

# A new genus-level classification of the Australian Funnel-web Spiders (Hexathelidae: Atracinae).

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## ABSTRACT

In 2010, Michael Gray, published a long overdue revision of the Australian Funnel-web Spiders (Hexathelidae: Atracinae), at the time referred to the genera *Atrax* Cambridge, 1877 and *Hadronyche* Koch, 1873.

While erecting a new monotypic genus *Illawarra* Gray, 2010 for a divergent species and placing three species in the genus *Atrax*, Gray placed the other 31 species into *Hadronyche*. In effect he created a very diverse assemblage.

Recognising this diversity, Gray (2010) created so-called "species groups" for similar species. However as the differences between the various species groups are themselves worthy of genus-level division, this paper uses the work of Gray to divide *Hadronyche* into five obvious genera, using two available names and erecting three new names according to the current edition of the *International Code of Zoological Nomenclature*.

A subgroup of four species within *Hadronyche sensu stricto* is also placed in a new subgenus.

**Keywords:** Taxonomy; nomenclature; spiders; Funnel-web; Australia; Hexathelidae; Atracinae; South Australia; New South Wales; Queensland; Victoria; *Atrax*; *Hadronyche*; *Illawarra*; *Anepsiada*; *Pseudatrax*; new genus; *Swilearanea*; *Shireenaranea*; *Grayaraneaus*; new subgenus; *Wongaraneaus*.

## INTRODUCTION

In 2010, Michael Gray, published a long overdue revision of the Australian Funnel-web Spiders (Hexathelidae: Atracinae), at the time referred to the genera *Atrax* Cambridge, 1877 and *Hadronyche* Koch, 1873 by almost all previous authors.

Gray (2010) was the first ever significant overview and revision of the until then taxonomically neglected Funnel-web Spiders. His paper recognized a total of 35 species of which 21 were newly named for the first time. Even this total is regarded as a significant underestimation of the species diversity within the group, including by Gray himself Gray (2010) little work has been done on the group since 2010.

Work by Mark Wong at the ANU as published online (Wong 2014), indicates significant genetic variation within the putative species *Atrax sutherlandi* Gray, 2010 within a very small distance in populations separated by small areas of unsuitable habitat.

This in itself indicates dispersal problems for these spiders and a likelihood of far greater diversity than external convergently evolving morphology may suggest.

While erecting a new genus *Illawarra* Gray, 2010 for a divergent species and placing just three species in the genus *Atrax*, Gray (2010) placed the other 31 species into *Hadronyche* which effect created a very diverse assemblage.

Prior to that, genus-level placement of species had been inconsistent among earlier authors, with most simply assigning

their new species to one or other of *Atrax* or *Hadronyche*.

Gray (2010) in his paper effectively transferred everything out of *Atrax* to *Hadronyche* with the exception of the type species for *Atrax*, namely *A. robustus* Cambridge, 1877, which he in turn divided into three species.

Recognising the diversity of *Hadronyche*, Gray (2010) created so-called "species groups" for similar species. However as the differences between the various species groups are worthy of genus-level division in themselves, this paper uses the work of Gray to divide *Hadronyche* into five obvious genera, using two available names and erecting three new names according to the *International Code of Zoological Nomenclature* (Ride *et al.* 1999)

A subgroup of four species within *Hadronyche* is also placed in a new subgenus.

Gray (2010) also provides a significant bibliography of relevant sources and rather than recite them here, I merely refer readers to Gray (2010) for this list, noting that Gray (2010) has been republished online and is widely available to anyone with an internet connection.

That paper can be found at:

[https://australianmuseum.net.au/uploads/journals/19162/1556\\_complete.pdf](https://australianmuseum.net.au/uploads/journals/19162/1556_complete.pdf)

In terms of the genus-level descriptions below, the diagnostic information for each group is also effectively lifted from Gray (2010) and I make no apologies for this.

I find this preferable to remanufacturing the data as “new” to claim some kind of scientific discovery. The basis of this paper is a review of Gray’s work and a finding that at the genus level, he should have split *Hadronyche* and yet failed to do so.

I should also note that I have worked extensively with Funnel web spiders across south-east Australia over the past 50 years and am by no means a novice when it comes to this group. In terms of the genus level descriptions, the following applies.

Unless mandated by the rules of the *International Code of Zoological Nomenclature* (Ride *et al.* 1999) or superseding publications, none of the spellings of the newly proposed names should be altered in any way. The names created herein have also been created with a view to avoiding any potential homonymy with earlier established names across all of zoology. Should one or more newly named taxa (genera) be merged by later authors to be treated as a single entity, the order of priority of retention of names should be the order (page priority) of the descriptions within this text (which is the same as that listed in the abstract).

Implicit in this taxonomic arrangement is recognition of all the genera, *Atrax*, *Hadronyche* and *Illawarra*, as well as the resurrection of the name *Anepsiada* Rainbow and Pulleine, 1918 for species within the so called *Hadronyche lamingtonensis* Gray, 2010 species group.

The genus name *Pseudatrx* Rainbow, 1914 is a subjective junior synonym of *Hadronyche sensu stricto* (applicable to the taxon first identified as *Atrax versutus* Rainbow, 1914) and is therefore not an available name for the species groups formally named within this paper.

The three newly named genera, *Swilearanea gen. nov.*, *Shireenaranea gen. nov.*, and *Grayaraneaus gen. nov.*, correspond in order to the so-called *Hadronyche infensa* (Hickman, 1964) species group, *H. anzses* Raven, 2000 species group and the *H. adelaidensis* (Gray, 1984) species group as identified by Gray (2010). The newly named subgenus *Wongaraneaus subgen. nov.* corresponds to a group of four species within *Hadronyche*, until now not commonly referred to a well-defined species group.

They consist of a putatively related group of four species from Victoria and Tasmania being *Hadronyche modesta* (Simon, 1891), *H. meridiana* Hogg, 1902, *H. jensenae* (Gray, 2010) and *H. pulvinator* (Hickman, 1927).

*Hadronyche* Koch, 1873 is herein confined to a group of species identified by (Gray, 2010) as the so-called “*cerberea* species group”. The taxon *Hadronyche cerberea* Koch, 1873 is the type species of the genus and therefore this group of species. The genus name *Anepsiada*, for the type species *Anepsiada ventricosa* Rainbow and Pulleine, 1918 is an available name. The type specimen is believed to be a species within the so-called “*lamingtonensis* species group” as identified by Gray (2010) and therefore that entire group of four described species (and potentially others not yet recognized) is referred to that genus. Those species, all named by Gray (2010) and placed by him in *Hadronyche*, are *lamingtonensis*, *raveni*, *annachristae* and *monteithi*.

The exact identity of the male type specimen of *Anepsiada ventricosa* Rainbow and Pulleine, 1918 is uncertain and it is therefore not known if this name “*ventricosa*” is a senior synonym of one of the other four, or alternatively a separate species (Gray 2010).

The species originally described as *Hadronyche anzses* Raven, 2000 was also placed by Gray (2010) into his so-called “*lamingtonensis* species group” (as the fifth and final species), but is clearly divergent from the others and therefore is herein transferred to a currently monotypic genus *Grayaraneaus gen. nov.* Hence *Hadronyche* Koch, 1873 as defined by Gray (2010) is now broken into five genera, namely *Hadronyche* Koch, 1873, *Anepsiada* Rainbow and Pulleine, 1918, *Swilearanea gen. nov.*, *Shireenaranea gen. nov.*, and *Grayaraneaus gen. nov.*

The three newly named genera are formally named below according to the rules of the *International Code of Zoological Nomenclature* (Fourth edition) (Ride *et al.* 1999).

All relevant measurements are given in millimetres (mm).

#### **SWILEARANEA GEN. NOV.**

**Type species:** *Atrax infensus* Hickman, 1964.

**Diagnosis:** *Swilearanea gen. nov.* are readily separated from other similar genera within what was formerly treated as *Hadronyche* Koch, 1873 and now including all of genera *Shireenaranea gen. nov.*, *Anepsiada* Rainbow and Pulleine, 1918 and *Grayaraneaus gen. nov.*, by the following suite of characters: Medium to large sized funnel web spiders. Male femora I, II without spines. Labium relatively long (LL/LW 0.85 mm-0.96 mm) (like the short labium in *Anepsiada* Rainbow and Pulleine, 1918 species). Central cheliceral tooth row long (except in that it is uniquely short and basal in *S. kaputarensis* (Gray, 2010)). Tibia II without apophysis, being either more or less sinuous (sometimes slightly thickened proximally) with ventral spines clustered in the proximal half; or more cylindrical with clustered to scattered spines. Metatarsus II without apophysis, cylindrical to weakly sinuous, sometimes slightly swollen mid-ventrally. Male palp with few spines (tibia 0-3, patella 0-1, femur 0-2). Embolus with shaft broad or narrow, moderately curved and weakly to not tapered. Distal part of embolus weakly to strongly twisted, twisting often extended back along the shaft as a deep, longitudinal fold, well developed in species with wider, weakly tapered emboli. Ratio of bulb length to palpal tibia length 0.78-0.95 (i.e. usually greater than in *Hadronyche* species). Posterior lateral spinnerets with moderately long apical segment (PLSAPW/L 0.32-0.37).

The genus *Hadronyche* Koch, 1873 and all of genera *Anepsiada* Rainbow and Pulleine, 1918, *Swilearanea gen. nov.*, *Shireenaranea gen. nov.*, and *Grayaraneaus gen. nov.*, differ from *Atrax* Cambridge, 1877 and *Illawarra* Gray, 2010 in tibia II being either unmodified or having a blunt, rounded apophysis or apophyseal swelling. They differ from both *Atrax* and *Illawarra* in having caput moderately to strongly raised and cheliceral paturon more robust. They differ from *Illawarra* by the male tarsi having two instead of three ventral spine rows.

**Distribution:** Coast and highlands from the Hawkesbury River region of mid-eastern New South Wales to southeastern Queensland.

**Etymology:** Named in honour of Marlene Swile of Mitchell’s Plain in South Africa, in recognition of her various services to the biological sciences in southern Africa. Both Marlene Swile and the relevant taxa also have hairs around their feet regions.

The “*aranea*” part of the genus name is the Latin word for spider.

**Content:** *Swilearanea infensa* (Hickman, 1964) (type species); *S. kaputarensis* (Gray, 2010); *S. levittgreggae* (Gray, 2010); *S. lynabrae* (Gray, 2010); *S. macquariensis* (Gray, 2010); *S. orana* (Gray, 2010); *S. valida* (Rainbow and Pulleine, 1918); *S. walker* (Gray, 2010).

#### **SHIREENARANEA GEN. NOV.**

**Type species:** *Atrax adelaidensis* Gray, 1984.

**Diagnosis:** *Shireenaranea gen. nov.* are readily separated from other similar genera within what was formerly treated as *Hadronyche* Koch, 1873 and now including all of genera *Swilearanea gen. nov.*, *Anepsiada* Rainbow and Pulleine, 1918 and *Grayaraneaus gen. nov.*, by the following suite of characters: They are small atracinae (CL 5.4 mm - 6.9 mm). Burrow entrance without triplines, with sidechamber closed by a trap-door. Carapace broad, strongly raised. Labium and sternum wide. Serrula absent. Cheliceral groove narrow with long central tooth row. STC teeth few (8-9). Male femora I, II with dorsal spines or bristles. Males without leg II apophyses; leg I modified (incrassate tibia and metatarsus) or unmodified. Male palpal tibia bulbous basally; patella wider than femur.

The genus *Hadronyche* Koch, 1873 and all of genera *Anepsiada* Rainbow and Pulleine, 1918, *Swilearanea gen. nov.*,

*Shireenaranea gen. nov.*, and *Grayaraneaus gen. nov.*), differ from *Atrax* Cambridge, 1877 and *Illawarra* Gray, 2010 in tibia II being either unmodified or having a blunt, rounded apophysis or apophyseal swelling. They differ from both *Atrax* and *Illawarra* in having caput moderately to strongly raised and cheliceral paturon more robust. They differ from *Illawarra* by the male tarsi having two instead of three ventral spine rows.

**Distribution:** Confined to the Gulf Ranges region of south-east South Australia.

**Etymology:** Named in honour of my wife, Shireen Hoser, originally from a wild and untamed place called Athlone in (Cape Town) South Africa, in recognition of her various services to the biological sciences in southern Africa and Australia. Both Shireen Hoser and the relevant taxa also have hairs around their feet regions. The “aranea” part of the genus name is the Latin word for spider.

**Content:** *Shireenaranea adelaidensis* (Gray, 1984) (type species); *S. eyrei* (Gray, 1984); *S. flindersi* (Gray, 1984).

#### GRAYARANEAEUS GEN. NOV.

**Type species:** *Hadronyche anzses* Raven, 2000.

**Diagnosis:** The genera *Grayaraneaus gen. nov.* and *Anepsiada* Rainbow and Pulleine, 1918 are readily separated from other similar genera within what was formerly treated as *Hadronyche* Koch, 1873 and now including all of genera *Swilearanea gen. nov.* and *Shireenaranea gen. nov.* by the following suite of characters: Small to medium sized atracine spiders (CL 5.0 mm - 8.0 mm). Males without leg II apophyses; femora I, II typically without dorsal spines (rarely a bristle-like spine on femur II).

Middle haematodocha usually exposed between tegulum and subtegulum. Carapace broad, strongly raised (CW/CL 0.48 mm - 0.51 mm). Cheliceral groove narrow, central teeth few, basal. Posterior lateral spinnerets with short apical segment (PLSAPW/L 0.53 mm - 0.63 mm). Labium relatively short (LL/LW 0.74 mm - 0.83 mm), cuspule number usually low (44-102), but moderate in *Grayaraneaus gen. nov.* (mean = 213). Sternum moderately wide. Several species have swollen or “boat-shaped” tarsi III and IV. Palpal patella wider than femur; tibia without spines, rather short and basally broad.

*Grayaraneaus gen. nov.* is in turn separated from *Anepsiada* Rainbow and Pulleine, 1918 by having only a few basal teeth (3) on the cheliceral promargin and metatarsus I with fewer spines (c. 10); and from *Anepsiada raveni* (Gray, 2010) and *A. lamingtonensis* (Gray, 2010) by tarsi III, IV swollen and “boat-shaped”.

The genus *Hadronyche* Koch, 1873 and all of genera *Anepsiada* Rainbow and Pulleine, 1918, *Swilearanea gen. nov.*, *Shireenaranea gen. nov.*, and *Grayaraneaus gen. nov.*), differ from *Atrax* Cambridge, 1877 and *Illawarra* Gray, 2010 in tibia II being either unmodified or having a blunt, rounded apophysis or apophyseal swelling. They differ from both *Atrax* and *Illawarra* in having caput moderately to strongly raised and cheliceral paturon more robust. They differ from *Illawarra* by the male tarsi having two instead of three ventral spine rows.

**Distribution:** Known only from the type locality which is Mossman Bluff summit, 10 km west of Mossman, north-east Queensland, Australia, Latitude -16°26'54"S, Longitude 145°16'59"E.

**Etymology:** Named in honour of Michael Gray of the Australian Museum in Sydney, New South Wales, Australia in recognition of his significant works on the Funnel-web spiders in Australia. “araneaus” is the male gender Latin word for spider.

**Content:** *Grayaraneaus anzses* (Raven, 2000) (monotypic).

#### SUBGENUS WONGARANEAEUS SUBGEN. NOV.

**Type species:** *Atrax modesta* Simon, 1891.

**Diagnosis:** The genus *Hadronyche* Koch, 1873 as defined herein is the group of spiders identified by Gray (2010) as his so-called “*cerberaea* species group” the species *Hadronyche cerberaea* Koch, 1873 being the type species for the genus and this group of species.

The genus *Hadronyche* Koch, 1873 and the component subgenus *Wongaraneaus subgen. nov.* as defined and named herein are readily separated from other similar genera within what was formerly treated as *Hadronyche* Koch, 1873, these

being all of genera *Swilearanea gen. nov.*, *Shireenaranea gen. nov.*, *Grayaraneaus gen. nov.* and *Anepsiada* Rainbow and Pulleine, 1918 by the following suite of characters: Small to large sized Atracinae. Male femora I, II usually with dorsal spines, sometimes spines absent. Labium relatively long, (LL/LW 0.86 mm - 0.99 mm), sometimes shorter (LL/LW 0.64 mm - 0.79 mm). Male tibia II shape and spination variable: unmodified cylindrical to weakly sinuous, with a few ventral spines clustered proximally or scattered; or sinuous with a spinose, rounded apophysis or apophyseal swelling placed mid-ventrally to proximally. Metatarsus II either cylindrical to weakly sinuous and without an apophysis, or sinuous (often ventrally concave proximally) with a mid-ventral apophysis/apophyseal swelling. Male palp with embolus often moderately short and broad, weakly curved and twisted. Ratio of bulb length to palpal tibia length 0.64 mm - 0.77 mm. Central cheliceral tooth row long. Apical segment of posterior lateral spinnerets short to long (PLSAPW/L 0.29 mm - 0.51 mm).

*Wongaraneaus subgen. nov.* are readily separated from other species within *Hadronyche* Koch, 1873 by having a shorter labium (LL/LW 0.69 - 0.79), which is less than in all other *Hadronyche* except for the species *H. mascordi* Gray, 2010 (which is within the nominate subgenus). However in *H. mascordi* this is associated with the partial fusion of the labium with the sternum in this species.

The genus *Hadronyche* Koch, 1873 and all of genera *Anepsiada* Rainbow and Pulleine, 1918, *Swilearanea gen. nov.*, *Shireenaranea gen. nov.*, and *Grayaraneaus gen. nov.*), differ from *Atrax* Cambridge, 1877 and *Illawarra* Gray, 2010 in tibia II being either unmodified or having a blunt, rounded apophysis or apophyseal swelling. They differ from both *Atrax* and *Illawarra* in having caput moderately to strongly raised and cheliceral paturon more robust. They differ from *Illawarra* by the male tarsi having two instead of three ventral spine rows.

**Distribution:** Victoria and Tasmania.

**Etymology:** Named in honour of Mark Wong of the Australian National University in Canberra, ACT, Australia in recognition of his significant works on the Funnel-web spiders in Australia. The “araneaus” part of the genus name is the male gender Latin word for spider.

**Content:** *Hadronyche (Wongaraneaus) modesta* (Simon, 1891); *H. (Wongaraneaus) meridiana* Hogg, 1902; *H. (Wongaraneaus) jensenae* (Gray, 2010) and *H. (Wongaraneaus) pulvinator* (Hickman, 1927).

#### Content within the subgenus *Hadronyche* Koch, 1873:

*Hadronyche (Hadronyche) cerberaea* Koch, 1873 (type species); *H. (Hadronyche) alpina* Gray, 2010; *H. (Hadronyche) emmalizae* Gray, 2010; *H. (Hadronyche) formidabilis* (Rainbow, 1914); *H. (Hadronyche) marracoonda* Gray, 2010; *H. (Hadronyche) mascordi* Gray, 2010; *H. (Hadronyche) monaro* Gray, 2010; *H. (Hadronyche) nimoola* Gray, 2010; *H. (Hadronyche) tambo* Gray, 2010; *H. (Hadronyche) venenata* (Hickman, 1927); *H. (Hadronyche) versuta* (Rainbow, 1914).

**Content of the genus *Anepsiada* Rainbow and Pulleine, 1918:** *Anepsiada ventricosa* Rainbow and Pulleine, 1918 (type species) (see earlier comments on the status of the type specimen); *A. annachristiae* (Gray, 2010); *A. lamingtonensis* (Gray, 2010); *A. monteithi* (Gray, 2010); *A. raveni* (Gray, 2010).

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#### CONFLICT OF INTEREST

The author has no known conflicts of interest in terms of this paper and conclusions within.