

A new southern Australian subgenus of *Temognatha* Solier (Coleoptera: Buprestidae: Buprestinae), with nomenclatural notes on Solier's generic name.

Magnus Peterson*

Abstract

Temognatha (*Calotemognatha*) subgen. nov. is described for three species: *T. (C.) yarelli* (Gory & Laporte, 1837); *T. (C.) laevicollis* (Saunders, 1868); *T. (C.) varicollis* (Carter, 1913). *Stigmodera laevicollis* Saunders is designated type species of *Calotemognatha*, and is illustrated. Lectotypes are designated for *Stigmodera bonvouloirii* Saunders, 1868, *S. laevicollis*, *S. varicollis*. Possible location of syntypes of *Buprestis variabilis* Donovan, 1805 and *Stigmodera (Temognatha) yarelli* is discussed. *Stigmodera (Stigmoderoides) Thery*, 1937, recently synonymized with *Temognatha* Solier, 1833, is shown to be nomenclaturally unavailable. Ovipositors (in dorsal view) of *T. (C.) laevicollis*, *Temognatha (Temognatha) variabilis* (Donovan) (type species of *Temognatha*) and *T. (T.) bonvouloirii* are figured. Distribution of the new subgenus is mapped. Correct spelling/citation of *Temognatha* is discussed.

Introduction

Bellamy (1988:416) and Gardner (1990:313-315,325) have shown how useful ovipositor morphology is in distinguishing supraspecific taxa within the externally uniform family Buprestidae.

After examining ovipositor morphology of all nominal species-level taxa currently assigned to *Temognatha* Solier, 1833, for an eventual revision of this stigmoderine genus, it became apparent that three of its species were clearly separable from the others on the basis of divergent structural modification to their ovipositors. Closer study revealed that these three taxa were very closely allied because this discrete structural modification was homologous and identical. This synapomorphy is significant enough to necessitate description of a new subgenus to accommodate the three species. This is the second in a series of papers describing new *Temognatha* taxa, which began with Peterson (1982).

Methods and Terminology

Specimen measurements linear, measured to the nearest 0.05 mm using a Zeiss stereomicroscope eyepiece graticule (cephalic, thoracic, leg measurements) or calipers (body measurements). Morphological measurement definitions and their text abbreviations (capitalized in brackets) as follows: total length (TL) — from front of head (between antennae) to elytral apex; total width (TW) — at widest point of body (elytra);

*69 Alvah Street, St James, Perth, Western Australia 6102.

head width (HW) — to outer margins of eyes in frontal view; minimum interocular distance at vertex (MIDAV).

Drawings were made with the aid of a Zeiss stereomicroscope camera lucida.

The following collection codens are used in the text: ANIC — Australian National Insect Collection, Canberra; BMNH — British Museum of Natural History, London; MMUS — Macleay Museum, University of Sydney; MNHN — Museum National d'Histoire Naturelle, Paris; MVMA — Museum of Victoria, Melbourne; SAMA — South Australian Museum, Adelaide; WAMP — Western Australian Museum, Perth.

Type specimen label data: a slash mark (/) separates data from individual labels; curved brackets enclose my notations for handwritten (h) or printed (p) label data, where noted; square brackets enclose inferred label data.

Correct spelling/citation of *Temognatha*/*Themognatha* Solier?

Examination of Solier (1833) revealed that this author used two different spellings (*Temognatha*/*Themognatha*) in his original descriptions/diagnoses of this Australian genus. Interpretation of the current International Code of Zoological Nomenclature provides two different methods for establishing which spelling is correct.

If both spellings are considered to constitute valid generic descriptions and available names (under Article 12a; b: 5-7), because they are introduced on separate pages and are accompanied by definitions/illustrations purporting to diagnose them, then precedence is determined by the First Reviser Principle (Article 24). I consider that Gory & Laporte (1837: 11, in *Stigmodera* livraison), who were the first to use both spellings in a subsequent work, clearly selected/validated *Temognatha* over *Themognatha*. They use the spelling *Temognatha* (in large bold print) as the heading under "Seconde Division" (p. 11), and also use it in the "division" (= subgeneric) key (p. 4), while the spelling *Themognatha* (in small fine print) is listed only once in their work, as a synonym under the genus *Stigmodera* (p. 3).

Alternatively, if one of the two original spellings is considered a lapsus (and therefore an incorrect original spelling under Article 32c) then the correct spelling should be ascertained by establishing the original author's intent, if possible, through studying the wording of the original description, potential origins of both spellings and their frequency of appearance in the original work. Solier (1833) mentions *Temognatha* on three occasions (once on p. 263; twice on p. 281, once in combination with the species name *variabilis*), but mentions *Themognatha* only once (p. 291). The names *Temognatha*/*Themognatha* are based on classical Greek, with half of each name having the common suffix stem *gnatha* (Greek for jaw). Adoption of the correct spelling thus partially depends on which, or whether the, prefix makes descriptive sense when used in combination with *gnatha*. A translation of the relevant section of Solier's original description reads: "Mandibles medium-sized, *knife-edged* interiorly above; the one on the right slightly obtuse, the one on the left pointed; *internal edge forming a tooth towards the extremity, only above*." This is compelling evidence that Solier's intended choice was the prefix *temo-*(= *temno-*) (Greek for carved, cut, to cut, divided), alluding to

the cutting ("knife-edged") and/or divided (subapically toothed) mandibles. The prefix *themon* (Greek for heap) was most unlikely as Solier's choice, since he did not mention heaped (conical) mouthparts (also note Solier's descriptive differentiation between left and right mandibles) and he illustrated (plate XI, figure 18) the mandibles as curved/elongate "knife blades" with a distinct subapical notch, which certainly could not be considered "heaped".

While it is sometimes impossible to determine a deceased author's intent, on this occasion the alternative methods both support *Temognatha* Solier as the correct spelling for this genus. Correct spelling of *Temognatha* only recently became an issue, because all works (including popular) subsequent to Solier (1833) (except four minor papers: Murray, 1852, 1873; Gehin, 1855; Boheman, 1858) completely synonymized this genus under *Stigmodera* Eschscholtz or treated it as its subgenus, until Matthews (1985) and Gardner (1990) resurrected *Themognatha* (sic) to generic status. Four different spellings of *Temognatha* (as a genus, or *Stigmodera* subgenus) have been deliberately used, since Solier's description of this taxon: *Temognatha* Solier, 1833; *Themognatha* Solier, 1833; *Temnognatha* Agassiz, 1845; *Themnognatha* Obenberger, 1922. I believe retention of the more frequently used incorrect spelling (*Themognatha*), on the basis of supposed "stability", is not justified in view of all the above evidence.

Systematics

Temognatha (*Calotemognatha*) subgen. nov.

Figures 1,2,5.

Type Species

Stigmodera laevicollis Saunders, 1868: 466. (Figure 1)

Diagnosis

Small to moderately large size; scutellum small; dorsal surface of ovipositor dorsal valve with complex, strongly sclerotized and carinate, apically bifurcate, reinforcing structure which extends slightly beyond lateroapical corner of dorsal valve margin (Figure 2); MIDAV 31-47% of HW, slightly to strongly sexually dimorphic; elytral pattern (when present) composed of four dark transverse fasciae, including apical and excluding basal margin; epipleuron entire (non-serrate), without apically directed ventral spur at level of hind-coxae, and only moderately expanded anterior to this level; elytral apices rounded to sub-truncate.

Description

Body: TL 10-39 mm, variable within and between species; elongate-oval in dorsal view, subparallel in lateral view; with silver-white setae on anterior half of venter (anterior to sternite 4), longer and more dense in males than females; with a mostly matt pale-coloured undersurface.

Head: frons with silver-white setae, longer and more dense in males than females; eyes large, with posterior margins touching pronotum and inner margins slightly to moderately converging dorsally; MIDAV 31-47% of HW, ♂ < ♀, interspecifically

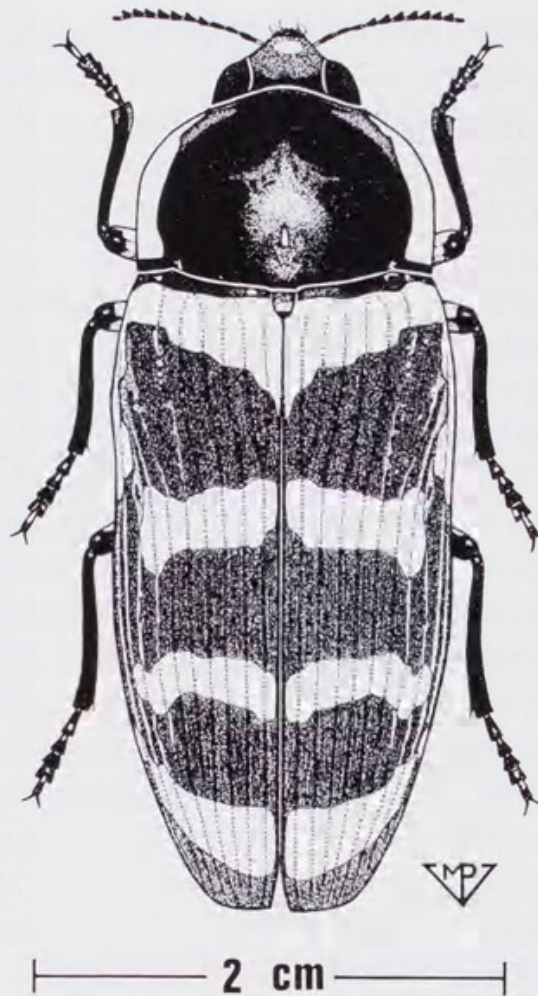
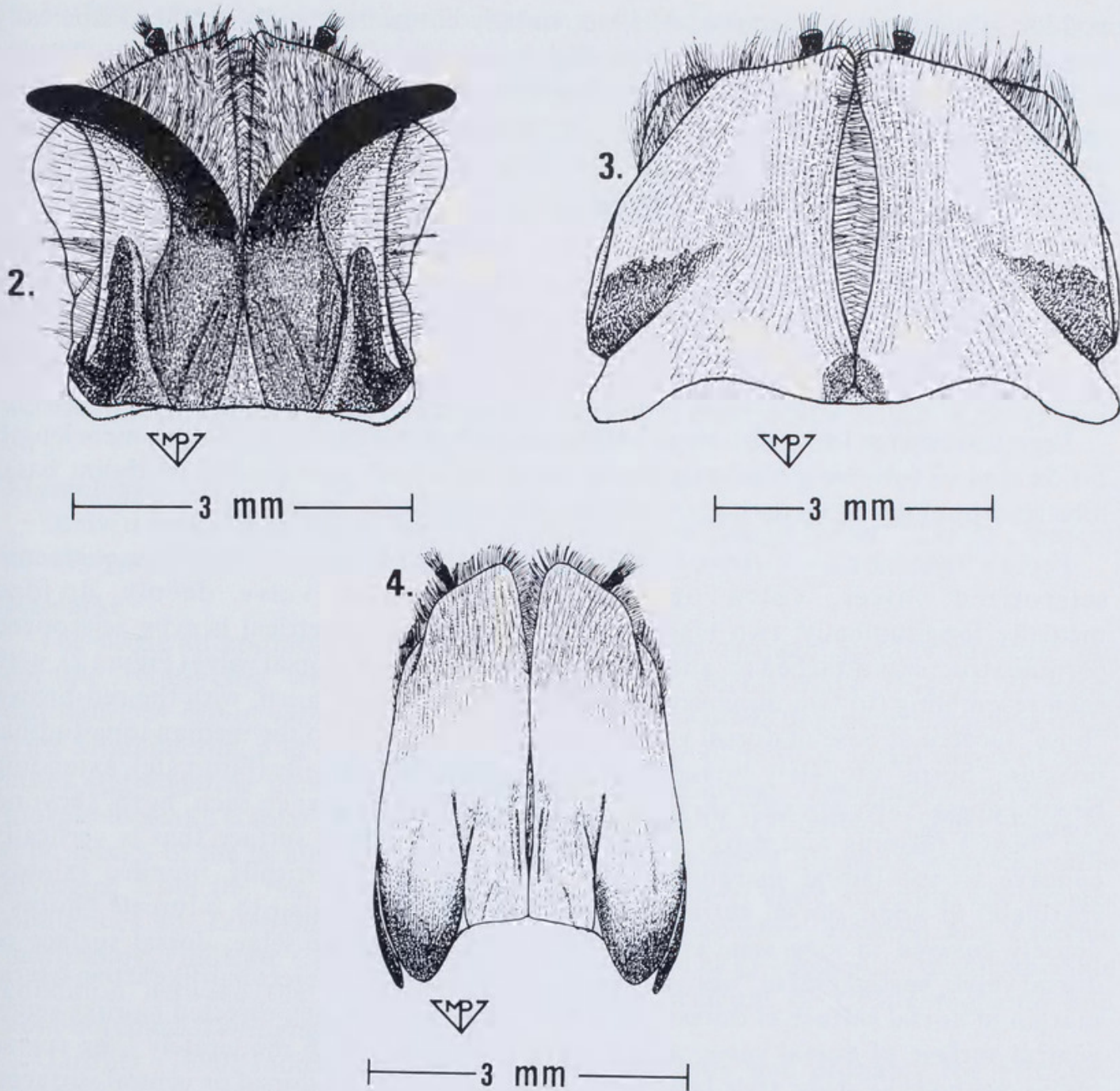


Figure 1. Dorsal view of female *Temognatha (Calotemognatha) laevicollis* (Saunders).

slightly to strongly sexually dimorphic; frontoclypeus slightly to moderately prolonged; labrum subtriangular with curved outer margin, apically with weak median notch; prementum attached to postmentum dorsally; postmentum subhexagonal (length 65-85% of width), anterior margin sometimes with slight median emargination; antennal length equal to or slightly greater than head width; antennomeres 4 or 5-11 (inclusive) serrate (occasionally antennomere 4 subserrate).

Thorax: sides of pronotum non-explanate, with lateral margin complete and weakly carinate; pronotum with very slightly bisinuate basal margin; pronotum with matt pale-coloured lateral margins; sternal cavity formed by metasternum and divided mesosternum; meso-metasternal suture oblique and halfway along sternal cavity; scutellum very small, less than or equal to 0.1x width of elytron, shape scutiform.

Elytra: non setose; interneurs numbering ten, completely separate, punctate-striate; apices rounded to occasionally sub-truncate, non-denticulate; epipleuron non-serrate for entire length, dorsoventrally moderately expanded anterior to level of hind-coxae, and never with apically directed ventral spur at latter level; elytral length roughly equal to length of abdomen; elytral pattern (when present) composed of four dark transverse fasciae (including apical and excluding basal margin), anterior three sometimes reduced to transverse rows of spots, alternating with pale interspaces.



Figures 2-4. Dorsal view of ovipositor dorsal valves: 2 — *Temognatha (Calotemognatha) laevicollis* (Saunders); 3 — *T. (T.) variabilis* (Donovan); 4 — *T. (T.) bonvouloirii* (Saunders).

Metathoracic wing (terminology based on Good, 1925): as for Stigmoderini; membranous, with apex of all posteriorly directed veins nearly reaching hind margin; radial cell closed, moderately large and elongate, with radial sector forming short recurrent spur; radiomedial crossvein complete and contacting radial cell slightly distad of first radial crossvein; medial recurrent vein same length as fused medial-cubital, reaching back to level of first radial crossvein; cubitus strongly developed; cubito-anal crossvein complete, with well developed recurrent 1stA spur; first anal vein same length

as $2dA_1$, slightly curved in basal $1/4$, not basally connected to other veins (especially $2dA_1$); $2dA_1$ basally connected to $2dA_2$ slightly distad of cubito-anal crossvein; "wedge cell" ($2d-2dA$) open; $2dA_3$ sub-basally connected to $2dA_2$, via crossvein contacting latter slightly distad of $2dA_1-2dA_2$ junction; $2dA_3$ same length as $2dA$; $3dA_2$ connected to $3dA_1$, via crossvein contacting latter $1/3$ distance from $2dA_3-3dA_1$ junction to apex; fourth anal vein present, well developed.

Abdomen: sternite 7 sexually dimorphic, in male with moderately arcuate apical emargination, in female apically rounded and more elongate; female proctiger (length $1.5\times$ width) comprised of completely fused epiproct and paraprocts, without discernible suture between both; male proctiger comprised of incompletely fused epiproct and paraprocts, with suture visible between both.

Legs: tarsomeres 1 to 4 with large well developed pulvilli; basal hind-tarsomere length $1-1.5\times$ that of following hind-tarsomere; tarsal claw with pronounced to absent basal lobe (morphology subgenerically variable, intraspecifically constant).

Female reproductive system: ovipositor with three testaceous membranous/semi-sclerotized valves, vulva opening ventral; dorsal valve deeply divided medially/longitudinally; two black-brown bilaterally symmetrical heavily sclerotized cornute structures attached to, and part of, dorsal surface of dorsal valve (Figure 2), with each resembling (in two dimensional dorsal view) a bovine horn, with the red-brown "boss" located at base of dorsal valve immediately adjacent to the median longitudinal division; "horns" arcuately curved away from each other apically (bifurcate), extending beyond dorsal valve apex for short distance at latero-apical corner; each "horn" (beyond the "boss") forming a strongly carinate ridge above dorsal surface that is vertically concave to the lateral margins of the ovipositor, and vertically rounded (almost spatulate) at apex; dorsal surface of dorsal valve, apicomедial to bifurcate "horns", densely covered in long semi-erect apically-directed hairlike setae; dorsal surface of dorsal valve, basolateral to "horns", sparsely covered in short erect hairlike setae; lateral margin of dorsal surface of dorsal valve with long erect laterally-directed hairlike setae; ventral surface of dorsal valve, apicomедial to "horns", with moderately long sparse semi-erect hairlike setae; style bearing valve without setae on dorsal or ventral surfaces, except at apical margin; recumbent apically-directed spatulate setae, on dorsal surface of style bearing valve, cover width of valve to slightly laterad of apex of dorsal valve "horns"; ventral surface of style bearing valve with moderately long sparse erect hairlike setae; dorsal surface of ventral valve without setae; ventral surface of ventral valve basally and medially with red-brown sclerotization, and covered in long sparse semi-erect hairlike setae (less densely than apicomедial area of dorsal valve); ovipositor setae testaceous.

Male reproductive system: aedeagal width $36-41\%$ of length (from basal apophysis apex to paramere apex); basal apophysis $20-25\%$ of aedeagal length; paramere apex dorsally and ventrally with erect hairlike setae; paramere blades (in dorsal view) acutely produced at apex with inner margins roundly angled to junction of both blades, junction occurring

at 69-75% of aedeagal length from base (apex of basal apophysis); outer margin of penis curved to penile apex, which is slightly more produced to form a small 'nipple'; penis width 36-43% of length; penis ventrally without membranous flap covering ostium, ostium at 80-83% of penis length from base.

Included Species

T. (Calotemognatha) yarelli (Gory & Laporte, 1837); *T. (C.) laevicollis* (Saunders, 1868); *T. (C.) varicollis* (Carter, 1913).

Distribution

The southern Australian mallee zone and adjacent forest/coastal habitats in the west. Currently known from the Carnarvon/Shark Bay region of midwest Western Australia across to the Euabalong/Lake Cargelligo district of central New South Wales (Figure 5).

Etymology

Derived from *calos*, Greek for beautiful, and *Temognatha* Solier, 1833 (the 'parent' genus); gender to be treated as feminine.

Remarks

The single autapomorphy of a sclerotized, strongly carinate, apically bifurcate and cornute reinforcing structure on the ovipositor dorsal valve (Figure 2) easily distinguishes *Temognatha (Calotemognatha)* from the other 10 genera/subgenera in the tribe Stigmoderini, and supports its monophyly. The ovipositor dorsal valves of these other stigmoderine genera/subgenera, and the remaining *Temognatha* species, are morphologically similar to that of *Temognatha variabilis* (Donovan, 1805) (Figure 3), type species of the nominotypical subgenus of *Temognatha*. Despite *Calotemognatha* diverging from the rest of the tribe in ovipositor dorsal valve structure, the greater similarities to *Temognatha* (in other aspects of ovipositor, internal and external morphology) indicate *Calotemognatha* is best treated as its subgenus. An intermediate condition between the ovipositor dorsal valve structure of *Calotemognatha* and nominotypical *Temognatha* is unknown.

Gardner (1990) indicated that 12 tubules per testis was probably the primitive condition, in the Stigmoderini, for this character. *Temognatha (Calotemognatha) yarelli* (G. & L.) was the only one of the 23 nominal taxa, that she listed under *Temognatha* (as *Themognatha*) and examined for this character, to exhibit this condition. All other listed species had the derived condition of much higher numbers of tubules per testis, and are members of the nominotypical subgenus of *Temognatha*. I consider this possible evidence that *T. (Calotemognatha)* diverged at an early stage from the *Temognatha* lineage.

Thery (1937) described *Stigmoderoides* as a subgenus of *Stigmodera* Eschscholtz, for the reception of six species, and this constitutes the only previous attempt to formally subdivide the traditional concept of *Temognatha*. Gardner (1990) synonymized *Stigmoderoides* under *Temognatha*, when she re-elevated the latter to generic level. However, Bellamy (1985, 1986) and Gardner (1990) obviously did not realize that

Stigmoderoides Thery, 1937 is unavailable for the purposes of nomenclature because it does not conform to Article 13b (see Art. 67h, 68b-e) of the current International Code of Zoological Nomenclature. Comparison of ovipositor dorsal valves of the two valid subgenera with those of a "*Stigmoderoides*" species (*Stigmodera bonvouloirii* Saunders, 1868) (see Figures 2-4) indicate this name would have been a direct synonym of the nominotypical subgenus of *Temognatha* Solier, had it been available. The taxon "*Stigmoderoides*" is currently referred to as the informal *Temognatha reichei* (G. & L.) species-group.

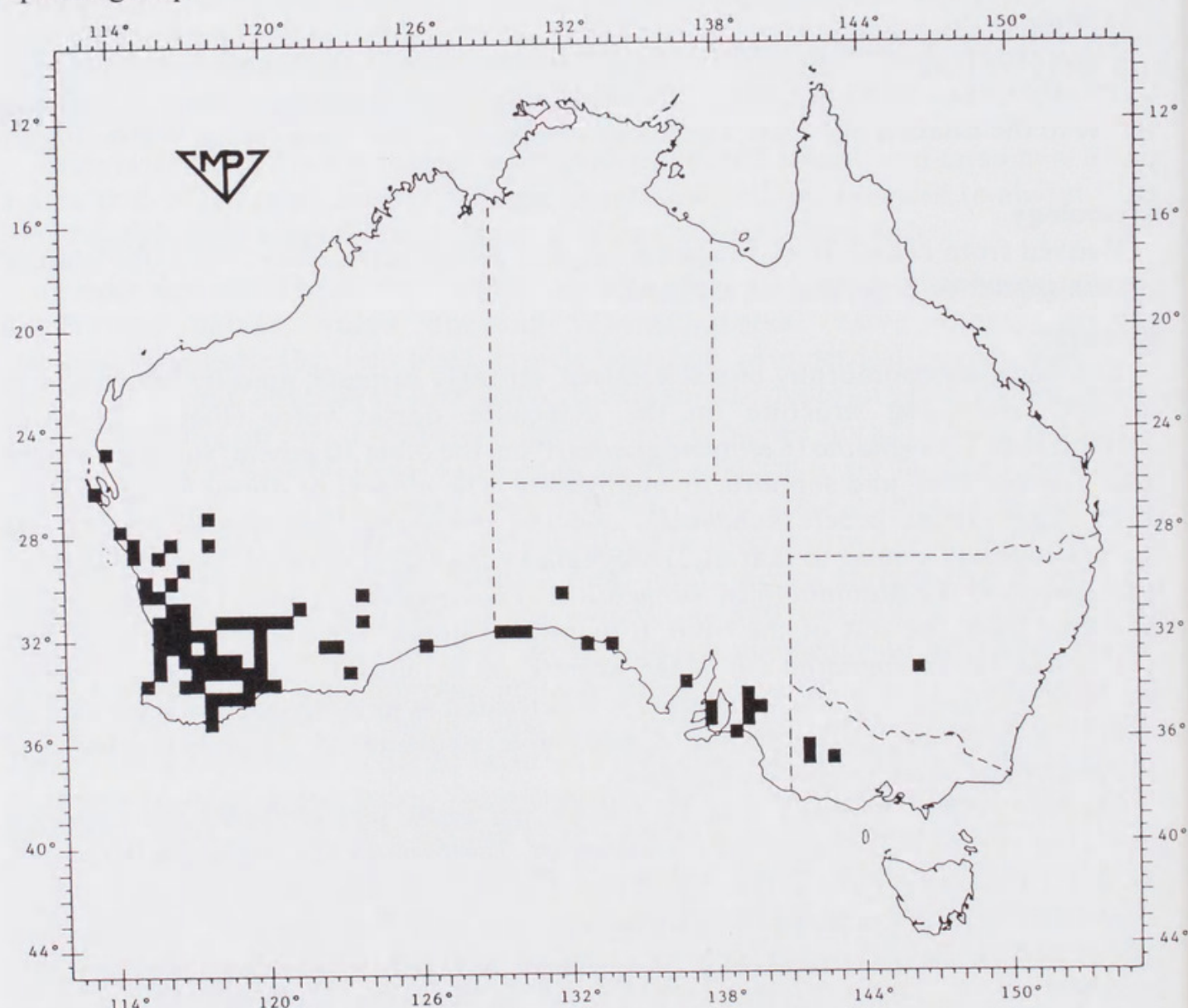


Figure 5. *Temognatha* (*Calotemognatha*) distribution.

Type Specimens Examined

***Temognatha* (*Calotemognatha*) *laevicollis* (Saunders):** Lectotype of *Stigmodera laevicollis* Saunders, 1868 (here designated): female; label data: laevicollis (Type) Saund.[ers]/ HT/ Saunders 74.18/ Type; lectotype measurements: TL — 33.6 mm, TW — 12.5 mm (in BMNH).

Temognatha (Calotemognatha) varicollis (Carter): Lectotype of *Stigmodera varicollis* Carter, 1913 (here designated): male; label data: Wanneroo (W.[estern]A[ustralia]) (h)/S.[tigmodera] yarelli L&G var. varicollis C[ar]t[e]r, W.[estern] Australia, Cotype (h); lectotype measurements: TL — 16.7 mm, TW — 6.0 mm (in SAMA).

Temognatha (Temognatha) bonvouloirii (Saunders): Lectotype of *Stigmodera bonvouloirii* Saunders, 1868 (here designated): female; label data: bonvouloiri (type) Saund.[ers]/ HT/ Saunders 74.18/ Type; lectotype measurements: TL — 34.0 mm, TW — 12.9 mm (in BMNH).

Temognatha (Calotemognatha) yarelli (Gory & Laporte): Syntype/s not located. Gory & Laporte (1837:14-15), in *Stigmodera (Temognatha) yarelli* description, provided a type locality ("Swan River, Nouv.-Holl."), listed specimen measurements ("Long. 12 lig. Larg. 4 lig. $\frac{1}{2}$." = TL: 27.0 mm; TW: 10.1 mm), illustrated a specimen of the species in colour (Plate 3, figure 11), noted their description was based on specimen/s in their own collection ("Du cabinet des auteurs"), but did not designate types; their measurements and description/illustration respectively suggest a single specimen was used for description, and that it was female; Horn & Kahle (1935:38-39,93) indicate Gory's buprestid collection and Laporte's buprestids from his second collection (which had suffered greatly) were eventually procured by Rene Oberthur (Oberthur's collection now housed in MNHN), and that Laporte's first collection (private) went to MVMA; primary type possibly among numerous unlabelled specimens (?syntypes), in MNHN, identified by Dr R.P. Dechambre as pinned with Gory & Laporte pins. I prefer not to designate a neotype, until it is certain syntype/s are lost/destroyed, since Gory & Laporte's excellent description/colour illustration is sufficient to diagnose the taxon and ascertain its nomenclature.

Temognatha (Temognatha) variabilis (Donovan): Syntypes not located. Donovan (1805:21), in *Buprestis variabilis* description, provided a generalized type locality ("New South Wales"), illustrated three specimens of the species in colour (plate 7, *), briefly described these, but did not list specimen measurements or designate types; Donovan's illustrations/description indicate a minimum of three syntypes were used and that two of these (with fewer dark spots on elytra) were males; Horn & Kahle (1935:60) indicate Donovan's collection of insects of the world went to J.C. Stevens (London), in 1818, and was subsequently auctioned; Anderson (1965:48) notes a large section of Donovan's collection was purchased by Sir Alexander Macleay before the latter left England for Australia in 1825 (Macleay's collection now housed in MMUS); Anderson (1965:50) also notes part of MMUS collection was destroyed or lost during the decade after the First World War; Britton & Stanbury (1981) did not locate/identify in MMUS, or transfer to ANIC on permanent loan, types of Australian buprestid species described by Donovan (1805); MMUS possesses eight poorly labelled (locality only, without attached type status indication) *variabilis* specimens (which may include missing syntypes, if still extant) with locality labels that generally agree with the description, but it is not certain if Macleay procured and brought all of Donovan's types to Australia or, if Macleay did

bring them here, that they were not later destroyed after the First World War. I prefer not to designate a neotype, until it is certain all syntypes are lost/destroyed, since Donovan's excellent colour illustrations/ meagre description are sufficient to diagnose the taxon and ascertain its nomenclature.

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