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RESEARCH ARTICLE

Revised taxonomy of *Temognatha duponti* (Boisduval) and *T. stevensii* (Gehin) (Coleoptera: Buprestidae: Stigmoderini), with definition of the *grandis* and *stevensii* species-groups

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Abstract: The nominal species *Temognatha duponti* (Boisduval, 1835) and *T. barbiventris* (Carter, 1916) are considered conspecific. The specific name *barbiventris* (Carter, 1916) **syn. nov.** is a subjective synonym of the name *duponti* (Boisduval, 1835). The nominal species *Temognatha stevensii* (Gehin, 1855) is not considered conspecific with *Temognatha duponti* (Boisduval, 1835). The specific name *stevensii* (Gehin, 1855) is revalidated as the name of the species *Temognatha stevensii* (Gehin, 1855). The specific name *tibialis* (Waterhouse, 1874) is a subjective synonym of the name *stevensii* (Gehin, 1855). The prevailing usage (ICZN, Article 33.3.1) of the name *stevensii* over *stewensii* is preserved for the species *Temognatha stevensii* (Gehin, 1855). Both valid species are diagnosed/redescribed and illustrated, and their relationships, biology and distributions are discussed. Complete synonymies and references, and photos/illustrations of some diagnostic head, elytral and genitalic structural features, are also provided. The *Temognatha grandis* and *T. stevensii* species-groups are defined. Lectotypes are designated for *Buprestis duponti* Boisduval, 1835 and *Stigmodera tibialis* Waterhouse, 1874.

Key words: *Temognatha*, *barbiventris*, *duponti*, *flavocincta*, *grandis*, *stevensii*, *tibialis*, synonyms, redescriptions, Australia, relationships, distributions, habitat, biology.

Introduction

The identity and synonymy of three nominal species of *Temognatha* Solier, *T. duponti* (Boisduval, 1835), *T. stevensii* (Gehin, 1855) and *T. tibialis* (Waterhouse, 1874), has been contentious for many years. The purpose of this paper is to finally establish their true identity

and taxonomic status, including any other *Temognatha* species that are interconnected with this issue.

Material and methods

Abbreviations for collections of specimens examined are as follows:

AMSA – Australian Museum, Sydney, New South Wales, Australia.
ANIC – Australian National Insect Collection, Canberra, A.C.T., Australia.
BMNH - Museum of Natural History, London, United Kingdom.
MNHN – Museum National d'Histoire Naturelle, Paris, France.
MPCP – M. Powell private collection, Perth, Western Australia.
MPWA – M. Peterson private collection, Perth, Western Australia.
MVMA - Museum of Victoria, Melbourne, Victoria, Australia.
RMCN – R. Mayo private collection, Narara, New South Wales.
SAMA – South Australian Museum, Adelaide, South Australia.
WADA – Western Australian Department of Agriculture, Perth, Western Australia.
WAMP – Westen Australian Museum, Perth, Western Australia.

Abbreviations are as follows: HW = head width, at widest point to outer margins of eyes; MIDAV = minimum interocular distance at vertex; TL = total length from anterior of clypeus to elytral apex; TW = total width at widest part of body; NSW – New South Wales; QLD – Queensland; SA – South Australia; VIC – Victoria; WA – Western Australia.

Measurements were taken using vernier calipers (accuracy ± 0.02mm). Elytral intervals and striae on each elytron are numbered in ascending order outwards from median suture to lateral margin.

For nomenclatorial and taxonomic acts, the International Code of Zoological Nomenclature (1999) is followed.

The following account in 'Publication History' that I consider relevant to resolving the correct taxonomy as well as defining patterns of usage for the specific epithets, should it become necessary to employ the International Code of Zoological Nomenclature (1999) for nomenclatorial reasons, is chronological in order. Author's comments and complementation are provided in square brackets [].

Biological references are commented on within the respective species redescriptions.

All illustrations and photos are by the author.

Results

Publication history

Boisduval (1835: 60–61) described *Buprestis Duponti* (as "2. B. DUPONTI. Boisd.") (type-locality: "Nouvelle-Hollande") in a short moderately detailed 16 line description in French, with a 3 line Latin diagnosis, and did not provide illustrations, measurements or type designations of this species in the original description. An English translation of his French description, is as follows: "Corselet [Thorax, based on his latin diagnosis] bronze, punctate and rugose, bordered with fawn; elytra furrowed and bright ferrous [iron colour], bordered with fawn, bidentate at their extremity. We have dedicated this species to M.[onsieur] Dupont, who has been kind enough to communicate with us and who possesses one of the richest collections of Coleoptera namely in Europe. It bears the carriage and features of [*Buprestis*] *Grandis*, but the thorax is bronze, the elytra are wider, flatter, more elongate, less

oval, with the two teeth at the extremity much more prominent; lastly the elytra are of a red ferrous instead of being black. It is found in New-Holland. It belongs to the genus *Conognatha*." It must be noted that Boisduval's full species-names of non-illustrated new species, when first introduced, were all printed with equal sized uniform lettering (see first quote above) but evidence from the printed species-names of most of his illustrated new species (species no.: 6, 11, 16, 18, 21, 22) indicates that he capitalized the first letter of all specific epithets of new species regardless of whether they were patronymic or descriptive adjectival.

Many of these early descriptions of buprestid species are often brief and uninformative, but three aspects of Boisduval's description of *Buprestis Duponti* are noteworthy: firstly his observation on the presence of well-developed more strongly protruding apical elytral spines in this species, compared to *Buprestis grandis* Donovan, 1805 [=*Temognatha grandis* (Donovan, 1805)]; secondly his comment on the wider, flatter, more elongate, less oval elytra, compared to *B. grandis*; thirdly he did not note the presence of dilated fore- or meso-tibiae, which are rather distinctive and obvious characters if they were present on the specimen/s used in his description. Donovan (1805: plate 8, fig. 1) provided an excellent and very accurate colour illustation of *Buprestis grandis* in his original description of this species, that confirmed its identity and would have allowed for an accurate comparison by Boisduval.

Gehin (1855: 58–60, Plate 1, fig. 2) described and illustrated *Themognatha Stewensii* (as "V. – THEMOGNATHA STEWENSII.") (type-locality: not provided) in a detailed 36 line description in French, with a 4 line Latin diagnosis, from at least two specimens based on the measurements provided in this description "Longeur : 0^{m},035 à 0^{m},038; largeur 0^{m},013 à 0^{m},014" (= length: 35–38 mm; width: 13–14 mm). Types were not mentioned in the original description. He specifically noted the dilated foretibiae ("La conformation trés-remarquable des tibias antérieurs") and mesotibiae ("tibias comprimés surtout ceux des pattes intermédiares qui sont fortement dilatées et échancrées extérieurement"). However he did not comment on the structure of its elytral apices, but the provided detailed colour illustration (the work of Louis Alexandre Auguste Chevrolat) showed that the elytral apices of this species were rounded without marginal or sutural spines. The illustration also showed mesotibial dilations and yellow sublateral margins to the pronotum. The species description additionally noted "J'ai dédié cette espèce à M.[onsieur] S. Stewens de Londres", thus repeating and confirming the 'correct original spelling' of the specific epithet with a 'w'. It must also be noted at this point that Gehin (1855) described *Stigmodera Vescoi* (pp. 56–57) and *Themognatha Chevrolatii* (pp. 60–61), respectively naming them after the French imperial naval surgeon "M. Eugène Vesco" (1816–1880) and the French entomologist "M. Chevrolat" (1799–1884) and spelling both with a 'v'. Equally, the text in Boisduval (1832: iv) spelt the English entomologist Edward Donovan's surname as "Donowan", and this suggests it was perhaps a convention of early 19^{th} century French publishers/printers to either translate the English 'v' into a 'w' or those names where the 'v' is both preceded and succeeded by a vowel. All subsequent authors, that referred to "*Themognatha Stewensii*" in various generic combinations in publication, listed its specific epithet as "*Stevensii*" or "*Stevensi*" in their catalogues and notes, and only Gehin's original description spelt the specific epithet as "*Stewensii*". It is certain that this species was named after the english natural history dealer S. Stevens of London, based on Gehin's comments on where 'S. Stewens' lived. It is most likely the 'w' in the genitive case specific epithet and in the text is a consequence of translation of the patronym into the French language or less likely a printer's error (lapsus). Therefore under the International Code of Zoological Nomenclature (1999) validation of the subsequent spelling '*stevensii* Gehin' over the original spelling is only

accomplished through Article (33.3.1) and relates to the continuous usage of '*stevensii*' for this species by all subsequent authors, thereby maintaining its nomenclatorial stability. Gehin's full species-names of new species, when first introduced, were all printed with equal sized uniform lettering as in Boisduval, but evidence from his text (pp. 62, 64) indicates he also capitalized the first letter of all specific epithets of his new species. It was also a standard convention during this era to describe patronymic specific epithets with a capitalized first letter, though this practice was eventually abandoned.

Lacordaire (1857: 60), in an overview of the higher taxonomy of Coleoptera at generic level, listed "*Them. Stevensii* Gehin, 1855" in a large footnote that outlined Australian "STIGMODERA" species described since Gory & Laporte (1838), but obviously did not comment on *Buprestis Duponti* Boisduval, 1835. He treated the genus '*Themognatha*' as a subgroup of '*Stigmodera*'.

Gemminger & Harold (1869), in the first catalogue of world Coleoptera species described at this time, did not list "*Buprestis Duponti* Boisduval, 1835" under any generic combination, either with a nominative or genitive specific epithet, anywhere in their work. However, in this publication (p. 1403) Gemminger & Harold did list *Themognatha Stewensii* within the genus *Stigmodera* as "Stevensi Gehin" from "Nov. Holland", and treated it as a valid species without synonyms in unnumbered species listings that were arranged alphabetically.

Edward Saunders (1871: 66), in the next catalogue just of world Buprestidae, listed both *Buprestis Duponti* (as *Dupontii*) and *Themognatha Stewensii* (as *Stevensii*) within the genus *Stigmodera* as separate valid species without synonyms from "*Australia*", and located "15. Dupontii, Boisd." between "14. Grandis, Don." and "16. Stevensii, Geh." in species listings that were apparently arranged phylogenetically, not alphabetically, and numbered separately within each genus.

Masters (1871), in his first catalogue of described Australian Coleoptera, listed "Duponti *Boisd*." (p. 132) and "Stevensi *Géhin*" (p. 139) as separate valid species without synonyms within the genus *Stigmodera*, recording both from "New Holland". The species listings were arranged alphabetically and were unnumbered.

Charles Owen Waterhouse (1874: 540) described *Stigmodera tibialis* (type-locality: "S. Australia") without illustrations in a very short 7 line description (in English) with a 4 line Latin diagnosis from at least two specimens, based on measurements provided in this description "Long. 21–24 lin. ; lat. 9–10½ lin." (= length: 44.4–50.8 mm; width: 19–22.2 mm), and specifically noted the mesotibial spurs ("by the triangular dilatation on the intermediate tibia") and that the specimens were in the "Coll. Brit. Mus.". Types were not designated in the description. Waterhouse (1882: part 14, plate 111) later illustrated in colour his *S. tibialis* as part of an identification guide to insects. This illustrated specimen showed rounded elytral apices (without sutural or marginal spines) as well as mesotibial dilations and a uniform bronze pronotum, was from "South Australia", and was lithographed by Maud Horman-Fisher. This individual is considered the Lectotype of *Stigmodera tibialis*.

In a checklist update Kerremans (1885: 142) listed "*tibialis* Waterh." as a valid species within the genus *Stigmodera* from "Australia occ." [West Australia], but did not list *Buprestis Duponti* or *Themognatha Stewensii* in this unnumbered alphabetically arranged interim catalogue.

Masters (1886), in his second catalogue of described Australian Coleoptera, listed all three nominal species as separate valid species without synonyms within the genus *Stigmodera* "2813 *Duponti* Boisd." (p. 85), "2941 *Stevensi* Gehin" (p. 96) and "2949 *tibialis* C.O. Waterh." (p. 97) from "Australia", "Western Australia" and "South Australia", respectively. The numbered species listings were arranged alphabetically.

Tepper (1887: 17), in his book on "Common Native Insects of South Australia", referred to the occurrence there of *Stigmodera gigas* (as "St. gigas") at Ardrossan and *Stigmodera grandis* (as "*St. grandis*, Hope,") in South Australia, and briefly commented on the biology of their imagines. *Stigmodera gigas* Carter was not described until 1916 and Tepper's "*gigas*" is a nomen nudum, while *Stigmodera grandis* was described by Donovan, not Hope, and neither species is known from South Australia. It would appear that Tepper's "gigas" was a lapsus for his "*grandis*", and his comments on the size and the variability and type of colour scheme of his "*grandis*" and its syntopic ecological association with *Stigmodera heros* at the same localities strongly indicates his "*grandis*" actually referred to *Stigmodera tibialis*, though no mention was made of the latter's tibial structure. My observation on its true identity is supported by specimens of '*S. tibialis*' in the South Australian Museum that match localities listed by Tepper for his "gigas", and his comments on *S. tibialis* in the following paper.

Tepper (1888: 25), in the first published part of an ongoing series of annual reports detailing named insects in the South Australian Museum, listed those Coleoptera/Buprestidae indigenous to Australia and specifically noted "Stigmodera Stephensi [sic], Géhin." from one locality "Australia" and "Stigmodera tibialis, Waterhouse." from three localities "Ardrossan, Port Lincoln, South Australia.", and treated them as separate valid species. He did not list 'Stigmodera Duponti'.

In a comment on "*Stigmodera tibialis*", Blackburn (1891: 137) noted the variability of its elytral and ventral segment pattern based on a series of specimens collected "near York", Western Australia by C.F. Johnson. He also noted that none of this series were an "approximation to *S. Stevensi*, Gehin, in respect of the colouring of the sides of the prothorax" and that "the acuteness of the angulation on the intermediate tibiae (which is said to be a distinguishing character) is very variable in degree". He concluded that "the specimens before me suggests inevitable doubt as to the validity of Mr. Waterhouse's species.".

Kerremans (1892), in his 'Catalogue Des Buprestides', listed all three species within the genus *Stigmodera*, "*Duponti* Boisd." (p. 148), "*Stevensi* Geh." (p. 157) and "*tibialis* Waterh." (p. 158), as separate valid species without synonyms from "Australie", "Australie" and "Australie occ.", respectively. The unnumbered species listings were arranged alphabetically.

Kerremans (1903: 204), in the 'Genera Insectorum', listed within the genus *Stigmodera* the single valid species "1. *S. Duponti*, Boisduval…(1835)" from "Australie", with "*Stevensi*, Gehin…(1835) [date incorrect]" and "*tibialis*, Waterhouse…(1874)" as its synonyms, but did not assign it to any of the included described subgenera ("B. *Stigmodera*, Eschscholtz", "C. *Themognatha*, Solier" or "D. *Castiarina*, Castelnau & Gory") instead grouping it by itself in his informal subgroup "A." because of its tibial structure. The species listings were numbered separately within each genus and apparently arranged phylogenetically.

Froggatt (1907), in the "Buprestidae" section (pp. 162–165) of his guide to Australian Insects, specifically commented on the size and colouration of "*Stigmodera tibialis*" and its occurrence in South and Western Australia (p. 164), without providing any biological information. He did not comment on any of the other nominal "*Stigmodera*" taxa I am investigating except for the indirectly relevant "*S. grandis*".

Heyne & Taschenberg (1908: 141, 142), in a guide to exotic Coleoptera written in German, essentially reiterated Kerremans (1903) and listed "duponti Boisd." as a valid species within the genus *Stigmodera* from "Australien" with "*stevensi Géhin*" and "*tibialis*

Waterh." as its synonyms, but inexplicably labelled the provided colour illustration of this species as *S. tibialis*. This species was included with eleven other species in their short review of *Stigmodera*.

Janáček (1915: 99), in a popular booklet for children, provided a picture of *Stigmodera duponti* [sensu Kerremans (1903)].

A further species needs to be considered in this review, based on Boisduval's comments in the description of *Buprestis Duponti*. Carter (1916: 113–114, Plate ix, fig. 7) described, and illustrated in a black & white outline diagram, *Stigmodera barbiventris* (type-locality: "Victoria: Beechworth") from two specimens, the designated holotype ("Type ♂") male from Beechworth and a ? paratype female from "probably Inverell". He also provided measurements of the holotype of this species, "Dim., 42 x 16 mm" and noted it was "in the National Museum, Melbourne". He did not specifically compare it to any other species but noted "The species is very distinct from all the other described larger species.".

Lea (1917: 576) recorded "Stigmodera tibialis, Waterh." from Ooldea in South Australia in the Buprestidae section (pp. 575–576) of a report on a South Australian Museum expedition from September to October 1916.

Carter (1929), in his checklist of Australian Buprestidae, listed "398. *barbiventris* Cart." within *Stigmodera* (*Themognatha*) as a valid species without synonyms (p. 289), but recorded it only from the state of "N.[ew] S.[outh] W.[ales]", despite the fact that the holotype was collected in the state of Victoria based on his own original description. In this genus/subgenus Carter also listed "410. *duponti* Boisd." as a valid species (p. 290) with "*stevensi* Gehin" as its only junior synonym, and recorded this species from "S.[outh] A.[ustralia] & W.[estern A.[ustralia]". Finally in this work Carter listed "462. *tibialis* Waterh." as a valid species without synonyms (p.291), and also recorded it from "S.[outh] A.[ustralia] & W.[estern A.[ustralia]". The numbered species listings were arranged alphabetically.

Two years later Carter (1931: 337) reassessed his opinion of the synonymy of *Stigmodera* (*Themognatha*) *duponti* and noted "*duponti* Boisd., is not identical with *Stevensi* Geh. Its brief description indicates *flavocincta* L. & G.; but this is conjecture."

Obenberger (1934), in the Catalogus Coleopterorum, listed "barbiventris" (p. 686) within the genus *Stigmodera* and subgenus "(*Themognatha*)" as a valid species without synonyms noting it as only occurring in the state of Victoria. He also listed both "Duponti" (p. 701) and "tibialis" (p. 742) in *Stigmodera* (*Themognatha*) as separate valid species without synonyms from "Southern Australia, Western Australia". It appears that Obenberger inadvertently omitted *Stigmodera Stevensii* from this catalogue, since he did list all other stigmoderine taxa described by Gehin (1855). His interpretation of 'Stigmodera Duponti' appears to follow Kerremans (1903) because of the distribution he provided for this species. All species listings in the catalogue were unnumbered and arranged alphabetically.

Carter (1940: 387) posthumously formalized his conjecture of 1931, and within the genus *Stigmodera* synonymized the two species "*duponti* Boisd. = *flavocincta* C. & G.", but did not comment further on *stevensii* Gehin or *tibialis* Waterhouse. The description of *Temognatha flavocincta* (Gory & Laporte) was published in 1838 and postdates that of *Temognatha duponti* (Boisduval).

Gardner (1988) examined the karyotypes and chromosome numbers of 34 species of Australian Stigmoderini, including '*Stigmodera* (*Themognatha*) *barbiventris*' (p. 163). She specifically provided a karyology formula for '*S.* (*T.*) *barbiventris*' (p. 164) and 16 other species, but did not provide formulas for '*S.* (*T.*) *duponti*', '*S.* (*T.*) *stevensii*', '*S.* (*T.*) *tibialis*', '*S.* (*T.*) *grandis*' or '*S.* (*T.*) *flavocincta*'.

Gardner (1990) illustrated the elytron of "*Themognatha barbiventris*" (p. 316, fig. 64) and noted the condition of its male/female reproductive and alimentary/nervous/musculature systems (p. 357). Gardner additionally illustrated the dorsal abdominal musculature of "*Themognatha tibialis*" (p. 321, figs. 77 & 78) and noted (p. 358) that data was also obtained on its male/female reproductive and alimentary/nervous systems.

Burns & Burns (1992) provided a distribution map for "*Themognatha barbiventris*" (p. 28, Map. 85) as part of a mapping program covering all jewel beetle species known to occur in the state of Victoria at the time, and noted on their map that there were 2 records from this state and that the flight period was unknown. They also listed "**Themognatha barbiventris** (Carter)" without synonyms (p. 9) in a checklist of Victorian Buprestidae at the beginning of this work, that accompanied the maps. They did not list or map any of the other nominal taxa under consideration in my paper.

Bellamy (2002: 320) reiterated Kerreman's (1903) synonymy of "*Themognatha stevensii* Genin, (1855)" and "*Stigmodera tibialis* Waterhouse, (1874)" under the valid species "*Buprestis duponti* Boisduval, (1835)", but within the genus *Temognatha* Solier in unnumbered alphabetical listings. He also commented on type-specimen disposition and noted location of "holotype (probable)…sex unknown" of *B. duponti* and *T. stevensii* in MNHP (Museum National d'Histoire Naturelle, Paris) and "syntypes…number and sex unknown" of *S. tibialis* in BMNH (Museum of Natural History, London), and listed the distribution of *Temognatha duponti* as "S[outh]A[ustralia] (W plateau), W[estern]A[ustralia] (W plateau)". Bellamy also listed (p. 315–316) "*Temognatha barbiventris* (Carter, 1916)" as a separate valid species with a distribution of "N[ew]S[outh]W[ales] (Murray-Darling basin), VIC[toria] (Murray-Darling basin)", and noted location of the "holotype…♂" in NMV (Museum of Victoria, Melbourne).

Golding (2006) provided dorsal habitus colour photos (p. 12) of two dead specimens of the "*Themognatha*" species "*T. barbiventris* (Carter, 1916)" next to each other, with photo caption "Pilliga, N.S.W." and measurements "42 & 37mm". He also provided dorsal habitus colour photos (p. 41) of two dead specimens of the "*Themognatha*" species "*T. duponti* (Boisduval, 1835)" [sensu Kerremans (1903)] next to each other, with photo caption "Ghooli, W.A." and measurements 43 & 45 mm. These represent 2 colour forms of this species, a pale unbanded and a different dark banded individual. Finally he provided a colour photo (p. 38) of a living "*T. duponti*" [sensu Kerremans (1903)] with a uniform bronze pronotum, in dorsolateral view while cleaning itself.

Bellamy (2008), in his World Catalogue of Buprestoidea within the genus *Temognatha*, listed "barbiventris" as a valid species without synonyms with "**Distribution**: AUS **Australia** New South Wales" only (p. 1097), and again repeated the synonymy of Kerremans (1903) listing "*stevensii*" and "*tibialis*" under the valid species "duponti", with "**Distribution**: AUS **Australia** South Australia Western Australia" (p. 1100). He also noted type depositories within the unnumbered alphabetical species listings for *T. barbiventris* "**Type**: MVMA", *T. duponti* "**Type**: MNHN", *T. stevensii* "**Type**: MNHN" and *T. tibialis* "**Type**: BMNH".

Taxonomy section

Boisduval's comparison of *Buprestis Duponti* with *B. Grandis* Donovan, 1805 was critical to determining the correct identity of the former species. Both species are now placed in the genus *Temognatha* Solier, 1833.

Firstly *Temognatha grandis* (Donovan, 1805) is diagnosed by the following combination of relevant comparative characters: species size large; TL: 34.5–51.9 mm; TW: 13.6–22.6 mm; elytra/body of species broad with TW/TL: 39.4–43.5%, mean 41.5% (n=30); eyes large, hind margin reaching to prothorax; MIDAV/HW: species: 31.8–40.1%; base of pronotum wider than elytral base; elytral epipleuron with posterio-ventral angulation/hook at metacoxal level; each elytral apex bidentate (teeth moderately well developed) with inner sutural tooth posterior to outer marginal tooth and with wide straight excision between the teeth (see Fig. 7); tarsal claws moderately curved with very slight basal lobe; venter uniformly dark bronze, including sternites.

Another species shares some diagnostic features with *T. grandis*. This is *Temognatha flavocincta* (Gory & Laporte, 1838), which was considered conspecific with the elusive *T. duponti* when Carter (1940) formally only synonymized these two nominal taxa. It is diagnosed by the following combination of relevant comparative characters: species size medium; TL: 26.7–36.4 mm; TW: 11.3–15.3 mm; elytra/body of species broad with TW/TL: 40.3–44.3%, mean 42.5% (n=22); eyes large, hind margin reaching to prothorax; MIDAV/HW: species: 36.1–44.1%; base of pronotum wider than elytral base; elytral epipleuron without posterio-ventral angulation/hook at metacoxal level; each elytral apex bidentate (teeth poorly developed to nearly obsolete) with inner sutural tooth at same level as outer marginal tooth and with narrow arcuate excision between teeth (see Fig. 9); sternite 5 apex truncate in male, widely rounded in female; tarsal claws strongly curved with a strong basal lobe; frons, anterior dorsal surface of pronotum and venter strongly hirsute, covered in long hairlike setae; pronotum blackish with cream/yellow narrow lateral margins; elytral disc uniformly red-brown (or occasionally blackish) with cream/yellow moderately narrow outer margin and epipleuron; venter black-bronze or blackish with sternites 1–4 with cream/yellow lateral margins and with sternite 5 with cream/yellow outer margin (including apex). It differs from *T. grandis* by being a smaller, more hirsute species with slightly wider less elongate elytra/body, with smaller teeth at elytral apex and a shorter arcuate excision between them (see Figs. 9, 7), with strongly curved tarsal claws with a strong basal lobe, and with cream/yellow margins to ventrites. Thus the *T. flavocincta* elytral structural characters do not conform to the primary diagnostic features provided by Boisduval for *T. duponti* in his original description.

A third and final species shares many diagnostic characters with *T. grandis*. This species is *Temognatha barbiventris* (Carter, 1916). It is diagnosed by the following combination of relevant comparative characters: species size large; TL: 35.80–49.42 mm; TW: 13.60–19.80 mm; elytra/body of species moderately slender with TW/TL: species: 36.8–41.5%, mean 39.8% (n=19); MIDAV/HW: species: 33.3–37.3%; base of pronotum wider than elytral base; elytral epipleuron with slight posterio-ventral angulation/hook at metacoxal level; each elytral apex either bidentate (two teeth strongly developed) with inner sutural long tooth posterior to outer marginal long tooth and with wide straight excision between teeth, or more commonly tridentate with an additional very small intermediate tooth between two main teeth (see Fig. 8); tarsal claws moderately curved with very slight basal lobe; pronotum bronze with narrow cream/yellow lateral margins dorsally and ventrally; elytral disc reddish laterally and yellowish medially, with narrow cream/yellow outer margin and epipleuron; venter uniformly bronze including ventrites. It differs from *T. grandis* by being a more slender, elongate species with larger teeth at elytral apex (see Figs. 8, 7), and having a paler more reddish elytral colouration, though it is nearly as large in size. This *T. barbiventris* character combination perfectly matches that provided by Boisduval to diagnose *Buprestis Duponti* in relation to *B. Grandis* (see Figs. 8, 7), particularly relating to elytral structure and relative size (see Fig. 1), and I therefore consider the two nominal species *T. duponti* (Boisduval, 1835) and *T. barbiventris* (Carter, 1916) conspecific.

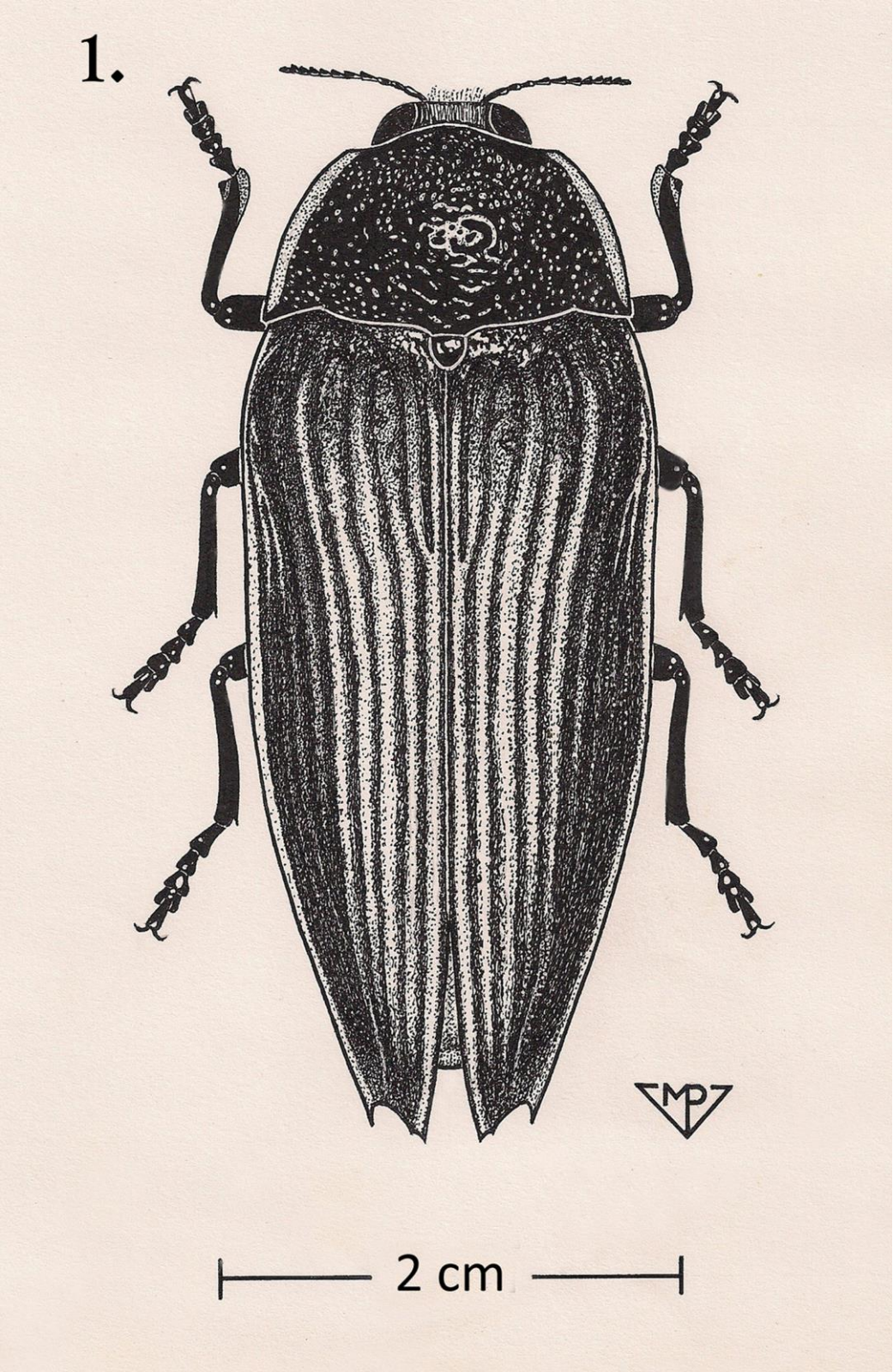


Figure 1. *Temognatha duponti* ♀ dorsal habitus illustration.

Buprestis Duponti was not part of the collections made by the Astrolabe during its visit to Australia, because the species was provided by "M. Dupont" from his private collection. Horn & Kahle (1935: 64) indicate that the Dupont brothers, Richard Henry and his

more enigmatic older brother Emil, disposed of their 'Private Collection' in parts. In 1848 both brothers, who were insect dealers/traders based in Paris, sold off a separated part of their collection to G.V. Mniszech. Some other parts of the collection were also sold separately, sometimes by both brothers and sometimes by a single brother, and these included the beetle families Elateridae, Curculionidae and Tenebrionidae which ultimately went to the Natural History Museum, London and the Zoological University Museum in Turin, Italy. Then, in part, the remaining beetles of their collection were sold on to G.V. Mniszech. The Mniszech collection was later procured by the printer René Oberthür who specialized in 'collecting' Coleoptera, and the latter's collection was eventually acquired by the Museum National d'Histoire Naturelle in Paris and declared a national monument in 1952. Thus the buprestids of the Dupont collection, including any potential type-specimens, are likely to be found in the MNHN. A search of European museums for potential types located two pinned specimens in the MNHN collection, that conform to Boisduval's description and were labelled "Duponti Boisd.". The first pinned specimen was located in "Box 178" of the separately housed Oberthür collection, with a large white handwritten label (submarginally bordered in red) stating "Duponti" and attached to its pin, and is considered the Lectotype of *Buprestis Duponti* Boisduval, 1835. The second pinned specimen, without labels attached to its pin, was located in the main Buprestid collection in its own small box with a box label stating "Duponti", and is a possible (though remote) candidate for being part of the type series of *B. Duponti*.

Equally, the Gehin and Waterhouse comments on the leg structure of "*Themognatha Stewensii*" and "*Stigmodera tibialis*", respectively, and their provided illustrations showing rounded elytral apices, clearly diagnose *T. stevensii* and *T. tibialis* as distinct from *T. duponti* (see Figs. 1, 3, 8, 10). The *T. stevensii* and *T. tibialis* descriptions also indicate in both cases that they were based on at least two syntypes and that no specific type-designations were made. Bellamy (2002; 2008) states that the primary types of *Themognatha stevensii* Gehin are located in the MNHN, and the primary type of *Stigmodera tibialis* Waterhouse is in the BMNH. However, the holotype designations for both *T. stevensii* and *B. duponti* (Bellamy, 2002: 320) are incorrect, based on their original descriptions, indicating that a lectotype ultimately needs to be designated for the former of these nominal taxa (contra Bellamy, 2002).

The problem of the misidentification of the discussed species was initiated when Kerremans (1903) erroneously synonymized *Temognatha stevensii* (Gehin, 1855) and *T. tibialis* (Waterhouse, 1874) under *T. duponti* (Boisduval, 1835), and was further exacerbated when subsequent 20th/21st century authors did not critically examine the original descriptions. Many of these subsequent authors have followed Kerreman's synonymy without question, though Carter (1931; 1940) made a greater but brief effort to examine this issue.

***Temognatha duponti* (Boisduval, 1835)** (Figs. 1, 2, 5, 8, 11)

Buprestis Duponti Boisduval, 1835: 60 – 61. Published type-locality: "Nouvelle-Hollande".
Stigmodera (Themognatha) barbiventris Carter, 1916: 113–114; Plate IX, fig. 7. **[syn. nov.].** Published type-locality: "Victoria: Beechworth".
Buprestis Duponti Boisduval, 1835: 60–61.
Stigmodera Dupontii: Saunders, 1871: 66.
Stigmodera Duponti: Masters, 1871: 132; 1886: 85; Kerremans, 1892: 148.
Stigmodera (*Themognatha*) *duponti*: Carter, 1931: 337.
Stigmodera duponti: Carter, 1940: 387.
Stigmodera (*Themognatha*) *barbiventris* Carter, 1916: 113–114; Plate IX, fig. 7.
Stigmodera (*Themognatha*) *barbiventris*: Carter, 1929: 289; Obenberger, 1934: 686; Gardner, 1988: 163, 164.

Stigmodera barbiventris: Carter, 1933: 150.
Themognatha barbiventris: Gardner, 1990: 316, 357, fig. 64; Burns & Burns, 1992: 9, 28 [Map 85]; Golding, 2006: 12.
Temognatha barbiventris: Bellamy, 2002: 315–316; 2008: 1097.

Type specimens: *Buprestis Duponti*: Lectotype ♀ [here designated] in "Box 178" of the separately housed Oberthür collection in MNHN [Lectotype examined from photos]; *Stigmodera* (*Themognatha*) *barbiventris*: Holotype ♂ in MVMA, Beechworth, VIC, C. French coll. [Holotype examined]; Measurements: TL: 41.3 mm, TW: 16.4 mm.

Specimens examined: 1♂, Calumet, 26ml NE of Binnaway, NSW, June 1933, C.F. Garnsey (AMSA); 1♀, Gulgong, NSW, 10 January 1940, S. Dean (AMSA); 1♂, Dubbo, NSW, Pascoe, 1897, ex W.W. Froggatt coll. (ANIC); 1♀, Coonabarabran, NSW, Nov. 1952 E.T. Smith (ANIC); 1♀, Amiens, QLD, 30 December 1958, A. Gemmell (ANIC); 1♂, Pilliga Scrub, NSW, 28 September 1973, J.C. LeSouef (ANIC); 1♀, 2♂, Pilliga Scrub, NSW, 30°50'S 149°28'E, 6 November 1976, K.R. Pullen (ANIC); 1♀, Burma Rd, Pilliga East State Forest, NSW, 7 November 1976, K.R. Pullen (ANIC); 2♂, Pilliga State Forest, NSW, 2–15 October, 2006, R. DeKeyser (MPCP); 1♀, Cornishtown, VIC, A.W. Cleaves (MVMA); 4♀, Coonabarabran, NSW, E.J. Smith (MVMA); 1♀, Coonabarabran, NSW, November, 1952, E.J. Smith (MVMA); 1♀, Mullallee Creek, 50km NNE of Coonabarabran, NSW, 15 November 1991, R. Mayo (RMCN); 1♀, Inverell, NSW, J.H. Rose (SAMA).

Redescription

Size: TL: 35.80–49.42 mm (n=19); female: 35.80–49.42 mm (n=13); male: 38.04–42.50 mm (n=6). TW: 13.60–19.80 mm (n=19); female: 13.60–19.80 mm (n=13); male: 14.85–17.06 mm (n=6); TW/TL: 36.8–41.5%, mean 39.8% (n=19).

Colouration: head entirely bronze (including frons, clypeus, postmentum); antennae bronze except for red-brown base of antennomere 1; pronotum bronze, with narrow white to yellow lateral margins always present both dorsally and ventrally (of matching extent) that do not quite reach basal margin; scutellum dark bronze-black; elytral colour pattern not variable intraspecifically or intrasexually and not sexually dimorphic: epipleuron entirely white to yellow to apex of outer apical tooth; lateral 1/3 of elytral disc reddish and medial 2/3 of disc yellowish to fawn; basal margin of elytra bronze or reddish; venter uniform bronze in both sexes, except for a tiny yellow sublateral spot near posterior corners of abdominal sternites 1 and 2 in males.

Species: size large with body moderately narrow and elongate, dorsal habitus as in Fig. 1; strongly hirsute with long dense hair-like setae on head (frons, clypeus, postmentum), venter and legs (femora, tibiae) but without setae on dorsal surface of pronotum.

Head (Fig. 2): eyes large with dorsal margin almost reaching to top of head, with inner margins straight, moderately separated and slightly converging dorsally and with hind margin reaching to prothorax; maximum width between outer margins of eyes slightly wider than base of head; MIDAV/HW ratio: species: 33.3–37.3% (n=10); female: 34.5–37.3% (n=4); male: 33.3–35.8% (n=6); MIDAV/HW ratio moderate, moderately sexually dimorphic with values overlapping between sexes; rostrum moderately produced/elongate (15% of head length), moderately wide with muzzle width 56.3% of HW to outer margins of eyes; clypeus with medial moderately deep arcuate, almost triangular, emargination; postmentum (Fig. 5) subhexagonal covered in long setae, maximum width 1.4× maximum length, anterior margin widely indented medially (emarginate).

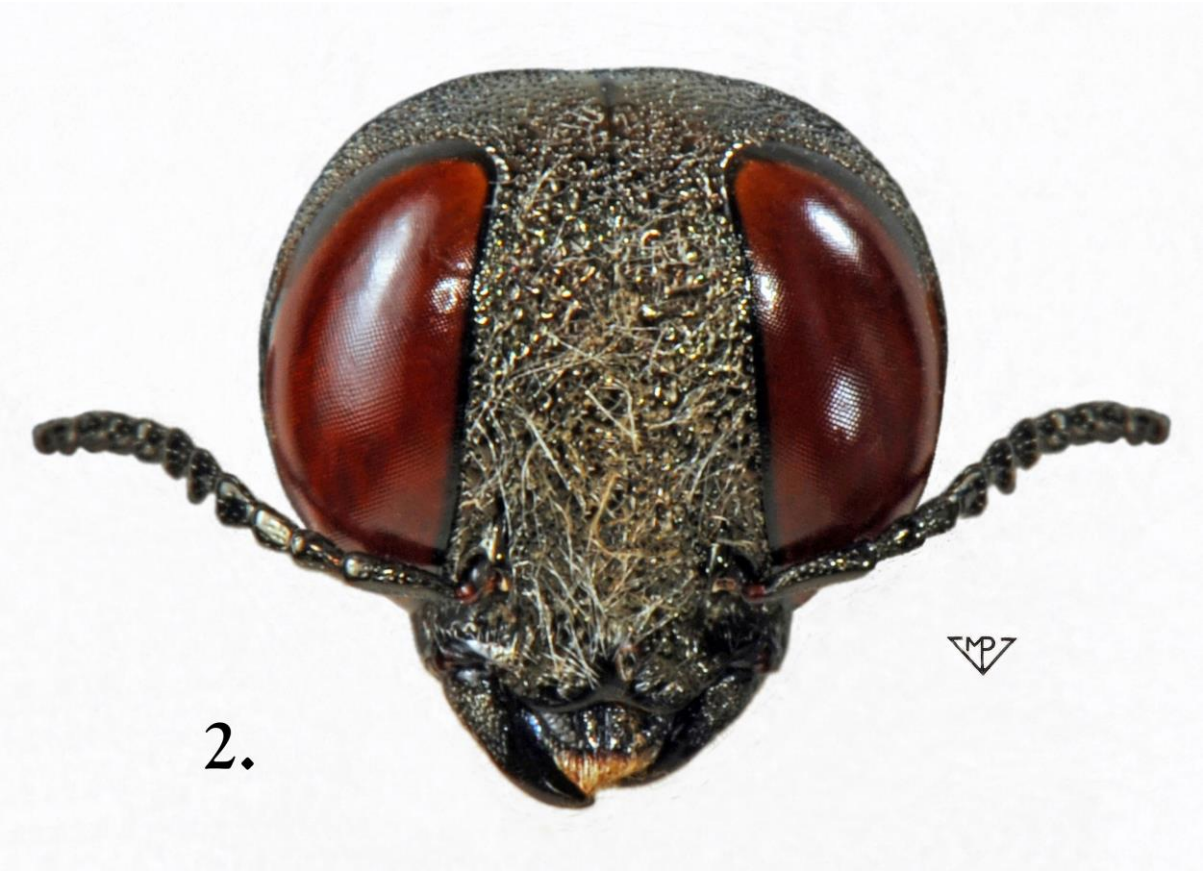


Figure 2. *Temognatha duponti* ♂ head.

Antennae: moderately long, serrate from antennomere 4.

Prothorax: dorsal pronotal sculpture slightly vermiculate, particularly in centre of disc; pronotum moderately broad with lateral margins gradually narrowing from base to apex, widest at base; lateral margins of pronotum not explanate; anterior margin of pronotum strongly and widely produced at middle; base of pronotum wider than elytral base, with small notch on each side opposite anterior projection of elytral base.

Scutellum: moderately small, scutiform (subpentagonal); scutellum width 8–9% of TW.

Elytra: disc punctate-striate, intervals mostly smooth with very few small irregularly scattered puncta and with basal 1/4 of some intervals costate (scutellary interval & intervals 3, 5); scutellary striae 1/4 of elytral length; epipleuron smooth (not serrate) with a moderately narrow humeral section and with a slight posterio-ventral angulation/hook at metacoxal level; in both sexes both elytral apices either tridentate (most commonly) with a long sutural tooth posterior to a long lateral/marginal tooth and with a very small intermediate tooth present (Fig. 8), or strongly bidentate with small intermediate tooth missing; elytral apex extending well caudad of sternite 5 apex.

Venter: abdominal sternite 5 longer in females than males, with apex slightly and widely rounded (almost truncate) in females, moderately widely and very shallowly (almost triangularly) excised in males; male abdominal sternite 7 tan with dark baso-lateral corners.

Legs: all legs simple in structure in both sexes, with all tibiae cylindrical and without dorsoventral flattening or lateral dilation; tibiae relatively straight; hindleg basal tarsomere

1.3x length of next hindleg tarsomere; underside of all tarsites on all legs with well developed pulvilli present; tarsal claws moderately curved with a very slight basal lobe.

Genitalia: female with 7 ovarioles/ovary; male with 85–91 tubules/testis; aedeagus as in Fig. 11.

Genetics: diploid number 2n = 22; Xy_p sex-determining mechanism; karyotype with 10 metacentric autosomes, with small acrocentric X chromosome relative to autosomes, with autosome 1 length 15% of total chromosome length and with nucleolar organizer region not discernable (Gardner, 1988: 164).

Distribution: This is a moderately wide-ranging species confined to the inland parts of south-east mainland Australia (Victoria, New South Wales, Queensland); it is currently known to occur from as far north as Amiens (28°35'S, 151°48'E) in the granite belt of south-east Queensland, southwards through Inverell (29°46'S, 151°07'E), Coonabarabran (31°16'S, 149°17'E), Dubbo (32°15'S, 148°37'E) and Gulgong (32°22'S, 149°32'E) along the western slopes and adjacent tablelands of the Great Dividing Range in New South Wales, to as far south as Beechworth (36°22'S, 146°42'E) in north-east Victoria.

Biology: Adult flight season based on all available specimen records is mid spring to early summer, from 28 September to 10 January, with the majority of records in October/November; known adult foodplants are flowers of Myrtaceae: *Leptospermum* spp. and *Eucalyptus* spp.; larval hostplants are unknown; this species is primarily known to occur in tall open *Eucalyptus* woodlands over clay or sandy soils; no biological information for *T. duponti* has been previously published, and Carter (1933: 150) specifically noted he "failed to find the rare *S. barbiventris*" in November 1930 while collecting beetles on "the local tea-tree" ("*Leptospermum* (*flavescens*)") on Garrawilla Station (22 miles east of Coonabarabran, near Mullaley), New South Wales.

Etymology: The species name *duponti* is a nominative patronym, and is named after the French natural history trader/coleopterist Richard Henry DUPONT (1798–1873).

Remarks: In this species there is very little intraspecific morphological or colour pattern variation present among individuals and no discernible regional level variation that would suggest subspecific differentiation, based on the relatively small number of examined specimens; I consider *Temognatha duponti* to be most closely related to the structurally similar *T. grandis* (Donovan, 1805), and slightly more distantly to *T. flavocincta* (Gory & Laporte, 1838), of the described species included in the genus; extensive agricultural practices have had a large impact on the available amount of natural habitats that *T. duponti* occupies on the western slopes of the Great Dividing Range, reducing their area to the point where some local populations of this species are now likely to be extinct particularly in the southern half of its known distribution between Dubbo and Beechworth; fortunately this species appears to still be moderately abundant regionally in the Pilliga State Forest and nearby Coonabarabran district of northern New South Wales, but recent records from elsewhere across its range are scarce or absent.

***Temognatha stevensii* (Gehin, 1855). [revalidated name]** (Figs. 3, 4, 6, 10, 12)

Themognatha Stewensii Gehin, 1855: 58 – 60. [unavailable name, ICZN: Article 33.3]. Published type-locality: none provided.

Themognatha stevensii Gehin, 1855: 58 – 60. [name in prevailing usage deemed to be a correct original spelling, ICZN: Article 33.3.1]
Stigmodera tibialis Waterhouse, 1874: 540. [synonym]. Published type-locality: "S.[outh] Australia".
Themognatha Stewensii Gehin, 1855: 58–60.
Themognatha Stevensii: Lacordaire, 1857: 60.
Stigmodera Stevensi: Gem. & Har., 1869: 1403; Masters, 1871: 139; 1886: 96; Blackburn, 1891: 137; Kerremans, 1892: 157; 1903: 204.
Stigmodera Stevensii: Saunders, 1871: 66.
Stigmodera Stephensi (sic): Tepper, 1888: 25.
Stigmodera stevensi: Heyne & Taschenberg, 1908: 141, 142.
Stigmodera (*Themognatha*) *stevensi*: Carter, 1929: 290; 1931: 337.
Stigmodera (*Themognatha*) *Stevensi*: Carter, 1931: 337.
Temognatha stevensii: Bellamy, 2002: 320; 2008: 1100.
Stigmodera tibialis Waterhouse, 1874: 540.
Stigmodera tibialis: Waterhouse, 1882: plate 111; Kerremans, 1885: 142; Masters, 1886: 97; Tepper, 1888: 25; Blackburn, 1891: 137; Kerremans, 1892: 158; 1903: 204; Froggatt, 1907: 164; Heyne & Taschenberg, 1908: 141, 142; Lea, 1917: 576.
Stigmodera (*Themognatha*) *tibialis*: Carter, 1929: 291; Barker & Inns, 1976: 147 – 148; Hawkeswood, 1982: 30, 31, 36; Hawkeswood & Knowles, 1985: 205; Carnaby, 1987: 20.
Themnognatha tibialis: Slater & Lindgren, 1955: 18.
Themognatha tibialis: Gardner, 1990: 321, 358, figs. 77 & 78.
Temognatha tibialis: Bellamy, 2002: 320; 2008: 1100; Hawkeswood & Peterson, 2004: 6 – 7; Bellamy *et al.* 2013: 22.
Stigmodera gigas (in error for *S. tibialis*): Tepper, 1887: 17. [nomen nudum, lapsus for *S. grandis*]
Stigmodera grandis (in error for *S. tibialis*): Tepper, 1887: 17.
Stigmodera Duponti: Kerremans, 1903: 204; Janáček, 1915: 99.
Stigmodera (*Themognatha*) *duponti* [sensu Kerremans]: Carter, 1929: 290; Carnaby, 1987: 13.
Stigmodera (*Themognatha*) *Duponti* [sensu Kerremans]: Obenberger, 1934: 701.
Temognatha duponti [sensu Kerremans]: Bellamy, 2002: 320; 2008: 1100; Bellamy *et al.* 2013: 22.
Themognatha duponti [sensu Kerremans]: Golding, 2006: 38, 41.

Type specimens: *Themognatha Stevensii*: location of syntypes unknown, but possibly MNHN [not examined]; *Stigmodera tibialis*: Lectotype [here designated] in BMNH [Lectotype figured in Waterhouse, 1882: plate 111].

Specimens examined: 1♂, Fowlers Bay, SA (ANIC); 1 indet. sex, 68km N of Cue, WA (Lake Annean, found dead), 15 October 1997, M. Golding/K. Kershaw/M. Powell (MPCP); 1♀, 1♂, 82.3km NE of Wubin, WA, 17 January 1988, M. Peterson (MPWA); 1♀, 12.8km E of Diemals H.S., WA, 18 January 1988, M. Peterson (MPWA); 1♀, Eucla, WA (MVMA); 1♂, Hummock, Yorke Peninsula, SA, 1878, J.G.O. Tepper (SAMA); 1♂, Ardrossan, SA, February 1880, J.G.O. Tepper (SAMA); 1♂, Eyre Telegraph Post, WA, 4 September 1889, W. Graham (SAMA); 2♂, Streaky Bay, SA, 1 March 1895, Roberts (SAMA); 1♀, Tarcoola, SA, 9 May 1901, E.A. King (SAMA); 1♂, Ooldea, SA, 6 October 1903, R.T. Maurice (SAMA); 1♂, Port Lincoln, SA (SAMA); 3♂, 10ml E of Kimba, SA, 24 February 1969, A. Aitken (SAMA); 1♂, Gingin, WA, L.J. Newman (WADA); 2♀, 1♂, Zanthus, WA, January, Mann (WADA); 1♀, Stirling Range, WA, 26 January 1971, K. & E. Carnaby (WADA); 2♀, 1♂, Kundip,WA, October 1936, J. Reeves (WADA); 1♀, 1♂, Israelite Bay, WA (WAMP); 1♀, Mundrabilla, WA, 25 February 1964, J. Wright (WAMP); 1♀, 1♂, Kalgoorlie, WA (WAMP).

Redescription

Size: TL: 35.40–51.54 mm (n=24); female: 43.46–51.54 mm (n=11); male: 35.40–48.10 mm (n=13). TW: 14.62–21.66 mm (n=24); female: 17.56–21.66 mm (n=11); male: 14.62–18.40 mm (n=13); TW/TL: 38.3–43.1%, mean 41.0% (n=24).

Colouration: head (including frons, clypeus, postmentum) and legs uniformly dark bronze; antennae uniform dark bronze except for base of antennomere 1 which is testaceous red-brown; pronotum dark bronze with or without narrow yellow sub-lateral margins dorsally and ventrally (dorsal and ventral extent does not always match in individuals when yellow margins are present) of variable length in both sexes; elytral colour pattern highly variable intraspecifically and intrasexually (to similar extent), but not sexually dimorphic: epipleuron yellowish; elytral disc entirely red-brown or red-brown with 2–4 narrow yellow transverse fasciae often broken into series of transversely aligned spots or with three broad transverse fascia with median fascia yellow or substantially yellow with variably sized diffuse reddish spots or entirely yellow; basal margin of elytra dark bronze; venter uniformly dark bronze anterior to abdominal sternites in both sexes, except for occasional individuals with additional small matt yellow markings on inflexed sub-margins of pronotum; male abdominal sternites variable in colouration, from substantially bronze with occasional matt yellow markings to almost uniformly matt yellow with very small bronze markings; female abdominal sternites mostly bronze with occasional matt yellow markings on apical sternites, and generally darker than males at the extremes of variation.

Species: size large with body broad and robustly built, dorsal habitus as in Fig. 3.; moderately hirsute with short dense fine hair-like setae on head (frons, clypeus, postmentum), venter and legs (femora, tibiae) but without setae on dorsal surface of pronotum, males ventrally more densely setose than females.

Head (Fig. 4): eyes small (particularly in females), with dorsal margin relatively distant from top of head, with inner margins straight, widely separated and very slightly converging dorsally and with hind margin relatively distant from prothorax; maximum width between outer margins of eyes less than width of base of head; MIDAV/HW ratio: species: 40.8–48.2% (n=14); female: 44.7–48.2% (n=7); male: 40.8–44.7% (n=7); MIDAV/HW ratio high, strongly sexually dimorphic with values not overlapping between sexes; rostrum moderately produced/elongate (14% of head length), very wide with muzzle width 67.4% of HW to outer margins of eyes; clypeus with deep medial arcuate, almost triangular, emargination; postmentum (Fig. 6) very wide, relatively narrow and subrectangular without long setae, maximum width 2.25× maximum length, anterior margin forming straight line.

Antennae: relatively short, serrate from antennomere 4.

Prothorax: pronotal sculpture strongly punctate; pronotum very broad, widest at 1/3 of length from base, with lateral margins widely rounded from base to apex; lateral margins of pronotum narrowly explanate; anterior margin of pronotum strongly and widely produced at middle; base of pronotum same width as elytral base, with strong notch on each side opposite anterior projection of elytral base.

Scutellum: small, scutiform; scutellum width 5–7% of TW.

Elytra: disc punctate-striate, scutellary striae 1/4 to 1/3 of elytral length; alternating intervals (intervals 2, 4, 6, 8 in females; intervals 4, 6, 8 in males) regularly punctate along length with other intervals not punctate along length and with intervals slightly raised for much of length, but not costate; epipleuron smooth (not serrate) with a moderately narrow humeral section and without posterio-ventral angulation/hook at metacoxal level; in both sexes both elytral apices rounded without sutural or marginal teeth and with sutural apex anterior to elytral apex (see Figs. 3, 10); elytral apex reaching to same level as sternite 5 apex, not overhanging.

Venter: abdominal sternite 5 longer in females than males, with apex widely truncate in females, widely and strongly arcuately excised in males; male abdominal sternite 7 testaceous yellow with narrow dark apical border.

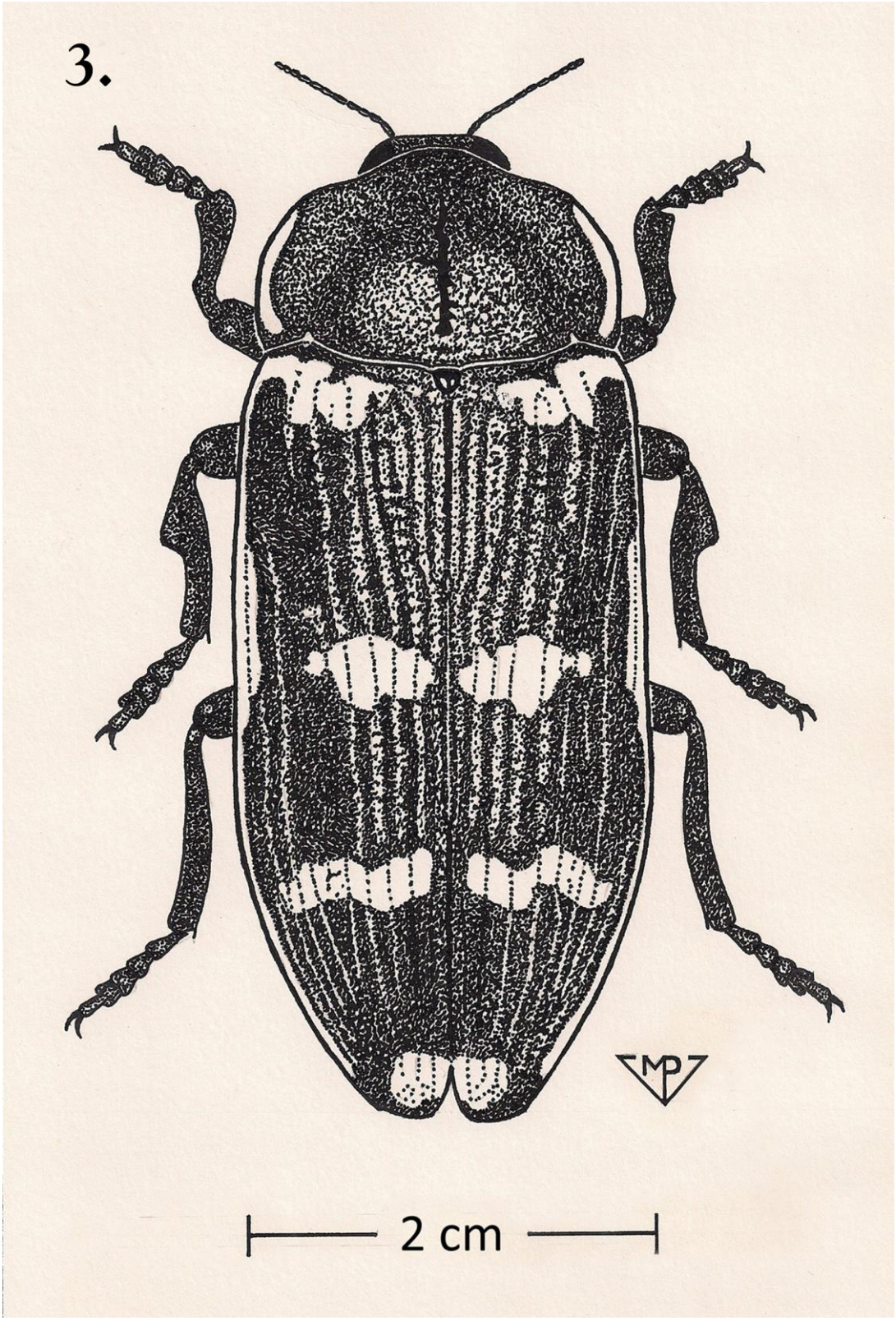


Figure 3. *Temognatha stevensii* ♀ dorsal habitus illustration of a typical form.

Legs: all legs modified in structure in both sexes, with all femora and tibiae dorsoventrally flattened, and with fore- and mid-tibiae with outer margin expanded and

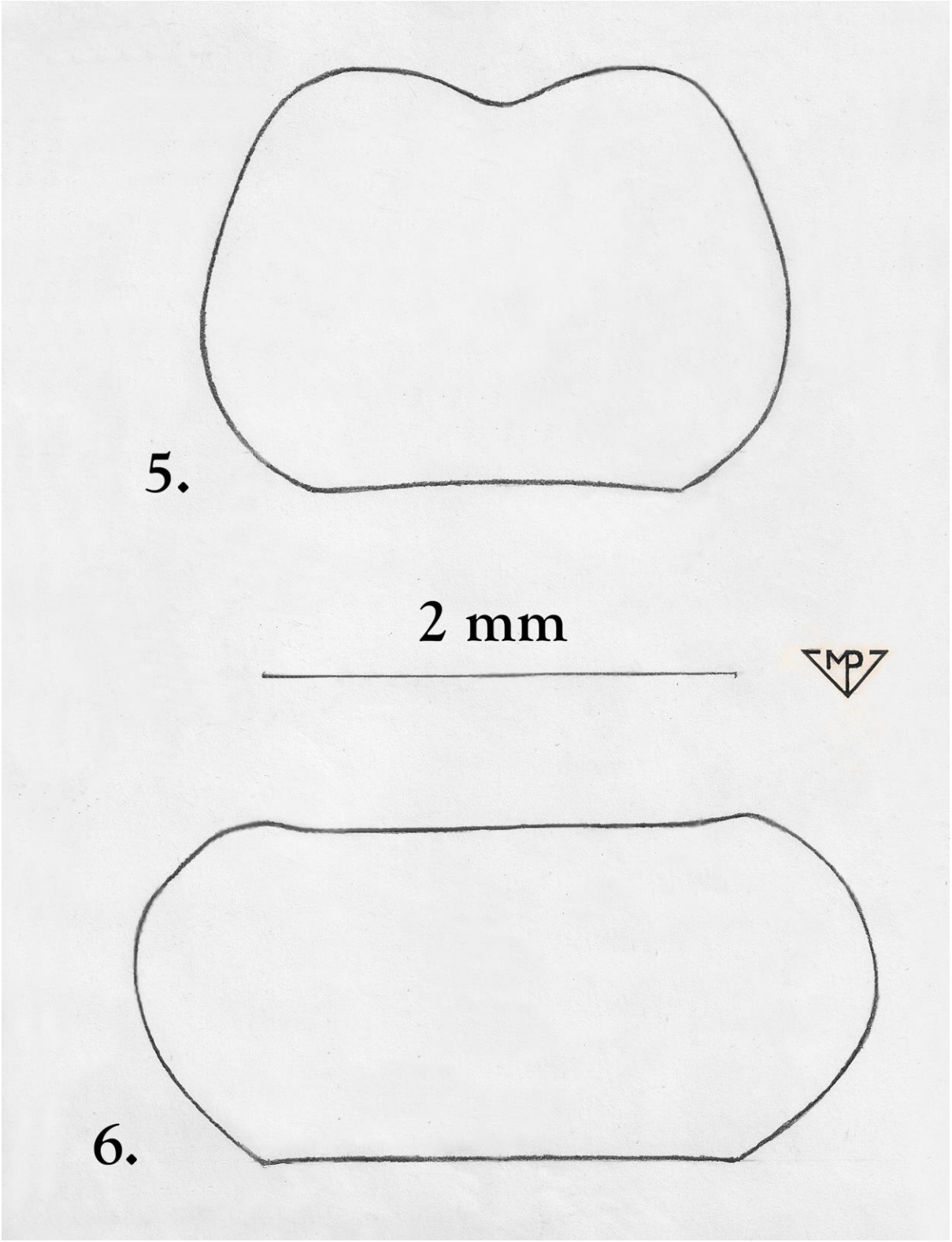
explanate (dilated) laterally; mid-tibiae with a further large expanded triangular dilation forming a spur from base to near midpoint on outer margin of tibia, and with widest part of triangle near midpoint with a consequent sharp angulation posteriorly; tibiae otherwise relatively straight or slightly curved outwards; hindleg basal tarsomere 1.4x length of next hindleg tarsomere; underside of all tarsites on all legs with well developed pulvilli present; tarsal claws strongly curved with strong basal lobe.

Genitalia: female with 7 ovarioles/ovary; male with 61–80 tubules/testis, aedeagus as in Fig. 12.

Figure 4. *Temognatha stevensii* ♀ head.

Distribution: This is a wide-ranging species confined to the western half of southern mainland Australia (Western Australia, South Australia); in Western Australia its current known main distribution is from Gingin (31°21'S, 115°54'E) in the far west, north-east to the Wubin area (29°34'S, 117°09'E), and south to the Stirling Range (34°23'S, 117°50'E), then eastwards across the Nullarbor Plain and adjacent coast as far north as the southern margin of the Great Victoria Desert and into South Australia, but it appears to be absent from the more mesic forest belt of the far south-west corner of the state; *T. stevensii* is mostly distributed east of the Darling Range on the drier plains of the wheat-belt and Goldfields of southern Western Australia, with an apparently isolated population occurring around the margins of Lake Annean (26°55'S, 118°15'E), a salt/playa-lake in the far north; in South Australia this species is currently known from as far north as Ooldea (30°27'S, 131°50'E) and Tarcoola

(30°43’S, 134°34’E) in the southern Great Victoria Desert, southwards throughout the Eyre Peninsula to Port Lincoln (34°44’S, 135°52’E), and as far east as the Hummock (34°02’S, 138°05’E) and Ardrossan (34°26’S, 137°55’E) at the base of the Yorke Peninsula.



Figures 5–6. *Temognatha* postmentum outline illustrations. **5,** *T. duponti*; **6,** *T. stevensii*.

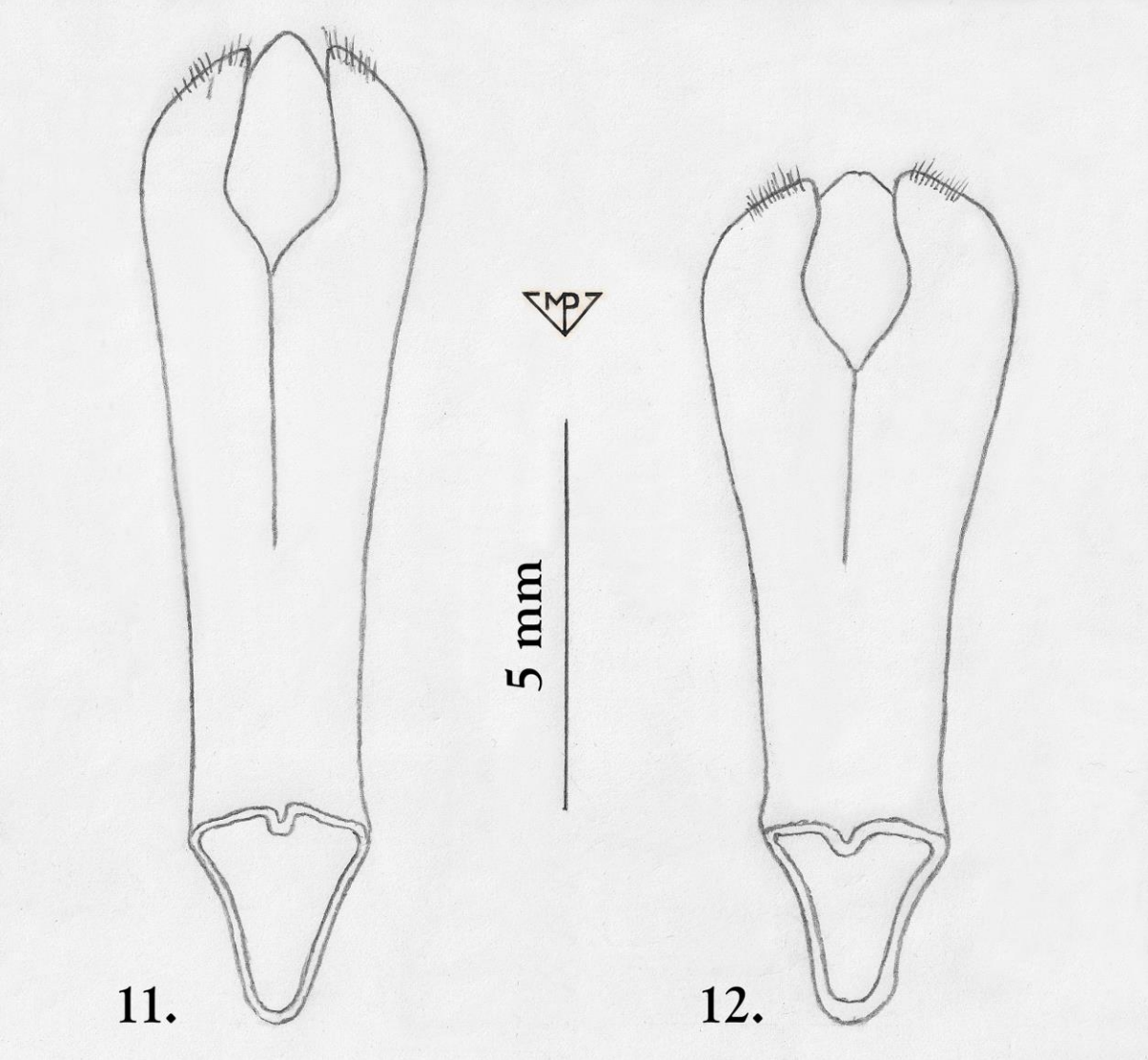
Biology: Adult flight season based on all available specimen records is mid summer to early autumn, from 10 January to 28 March, with most records in February; known adult foodplants are flowers of Myrtaceae: *Eucalyptus* spp. and *Melaleuca* spp. (*M. lanceolata* & *M. pauperiflora*, Peterson pers. obs.); larval hostplants are unknown; this species is primarily known to occur in mallee (stunted *Eucalyptus* spp.) over sandy heath, and from slightly taller open *Eucalyptus* woodlands over *Melaeuca* on clay soils; Tepper (1887: 17) recorded '*Stigmodera tibialis*' (as "*S. gigas*" and "*S. grandis*") feeding on the flowers of the whipstick mallee *Eucalyptus uncinata* at Ardrossan during February 1878 and 1880; Slater & Lindgren (1955: 10, 17–18) recorded "*Themnognatha tibialis* Waterh." from Queen Victoria Spring in Western Australia and noted it had "many colour and pattern varieties" and that it and 12 other *Temognatha* species and one *Calotemognatha* Peterson species were "feeding on the flowering *Eucalyptus uncinata*" during the period 18–26 January, 1955; Barker & Inns (1976: 147–148) noted the predation of "*Stigmodera tibialis*" by the giant robberfly *Phellus pilifera* (Asilidae); Hawkeswood (1982: 30) recorded *Stigmodera* (*Themognatha*) *tibialis* from the flowers of five plants of *Eucalyptus cylindriflora* at ca. "16 km E of 90 mile water tanks" in Western Australia, provided black & white photos (Figs. 3, 6) of two live colour forms of this species (p. 31) though Fig. 6 was incorrectly labelled as *Stigmodera* (*Themognatha*) *heros*, and briefly commented on some of the previously published distribution and biology of *tibialis* (p.36); Hawkeswood & Knowles (1985) noted possible predation of *Stigmodera* (*Themognatha*) *tibialis* by adult Australian Magpies near Hyden in Western Australia on 19 February 1978; Carnaby (1987: 13) provided colour photos of three different dead specimens of "Stigmodera Themognatha duponti", all with yellow pronotal submargins, red elytra with varying yellow fascia and tibial spurs, and noted it "is common in the Southern areas of Mallee in February". Carnaby (1987: 20) also provided colour photos of two live individuals of "Stigmodera Themognatha tibialis", one with yellow pronotal submargins and elytra and one with red elytra and yellow fascia and a completely bronze pronotum and both with tibial spurs, and noted it "is very common in all the north and eastern Mallee area in January and February, a very strong powerful beetle"; Hawkeswood & Peterson (2004: 6–7) recorded imagines of "*Temognatha tibialis* (Waterhouse)" from non-flowering (near Lake Magenta) and flowering (20km east of East Hyden; 5km west of Forrestania) *Eucalyptus foecunda* in Western Australia during the period 16–17 February, 1980; Bellamy *et al.* (2013: 22) noted some of these biological references under *Temognatha duponti* [sensu Kerremans (1903)], but incorrectly cited Froggatt (1907) under this species as this paper does not refer to any biological observations that are specific to this nominal taxon (as *S. tibialis*).

Etymology: The species name *stevensii* is a genitive patronym, and is named after the London-based natural history trader Samuel STEVENS (1817–1899).

Remarks: In this species there is a large amount of intraspecific colour pattern variation, but very little morphological variation, present among individuals and no discernible regional level variation that would suggest subspecific differentiation, based on a large number of examined specimens; the synonymy of *tibialis* under *stevensii*, without reference to *duponti*, was first hinted at by Blackburn (1891) but was never formalized as a separate event, thus the first time *tibialis* and *stevensii* were formally synonymized was under *duponti* by Kerremans (1903); I consider *T. stevensii* to be most similar, and probably most closely allied, to *T. heros* (Gehin, 1855) based on their general appearance, similar MIDAV/HW ratios, similar elytral punctation and rugosity, ventral colouration and large size; *Temognatha stevensii* can be very abundant across the more arid parts of its range beyond the farmed areas of Western

Figures 7–10. *Temognatha* elytral apices. **7,** *T. grandis*; **8,** *T. duponti*; **9,** *T. flavocincta*; **10,** *T. stevensii*.

Australia and South Australia, and thus the species appears to currently not be under threat by farming practices though the latter has caused some localized population declines in wheatbelt areas; it also appears that the Flinders Range system and its botanical communities were and are a barrier to the dispersal of this species eastwards into south-east South Australia, Victoria and New South Wales.



Figures 11–12. *Temognatha* male genitalia illustrations. **11,** *T. duponti* aedeagus, dorsal; **12,** *T. stevensii* aedeagus, dorsal.

Species-group definition

Temognatha, as currently construed, is a morphologically diverse genus containing a number of distinct species-groups. A complete analysis of the relationships of all species included in this genus is beyond the scope of this paper. However, following on from the creation of informal *Temognatha* species-groups by Peterson (1982; 1989; 1991; 1996) and Gardner (1990), and my previous comments on *T. duponti*, I hereby group *T. grandis* (Donovan, 1805), *T. duponti* (Boisduval, 1835), *T. flavocincta* (Gory & Laporte, 1838), *T.*

fusca (Saunders, 1871) and *T. pubicollis* (Waterhouse, 1874) and designate these five species as the informal *T. grandis* species-group. The *T. grandis* species-group is diagnosed by the following character combination: eyes large, hind margins reaching to prothorax; MIDAV/HW: 31.8–48.2%; base of pronotum wider than elytral base; short basal hind tarsal segment, 1.2–1.5× longer than next hind tarsal segment; frons, venter and legs (femora and tibiae) strongly hirsute (including dorsum of pronotum in 3 of 5 species), with most species and individuals covered in long hair-like setae that are easily abraded; colour patterns/schemes similar interspecifically and relatively uniform intraspecifically and within their sexes, but not sexually dimorphic; pronotum with narrow whitish to yellowish lateral margins, elytral colour scheme comprised of a pale epipleural/lateral almost cinctate border with a darker elytral disc, with outer pale margins of slightly variable width but narrower than darker elytral disc colouration. They appear to form a natural complex, with the included species being possibly derived in some characters (e.g. pronotal base wider than elytral base), but this will be most likely confirmed with further morphological study/analysis and support from genetics data. Distributions of the species-pair *T. grandis* - *T. duponti* are restricted to south-east mainland Australia, and they are morphologically divergent from the remaining *T. grandis* group species by possessing humeral epipleuron with ventral angulation at metacoxal level, well developed elytral apex teeth with sutural tooth posterior to marginal tooth, large size and lack of hair-like setae on dorsum of pronotum. The species-pair *T. fusca* - *T. pubicollis* are even more hirsute than the other species of the *T. grandis* group and possess long dense setae on dorsum of pronotum, humeral epipleuron without ventral angulation at metacoxal level and elytral apices roundly tapered to a single sutural apex caudally, without sutural or marginal teeth. *Temognatha flavocincta* is somewhat intermediate between the two species-pairs. *Temognatha flavocincta* and *T. fusca* are distributed across southern Australia, occurring from south-west Western Australia in the west through southern South Australia (including Kangaroo Island for *T. fusca*) to as far east as north-west Victoria, with *T. pubicollis* similarly distributed but additionally occurring further north in the Great Victoria Desert and southern Great Sandy Desert of Western Australia and in the MacDonnell Ranges of the Northern Territory.

Despite *T. stevensii* sharing some similarities with *T. heros*, the unusual flattened and dilated tibial structure of *T. stevensii* is a departure from any stigmoderine or other buprestid species, and its function at this time is unknown. Additionally the *T. stevensii* head structure is distinctive within the genus, with the dorsal margin of its small eyes relatively distant from top of head, with their hind-margins not reaching prothorax, with head width across eyes not as great as total head width, very broad rostrum/muzzle and with the relatively widest and narrowest postmentum in the genus, and I treat *T. stevensii* as the sole member of the *T. stevensii* species-group. The *T. stevensii* species-group is further diagnosed by the following character combination: size large; colour patterns/schemes highly variable intraspecifically and intrasexually, but not sexually dimorphic; pronotum with or without narrow yellowish sub-lateral margins; narrow humeral epipleuron without angulation at metacoxal level.

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