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The Orb-Weaving Spider Genus *Larinia* in Australia (Araneae: Araneidae)

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> Abstract

Despite some dispute on the validity of the genera in the "*Larinia*-group" (as defined by Grasshoff in 1970), *Larinia* Simon, 1874 and *Lipocrea* Thorell, 1878 have been maintained as separate genera. Our review does not allow sustaining a separation of these two genera in Australia taking into account morphological variability within and between the species. We accept a commonly employed broader concept of *Larinia* and recognise five Australian species. *Larinia montagui* Hogg, 1914 (revalidated) is the most common representative of the genus in Australia, with records from all mainland states and many offshore islands. *Larinia phthisica* (L. Koch, 1871) and *L. tabida* (L. Koch, 1872) occur sympatrically along the coast in the northern two thirds of Australia, with *L. phthisica* also being present in South Australia. *Larinia jamberoo* sp. nov. has been reported from New South Wales, South Australia and Victoria. The synonymy of *Larinia delicata* Rainbow, 1920, currently only known from Lord Howe Island, with *Lipocrea diluta* Thorell, 1887 is disputed and the species revalidated.

> Key words

Systematics, taxonomy, new species, *Larinopa*, *Larinia*-group, Mangorini.

1. Introduction

The orb-weaving spider genus *Larinia* Simon, 1874 currently includes 52 species world-wide (PLATNICK 2008). Members of this genus can be found on almost all continents, except Antarctica, with more than ten species known each from Africa (e.g. GRASSHOFF 1970a; LEVY 1986; PLATNICK 2008), the Americas (LEVI 1975; HARROD et al. 1991) and the Palaearctic, including China (YIN 1994; YIN et al. 1997; PLATNICK 2008) and Japan (TANIKAWA 1989). Seven species are known from the Indian subcontinent (e.g. TIKADER 1982; GAJBE 2004), but only two species are currently recognised from south-east Asia (*Larinia parangmata* Barrion & Litsinger, 1995) and Australia (*Larinia phthisica* L. Koch, 1871).

The generic concepts of *Larinia* and related taxa have been controversial since their first major systematic revision (GRASSHOFF 1970a,b, 1971a,b). GRASSHOFF (1970a) recognised three groups within the tribe Mangorini Simon, 1895, of which his "*Larinia* group" included eight genera: *Larinia*, *Drexelia* McCook, 1892, *Lipocrea* Thorell, 1878, *Siwa* Grasshoff, 1970, *Paralarinia* Grasshoff, 1970, *Faradja* Grasshoff, 1970, *Mahembea* Grasshoff, 1970 and the monotypic *Lariniaria* Grasshoff, 1970.

In a study of North American orb-weaving spiders LEVI (1975) disputed the validity of the genera recognised by GRASSHOFF (1970a) and retained *Larinia* for all species revised, although he conceded that (page

102) "Perhaps it is the broader aspect of the study […] that makes me uneasy about using the small genera in Grasshoff's […] excellent studies, even though each is a natural grouping of closely related species." LEVI's (1975) broader concept of *Larinia* had nomenclatural consequences for *Drexelia* only, as he placed the type species of this genus, *Epeira directa* Hentz, 1847 into *Larinia*. LEVI's (1975) concept of *Larinia* was followed by MARUSIK (1986), TANIKAWA (1989), HARROD et al. (1991) and YIN et al. (1997). In contrast, LEVY (1986) applied the genera of Grasshoff, stating that (page 1) "reverting to the cumulative genus *Larinia* would imply abandoning the fine discrimination attained thus far. Maintaining, though with a margin of doubt, the numerous genera of Grasshoff, leads to the placement in a different genus of each member of this group in Israel. […] Of the genera concerned herein, apparently *Larinia*, *Lipocrea* and *Drexelia* form a tight, closely related group, while *Siwa* might be considered as being a little apart." Although most authors prefer a wider definition of *Larinia*, sometimes mainly for "operational reasons" (HARROD et al. 1991), all of Grasshoff's genera, except *Drexelia*, are considered valid (PLATNICK 2008). It is clear that only a detailed phylogenetic analysis of all species and sexes within the *Larinia*-group will provide synapomorphies for all genera and thereby answers to the confusion within this group and show if Grasshoff's genera can be maintained.

There is also ample confusion within *Larinia* and allied genera in Australia. Four species of the *Larinia*-group have been reported from Australia, *Larinia phthisica* (L. Koch, 1871), *Lipocrea tabida* (L. Koch, 1872), *Larinia montagui* Hogg, 1914 (currently listed as junior synonym of *Lariniaria argiopiformis* (Bösenberg & Strand, 1906)), and *Larinia delicata* Rainbow, 1920 (currently a junior synonym of *Lipocrea diluta* (Thorell, 1887)). DAVIES (1988: p. 31, plate 29) illustrated *L. tabida* as part of a key to Australian orb-weaving spiders; however, a comparison of her illustrations with those of GRASSHOFF (1970a: figs. 12–13, p. 229) strongly suggest that DAVIES (1988) misidentified this species. Examination of type material showed that the species she illustrated is *Larinia montagui* Hogg, 1914, which we consider a valid species. Likewise, our examination of the type material of *L. delicata* showed that this species is not conspecific with *L. diluta* necessitating a revalidation of this species here. However, its inclusion in *Larinia* must be considered tentative due to considerable somatic and genitalic differences to all other species treated here.

The aim of this study is to taxonomically revise the five Australian species of *Larinia*, including a new species, *L. jamberoo* sp. nov., and provide a key for their identification. Lacking a proper phylogenetic framework for the *Larinia*-group, we apply a broader concept for the generic limitations of *Larinia* in Australia.

2. Methods

This review is based on an exhaustive examination of most Australian museum collections as well as type material or relevant species deposited overseas. Descriptions are based on specimens preserved in 70% ethanol. *Larinia* generally display bright green colours when alive, however these fade to yellow or yellow-brown after storage in 70% ethanol.

Female epigynes were prepared for examination by submersion in 10% KOH for ca. 2 h. For clarity, the illustrations of male pedipalps and female epigynes omit the setae. The description of the views of the male pedipalp relate to their position as a limb, i.e. a full view of the bulb is a retrolateral view as in Araneidae the cymbium is situated mesal. The length of eye rows is measured as their maximum width, i.e. including the diameter of the eyes. The length of leg segments is given in the following order: femur + patella/tibia + metatarsus + tarsus = total length. All measurements in the descriptions are in [mm].

The morphological nomenclature generally follows GRASSHOFF (1970a); however we distinguish between the epigynal scape and a median septum. A scape is an elongated process originating at the anterior margin of the epigyne and connected to the epigyne only at this point. In contrast, a median septum is a central structure raised from the epigyne that is connected to the epigyne over its whole length.

Images were taken with a Leica DFC500 digital camera that was attached to a Leica MZ16A stereo microscope. Photographs were taken in different focal planes (ca. 10–20 images) and combined with the Leica Application Suite version 2.5.0R1.

Species are listed in alphabetical order in the taxonomic part of this study, with the exception of *L. delicata* that shows considerable somatic differences to all other *Larinia* treated here and is therefore redescribed last.

3. Abbreviations

Morphology

ALE, AME	anterior lateral / median eyes
PE	posterior eyes
CL, CW	cephalothorax length and width
PLE, PME	posterior lateral / median eyes
TL	total length

Collections

AM	Australian Museum, Sydney (Australia)
BMNH	Natural History Museum, London (United Kingdom)
NMV	Museum Victoria, Melbourne (Australia)
QM	Queensland Museum, Brisbane (Australia)
SAM	South Australian Museum, Adelaide (Australia)
WAM	Western Australian Museum, Perth (Australia)
ZMB	Museum für Naturkunde, Zentralinstitut der Humboldt-Universität, Berlin (Germany)
ZMH	Zoologisches Institut und Zoologisches Museum, Universität Hamburg (Germany)
ZMUC	Zoological Museum, University of Copenhagen (Denmark)

4. Taxonomy

4.1. Key to the species of *Larinia* of Australia

1 Carapace much higher in thoracic region than in cephalic region, with deep longitudinal fovea (Fig. 50) ..... ***L. delicata***
- Carapace of equal height over its whole length (Figs. 27, 42) **2**

2 Males **3**
- Females **6**

3 Femur IV of males without basoventral spines (Fig. 24); median apophysis with two neighbouring, apically directed spines (Fig. 29) ..... ***L. phthisica***
- Femur IV of males with two (rarely one or three) basoventral spines (Figs. 2, 13, 37) **4**

4 Median apophysis almost rectangular in ventral view (Fig. 17), without apical hook or keel ..... ***L. montagui***
- Median apophysis of variable shape, with apical keel (Fig. 6) or apically directed hook-shaped process (Fig. 41) **5**

5 Median apophysis with keel (Fig. 6) ..... ***L. jamberoo* sp. nov.**
- Median apophysis with apically directed hook-shaped process (Fig. 41) ..... ***L. tabida***

6 Epigyne with scape (i.e. only connected to epigyne anteriorly) (Figs. 30, 43), which is almost always broken off (e.g. Fig. 32) **7**
- Epigyne with median septum (i.e. central structure that is connected to epigyne over its whole length), never broken off (Figs. 7, 18) **8**

7 Rim of epigyne distinct almost all around and comparatively narrow (Fig. 43); outline of scape (if present) drop-shaped (Fig. 43) ..... ***L. tabida***
- Rim of epigyne distinct mainly along posterior margin and comparatively wide (Figs. 30, 32); scape (if present) with almost parallel lateral margins, slightly narrowing posteriorly (Fig. 30) ..... ***L. phthisica***

8 Median septum indistinct, wider anteriorly than posteriorly; epigyne somewhat nose-shaped (Fig. 7) ..... ***L. jamberoo* sp. nov.**
- Median septum wider posteriorly than anteriorly (Fig. 18) ..... ***L. montagui***

4.2. Genus *Larinia* Simon, 1874

Type species: *Epeira lineata* Lucas, 1846; by monotypy. Gender female.

Remarks. *Larinia* was diagnosed and described in detail by Grasshoff (1970a). Levi (1975) did not accept the fine-scale differentiation of genera in the *Larinia*-group sensu Grasshoff and provided a broader generic concept for the genus. Likewise, we cannot confirm the generic concept of Grasshoff (1970a) for the Australian fauna, in particular the distinction between *Larinia* and *Lipocrea*. Grasshoff (1970a) distinguished *Larinia* and *Lipocrea* (sub *Larinopa*) by a separation (*Larinia*; e.g. Fig. 6) or fusion (*Lipocrea*) of an apical extension of the tegulum with the conductor. In contrast, we recognise a distinctly separated conductor in *Lipocrea* sensu Grasshoff (all Australian *Larina* except *L. phthisica*; see Figs. 18, 28, 40) and in our morphological interpretation these species differ from *L. phthisica* solely in the absence of an apical tegular extension. We do not consider that this character warrants separate generic status for these species. Female genitalia of the Australian species also suggest a generic placement different to that suggested by Grasshoff (1970a). The epigyne structure of *L. phthisica* is much more similar to *L. tabida* (presence of scape) than to *Larinia jamberoo* sp. nov. or *Larinia montagui* (presence of median septum), the latter three representing *Lipocrea* sensu Grasshoff (1970a) based on male pedipalp morphology. Interestingly, Grasshoff's (1970a) study did not include any species with median septum and the discovery of two Australian species with such epigyne structure may provide informative character states for future phylogenetic studies of this group. Considering the problems in distinguishing separate genera by interpreting the morphology of male and female genitalic characters combined and the fact that all Australian *Larinia*, except *L. delicata*, are somatically almost indistinguishable from each other, we here decided to follow former studies of this group who employed a broader concept of *Larinia* (Levi 1975; Marusik 1986; Tanikawa 1989; Harrod et al. 1991; Yin et al. 1997).

Grasshoff (1970a) considered *Larinia* part of the araneid tribe Mangorini. However, the monophyly of this tribe was not supported by a preliminary mor-

phological phylogeny of the Araneidae (SCHARFF & CODDINGTON 1997) that included four of its putative genera: *Eustala anastera* (Walckenaer, 1842), *Larinia borealis* (Hentz, 1847), *Larinia directa* (Hentz, 1847), 1894 (both members of *Drexelia* in GRASSHOFF 1970a, 1971a) and *Mangora gibberosa* (Hentz, 1847). *Eustala* only showed remote similarity to *Larinia* and *Mangora* in the preferred phylogeny, however, nodal support for any of the 'distal' Araneinae was low. *Larinia* (*Drexelia*) was placed as sister group to *Aculepeira* and *Araneus* combined, all of which represented the sister group to *Nuctenea* (SCHARFF & CODDINGTON 1997). The phylogenetic position of *Mangora* remained ambiguous (SCHARFF & CODDINGTON 1997). Solving any of the above taxonomic problems is far beyond the scope of our study and will require a detailed phylogenetic analysis of the Araneidae that includes world-wide representatives of the Mangorini sensu GRASSHOFF (1970a).

4.3. *Larinia jamberoo* sp. nov.
Figs. 1–11

Type material. ***Holotype***: ♂, Jamberoo Mountain [34°39′S 150°46′E, New South Wales, Australia], 20.i.1996, J. Noble, Noble slide reference no. 25 & 26 (AM KS56909). ***Paratype***: ♀, same locality as holotype, 1.iii.1996, J. Noble, slide reference 25, 26 (AM KS 49947).

Other material examined. AUSTRALIA: ***New South Wales***: 1 ♀, Arcadia, Bay Road, 0.2 km E of Calabash Road, 33°36′53″S 151°04′36″E (AM KS91126); 2 ♂♂, Jamberoo Mountain, 34°39′S 150°46′E (AM KS51901, KS53724). ***South Australia***: 1 ♀, Crystal Brook, E of golf course eastern boundary, 33°21′S 138°13′E (SAM NN23538). ***Victoria***: 1 ♀, Carnegie, 37°53′S 145°03′E (NMV K10087); 1 ♂, Hamilton, 37°44′S 141°01′E (NMV K10401).

Etymology. The species name is a noun in apposition and refers to the type locality, Jamberoo Mountain in New South Wales.

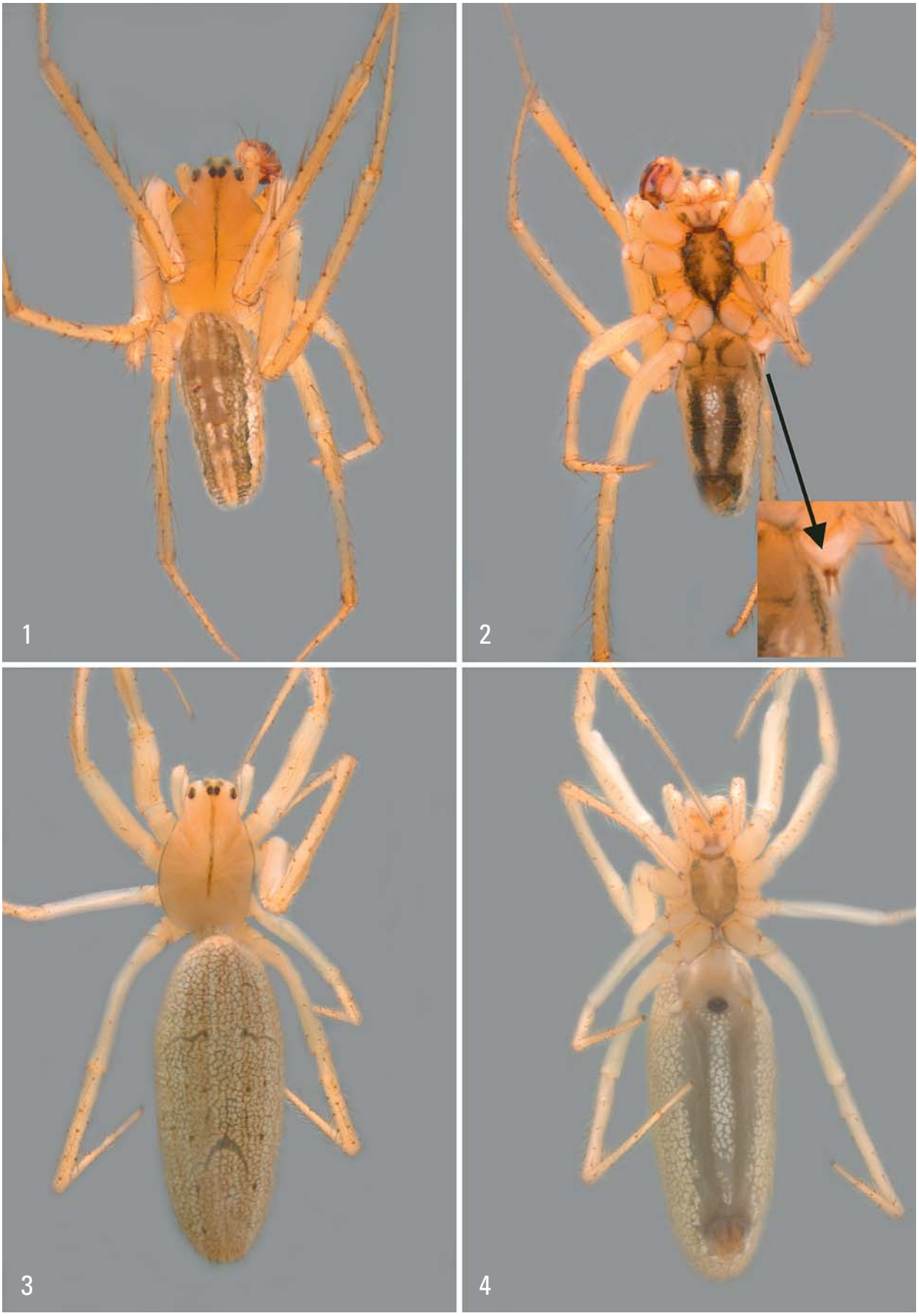
Diagnosis. *Larinia jamberoo* is most similar to *L. montagui*. Males differ distinctly in the shape of the median apophysis, which has a central keel-shaped process (absent in *L. montagui*) (Fig. 6 *vs* Fig. 17). The median septum of the female epigyne narrows posteriorly, whereas it widens posteriorly in *L. montagui* (Fig. 7 *vs* Fig. 18).

Description, male (holotype from Jamberoo Mountain, NSW; AM KS 56909). Total length 4.16. Carapace (Fig. 1): 2.08 long, 1.42 wide; yellow-brown, light brown and narrow median band between fovea and PME; one long white bristle between the AME; clypeus 0.08 high. Eyes: AME 0.12, ALE 0.10, PME 0.12, PLE 0.09; row of eyes: AME 0.35, ALE 0.65, PME 0.21, PLE 0.67. Sternum (Fig. 2): 0.92 long, 0.58 wide; black-pigmented, with yellow-brown, irregular median band; few brown setae anteriorly. Labium: wider than long; basal half with black pigmentation, anterior part forms a nearly semicircular white rim. Chelicerae: yellow; few light brown macrosetae apico-medially; four promarginal teeth, with the apical and third one largest, the second and fourth much smaller; three retromarginal teeth of similar size. Pedipalps (Figs. 5–6): conductor nearly circular with a pointed tip (Fig. 5); median apophysis with keel (Fig. 6). Legs: leg formula I>II>IV>III; uniformly yellow, two baso-ventral spines on femur of leg IV (arrow in Fig. 2); lengths of segments: pedipalp 0.46 + 0.39 + - + 0.69 = 1.54, I 2.12 + 3.23 + 2.81 + 0.92 = 9.09, II 2.08 + 2.77 + 2.27 + 0.85 = 7.97, III 1.23 + 1.46 + 0.96 + 0.54 = 4.20, IV 2.00 + 2.43 + 2.04 + 0.62 = 7.08. Abdomen (Fig. 1): 2.23 long, 1.08 wide; yellow-brown with darker folium pattern which incorporates two intermittent white longitudinal lines; venter with two black longitudinal lines and white spots interspersed between those; booklung covers surrounded by dark pigmentation (Fig. 2); spinnerets with dark pigmentation and surrounded by dark ring. ***Variation***. A second male measured (NMV K10401) was larger (TL 5.94, CL 2.42, CW 1.58) than the holotype described above.

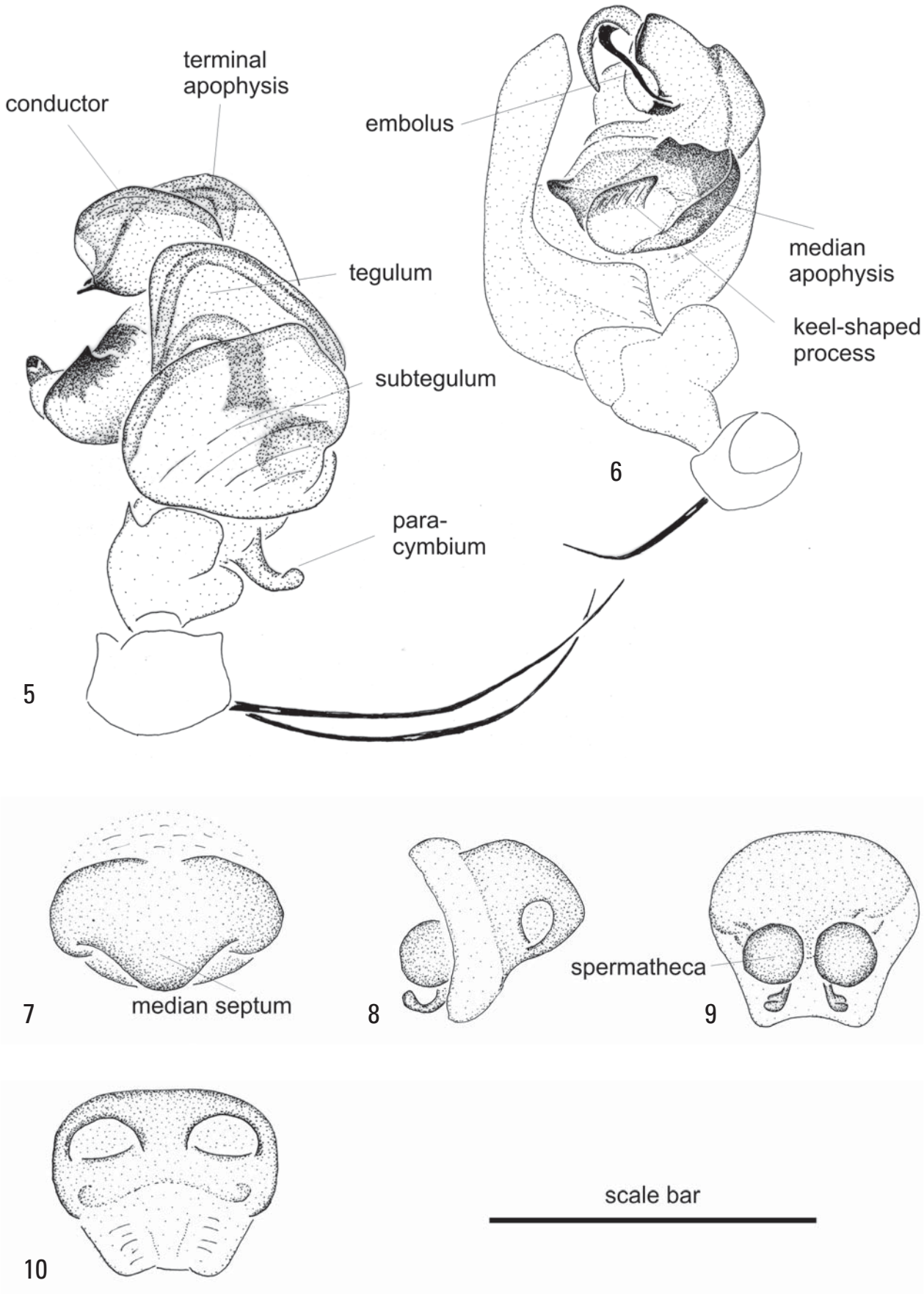
Description, female (paratype from Jamberoo Mountain, NSW; AM KS 49947). Somatic characters of the female agree in general details with the male, except that the carapace has narrow brown marginal bands and the folium pattern on the abdomen is more distinct as it is somewhat darker (see Figs. 3–4, female from Crystal Brook, SA). Total length 6.39. Carapace: 2.50 long, 2.08 wide; clypeus: 0.10 high. Eyes: AME 0.12, ALE 0.11, PME 0.11, PLE 0.10; row of eyes: AME 0.40, ALE 0.86, PME 0.24, PLE 0.88. Sternum: 1.27 long, 0.81 wide. Legs: leg formula I>II>IV>III; lengths of segments: pedipalp 0.65 + 0.69 + - + 1.00 = 2.35, I 2.62 + 3.93 + 3.08 + 1.08 = 10.70, II 2.50 + 3.58 + 2.54 + 0.92 = 9.55, III 1.69 + 1.89 + 1.16 + 0.65 = 5.39, IV 2.50 + 3.27 + 2.35 + 0.77 = 8.89. Abdomen: 4.54 long, 2.39 wide. Epigyne (Figs. 7–10): strongly sclerotised, median septum forms a blunt, posterior lobe (Fig. 7); spermathecae round, less than their radius apart (Fig. 9). ***Variation***. TL 6.97–7.45, CL 2.30–2.85, CW 1.45–1.82 (n = 3).

Distribution. *Larinia jamberoo* is currently known from south-eastern mainland Australia, including New South Wales, South Australia and Victoria (Fig. 11).

Life history and habitat preferences. Adult males were collected in January, May and June, females between March and April with one record from November. This suggests reproductive activity between



Figs. 1–4. *Larinia jamberoo* sp. nov. **1–2**: Male holotype from Jamberoo Mountain New South Wales, Australia (AM KS56909) (1 dorsal, 2 ventral view [inset shows ventral spines on femur IV]) (TL 4.16 mm). **3–4**: Female from Crystal Brook, South Australia (SAM NN23538) (3 dorsal, 4 ventral view) (TL 7.33 mm).



Figs. 5–10. *Larinia jamberoo* sp. nov., male holotype (AM KS56909) and female paratype (AM KS49947) from Jamberoo Mountain, New South Wales, Australia. **5–6**: Left male pedipalp (5 retrolateral, 6 ventral view). **7–10**: Female epigyne (7 ventral, 8 lateral, 9 dorsal, 10 posterior view). Scale bar: 5–6, 0.52 mm; 7–10, 0.49 mm.

Fig. 11. Records (n = 10) of *Larinia jamberoo* sp. nov. in Australia.

late summer and throughout winter. Only the South Australian record included information on the habitat of this species, "on bushes near creek".

4.4. *Larinia montagui* Hogg, 1914

Figs. 12–22

Larinia montagui Hogg, 1914: 75–77, pl. 1, fig. 4.
Larinia montaguei (Hogg). Bonnet 1957: 2350 (invalid emendation; see ICZN 1999, Article 31.1.2)
Lariniaria argiopiformis Bösenberg & Strand, 1906. Grasshoff 1970a: 217 (misidentification; synonymy refuted here).
Larinia tabida (L. Koch, 1872). Davies 1988: 308, fig. 29 (misidentification).

Type material. ***Syntypes***: 2 ♀♀, Montebello Islands [20°26′S 115°31′E, Western Australia, Australia], P. D. Montague (BMNH); 1 ♀, same data, T. H. Haynes (BMNH) (examined).

Other material examined. AUSTRALIA: ***New South Wales***: 1 ♀, Arcadia, 33°07′S 151°02′E (AM KS90973); 1 ♂, 3 ♀♀, Bonny Hills, 8 km N, 31°35′S 152°51′E (AM KS10176); 6 ♀♀, Clarence River, Copmanhurst, 31°35′S 152°51′E (SAM NN23520–5); 2 ♀♀, Lord Howe Island, 31°33′S 159°05′E (AM KS33425); 1 ♀, Lord Howe Island, E slopes of Roach Island, 31°30′08″S 159°04′09″E (AM KS75702); 1 ♂, 3 ♀♀, same data (AM KS75721); 2 ♂♂, same data (AM KS75657); 1 ♀, Lord Howe Island, end of Valley of the Shadows, 31°31′43″S 159°04′42″E (AM KS70566); 1 ♂, Lord Howe Island, Little Slope, S base of Mt Gower, 31°35′54″S 159°04′18″E (AM KS33436); 1 ♀, same data (AM KS33441); 1 ♀, Lord Howe Island, NE slope of Rabbit Island, 31°32′12″S 159°03′36″E (AM KS33440); 1 ♂, Lord Howe Island, Roach Island, 31°30′07″S 159°04′06″E (AM KS89094); 1 ♀, 1 juv., Lord Howe Island, summit of Kim's Lookout, 31°30′54″S 159°03′00″E (AM KS33437); 1 ♀, Lord Howe Island, track to start of Mt Gower Track, S end Salmon Beach, 31°33′50″S 159°04′30″E (AM KS70618); 1 ♀, Lord Howe Island, track to start of Mt Gower Track, 31°33′54″S 159°04′29″E (AM KS70558); 1 ♀, Merriwa, SE of, The Battery picnic area, 32°07′S 150°21′E (AM KS75041); 1 ♀, Norfolk Island, 29°02′S 167°57′E (AM KS51591); 1 ♂, Rivatts Creek, 33°37′S 150°40′E (AM KS33433); 1 ♀, Scone, 32°02′S 150°52′E (AM KS33421); 1 ♀, Solitary Island, 29°55′S 119°54′E (QM S83402); 3 ♀♀, South West Rocks, 30°51′S 153°04′E (AM KS46011, KS50171–2); 4 ♀♀, 1 juv., Wyangarie, 29°24′S 150°33′E (AM KS33444). ***Northern Territory***: 2 ♀♀, 3 juv., Campbell Spring, 15°32′S 131°17′E (WAM T75251). ***Queensland***: 1 ♀, 1 juv., ?Queensland, no exact locality, labeled "Q3050", (QM S83403); 2 ♀♀, Belmont Hills Bushland Reserve, 27°31′S 153°07′E (QM S83400); 1 ♀, Boggomoss No. 3, 25°26′S 150°01′E (QM S36384); 1 ♂, 1 ♀, 1 juv., same data (QM S37344); 1 ♀, Boggomoss No. 4 and 5, 25°26′S 150°01′E (QM S36526); 1 ♀, 1 juv., Boggomoss No. 8, 25°27′S 150°02′E (QM S36920); 2 ♀♀, Boggomoss No. 12, 25°27′S 150°08′E (QM S36897); 2 ♀♀, 1 juv., Boggomoss No. 21, 25°27′09″S 150°02′31″E (QM S36445); 2 ♀♀, same data (QM S37356); 2 ♂♂, Bribie Island, 27°03′30″S 153°11′32″E (AM KS69400, KS69480); 1 ♀, Brisbane Forest Park, 27°25′04″S 152°49′48″E (AM KS69569); 2 ♀♀, Burgess Creek, 4 km S Noosa Heads, 26°25′S 153°06′E (SAM NN23518–9); 2 ♀♀, 1 juv., Cania Gorge, 24°38′S 150°58′E (WAM T75249); 1 ♀, Chelsea Road Bushland Reserve, 27°28′58″S 153°11′15″E (QM S83387); 1

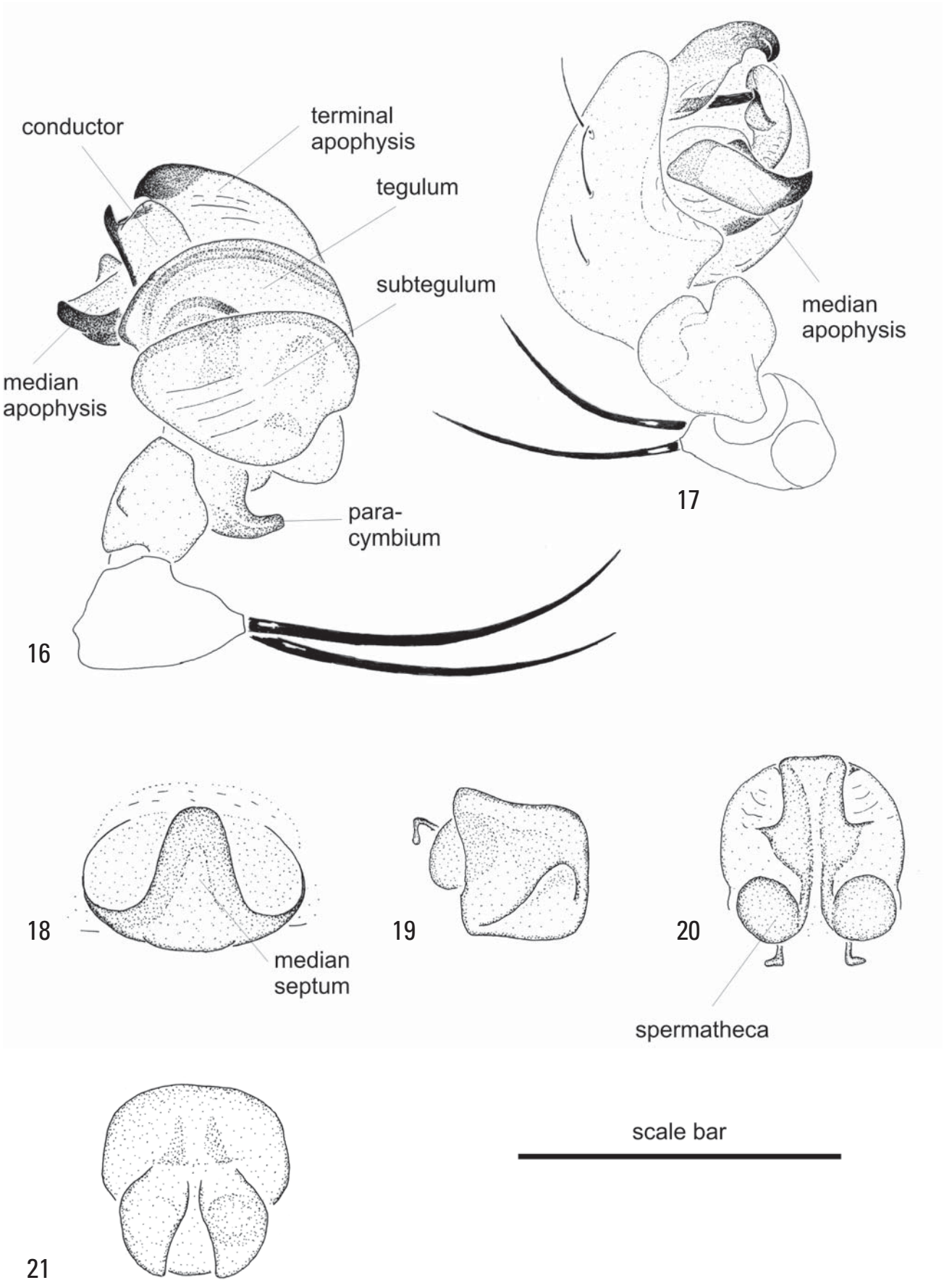
♀, Coen, 13°56′S 143°11′E (QM S83396); 2 ♀♀, Dawson River, Nathan Gorge, 25°27′08″S 150°08′12″E (QM S37328); 1 ♂, Deepwater National Park, 24°18′S 151°56′E (QM S25399); 1 ♀, Drewvale, Illaweena Street, 27°38′39″S 153°03′47″E (QM S67625); 1 ♀, 1 juv., Duringa, 15 mi E, 26°01′S 150°17′E (QM S83392); 1 ♀, Eatons Hill, Brisbane, 27°20′S 152°56′E (QM S83384); 2 ♂♂, 6 ♀♀, 3 juv., Gatton, 27°34′S 152°17′E (AM KS33426); 1 ♂, 1 ♀, 2 juv., Gatton, Queensland Agricultural College, 27°34′S 152°20′E (QM S66756); 1 ♀, Greymere, W of, W of Rockhampton, 23°22′S 150°30′E (QM S83386); 1 ♀, Horn Island, Torres Strait, 10°36′S 142°17′E (QM S83393); 1 ♀, Kroombit Tops, Upper TA47 Creek, 24°25′S 151°03′E (QM S83395); 1 ♂, 2 ♀♀, Moa Island, 10°11′S 142°16′E (QM S83401); 1 ♀, 1 juv., Moonee, 30 mi W, 27°47′S 149°59′E (QM S83405); 1 ♀, Mount Coolum, 26°34′S 153°05′E (QM S83394); 1 ♀, Mt Moffat National Park, Foleys Yards Mahagony Forest, 25°01′S 147°57′E (QM S14436); 1 ♀, 3 juv., Murray Island, Torres Strait, 9°56′S 144°02′E (QM S83398); 1 ♀, Palfrey Island, 14°41′S 145°26′E (AM KS68510); 1 ♀, Peak Downs, 22°56′S 148°05′E (ZMH, Museum Godeffroy); 1 ♀, Peak Downs, near Capella, 22°56′S 148°05′E (QM S83399); 3 ♀♀, Port Mackay, 21°10′S 149°14′E (ZMB, Museum Godeffroy no. 3352); 1 ♂, Railway Reserve, Queensland Museum, 27°28′S 153°01′E (QM S83391); 1 ♀, Rockhampton, 23°22′S 150°30′E (BMNH 1915.3.5.1234); 1 ♀, same data (ZMH, Museum Godeffroy); 1 ♀, 1 juv., Sarina, 21°25′S 149°13′E (QM); 1 ♀, Springbrook Mountain, 28°14′S 153°17′E (QM S83390); 1 ♀, 1 juv., St George, 28°03′S 148°35′E (QM S83389); 1 ♂, 1 juv., Warwick, 28°13′S 152°02′E (QM S83397); 1 ♂, 1 ♀, 1 juv., same data (QM S83385); 1 ♂, 4 ♀♀, 2 juv., same data (QM S83404); 1 ♀, Yorke Island, Torres Strait, 9°44′S 143°25′E (QM S83408); 2 ♀♀, 9 juv., same data (QM S83407). ***South Australia***: 4 ♀♀, Aldinga Scrub Conservation Park, 35°17′S 138°27′E (SAM NN23531–4); 2 ♀♀, Crystal Brook, E of golf course eastern boundary, 33°21′S 138°13′E (SAM NN23535–6); 1 ♀, Crystal Brook, golf course near railway line, 33°21′S 138°12′E (SAM NN23537); 5 ♀♀, Tod River mouth, 1 km S, 34°36′S 135°54′E (SAM NN23526–30). ***Victoria***: 1 ♀, Bacchus Marsh, 37°40′S 144°26′E (NMV K10067); 1 ♂, 1 ♀, 3 juv., Hamilton, 37°44′S 142°01′E (NMV K10081). ***Western Australia***: 1 ♂, Barn Hill, S of turnoff in highway parking bay, 18°25′23″S 122°06′42″E (SAM NN23511); 1 ♀, Barrow Island, 20°47′38″S 115°27′24″E (WAM T77402); 1 ♂, 2 ♀♀, 3 juv., Barrow Island, airport, 20°52′01″S 115°24′19″E (WAM T77398–9); 3 ♀♀, Barrow Island, Bandicoot Bay, 20°52′07″S 115°20′01″E (WAM T57660, T77408); 2 ♀♀, Barrow Island, Chevron Texaco camp, 20°49′43″S 115°26′36″E (WAM T77400–1); 2 ♀♀, Barrow Island, WAPET Camp, 20°49′43″S 115°26′40″E (WAM T57662–3); 1 ♂, same data (WAM T57663); 1 ♀, Brooke Island, Montebello Islands, 20°26′S 115°30′E (WAM T57665); 1 ♂, Cape Cuvier, Quobba Station, 24°08′20″S 113°26′44″E (WAM T75245); 1 ♀, Corneille Island, Bonaparte Archipelago, 14°11′21″S 125°43′55″E (WAM T75246); 1 ♀, Fenelong Island, Bonaparte Archipelago, 14°08′14″S 125°41′57″E (WAM T75252); 1 ♂, Geraldton, Spalding Park, 28°45′S 114°37′E (WAM T75247); 1 ♀, John Wayne Country, Barrow Island, 20°45′14″S 115°21′53″E (WAM T57664); 1 ♀, King Leopold Range, Silent Grove Camping area, Kimberley region, 17°04′S 125°14′E (WAM KS58591); 1 ♀, King Edward River campsite, 14°55′S 126°12′E (WAM T75253); 1 ♀, Mattress Point, Barrow Island, 20°44′44″S 115°28′29″E (WAM T57661); 2 ♀♀, Roebuck Bay, Broome, W of caravan park, 17°58′34″S 122°13′50″E (SAM NN23514–4); 1 ♀, 1 juv., South Maret Island, 14°26′S 124°59′E (WAM T81162); 1 ♀, South Yardie Well, Cape Range, 22°25′S 113°46′E (WAM T75248); 1 ♀, Yampi, 16°10′S 123°39′E (WAM T75250); 2 ♀♀, Yardie Creek, Cape Range National Park, 22°19′13″S 113°48′47″E (SAM NN23512–3).

Diagnosis. *Larinia montagui* is most similar to *L. jamberoo*. Males differ in the shape of the median apophysis, which lacks the keel-shaped process present in *L. jamberoo* (Fig. 6 *vs* Fig. 17). Females differ in the shape of the median septum of the epigyne that is wider posteriorly than anteriorly (vice versa in *L. jamberoo*) (Fig. 7 *vs* Fig. 18).

Description, male (from Barrow Island, WA; WAM T57663). Total length 7.07. Carapace (Fig. 12): 2.38 long, 1.77 wide; light yellow-brown, indistinct brown and narrow median band between fovea and PME; covered with white setae, white macrosetae around eyes; one long white bristles between the AME; clypeus 0.06 high. Eyes: AME 0.17, ALE 0.13, PME 0.12, PLE 0.08; row of eyes: AME 0.44, ALE 0.81, PME 0.18, PLE 0.86. Sternum (Fig. 13): 1.08 long, 0.62 wide; yellow-brown; laterally with dark pigmentation; few light brown setae. Labium: wider than long; basal half brown, anterior part forms a nearly semicircular white rim. Chelicerae: yellow-brown, basally somewhat darker; few light brown macrosetae apico-medially; three promarginal teeth, with the basal one smallest; three retromarginal teeth of similar size. Pedipalps (Figs. 16–17): conductor almost quadrangular with pointy tip (Fig. 16); median apophysis almost rectangular in ventral view (Fig. 17). Legs: leg formula I>II>IV>III; yellow-brown with brown pigmentation, two baso-ventral spines on femur of leg IV (only one spine on left leg) (Fig. 13, insert); Lengths of segments: pedipalp 0.54 + 0.54 + - + 0.69 = 1.77, I 3.08 + 4.69 + 4.23 + 1.23 = 13.23, II 2.92 + 4.23 + 3.31 + 1.08 = 11.54, III 1.92 + 1.85 + 1.61 + 0.69 = 6.08, IV 2.85 + 3.54 + 2.85 + 0.92 = 10.15. Abdomen (Figs. 14–15): 4.54 long, 2.61 wide; yellow with light median band in darker, wider band; venter yellow, with two indistinct darker bands; spinnerets light brown. ***Variation***. TL 5.51–7.15, CL 2.30–2.80, CW 1.58–1.81 (n = 10).

Description, female (from Barrow Island, WA; WAM T77408). Somatic characters of the female agree in general details with the male, except that the carapace has narrow brown marginal bands and there are two bristles between the AME (Figs. 14–15). Total length 8.15. Carapace: 2.69 long, 1.61 wide; clypeus 0.06 high. Eyes: AME 0.13, ALE 0.10, PME 0.12, PLE 0.10; row of eyes: AME 0.40, ALE 0.94, PME 0.23, PLE 0.94. Sternum: 1.23 long, 0.77 wide. Legs: leg formula I>II>IV>III; lengths of segments: pedipalp 0.69 + 0.85 + - + 0.85 = 2.38, I 2.85 + 4.31 + 3.46 + 1.08 = 10.69, II 2.77 + 3.92 + 2.77 + 0.92 = 10.38, III 1.77 + 1.92 + 2.00 + 0.69 = 6.38, IV 2.69 + 3.54 + 2.69 + 0.85 = 9.77. Abdomen: 5.38 long, 2.61 wide. Epigyne (Figs. 18–21): median septum wider anteriorly than posteriorly (Fig. 18); spermathecae round and

Figs. 12–15. *Larinia montagui* Hogg. **12–13**: Male from WAPET Camp, Barrow Island, Western Australia (WAM T57663) (12 dorsal, 13 ventral view [inset shows ventral spines on femur IV]) (TL 7.07 mm). **14–15**: Female from Mattress Point Barrow Island, Western Australia (WAM T57661) (14 dorsal, 15 ventral view) (TL 8.15 mm).



Figs. 16–21. *Larinia montagui* Hogg, male from WAPET Camp, Barrow Island, Western Australia (WAM T57663) and female from Barrow Island, Bandicoot Bay, Western Australia (WAM T77408). **16–17**: Left male pedipalp (16 retrolateral, 17 ventral view). **18–21**: Female epigyne (18 ventral, 19 lateral, 20 anterior, 21 posterior view). Scale bar: 16–17, 0.83 mm; 18–21, 0.45 mm.

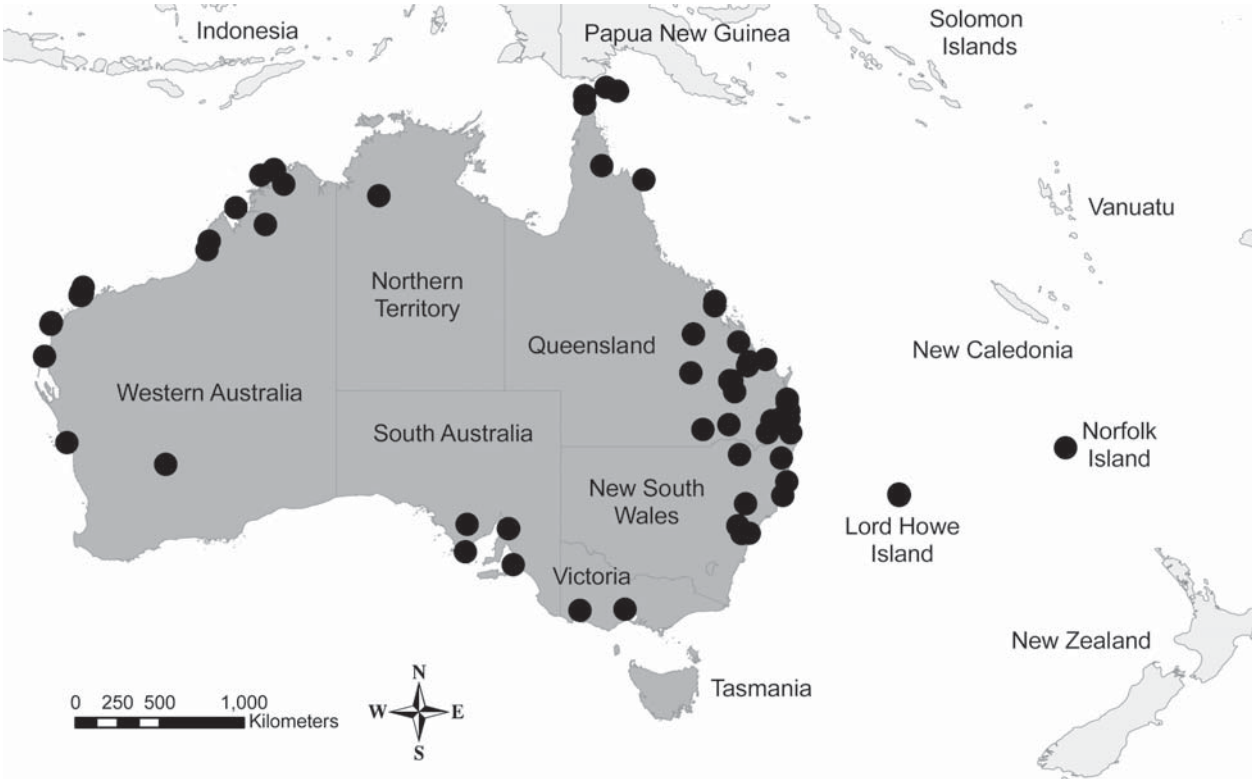


Fig. 22. Records (n = 137) of *Larinia montagui* Hogg in Australia.

less than their diameter apart, copulatory duct narrow (Fig. 20). ***Variation***. TL 6.75–11.88, CL 2.69–4.00, CW 1.63–2.25 (n = 14).

Distribution. *Larinia montagui* has been found in all mainland states of Australia and many off-shore islands (Fig. 22).

Life history and habitat preferences. Adult *L. montagui* have been found all year round. The species appears to tolerate a variety of climatic conditions and has been found in a variety of habitats. It was mainly recorded from grassland and heathland into low woodland, but habitat descriptions also include rainforests, soy bean crops and mangroves.

Remarks. In his first publication on *Larinia* and allied genera, Grasshoff (1970a) listed *L. montagui* as junior synonym of *Lariniaria argiopiformis* (Bösenberg & Strand, 1906) without justification. However this synonymy was accepted in subsequent catalogs (e.g. Platnick 2008). Curiously, in his later revision of *Lariniaria* Grasshoff (1970b) did not include *L. montagui* as synonym of that species. We examined the type material of *L. montagui* lodged at the BMNH, and recognised it as the most common species of *Larinia* in Australia. The morphology of this species, in particular that of the male and female genitalia, is vastly different to that of *L. argiopiformis* (e.g. Grasshoff 1970b: figs. 29a–e). Consequently, we reject the synonymy and revalidate *L. montagui* as valid species. The type material is in poor condition and therefore we redescribe the female based on a more recently collected specimen from Western Australia.

4.5. *Larinia phthisica* (L. Koch, 1871)

Figs. 23–35

Epeira phthisica L. Koch, 1871: 103–104, plate 8, figs. 5, 5a; Keyserling 1887a: 171–172, plate 14, figs. 6, 6a.

Larinia phthisica (L. Koch): Rainbow 1911: 181; Roewer 1942: 771; Bonnet 1957: 2351; Chrysanthus 1961: 205, figs. 42–45; Grasshoff 1970b: 224–225, figs. 7a–e, 8f–i; Grasshoff 1973: 148, fig. 11; Tikader & Biswas 1981: 44, plate 6, figs. 72–73; Tikader 1982: 208, figs. 408–410; Platnick 1989: 339; Tanikawa 1989: 36–40, figs. 15–21; Platnick 1993: 443; Okuma et al. 1993: 23, figs. 18, 20A–B; Barrion & Litsinger 1995: 614–616, figs. 386a–e, 387a–l; Zhu & Zhang 1993: 37, figs. 8–13; Yin et al. 1997: 321, figs. 225a–f; Platnick 1998: 509; Song et al. 1999: 291, figs. 171N–O, 172G–H, P.

L. chhagani Patel, 1975: 113–116, figs. 5–8. BRIGNOLI 1983: 272 (synonymy in TIKADER & BISWAS 1981).
L. nenilini Marusik, 1986: 246, figs. 1–5. PLATNICK 1989: 339; SONG et al. 1992: 10, figs. 2A–F; PLATNICK 1998: 509 (synonymy in YIN et al. 1997).
L. albigera Yin et al., 1990: 76, figs. 188–194. PLATNICK 1993: 442 (female only, male is *Lariniaria argiopiformis* Bösenberg & Strand, 1906) (synonymy in YIN 1994).
L. triprovina Yin et al., 1990. YIN 1994: 135 (male only, misidentification).

Type material. ***Lectotype*** (designated here) of *Epeira phthisica* L. Koch, 1871: 1 ♀, Port MacKay [21°10′S 149°14′E, Queensland, Australia], Museum Godeffroy no. 7557 (ZMH, RACK (1961)-catalogue no. 262) (examined). ***Paralectotypes*** of *Epeira phthisica* L. Koch, 1871: 1 ♀, data as lectotype (ZMH, RACK (1961)-catalogue no. 262) (misidentification, this specimen is *L. tabida*); 2 ♀♀, Port MacKay [21°10′S 149°14′E, Queensland, Australia], Museum Godeffroy (ZMB 3344); 2 ♀♀, Port MacKay [21°10′S 149°14′E, Queensland, Australia], Museum Godeffroy No. 7557 (NMV K10084); 1 ♀, same data (BMNH 1915.3.5.982) (all examined).

Other material examined. AUSTRALIA: ***New South Wales***: 1 ♂, Taree, 18 km N, 31°48′S 152°29′E (AM KS10195); 1 ♀, same data (AM KS10184); 1 ♂, 1 ♀, 1 juv., Taree, 3 km N, 31°54′S 152°29′E (AM KS49110). ***Northern Territory***: 10 ♀♀, Darwin, 12°27′S 130°50′E (NMV K10082, K10085); 1 ♀, Jabiru, Retention Pond No 1, Ranger Uranium Mines, 12°40′S 132°55′E (SAM NN23506). ***Queensland***: 1 ♀, Allingham Creek, Bluff Downs Station, 19°46′S 145°59′E (QM S83379); 1 ♀, Archer River Crossing, 13°25′S 141°41′E (QM S83376); 1 ♂, 1 ♀, Gillies Highway, 1 km W Gordonvale, 17°05′S 145°45′E (QM S83375); 1 ♀, Gordonvale, 17°05′S 145°46′E (WAM 16/418); 3 ♀♀, 2 juveniles, same data (AM KS99789); 1 ♂, same data (QM S83406); 1 ♀, 4 juv., same data (AM KS33424); 1 ♀, 1 juv., same data (NMV K10083); 1 ♀, Port MacKay, 21°10′S 149°14′E, Museum Godeffroy 7557 (possible syntype of *Epeira indagatrix* L. Koch, 1871) (ZMH, RACK (1961)-catalogue no. 244); 1 ♀, Rockhampton, Kershaw Gardens, 23°22′S 150°30′E (AM KS67021); 1 ♂, 2 ♀♀, 16 juv., Saibai Island, 9°24′S 142°41′E (QM S83377); 1 ♀, Upper Brookfield, 27°28′S 152°51′E (QM S83378). ***South Australia***: 1 ♂, 2 ♀♀, 1 juv., Crystal Brook, E of golf course eastern boundary, 33°21′S 138°13′E (SAM NN23508–10); 1 ♀, Inman River, Victor Harbor, near caravan park, 35°33′30″S 138°37′30″E (SAM NN23507); 1 ♀, North Para River, Anjeston, 34°33′S 138°52′E (AM KS32086); 1 ♀, Slaney Creek, Chowilla, 33°56′S 140°56′E (SAM NN670). ***Western Australia***: 1 ♂, 1 ♀, Durack River Crossing, Gibb River Road, Kimberley region, 15°56′S 127°13′E (AM KS58592); 1 ♂, 2 ♀♀, 1 juv., King Edward River campsite, 14°55′S 126°12′E (WAM T75254); 1 ♂, 1 ♀, 3 juv., Millstream, 21°12′S 117°16′E (WAM T75257); 2 ♀♀, Millstream, near Crystal Pool, 21°12′S 117°16′E (WAM T75256).

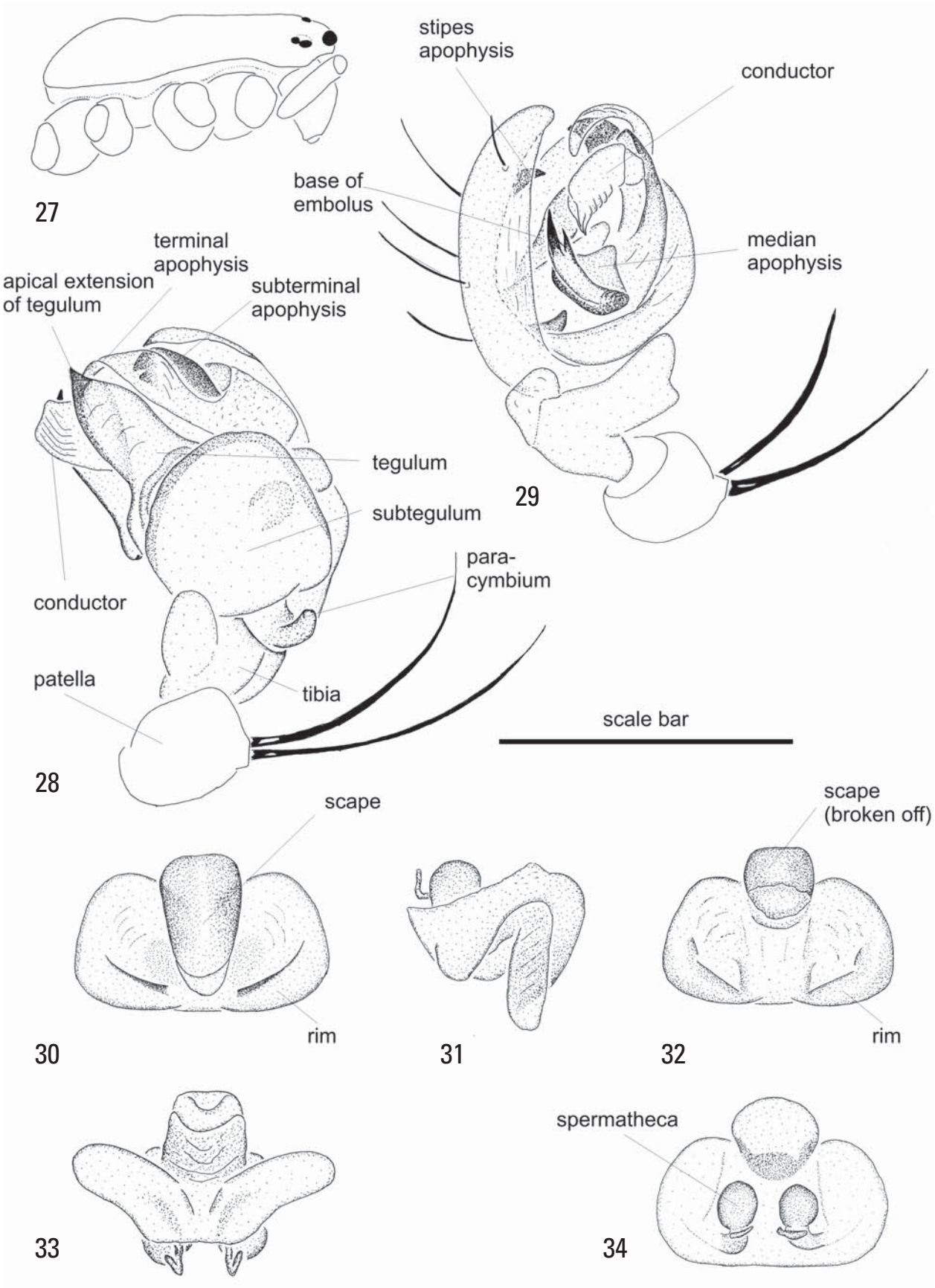
Diagnosis. The shape of the male pedipalp, in particular the median apophysis with its two pointed apical processes (Fig. 29) is unique within the Australian species of *Larinia*. The female epigyne is most similar to that of *L. tabida*, but the posterior rim of the epigyne is stronger in *L. phthisica* than in *L. tabida* and does not reach as far anteriorly at the lateral margins (Fig. 30 *vs* Fig. 43). If a scape is present (often broken off), its lateral sides are almost straight in *L. phthisica* but curved in *L. tabida*.

Description, male (from King Edward River campsite, WA; WAM T75254). Total length 7.00. Carapace (Fig. 36): 2.38 long, 1.38 wide; dorsal profile straight in lateral view with minor indentation near fovea region (Fig. 27); yellow-brown, light brown median band that forms a three-ended fork behind the PE; covered with white setae, two long white bristles between the AME; clypeus 0.06 high. Eyes: AME 0.15, ALE 0.11, PME 0.09, PLE 0.08; row of eyes: AME 0.42, ALE 0.75, PME 0.25, PLE 0.79. Sternum (Fig. 24): 1.15 long, 0.69 wide; yellow; covered with light brown macrosetae. Labium: basal half light brown, anterior part forms a nearly semicircular white rim. Chelicerae: yellowish-brown; few brown macrosetae apico-medially; four promarginal teeth, with the apical and third one largest, the second and fourth much smaller; three retromarginal teeth of similar size. Pedipalps (Figs. 28–29): apical extension of tegulum pointed (Fig. 28); median apophysis with two narrow apical processes (Fig. 29). Legs: leg formula I>II>IV>III; uniformly yellow, sockets of setae brown; lengths of segments: pedipalp 0.62 + 0.46 + - + 0.77 = 1.85, I 2.92 + 4.84 + 4.15 + 0.92 = 12.84, II 2.77 + 4.54 + 3.46 + 0.85 = 11.61, III 2.00 + 1.92 + 1.31 + 0.62 = 5.84, IV 3.23 + 3.23 + 2.85 + 0.65 = 9.96. Abdomen: 4.61 long, 1.15 wide; yellow-brown with indistinct median band (Fig. 23); ventrally somewhat darker; spinnerets light brown (Fig. 24). ***Variation***. TL 7.13–8.50, CL 2.63–3.25, CW 1.38–2.00 (n = 4).

Description, female (same data as male). Somatic characters of the female agree in general details with the male, except that the colouration is overall slightly darker (Figs. 25–26). Total length 9.61. Carapace: 3.08 long, 1.77 wide; clypeus 0.10 high. Eyes: AME 0.15, ALE 0.10, PME 0.10, PLE 0.09; row of eyes: AME 0.48, ALE 1.06, PME 0.21, PLE 1.08. Sternum: 1.54 long, 0.85 wide. Legs: lengths of segments: pedipalp 0.85 + 1.00 + - + 0.92 = 2.77, I 3.54 + 5.69 + 4.77 + 1.08 = 15.07, II 3.38 + 5.38 + 3.92 + 1.00 = 13.69, III 2.54 + 2.31 + 1.61 + 0.69 = 7.15, IV 4.08 + 4.54 + 3.54 + 0.77 = 12.92. Abdomen: 6.54 long, 1.92 wide. Epigyne (Figs. 30–34): wider than long in ventral view; scape with a pocket at tip (Fig. 30), in many cases broken off (Fig. 32); spermathecae round, less than their diameter apart (Fig. 34). ***Variation***. TL 7.25–12.50, CL 2.88–4.13, CW 1.63–2.38 (n = 7).

Distribution. In Australia, most records of *L. phthisica* are from coastal areas in the northern two thirds

Figs. 23–26. *Larinia phthisica* (L. Koch). **23–24**: Male from King Edward River campsite, Western Australia (WAM T75254) (23 dorsal view, 24 ventral view) (TL 7.00 mm). **25–26**: Female (same data) (25 dorsal view, 26 ventral view) (TL 9.61 mm).



Figs. 27–34. *Larinia phthisica* (L. Koch). **27–29**: Male from King Edward River, Western Australia (WAM T75254), 27 carapace, lateral view, 28–29 left pedipalp (28 retrolateral, 29 ventral view). **30–32**: Epigyne of female from Gibb River Road, Durack River Crossing, Western Australia (AM KS58592) (30 ventral, 31 lateral, 32 posterior view). **33–34**: Epigyne of female from King Edward River, Western Australia (WAM T75254) (33 ventral view – scape broken off, 34 dorsal view). Scale bar: 27, 2.34 mm; 28–29, 0.68 mm; 30–34, 0.69 mm.

Fig. 35. Records (n = 32) of *Larinia phthisica* (L. Koch) in Australia.

of the continent, but the species is also found in South Australia into the centre (Fig. 35). *Larinia phthisica* is also reported from Uzbekistan and Turkmenistan (Marusik 1986), India (Patel 1975; Tikader & Biswas 1981; Tikader 1982), China (e.g. Song et al. 1999), the Philippines (Barrion & Litsinger 1995), Bangladesh (Okuma et al. 1993) and West Papua, Indonesia (Chrysanthus 1961).

Life history and habitat preferences. In Australia, adult *L. phthisica* have been found all year round. They appear to prefer low vegetation such as grass and shrubs, and were commonly found near the edge of watercourses.

Remarks. The collection of the Godeffroy Museum in the ZMH has a female of *L. phthisica* that is labelled "*Epeira indagatrix* L. Koch; M.G. 7557 Port Mackay". This was listed as possible syntype of *Epeira indagatrix* by Rack (1961; catalog no. 244), although the spider does not confirm to the original description of *E. indagatrix* by L. Koch (1871). To avoid nomenclatural confusion between both species and to provide taxonomic stability for the species-group name *L. phthisica*, a lectotype (ZMH, Rack (1961)-catalog. no. 262) is designated here from the syntype series of *Epeira phthisica*. The second female syntype listed in Rack's (1961)-catalog no. 262 is *L. tabida*. Keyserling (1887) firstly described the male of *L. phthisica* from a pair in the Godeffroy Museum collected in Peak Downs (Queensland). We were not able to confirm the identity of this male as the two spiders could not be located in the collection of the BMNH where they are expected to be housed.

Larinia chloris (Audouin, 1826) from the Middle East, Africa and India is very similar to *L. phthisica*, but differs in various ways, including differences in the shape of the epigynum (Grasshoff 1970a). It remains unclear if *L. phthisica* and *L. chloris* represent separate species or are morphological variations of the same (Grasshoff 1970a, 1973; Levy 1986; Tanikawa 1989). Since Grasshoff's (1970a) revisionary work, a number of *Larinia* species have been described and subsequently synonymised with *L. phthisica* (see above) but apparently in many cases without examination of type material. A detailed comparison of specimens within the putative range of *L. phthisica* and *L. chloris* is required to undoubtedly clarify the validity of these species. It is beyond the scope of this study to comprehensively elucidate the relationships of all species with affinities to *L. phthisica* from different regions of the globe. Our aim is to provide accurate illustrations for an identification of this species, which was originally described from Australia.

4.6. *Larinia tabida* (L. Koch, 1872)

Figs. 36–47

Epeira tabida L. Koch, 1872: 105–106, plate 8, figs. 6, 6a. KEYSERLING 1887: 170–171, plate 14, fig. 5.

Meta soror Thorell, 1877: 433 (new synonymy in THORELL 1890: 188; cited in GRASSHOFF 1970b).

Lipocrea tabida (L. Koch). THORELL 1887: 148; PLATNICK 1993: 445; PLATNICK 1998: 512.

Larinia tabida (L. Koch). THORELL 1890: 25; RAINBOW 1911: 181; ROEWER 1942: 771; BONNET 1957: 2351–2352; CHRYSANTHUS 1961: 205, figs. 46–49; CHRYSANTHUS 1971: 26, fig. 42.

Larinia vicina Kulczyński, 1911: 121, plate 4, figs. 8–9. ROEWER 1942: 771; BONNET 1957: 2352 (new synonymy in CHRYSANTHUS 1961, confirmed in GRASSHOFF 1970a).

Larinopa tabida (L. Koch). GRASSHOFF 1970a: 228–230, figs. 9b, 12c–d, 13a–f.

Type material. ***Holotype*** of *Epeira tabida* L. Koch, 1872: ♀, Port McKay [21°10′S 149°14′E, Queensland, Australia], Museum Godeffroy no. 7549 (ZMH, RACK (1961)-catalogue. no. 280) (examined).

Other material examined. AUSTRALIA: ***New South Wales***: 1 ♀, Bungawalbin State Forest, 29°08′04″S 153°08′01″E (AM KS885321); 1 ♀, Bungawalbin Nature Reserve, 29°05′44″S 153°04′19″E (AM KS88533); 1 ♀, Crowdy Bay National Park, 9 km S Laurieton, 31°50′S 152°45′E (AM KS9396); 1 ♀, Kempsey, banks of Mackay River, 31°04′S 152°50′E (AM KS56993); 1 ♂, Laurieton, Henry Kendell Forestry Reserve, 31°39′S 152°48′E (AM KS10158); 1 ♀, Urunga, 30°29′S 153°01′E (AM KS56994). ***Northern Territory***: 1 ♂, Litchfield National Park, Wangi Falls, 13°9′49″S 130°40′46″E (AM KS58593). ***Queensland***: 1 ♀, Atherton Tablelands, Rose Gums, 17°18′44″S 145°42′09″E (ZMUC); 1 ♂, 1 ♀, 14 juv., Bamaga, around hotel, 10°53′S 142°24′E (QM S13007); 1 ♂, Bribie Island, 27°03′30″S 153°11′32″E (AM KS69605); 1 ♀, Chelsea Road Bushland Reserve, 27°28′58″S 153°11′15″E (QM S65836); 1 ♂, Cooktown, base track of Mt Cook, Mt Cook National Park, 15°29′11″S 145°15′40″E (AM KS57873); 1 ♂, Edmonton area, 17°01′S 145°44′E (AM KS33423); 1 ♀, Gold Creek Reserve, 27°27′53″S 152°52′32″E (QM S65159); 1 ♂, Gordonvale, 17°05′S 145°47′E (AM KS33445); 1 ♀, 1 juv., same data (QM S83382); 1 ♀, same data (QM W13); 1 ♀, same data (WAM 16/418A); 1 ♀, Port Mackay, 17°05′S 145°47′E, Museum Godeffroy no. 7557 (ZMH RACK (1961)-catalogue. No 262) (paralectotype ♀ of *L. phthisica*; misidentification); 3 ♀♀, Saibai Island, 9°24′S 142°41′E (QM S83380); 2 ♀♀, Spear Creek, Mt Molloy, 16°42′S 145°24′E (QM S83381); 1 ♀, Weatherstation Creek, 13°42′S 143°17′E (QM S83383). ***Western Australia***: 1 ♀, Gibb River Road/Kalumburu-turnoff, campsite on river, 15°58′S 126°51′E (WAM T75255).

Diagnosis. The shape of the male pedipalp, in particular the median apophysis with its hook-shaped process (Fig. 41) is unique within the Australian species of *Larinia*. The female epigyne is most similar to that of *L. phthisica*, but the posterior rim of the epigyne is narrower and reaches further anteriorly (Fig. 30 *vs* Fig. 43). If a scape is present, it is oval (not with straight lateral borders as in *L. phthisica*).

Description, male (from Wangi Falls, Litchfield National Park, NT; AM KS58593). Total length 7.69. Carapace (Fig. 36): 3.08 long, 1.77 wide; dorsal profile straight in lateral view (Fig. 42); yellow-brown, with narrow brown median band that widens twice along its length; covered with white setae, two long white bristles between the AME; clypeus 0.08 high. Eyes: AME 0.17, ALE 0.11, PME 0.12, PLE 0.09; row of eyes: AME 0.47 (0.42), ALE 0.84 (0.88), PME 0.16 (0.23), PLE 0.90 (0.92). Sternum: 1.46 long, 0.65 wide; yellow; covered with few light brown setae mainly marginally (Fig. 37). Labium: wider than long; basally yellow-brown, anterior part forms a nearly semicircular white rim. Chelicerae: yellow-brown; four promarginal teeth, with the apical and third one largest, the second and fourth much smaller; three retromarginal teeth of similar size. Pedipalps (Figs. 40–41): conductor elongated (Fig. 40); median apophysis with hook-shaped process (Fig. 41). Legs: leg formula I>II>IV>III; uniformly yellow-brown; two basoventral spines on femora of leg IV (Fig. 37, insert); lengths of segments: pedipalp 0.69 + 0.62 + - + 0.77 = 2.08, I 3.54 + 5.54 + 5.08 + 0.54 = 14.69, II 3.38 + 5.00 + 4.15 + 1.15 = 13.69, III 2.38 + 2.31 + 1.54 + 0.69 = 6.92, IV 3.69 + 4.31 + 3.54 + 0.77 = 12.30. Abdomen (Figs. 36–37): 4.38 long, 1.54 wide; yellow-brown with indistinct light median band and five pairs of black spots; venter yellow-brown with white pigmentation medially and two longitudinal brown lines; spinnerets light brown. ***Variation***. TL 7.50–7.69, CL 2.88–3.08, CW 1.69–1.79 (n = 3).

Description, female (from Gibb River Road, Kalumburu-turnoff, WA; WAM T75255). Total length 8.31. Carapace (Fig. 38): 2.77 long, 1.61 wide; yellow-brown, with narrow light brown median band that is widest half-way between PME and fovea; margins of carapace light brown; covered with very light brown setae mainly medially; white setae mainly around eyes, two long white bristles between the AME; clypeus 0.08 high. Eyes: AME 0.15, ALE 0.10, PME 0.10, PLE 0.09; row of eyes: AME 0.42, ALE 0.88, PME 0.23, PLE 0.92. Sternum (Fig. 39): 1.38 long, 0.77 wide; yellow-brown, somewhat darker towards margins; covered with brown setae. Labium: wider than long; basally light brown, anterior part forms a nearly semicircular white rim. Chelicerae: yellow; few light brown setae mainly apico-medially; four promarginal teeth, with the apical and third one largest, the second and fourth much smaller; three retromarginal teeth of similar size. Legs: leg formula I>II>IV>III; uniformly

yellow, with black spots; lengths of segments: pedipalp 0.85 + 0.92 + - + 0.85 = 2.61, I 3.08 + 4.92 + 4.15 + 1.15 = 13.30, II 3.00 + 4.38 + 3.46 + 1.00 = 11.84, III 1.92 + 2.23 + 1.31 + 0.77 = 6.23, IV 3.15 + 3.92 + 3.15 + 0.85 = 11.07. Abdomen (Figs. 38–39): 5.46 long, 1.85 wide; yellow-brown with six pairs of black spots; venter yellow-brown; spinnerets light brown. Epigyne (Figs. 43–46): wider than long in ventral view, with narrow rim nearly reaching to base of scape (Fig. 43); scape oval (in many cases broken off); spermathecae round and separated by approximately their radius (Fig. 46). ***Variation***. Only one further female (WAM 16/418A) was measured which was slightly smaller than the specimen described above (TL 8.00, CL 3.00, CW 2.00).

Distribution. North and east coast of mainland Australia, also on some Torres Strait islands (Fig. 47); also in Sulawesi and West Papua, Indonesia (Thorell 1877; Chrysanthus 1961). Records of *L. tabida* from Lord Howe Island (Rainbow 1920; AM KS33425, examined) are misidentified *L. montagui*. Three females of *L. tabida* reported from New Caledonia (Berland 1924) were not examined.

Life history and habitat preferences. *Larinia tabida* males and females have been found all year round with the exception of April, October and November. Similar to *L. phthisica*, this species appears to prefer low vegetation such as grassland and shrubs, but has also been found in rainforest and amongst trees of Spotted Gum (*Corymbia maculata*).

Remarks. Rack (1961; catalog. no. 280) listed 5 syntypes for *L. tabida*. The original description, however, is based on a single female holotype (L. Koch 1872; p. 106, from German: "From Port Mackay (One specimen in the Museum Godeffroy)."). Therefore, the single female listed above is here considered the holotype of *L. tabida*. The remaining four specimens (Museum Godeffroy no. 7548) are all immature and accurate species identification is not possible.

Keyserling (1887: 171) firstly described the male of *L. tabida* based on (translated from German) "specimens from Australia without exact locality data" from the Godeffroy Museum. We have not been able to locate any of these specimens in the BMNH where Keyserling's material is expected to be housed, nor in the ZMH or ZMB where material of the Godeffroy Museum is lodged.

4.7. *Larinia delicata* Rainbow, 1920 (revalidated)

Figs. 48–54

Larinia delicata Rainbow, 1920: 247–248, plate 29, figs. 51–54. Roewer 1942: 771; Bonnet 1957: 2348.

Larinopa diluta (Thorell, 1887): Grasshoff 1970a: 233 (misidentification; synonymy refuted here).

Type material. ***Syntypes***: 1 ♂, 1 ♀, Lord Howe Island [31°32′S 159°05′E, New South Wales, Australia], December 1915 – January 1916, A.M. Lea (AM KS6590); 1 ♂, same data (SAM NN243); 1 ♀, same data (SAM NN244) (all examined).

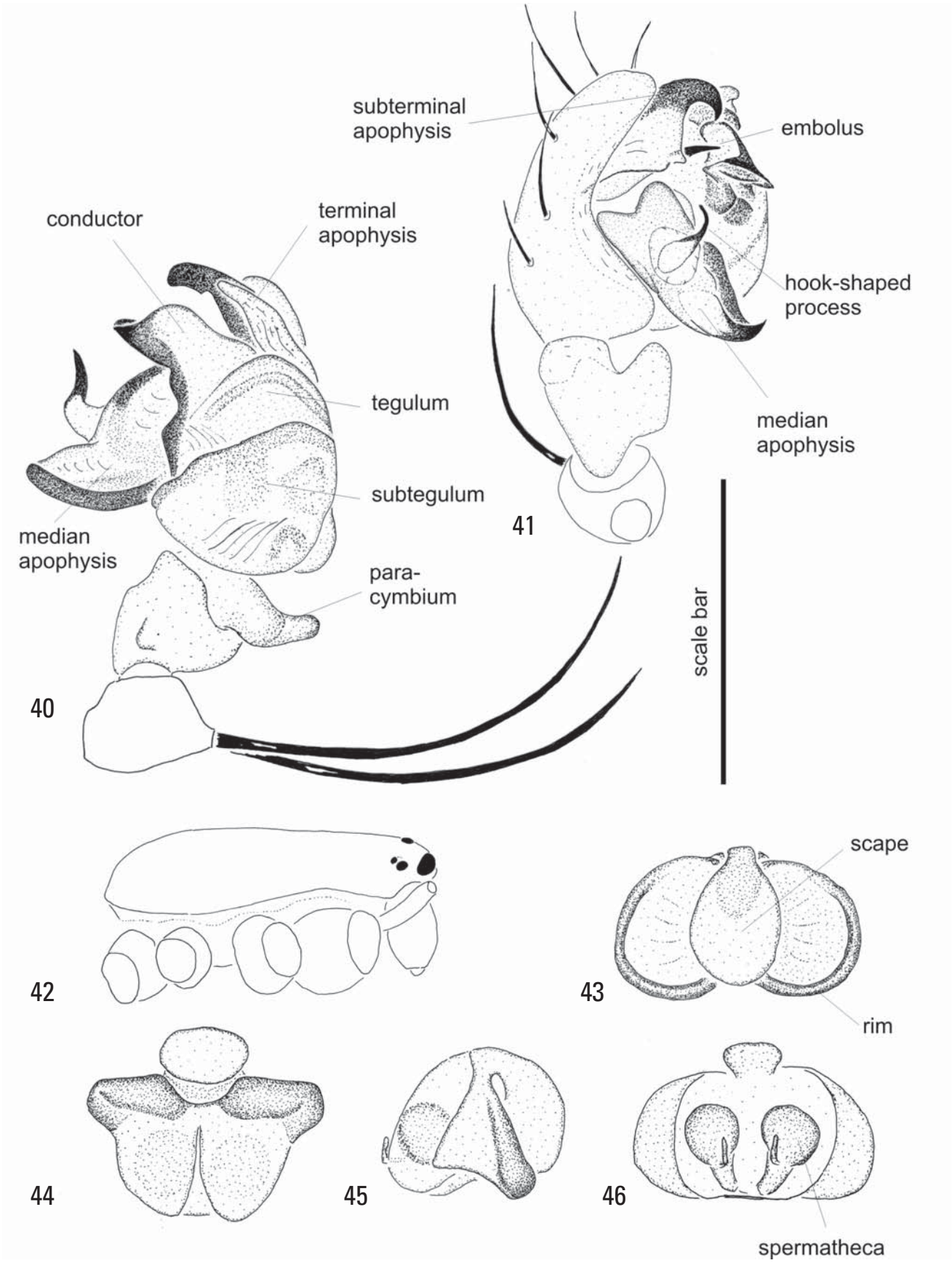
Other material examined. AUSTRALIA: ***New South Wales***: 1 ♂, Lord Howe Island, track to N end of Middle Beach, 31°31′35″S 159°04′20″E (AM KS70745); 1 ♂, Lord Howe Island, Research Centre, 31°31′37″S 159°03′58″E (AM KS70632).

Diagnosis. *Larinia delicata* clearly differs from all Australian *Larinia* by the high thoracic region of the carapace (Fig. 50).

Description, male (from Lord Howe Island, NSW; AM KS70632). Total length 4.52. Carapace (Fig. 48): 2.17 long, 1.67 wide; strongly arched in thoracic region (Fig. 50) and with deep longitudinal fovea; yellow-brown, indistinct darker radial pattern; few dark setae medially in anterior half, few white setae around eyes; clypeus 0.06 high. Eyes: AME 0.14, ALE 0.09, PME 0.09, PLE 0.11; row of eyes: AME 0.42, ALE 0.92, PME 0.88, PLE 0.94. Sternum (Fig. 49): 1.09 long, 0.86 wide; yellow; few light brown setae. Labium: wider than long; yellow-brown, anterior part forms a nearly semicircular white rim. Chelicerae: yellow-brown, apically somewhat lighter; three promarginal teeth, with the basal one smallest; four retromarginal teeth of decreasing size to basal one. Pedipalps (Figs. 51–52): apical extension of tegulum truncated (Fig. 51); median apophysis with two sclerotised processes, stipes present (Fig. 52). Legs: leg formula I>II>IV>III; yellow; lengths of segments: pedipalp 0.62 + 0.43 + - + 0.64 = 1.69, I 3.24 + 4.57 + 3.67 + 1.00 = 12.47, II 2.76 + 3.71 + 2.71 + 0.86 = 10.04, III 2.05 + 2.14 + 1.67 + 0.57 = 6.43, IV 2.48 + 2.76 + 2.21 + 0.62 = 8.07. Abdomen (Figs. 48–49): 2.67 long, 1.24 wide; very light olive-green, covered with small white spots except medially; venter as dorsally; spinnerets yellow-brown. ***Variation***: The syntype male (AM KS6590) is slightly larger (CW 1.70, CL 2.12, TL 5.15) than the specimen described here.

Description, female (syntype from Lord Howe Island, NSW; AM KS6590). Somatic characters of the female agree with those of the male, however the

Figs. 36–39. *Larinia tabida* (L. Koch). **36–37**: Male from Wangi Falls, Litchfield National Park, Northern Territory, Australia (AM KS58593) (36 dorsal, 37 ventral view [inset shows ventral spines on femur IV]) (TL 7.69 mm). **38–39**: Female from Gibb River Road, Kalumburu turnoff, Western Australia (WAM T75255) (38 dorsal, 39 ventral view) (TL 8.31 mm).

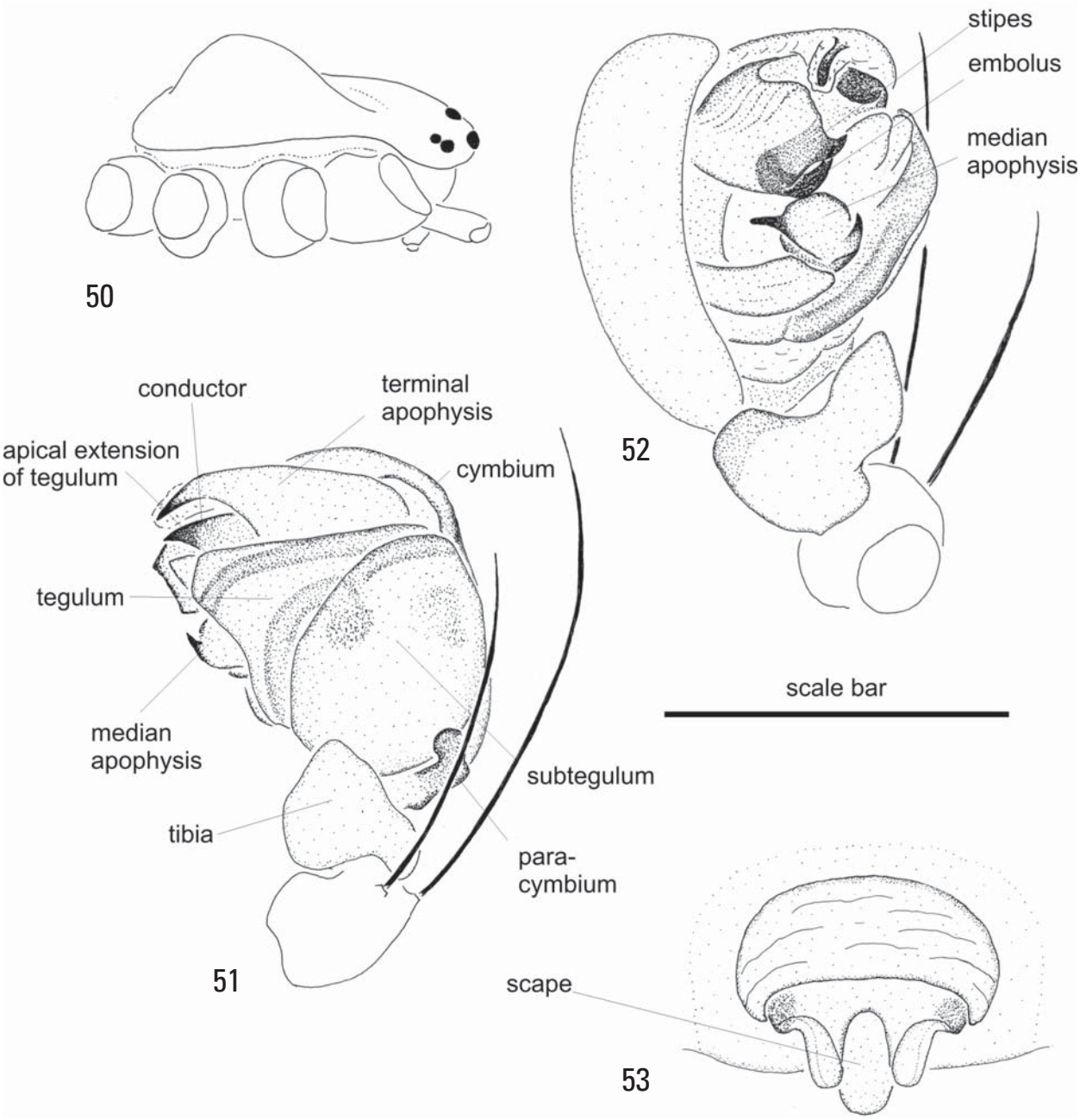


Figs. 40–46. *Larinia tabida* (L. Koch), male from Wangi Falls, Litchfield National Park, Northern Territory, Australia (AM KS58593) and female from Gibb River Road, Kalumburu turnoff, Western Australia (WAM T75255). **40–41**: Left male pedipalp (40 retrolateral, 41 ventral view). **42**: Carapace male, lateral view. **43–46**: Female epigyne (43 ventral, 44 posterior, 45 lateral, 46 dorsal view). Scale bar: 40–41, 0.68 mm; 42, 2.80 mm; 43–46, 0.51 mm.

Fig. 47. Records (n = 26) of *L. tabida* (L. Koch) in Australia.

Figs. 48–49. *Larinia delicata* Rainbow, male from Lord Howe Island, New South Wales, Australia (AM KS70745) (48 dorsal, 49 ventral view) (TL 4.52 mm).

specimen is very bleached and natural colouration and setae patterns are not clearly evident and therefore not illustrated here. Total length 5.70. Carapace: 2.24 long, 1.82 wide; clypeus 0.15 high. Eyes: AME 0.12, ALE 0.10, PME 0.08, PLE 0.10; row of eyes: AME 0.38, ALE 1.02, PME 0.29, PLE 1.06. Sternum:



Figs. 50–53. *Larinia delicata* Rainbow, male (AM KS70745) and female paratype (AM KS6590) from Lord Howe Island, New South Wales, Australia. **50**: Male carapace, lateral view. **51–52**: Left male pedipalp (51 retrolateral, 52 ventral view). **53**: Female epigyne (ventral view). Scale bar: 50, 2.17 mm; 51–52, 0.57 mm; 53, 0.42 mm.

1.15 long, 0.85 wide. Legs: leg formula I>II>IV>III; lengths of segments: pedipalp 0.85 + 0.97 + - + 0.97 = 2.79, I 3.27 + 4.42 + 3.15 + 0.91 = 11.76, II 2.73 + 3.64 + 2.67 + 0.79 = 9.82, III 2.12 + 2.12 + 1.64 + 0.61 = 6.48, IV 2.55 + 2.79 + 2.18 + 0.61 = 8.12. Abdomen: 1.76 long, 1.70 wide. Epigyne (Fig. 53): scape tongue-shaped, laterally covered by additional tongue-shaped processes; internal genitalia not examined (only type material available for study).

Distribution. *Larinia delicata* is currently known from Lord Howe Island only (Fig. 54).

Remarks. *Larinia delicata* (Rainbow, 1920) was synonymised with *Lipocrea diluta* Thorell, 1887 purely based on the original description by Rainbow (1920) (Grasshoff 1970a). Examination of the type material of *Larinia delicata* from Lord Howe Island, New South Wales (AM KS6590) clearly showed that this species is not conspecific with the species that Grasshoff (1970a: 234, figs. 17a–c) illustrated as *L. diluta*; genitalia of both male and female differ greatly. We therefore here revalidate *L. delicata* as a good species.

Rainbow originally placed this species in *Larinia*, but based on Grasshoff's (1970a) key for males to the

Fig. 54. Records (*n* = 6) of *Larinia delicata* Rainbow in Australia.

genera of the *Larinia*-group this species could belong to *Paralarinia*. The unusual carapace profile of *P. delicata* (Fig. 49) shows very good agreement with that of *Paralarinia denisi* (Lessert, 1938) as illustrated in GRASSHOFF (1970a), but the shape of the female epigyne of *P. delicata* is very different to any other *Paralarinia* (e.g. GRASSHOFF 1970b: figs. 22a–c), which have a long, wrinkled scape with apical pocket and no lateral processes as *P. delicata*. Therefore, we consider the placement of *Larinia delicata* in *Larinia* as tentative pending a phylogenetic analysis of the Australian species of the *Larinia*-group sensu GRASSHOFF (1970a).

The type material is in poor condition; the colouration is faded and the specimens are fairly fragile. Therefore, the male of *L. delicata* is here described based on more recently collected material.

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