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A new species of Endangered giant trapdoor spider (Mygalomorphae: Idiopidae: *Euoplos*) from the Brigalow Belt of inland Queensland, Australia

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Abstract. A new species of giant trapdoor spider, *Euoplos dignitas* sp. nov. (family Idiopidae), is described from the Brigalow Belt of inland Queensland, Australia. Phylogenetic analysis of a six gene molecular dataset for the tribe Euoplini reveals that this species is sister to the *spinnipes*-group from eastern Queensland, and unrelated to a morphologically similar congener (*E. grandis* Wilson & Rix, 2019) that occurs further south in the Brigalow Belt. Both *E. dignitas* sp. nov. and *E. grandis* are very large, scopulate, plug door-building trapdoor spiders from transitional woodland habitats on vertosols ('black soils'), with superficially similar females and strongly sexually-dimorphic 'honey-red' males. Information on the known biology and distribution of *E. dignitas* sp. nov. is summarized, and a conservation assessment is provided under the International Union for Conservation of Nature's (IUCN) Red List Criteria, indicating that this species is likely Endangered.

Keywords: Avicularioidea, biogeography, Bipectina, Domiothelina, phylogeny, taxonomy

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The 'golden trapdoor spiders' of the genus *Euoplos* Rainbow, 1914 are among Australia's best-known mygalomorph spiders, having been the subject of an extensive research program since 2017 aimed at understanding the diversity, phylogeny, biogeography and biology of this distinctive group (Rix et al. 2017a, c, 2019a, b; Wilson et al. 2018, 2019, 2020, 2021; Wilson & Rix 2021). Along with the genus *Cryptoforis* Wilson, Rix & Raven, 2020, which was separated from *Euoplos* and newly described in 2020, the genus *Euoplos* belongs the monophyletic tribe Euoplini Rainbow, 1914. This tribe was recovered as the sister-group to all other Australasian Idiopidae in recent phylogenetic analyses (Rix et al. 2017a; Wilson et al. 2020). Species of *Euoplos* are small to very large Idiopidae from both eastern and western mainland Australia, all of which build hard, plug-like 'soil + silk' doors, as opposed to flap-like 'leaf litter + silk' doors in most species of *Cryptoforis* (Wilson et al. 2020). Males of *Euoplos*, like those of *Bungulla* Rix, Main, Raven & Harvey, 2017 and a number of species in other Australian idiopid genera, are unusual in lacking paired clasping spurs on the distal prolateral tibia I, and both male and female *Euoplos* are generally characterized by relatively conservative somatic and genitalic morphologies, with the remarkable exception of the *mcmillani*-group of 'white-headed trapdoor spiders' from south-western Western Australia (see Rix et al. 2019a).

Among the many species of *Euoplos* known from eastern Australia (Fig. 1) are an allopatrically distributed suite of species from semi-arid and transitional inland habitats west of the Great Dividing Range. The best known of these is *Euoplos grandis* Wilson & Rix, 2019 from the Darling Downs 'black soil' (vertosol) plains of south-eastern Queensland's inland Brigalow Belt bioregion – a very large trapdoor spider with striking 'honey-red' males and stocky, dark-colored scopulate females (Fig. 2) (Rix et al. 2019b). However, a number of other undescribed inland species are also known, including a new species from west of Theodore, central Queensland (JDW, unpubl. data), *Euoplos* "Burren Junction" and *Euoplos* "Orange" from inland New South Wales (Wilson et al. 2020; Fig. 1), *Euoplos* 'Quinkan' from Cape York Peninsula (Wilson et al. 2020; Fig. 1), and an undescribed species known from near the Queensland towns of Monto and Eidsvold (code-named *Euoplos* "Monto"; Figs. 2–11). The latter species was not previously sampled in any molecular or morphological phylogenetic analyses, but was included by Rainbow & Pulleine (1918) in their erroneously broad taxonomic concept of *E. variabilis* Rainbow & Pulleine, 1918, based on specimens collected in the early 20th Century from near Eidsvold. *Euoplos* "Monto" was thus an enigmatic species with only a handful of specimens in the Queensland Museum's collection, all but one collected prior to the 1970s and with no known males (hence its exclusion from the total-evidence analysis of the tribe Euoplini by Wilson et al. 2020). However, with very large females bearing scopulae, and a distribution encompassing the inland Queensland Brigalow Belt, a hypothesized relationship to *E. grandis* was considered, potentially the result of allopatric *in situ* speciation within the Brigalow Belt bioregion. To address this question, sequenceable genetic material and optimally a male specimen were required, and field work in May 2021 resulted in the first collections of this species since the 1990s.

In this paper, we taxonomically describe the giant trapdoor spider *E. dignitas* sp. nov., based on material newly collected near Monto, Queensland, Australia. To explore the phylogenetic relationship between this species and the morphologically similar *E. grandis*, we further sequenced three specimens of *E. dignitas* sp. nov. for six genes and added these data to an expanded matrix for the tribe Euoplini. Beyond the documentation of an impressive and rare species from a highly threatened bioregion, our aims with this study were therefore to understand whether these two very large trapdoor spiders from inland Queensland represent sister-species or unrelated

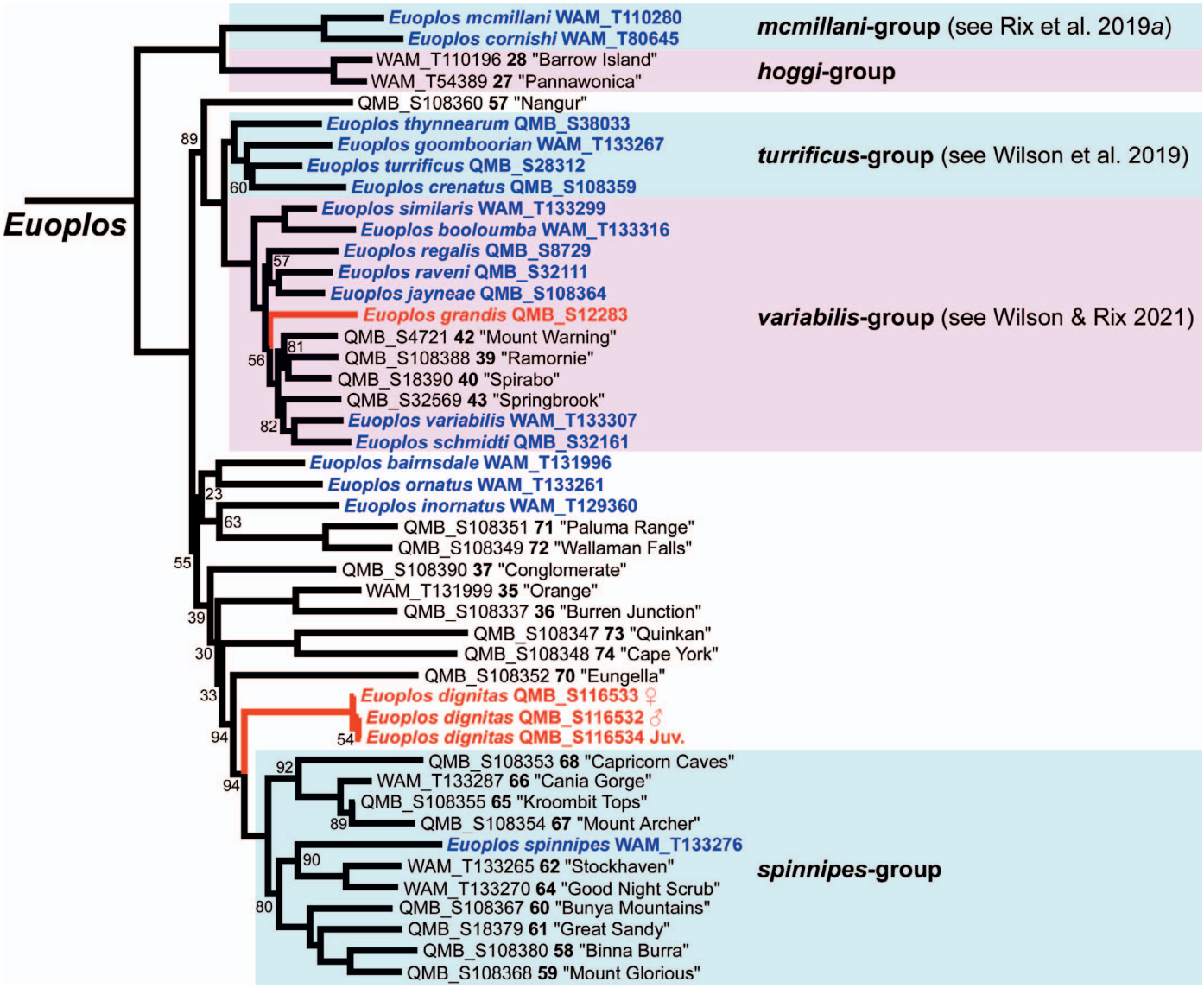


Figure 1.—Phylogeny of the genus *Euoplos* (expanded from the molecular-only taxon sample of Wilson et al. 2020, fig. 3), inferred from a W-IQ-TREE maximum likelihood analysis of the six gene molecular dataset (63 taxa, 4,108 bp). Nodes have an ultrafast bootstrap value of ≥ 0.95 unless otherwise stated. Previously named species are shown in blue text, except *E. dignitas* sp. nov. and *E. grandis*, which are highlighted in red. Undescribed species codes are as per Wilson et al. (2020). See text for details.

congeners, and to summarize the known distribution, biology and conservation status of a previously poorly-known species.

METHODS

Molecular methods and phylogenetics.—Nucleotide sequence data were generated for six protein-coding genes from three specimens of *E. dignitas* sp. nov., as per Wilson & Rix (2021). The six protein-coding genes included two mitochondrial genes (cytochrome *c* oxidase subunit 1 [*COI*] and cytochrome *b* [*CYB*]), plus four nuclear loci (ribosome production factor 2 homolog [*RPF2*]; 39S ribosomal protein L45, mitochondrial [*MRPL45*]; histone acetyltransferase type B catalytic subunit [*HAT1*]; and Xaa-Pro aminopeptidase 3 [*XPNPEP3*]) (see Rix et al. 2017a). Methods used for DNA extraction and polymerase chain reaction (PCR) amplification of sequences have been detailed previously (Rix et al. 2017a; Wilson et al. 2018, 2020), with PCR chemistry and Sanger sequencing as per Rix et al. (2020). Sequence editing, alignment, concatenation and matrix generation were performed using Geneious (ver. 9.1.8), following Wilson & Rix (2021).

To explore the phylogenetic position of *E. dignitas* sp. nov. relative to other lineages of *Euoplos*, we added molecular data for three specimens to the 60-taxon molecular-only taxon sample of Wilson et al. (2020, fig. 3) (see Table 1). Phylogenetic analysis of this expanded 63-taxon dataset, including model selection, was conducted using maximum likelihood, in the W-IQ-TREE online interface (Nguyen et al. 2015; Trifinopoulos et al. 2016). To assess node support, 1000 ultrafast bootstrap replicates (Minh et al. 2013) were implemented within W-IQ-TREE.

Table 1.—GenBank accession numbers for the three specimens of *Euoplos dignitas* sp. nov. collected near Monto, Queensland, Australia that were added to the molecular-only taxon sample of Wilson et al. (2020, fig. 3), for inclusion in the 63-taxon (six gene) expanded dataset (see Fig. 1).

Specimen	Species	*COI*	*CYB*	*RPF2*	*MRPL45*	*HAT1*	*XPNPEP3*
QMB S116532 ♂	*E. dignitas*	OL623821	OL623823	OL623832	OL623829	OL623826	–
QMB S116533 ♀	*E. dignitas*	OL623820	–	OL623830	OL623827	OL623824	OL623833
QMB S116534 Juv.	*E. dignitas*	–	OL623822	OL623831	OL623828	OL623825	OL623834

Morphological methods.—Standard morphological methods, including the format of species descriptions, follow similar recent taxonomic contributions (e.g., Wilson et al. 2021; Wilson & Rix 2021). Specimens are lodged at the Queensland Museum, Brisbane (QMB) and the South Australian Museum, Adelaide (SAM), and the following abbreviations are used throughout the text: ALE, anterior lateral eye/s; AME, anterior median eye/s; IBRA_BBS, Brigalow Belt (South) bioregion; PL, prolateral; PLE, posterior lateral eye/s; PME, posterior median eye/s; RL, retrolateral; RTA, retrolateral tibial apophysis (of male pedipalp); V, ventral. Superscript DNA voucher codes are listed in the Material Examined section for those specimens sequenced for the phylogenetic analysis, and for conservation reasons, specific GPS coordinates of collection localities are not provided (*sensu* Rix et al. 2019b).

RESULTS AND DISCUSSION

Phylogenetic analysis of the 63-taxon (six gene) molecular matrix, expanded from Wilson et al. (2020), recovered a maximum likelihood topology (of log likelihood -44002.2464) for the tribe Euoplini (Fig. 1) broadly concordant with previous phylogenetic analyses (see Wilson et al. 2018; Wilson et al. 2020, fig. 3; Wilson & Rix 2021). Monophyletic lineages of *Euoplos* recovered here and documented in previous studies include the 'Western Australian arid zone clade' (including the *hoggi*- and *mcmillani*-groups; Rix et al. 2019a), the *turrificus*-group (Wilson et al. 2019) sister to the *variabilis*-group (Wilson et al. 2020; Wilson & Rix 2021), and the *spinnipes*-group (Wilson et al. 2020) (Fig. 1). As in Wilson & Rix (2021) and Wilson et al. (2018), *E. grandis* was recovered within the *variabilis*-group with high support. In contrast, *E. dignitas* sp. nov. was recovered as a new species-level lineage sister to the *spinnipes*-group, with moderate support.

The strong resemblance between two giant trapdoor spiders from the Brigalow Belt of inland Queensland – *E. dignitas* sp. nov. and *E. grandis* (Fig. 2) – represents a possible example of parallel or even convergent evolution within Australian Idiopidae (although the degree to which both species have converged relative to ancestral forms is unknown). Indeed, despite the two species being only distantly related congeners (Fig. 1), this resemblance includes the somatic phenotype of the male (i.e., large idiopids with a striking 'honey-red' carapace and legs and grey-brown abdomen; Fig. 2), the somatic phenotype of the female (i.e., very large, dark-colored, scopulate idiopids with a red-brown carapace and legs; Fig. 2), and even burrow-building behavior (i.e., large, plug-door burrows on flat ground, as opposed to burrows on inclined banks; Figs. 8–10; cf. Rix et al. 2019b, figs. 1c, 3b, 6). While close morphological examination, particularly of leg I (in both males and females), does reveal crucial differences between the two species, more indicative of their true phylogenetic affinities, the similarity of form and burrow-building behavior in two such distantly related species is noteworthy. Both *E. dignitas* sp. nov. and *E. grandis* are closely tied to transitional woodland habitats on 'black-soil' (vertosol) open plains within the Brigalow Belt (South) bioregion, and both species lineages are likely to have diverged from congeners in the late Miocene or early Pliocene (*sensu* Rix et al. 2017a, fig. 6). Natural selection within this shared habitat is therefore proposed as a possible evolutionary driver of phenotypic similarity, with biogeographic influences potentially driving independent speciation within the Brigalow Belt.

From a conservation perspective, both *E. dignitas* sp. nov. and *E. grandis* are significant in having seemingly restricted ranges in threatened, highly fragmented woodland habitats within a now Endangered Ecological Community under the Australian Commonwealth's *Environmental Protection and Biodiversity Conservation Act* (Eastwood et al. 2008; Rix et al. 2017b, 2019b). Conservation assessment of *E. dignitas* sp. nov. under the International Union for Conservation of Nature's (IUCN) Red List Criteria (see Conservation status, below) indicates that this species is Endangered or possibly even Critically Endangered, and urgent on-the-ground surveys are required to understand where in the landscape populations still exist, and if those populations are actively declining. Work on lizards over the last decade has also revealed previously overlooked range-restricted taxa of conservation concern in the Brigalow Belt bioregion (Melville et al. 2014; Hoskin 2019). Like some other threatened fauna species in the Brigalow Belt bioregions (e.g., Amey et al. 2018), roadside verges (Fig. 11) may be an important refuge for *E. dignitas* sp. nov., in the absence of larger protected areas of woodland. However, verge habitats throughout the Brigalow Belt are still subject to clearing, grading and even stocking, rendering the long-term persistence of such populations tenuous at best. An integrated conservation plan that incorporates rigorous survey, population-genetic assessment, conservation listing and focused management and protection of remnant populations is therefore required, to inform management and to give *E. dignitas* sp. nov. the best chance of survival long-term.

TAXONOMY

Family Idiopidae Simon, 1889
Subfamily Arbanitinae Simon, 1903
Tribe Euoplini Rainbow, 1914
Genus *Euoplos* Rainbow, 1914

Euoplos Rainbow, 1914: 217.

Type species.—*Euoplos spinnipes* Rainbow, 1914, by monotypy.

Figure 2.—Comparative live habitus images of female (left) and male (right) *Euoplos grandis* Wilson & Rix, 2019 (top row; see Rix et al. 2019b, fig. 1) and *E. dignitas* sp. nov. (bottom row), showing the overall similarity between these two unrelated Brigalow Belt species. Images by M. Rix.

Diagnosis.—For a full analysis and discussion of the diagnostic characters separating the tribe Euoplini from other Arbanitinae, see Rix et al. (2017c); and separating *Euoplos* from *Cryptoforis*, see Wilson et al. (2020, 2021).

Distribution.—The genus *Euoplos* has a broad distribution in eastern Australia from northern Queensland south to Victoria, and in Western Australia from the Pilbara bioregion south to the Warren bioregion (Rix et al. 2017c; Wilson et al. 2020, 2021; Wilson & Rix 2021). Anecdotal information suggests that the genus may also occur in the Flinders Ranges of South Australia, although this cannot be confirmed with museum specimen records.

Composition and remarks.—The genus *Euoplos* includes 24 described species, including one species newly described in this study: *E. bairnsdale* (Main, 1995), *E. ballidu* (Main, 2000), *E. booloumba* Wilson & Rix, 2021, *E. cornishi* Rix, Wilson & Harvey, 2019, *E. crenatus* Wilson, Rix & Raven, 2019, *E. dignitas* sp. nov., *E. festivus* (Rainbow & Pulleine, 1918), *E. goomboorian* Wilson, Rix & Raven, 2019, *E. grandis* Wilson & Rix, 2019, *E. hoggi* (Simon, 1908), *E. inornatus* (Rainbow & Pulleine, 1918), *E. jayneae* Wilson & Rix, 2021, *E. kalbarri* Rix, Wilson & Harvey, 2019, *E. mcmillani* (Main, 2000), *E. ornatus* (Rainbow & Pulleine, 1918), *E. raveni* Wilson & Rix, 2021, *E. regalis* Wilson & Rix, 2021, *E. saplan* Rix, Wilson & Harvey, 2019, *E. schmidti* Wilson & Rix, 2021, *E. similaris* (Rainbow & Pulleine, 1918), *E. spinnipes* Rainbow, 1914, *E. thynnearum* Wilson, Rix & Raven, 2019, *E. turrificus* Wilson, Rix & Raven, 2019, and *E. variabilis* (Rainbow & Pulleine, 1918).

Euoplos dignitas Rix & Wilson, sp. nov.
ZooBank LSID: http://zoobank.org/?lsid=urn:lsid:zoobank.org:act:46F3D257-667E-4B59-BCDA-C0B7746F45F2
(Figs. 1–34)

Type material.—*Holotype male*. AUSTRALIA: *Queensland*: NW. of Monto [*specific locality not disclosed*] [IBRA_BBS], open grassy woodland on roadside verge, 6 May 2021, hand collected from burrow, M.G. & A.G. Rix (QMB S116532^{DNA}).

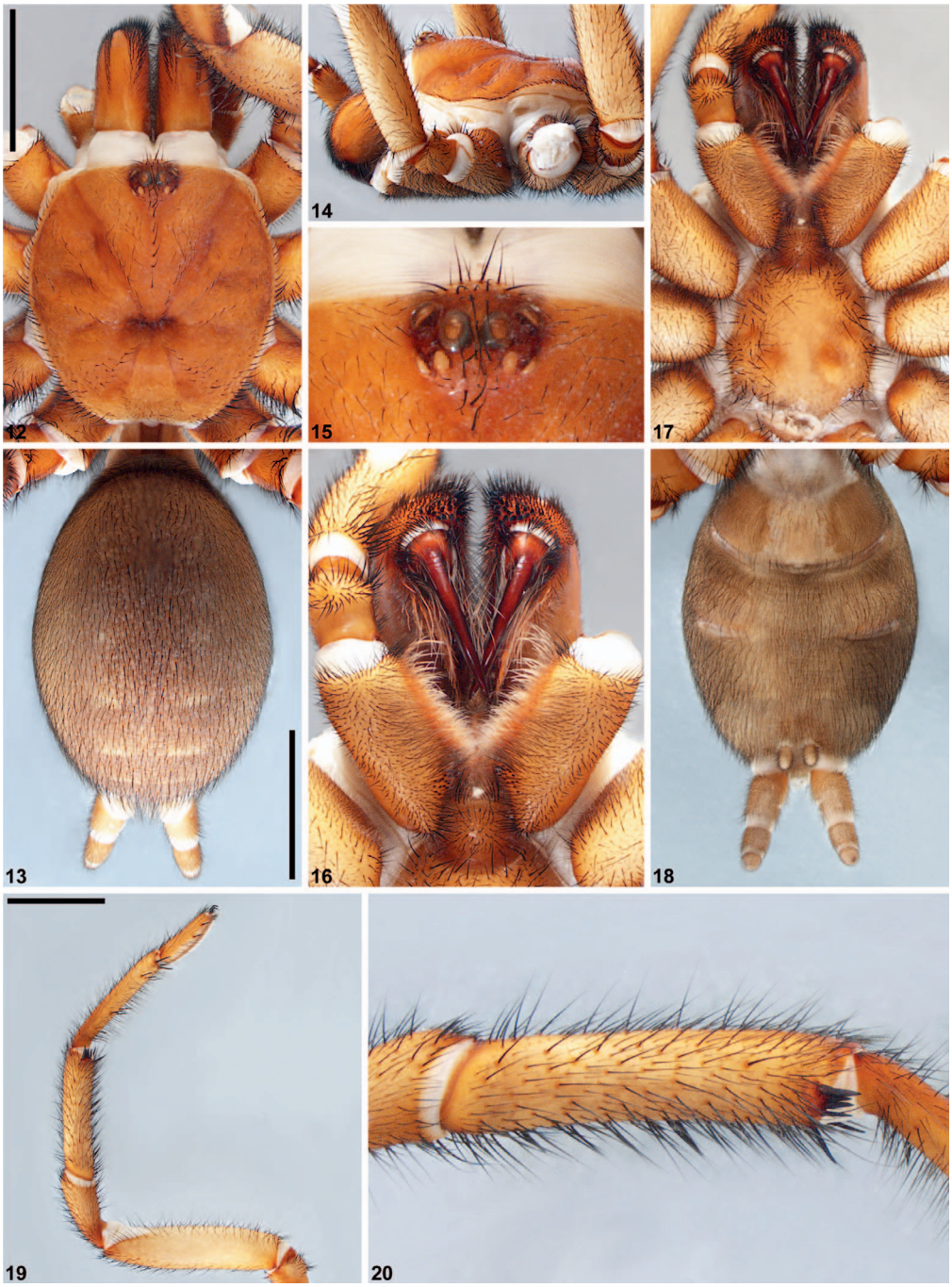
Figures 3–11.—Live habitus, burrow and habitat images of *Euoplos dignitas* sp. nov. from NW of Monto (Queensland): 3–5, holotype male (QMB S116532); 6, 7, paratype female (QMB S116533); 8, 9, closed burrows of two large females; 10, open burrow of large female, showing thick plug-like door and beveled burrow rim; 11, roadside open grassy woodland habitat at the type locality. Images by M. Rix.

Paratypes. AUSTRALIA: *Queensland*: 1 ♀, same data as holotype except 5 May 2021 (QMB S116533^{DNA}); 1 juvenile, same data (QMB S116534^{DNA}).

Other material examined.—AUSTRALIA: *Queensland*: 1 ♀, Monto, "Colodan" [IBRA_BBS], 26 June 1997, J. Henderson (QMB S42746); 1 ♀, Monto [IBRA_BBS], 17 September 1935, C. King (QMB S8091); 1 ♀, Hutton's property, 23 miles [ca. 37 km] N. of Monto, along Biloela Road [IBRA_BBS], in lawn, black soil, hard lid trapdoor, 10 August 1961, M.A. Tesch (QMB S91310); 1 juvenile, same data (QMB S91313); 1 ♀, same data except P.R. Webb (QMB S91312); 1 juvenile, same data (QMB S91314); 1 juvenile, same data (QMB S91315); 1 ♀, Eidsvold [IBRA_BBS], February 1915, T.L. Bancroft (QMB S8803); 1 ♀, same data except 29 November 1917 (QMB S9890); 1 ♀, same data except July 1924 (SAM NN2833);); 1 ♀, same locality data except R. Pulleine [no collection date] (SAM NN2834); 1 ♀, Eidsvold region, 2 miles [ca. 3.2 km] from Ceratodus along Hollywell Road [IBRA_BBS], in patch of bare earth beside road, hard lid trapdoor, 11 August 1961, M.A. Tesch (QMB S91311).

Etymology.—The specific epithet is derived from the Latin *dignitas* (noun: 'dignity', 'greatness'), in reference to the impressive nature of this large species, but also to Queensland Museum's 'Project DIG' ('Digital Infrastructure Growth') initiative, which funded the description of this species. Project DIG is a partnership between Queensland Museum Network (QM), BHP and BMA, which aims to transform how QM stores and shares its collections and research.

Diagnosis.—Males of *E. dignitas* sp. nov. can be distinguished from members of the eastern Australian *variabilis*-group (i.e., *E. booloumba*, *E. grandis*, *E. jayneae*, *E. raveni*, *E. regalis*, *E. schmidti*, *E. similaris*, *E. variabilis*; see Wilson & Rix 2021), from members of the Queensland *turrificus*-group (i.e., *E. crenatus*, *E. goomboorian*, *E. thynnearum*, *E. turrificus*; see Wilson et al. 2019), and from *E. inornatus* from Western Australia by the presence of a distal protuberance and accompanying comb of macrosetae on prolateral tibia I (Fig. 20). Males can further be distinguished from members of the Western Australian *mcmillani*-group (i.e., *E. ballidu*, *E. cornishi*, *E. kalbarri*, *E. mcmillani*, *E. saplan*; see Rix et al.



Figures 12–20.—*Euoplos dignitas* sp. nov., male holotype (QMB S116532) from NW. of Monto (Queensland), somatic morphology: 12, 13, carapace and abdomen, dorsal view; 14, cephalothorax, lateral view; 15, eyes, dorsal view; 16, mouthparts, ventral view; 17, 18, cephalothorax and abdomen, ventral view; 19, leg I, prolateral view; 20, leg I tibia, prolateral view. Scale bars = 5.0 mm.

2019a) by the color of the carapace, which is honey-red (in life) or red-brown (in ethanol) (Figs. 2–5, 12) as opposed to white; from *E. spinnipes* by the color of the carapace, which is much paler (Fig. 12; cf. Rix et al. 2017c, fig. 289), and by the absence of broad abdominal chevrons (Fig. 13; cf. Rix et al. 2017c, fig. 290); and from *E. hoggi* and *E. ornatus*, to which they are similar, by their much larger size (holotype with carapace length of 9.3 mm, as opposed to <8.0 mm in both *E. ornatus* and *E. hoggi*).

Females of *E. dignitas* sp. nov. can be distinguished from those of *E. spinnipes* (and other undescribed species in the *spinnipes*-group *sensu* Wilson et al. 2020) by the presence of scopulae on the anterior legs (Figs. 31, 32); and from *E. grandis* (*variabilis*-group) and members of the *turrificus*-group by the presence of narrower spermathecae with more defined crowns (Fig. 33). Females of *E. dignitas* sp. nov. are most similar in general appearance to members of the *variabilis*-group (see Wilson & Rix 2021), however, the only species of

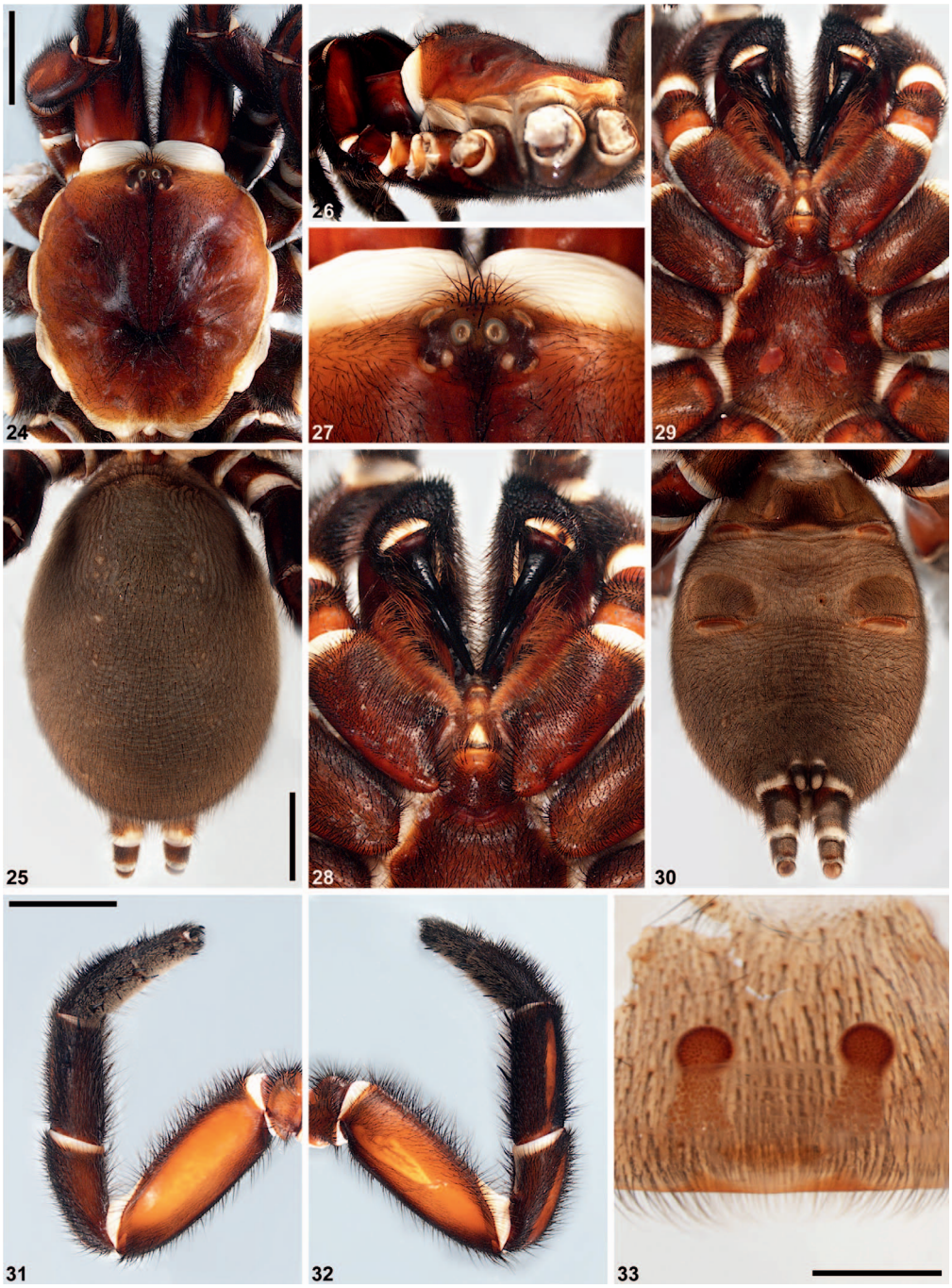
Figures 21–23.—*Euoplos dignitas* sp. nov., male holotype (QMB S116532) from NW. of Monto (Queensland), pedipalp: 21, retrolateral view; 22, retroventral view; 23, prolateral view. Scale bar = 5.0 mm.

the *variabilis*-group known to occur in the inland Brigalow Belt (South) bioregion is *E. grandis*, from which *E. dignitas* females can also be distinguished by the more numerous spines on the anterior legs (e.g., the paratype female of *E. dignitas* has 25 spines on leg I, compared with 16 in *E. grandis*; Figs. 31, 32).

Males, females and juveniles of *E. dignitas* sp. nov. can also be distinguished from genotyped congeners (both described and undescribed) by nucleotide sequence data under a phylogenetic species concept (Fig. 1), based on now rigorous Australia-wide sampling for the genus *Euoplos* (see Wilson et al. 2020).

Description (male holotype).—Total length 26.36. *Carapace*: 9.31 long, 8.80 wide (length/width = 1.06); tan-brown (honey red-brown in life; Figs. 2–5); with short, black bristles in radial patches and around margin; fovea slightly procurved (length/width = 0.16), ~0.2 × width of carapace in line with fovea (Fig. 12). *Ocular region*: eyes on distinct tubercle (Fig. 14); eye group compact, rectangular (width/length = 1.76), length 1.05, anterior width 1.84, posterior width 1.65, ~0.3 × pars cephalica width, AME (0.55) > ALE (0.48) > PLE (0.37) > PME (0.31) (Figs. 12, 15). *Mouthparts*: rastellum of several thorn-like spines on chelicerae; maxillae with ~20 cuspules on antero-ental edge; labium 1.64 × wider than long, with a single thin cuspule on the anterior edge (Fig. 16). *Sternum*: widest between coxae of legs II and III; length/width = 1.01; covering of black hairs, rubbed off in centre; anterior and medial sigilla small and marginal, posterior sigilla larger (max. diameter = 0.18 × sternum length), ovoid, sub-central (Fig. 17). *Abdomen*: 11.36 long, 8.09 wide, oval; light brown (slightly darker in life; Figs. 2–5) with six pairs of small, beige spots/lines; light coat of hairs; spinnerets with spigots on all segments, apical segments domed (Figs. 13, 18). *Legs*: concolorous with carapace, scopulae on tarsi I, II; leg I length 29.39 (8.90, 4.52, 6.28, 6.67, 3.03), leg I length/carapace length = 3.16, tibia length/width = 4.26 (Fig. 19). *Tibia I*: with single prolateral protuberance armed with comb of four spines (Fig. 20). *Claws:* all legs with three claws, superior claws with row of few (<7) teeth, inferior claws bare. *Trichobothria*: left leg I = in single dorsal row on metatarsus; in irregular, wide band on tarsus. *Pedipalp:* tibia 2.34 × longer than wide in retrolateral view; RTA relatively small, triangular, with 60–70 spinules on retrolateral side (Figs. 21, 22); cymbium with pointed retrolateral lobe and rounded prolateral lobe (Figs. 21–23). *Copulatory organ:* total length ~55% of palpal tibia length; embolus ~1.1 × length of bulb, curved and twisted 90°, tip ~0.25 × width of embolus base; haematodocha extending down ~0.3 of embolus.

Description (female QMB S116533).—Total length 42.89. *Carapace*: 14.53 long, 12.54 wide (length/width = 1.16); red-brown (darker in life; Figs. 2, 6, 7); glabrous; fovea wide, procurved (length/width = 0.24), ~0.25 × width of carapace in line with fovea (Fig. 24). *Ocular region*: eyes on slight tubercle (Fig. 26); eye group compact, rectangular (width/length = 1.72), length 1.52, anterior width 2.50, posterior width 2.61, ~0.3 × pars cephalica width, ALE (0.67) > AME (0.54) > PLE (0.45) > PME (0.40) (Figs. 24, 27). *Mouthparts*: rastellum of many thorn-like spines on pronounced mound on chelicerae; maxillae with ~35 cuspules on antero-ental edge; labium 1.19 × wider than long, without cuspules (Fig. 28). *Sternum*: widest between coxae of legs II and III; length/width = 1.06; covering of black hairs; anterior and medial sigilla small and marginal, posterior sigilla larger (max. diameter = 0.20 × sternum length), ovoid, sub-central (Fig. 29). *Abdomen*: 20.21 long, 14.43 wide, oval; dark brown (the same in life; Figs. 2, 6, 7) with six pairs of highly inconspicuous beige spots;



Figures 24–33.—*Euoplos dignitas* sp. nov., female paratype (QMB S116533) from NW. of Monto (Queensland): 24, 25, carapace and abdomen, dorsal view; 26, cephalothorax, lateral view; 27, eyes, dorsal view; 28, mouthparts, ventral view; 29, 30, cephalothorax and abdomen, ventral view; 31, leg I, prolateral view; 32, leg I, retrolateral view; 33, spermathecae, dorsal view. Scale bars = 5.0 mm (24, 25), 1.0 mm (33).

light coat of hairs; spinnerets with spigots on all segments, apical segments domed (Figs. 25, 30). *Legs*: slightly darker than carapace, relatively dense scopulae on tarsi and metatarsi I and II, denser on prolateral side; leg I length 28.29 (9.11, 6.38, 5.51, 4.51, 2.78), leg I length/carapace length = 1.95, tibia length/width = 2.12 (Figs. 31, 32). *Leg spines*: anterior legs with lateral spines; left leg I = femur 0, patella 0, tibia 7 (2PL, 1V and 4RL), metatarsus 11 (5PL, 6RL), tarsus 7 (3PL, 4RL), total = 25 (Figs. 31, 32); posterior legs with lateral and dorsal spines, few ventral (except on tarsi); patch of ~7 thorn-like spines on prolateral patella III. *Claws:* all legs with three claws, superior claws with single proximal tooth with/without few accompanying denticles, inferior claws bare. *Trichobothria*: left leg I = in single dorsal row on metatarsus; in irregular, wide band on tarsus. *Internal genitalia:* paired spermathecae parallel; with distinct, rounded crowns; entirely sclerotized, crowns slightly darker; length ~1.8 × width; distance between bases about 2 × crown width (Fig. 33).

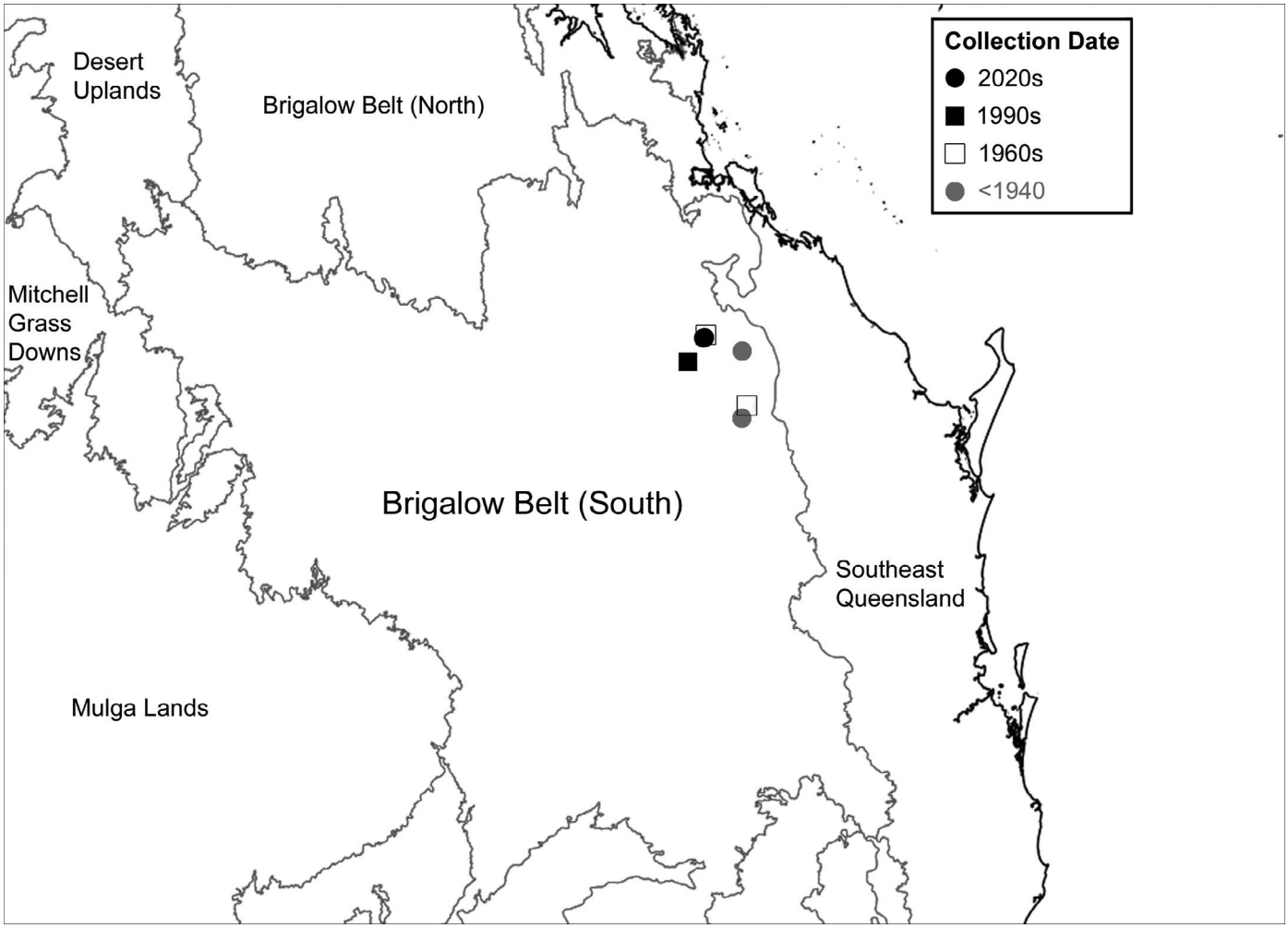


Figure 34.—Map showing known collection records of *Euoplos dignitas* sp. nov. from the Brigalow Belt of inland Queensland, with different symbols representing different collection dates (by decade). Interim Biogeographic Regionalisation of Australia (IBRA) 7.0 bioregional boundaries and select names are indicated.

Distribution and remarks.—*Euoplos dignitas* is currently known from only a relatively small area of the eastern Brigalow Belt (South) bioregion of inland Queensland, from north-west of Monto south to approximately Eidsvold (Fig. 34). Like *E. grandis* from the Brigalow Belt of southern Queensland, *E. dignitas* appears to favor open woodland habitats on black soil (vertosol) country, where the spiders build burrows with a thick plug-like trapdoor on flat ground (Figs. 8–10). At the type locality the spiders can be found in open grassy woodland along a roadside verge, and appear to take advantage of the relatively stable conditions that exist on the un-ploughed and un-stocked (road-) side of fence lines (Fig. 11). The single known male was collected in its burrow in early May, indicating that like *E. grandis*, males of this species likely wander in search of females in late Autumn or Winter.

Conservation status.—Other than the type series, very few specimens of this species have been collected in recent decades, with only a single female submitted to the Queensland Museum since the 1960s (Fig. 34). An extensive three-day search in the Eidsvold–Monto region in May 2021 revealed only a single population along several hundred meters of a roadside verge, with most available habitat cleared for agriculture or stock. Roadside surveys in remnant habitats were largely unsuccessful, with most verges highly disturbed or recently graded, the latter extremely destructive for trapdoor spiders, their burrows and the integrity of their habitat. Although the distribution of this species remains imperfectly known, and additional detailed surveys are required, existing data would suggest that this species is of conservation significance under the International Union for Conservation of Nature's (IUCN) Red List Criteria. Indeed, the known extent of occurrence based on existing collection records is $<$ 2,000 km^2 (ca. 1,850 km^2), and the number of known extant populations is one or perhaps two (based on $>$1990 records), with extant and historical locations all severely fragmented. With continuing decline in the extent and/or quality of habitat, this species is currently assessed as Endangered (IUCN B1a,b[iii], B2a,b[iii]), but a Critically Endangered assessment may be warranted in future if the area of occupancy is found to be $<$10 km^2.

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