata* Blackb./Paralectotype *Paropsis vittata* Blackburn, 1899 des. de Little, Reid & Lagerwey 2022 (NHML); ♂ and ♀ mounted on same pin/*Paropsis vittata* Blackb. Cotypes [Blackburn's handwriting]/Victoria [printed label]/*Paropsis vittata* Blackb. Vic: N.S.W. cotypes [A.M. Lea's handwriting]/Paralectotypes *Paropsis vittata* Blackburn, 1899 des. de Little, Reid & Lagerwey 2022 (SAM).

Other material (11). **Tasmania:** ♂/ -42.0427, 146.3057, GDA94, W. corner "Skullbone Plains" near Lake Ina, Tasmania, 28 Feb 2012, D.W. de Little, F6190, *Paropsisterna vittata* Det. D. de Little, 2020/[TMAG]; ♂, ♀/ TAS, "Surrey Hills", Bunkers Road, -41.52, 145.72, 14 Dec 1974, D.W. de Little/ *Eucalyptus delegatensis*/TMAG F14896, F14895 *Paropsisterna vittata* Det. D. de Little, 2020/[TMAG]; ♂/TMAG F33014, TAS, Mt Wellington, -42.8825, 147.2208, *Eucalyptus coccifera*, D.W. de Little,

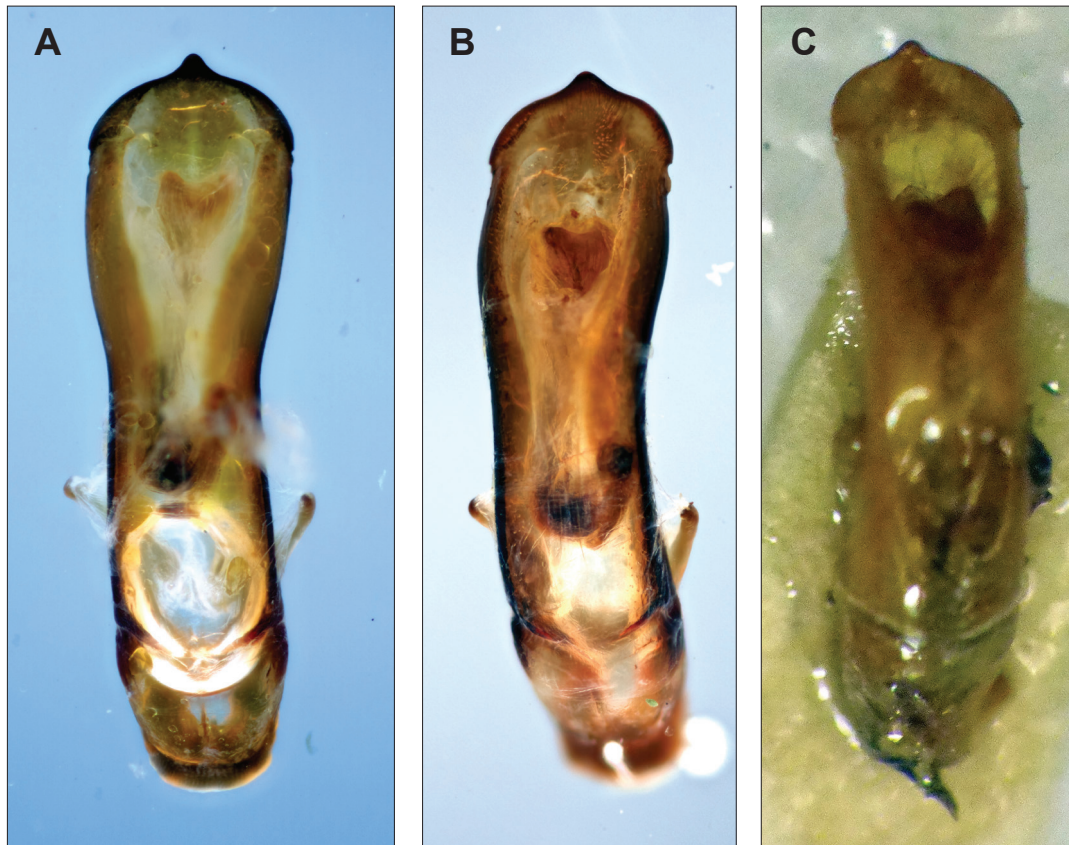


PLATE 6 — Aedeagi of *Paropsisterna vittata*. A. Tasmania (TMAG F14896). B. Victoria (TMAG F40358). C. Lectotype (NHML).

12 Jan 2017/*Paropsisterna vittata* (Blackburn, 1899), Det. D. de Little 2020/[TMAG]; ♂/TMAG, F40369, TAS., Wellington Ra., Knights Ck. Tk., -42.8682, 147.204, beating, col. D. de Little 28 Dec 2019/*Paropsisterna vittata* (Blackburn, 1899), Det. D. de Little, 2019/[TMAG]; **Victoria:** 5♂, 1♀/ TMAG F40358, F40361, F40362, F40363, F40366, VIC., Mt Donna Buang, -37.711, 145.878, Reared D. de Little, 14 Feb 2019/ *Paropsisterna vittata* (Blackburn, 1899), Det. D. de Little 2019/[TMAG].

Diagnosis. Live adult with disc of elytra variably pale green to dark red with paler tessellations and often with a darker broad H-shaped marking covering both elytra with the cross-bar one-third of distance from base to apex (pl.1E, 1F); dead and live adults with two anteriorly projecting extensions to black pigmentation at base of head; pronotum anterior angles more or less acute, <90°, discal puncturation nearly as coarse as marginal puncturation; elytral seriate puncturation coarse and moderately regular, interstitial puncturation much finer; ventrites and legs of dead specimens variably testaceous to dark brown; apical third of penis broadest in lateral view, expanding and then rounded towards apex with lateral notches and incurved flaps at shoulders (pl. 6A, B, C).

Description. Length: ♂, 7.5–8.5 mm ♀, 8–9 mm; body broadly ovate (length to width ratio 1.3) and convex (length to height ratio 2.5), with highest point at about half body

length; head slightly wider than half pronotal width; elytra at anterior angles 1.3x pronotal width. Colour pattern of mature live beetle translucent pale brown head black at base with pigmentation produced anteriorly in two sub-central crests, antennomeres 7–11 dark brown to black (♂), pronotum pale brown, legs pale brown, black patch at distal end of femur (♂), scutellum black, elytral suture black for one third of its length to entire length from base to apex, elytral disc of mature adults variable green-gold to dark orange-red with paler tessellations and with a darker broad H-shaped fascia with the cross bar crossing elytral suture approximately one-third of its distance from base to apex, elytral disc of teneral adults clear green-gold with orange-red fascia; elytral margins translucent. Colour of dead mature beetle; entirely yellow-brown except: base of head black, lateral margins of ventrites dark brown (♂). Pubescence: head with depressed areas adjacent to eyes with erect setae, two long setae projecting anteriorly from sides of apical margin of clypeus; rest of head, all of pronotum (including hypomera) and elytra (including epipleura) glabrous; prosternum glabrous except setose anterior margin and apex of prosternal process; mesepimera and mesoventrite glabrous except process; metanepisterna, metaventrite glabrous; abdominal ventrites glabrous except lateral margins and apex ventrite V densely setose; antennomeres 4–11 with smooth impunctate midline and raised setae either side of this; femora almost glabrous; tibiae setose; antennomeres 4–11 with smooth impunctate

midline and raised setae either side of this; femora almost glabrous; tibiae setose, densely towards apices; ♂ with ovate pads of spatulate setae on pro- and meso- first tarsomeres.

Head: eyes; small, separated by c. 4x greatest widths; frontoclypeal suture broadly V-shaped; frontoclypeus; irregularly punctured, with mixed large (slightly larger than eye facets) and small (slightly smaller than eye facets) punctures, often coalescent in small pits, densely and finely punctured in depressed areas adjacent to eyes, more evenly sized and not coalescing at base of head (in black area); interspaces finely microreticulate; antennae; c. half body length, all antennomeres elongate, 2 shortest, 11 longest; 1 and 3 almost as long as 11, 4–11 distinctly flattened, 5–10 slightly asymmetric; labrum microreticulate, finely and sparsely punctured, apex shallowly concave; securiform apical maxillary palpomere broader in ♂, with sharper lateral angles.

Thorax: pronotum strongly transverse, width c. 2.3x length, posterior angles broadly rounded, anterior angles strongly produced and more-or-less sharply rounded, pronotal margins entirely finely beaded; disc of pronotum (area behind vertex) punctured at head but punctures and interspaces larger, punctures increasing in size and conflation towards sides of pronotum which are rugose with irregular slightly ridged intervals; pronotal surface shining with scattered micropunctures; prosternum elevated as smooth ridge along midline commencing adjacent to anterior margin of procoxae, posteriorly bifurcating to follow lateral margins of process (middle of process depressed); prosternal process elongate spatulate, reaching well beyond posterior margins of procoxae; scutellum elongate semi-ovate, strongly micropunctured; elytra broadest at about middle, but with laterally prominent obtuse anterior angles (c. 120°); humeri prominent, at about 3/5 width from suture to lateral margin; scutellary striole strongly punctured, 9 distinct striae, stria punctures as large as on pronotal disc, striolar and stria punctures often slightly irregularly placed (not neatly linear); striae 4 and 5 anastomosed well before apex, striae 2 and 3 and 6–8 anastomosing closer to apex, then merging with striae 1 and 9 in large irregular punctures at elytral apex; intervals 1–9 and strip outside stria 9 with scattered mixed punctures, similar to pronotal disc; slightly reflexed outer margins of elytra with broad strongly punctuate area, punctures more evenly spread and larger than on pronotal disc; mesoventrite deeply hollowed anteriorly to accommodate prosternal process, small tubercle either side of hollow; mesoventrite process strongly elevated, anterior face deeply concave and posterior face (apex) deeply concave; metaventrite smooth except finely wrinkled and punctuate in lateral angles, process flat or slightly elevated; inner margins of protibiae slightly concave before apex; apical third of meso- and metatibiae with dorsal seta-fringed excavation to accommodate tarsi; male pro- and meso- first tarsomeres ovate, female elongate-triangular; claws with acute tooth on middle of ventral surface.

Abdomen: ventrites I–IV shining but finely microreticulate, close and finely punctured at base, wrinkled at sides, with sparse fine punctures elsewhere; ventrite V as I–IV, but without lateral wrinkles and more closely punctured, with subapical transverse setose groove in both sexes; apex of

male ventrite V truncate with slight median convexity, apex of female broadly convex; penis in dorsal view narrowest at middle, slightly expanded to strongly convex apex with large prominent mucron, junction of shaft with apex notched and apical margin strongly recurved either side of mucron, midline broadly grooved on apical half and at base; in lateral view apical half slightly convexly expanded, curving to explanate notched lip and strongly recurved mucron; flagellum not exerted.

Larva. Four larval instars (L1–4). Head capsule widths: L1: 0.8 mm; L2: 1.2 mm; L3: 1.7 mm; L4: 2.1 mm. L4 maximum length 14 mm. L3–4 broadest at mid abdominal segments. L1–3 head capsule, legs and lateral body tubercles black, L4 pale greyish brown with reduction of black pigmentation on head capsule, legs and lateral body tubercles.

Egg. Elongate oval, length 2.8 mm, width 1.1 mm, chorion tuberculate, white or orange-pink, deposited in a side-by-side raft of 5–10 on leaf lamina.

Notes. Blackburn (1899) described *Paropsis vittata* from the Australian Alps of Victoria and New South Wales.

Tasmanian specimens were misidentified as "*Chrysopharta simsoni*" by de Little (1979) based on Blackburn's (1899) description of living specimens having the "disc of the elytra suffused with a rosy or golden-rosey metallic gloss" and its "somewhat less nitid surface" than *Paropsis aurea*. Living and dead specimens from mainland SE Australia (including Blackburn's syntypes) and Tasmania have now been examined, including dissection and examination of the penis and rearing of immature stages and there is no doubt that the Tasmanian form is conspecific with mainland *Paropsisterna vittata*.

Blackburn (1899) based his description of *Paropsis vittata* on four syntypes, a male and female pair held by NHML, and a male and female pair held by SAM. The male with genitalia dissected held by NHML is here designated the lectotype.

Paropsisterna vittata (pl. 1 E, F) somewhat resembles *P. selmani* Reid and de Little, 2013 (pl. 1G, H) in live colouration and form. Live adult specimens of the latter species are easily distinguished by the elytral apical diamond-shaped marking. Larvae of *P. selmani* have black head capsules and a dark lateral band whereas larvae of *P. vittata* are without these features.

Paropsisterna vittata occurs in the alpine to sub-alpine regions of Tasmania. It has been abundant in recent summers on *Eucalyptus coccifera* close to the summit of kunanyi/Mt Wellington. In Victoria the species is confined to high elevation.

CONCLUSION

The identity of the epithetical "Hobart Gold" is solved. It is not *Paropsisterna aurea* which is found to be a junior synonym of *P. hectica*, and it is not *P. vittata* which occurs in Tasmania as well as in its type locality, the Australian Alps. *Paropsisterna simsoni*, the "Hobart Gold", is when living, the least golden of the three species.

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