

## ***Maratus occasus*, a new peacock spider from Queensland, Australia with a review of the *Maratus tasmanicus* group (Araneae: Salticidae: Euophryini: *Maratus* Karsch 1878)**

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**Abstract.** A new species of the peacock spider genus *Maratus* Karsch, 1878 is described from Queensland, Australia: *Maratus occasus* sp. nov., the northernmost known occurring species of the *Maratus tasmanicus* group. Morphological characters and distribution of the three known species of the *M. tasmanicus* group are compared.

**Keywords.** Australia, euophryine, jumping spider, salticid, taxonomy, new species

Presently the Australian peacock spiders are assigned to two genera: *Maratus* Karsch 1878 and *Saratus* Otto & Hill 2017. While the genus *Saratus* is monotypic, its sister-genus *Maratus* is highly diverse with at least 73 described peacock spider species (Schubert 2019). In *Maratus*, fourteen intrageneric clades of species which share similar morphological and behavioural traits have been proposed by Otto and Hill (2017). In one of these clades, the *Maratus tasmanicus* group, the males bear a large triangular fan with lobate opisthosomal flaps, each flap decorated with a large black spot (Otto and Hill, 2017). Two species of this group are presently described: *Maratus australis* Otto & Hill 2016 from the southwest Australian coast, and *Maratus tasmanicus* Otto & Hill 2013 from the southeast Australian coast. Here, an additional species from inland Queensland is described, *Maratus occasus* sp. nov., significantly expanding the known geographic range of species in the *M. tasmanicus* group.

### **Materials and Methods**

The spiders examined for this study were hand-collected in the vicinity of Lake Broadwater, Australia in September 2016 and October 2017. Conspecificity of males and females was determined by the collection of individuals encountered together. The type specimens were preserved in 100% ethanol and have been lodged in the Queensland Museum (QM). Latitude, longitude, and elevation were determined using a GPS receiver. The holotypes were examined with a Leica M205C (TM) and photographed utilising a Leica DCF450 (TM) camera attachment. Measurements of the specimens were made using the measuring tool on Leica Application Suite 5.2 (TM) and cross examined with the measurement tool on ImageJ. Photographs of living spiders were produced with an Olympus EM-1 Mark II (TM) equipped with an Olympus M-Zuiko (TM) 60mm macro lens. Abbreviations are as follows: ALE, anterior lateral eyes; AME, anterior median eyes; PLE, posterior lateral eyes. Total length measurement refers to the distance from the anterior margin of the carapace to the posterior margin of the opisthosoma.

***Maratus occasus* sp. nov.**

*Type specimens.* Holotype: Male. Australia, Queensland: Lake Broadwater, 27°20'21.12"S, 151°5'49.595"E, 30 September 2016 (Coll. P. W. Price, deposited in the Queensland Museum, QMS 110414). Paratypes: 4 male, 1 female. Australia, Queensland: Lake Broadwater, 27°20'25.89"S, 151°5'48.231"E, 6 October 2017 (Coll. P. W. Price, deposited in the Queensland Museum, QMS 110415).

*Etymology.* The specific name (*occasus*, Latin m., noun in apposition, English translation: sunset) refers to the colours of the scale patterns on the dorsal opisthosomal plate of the male.

*Diagnosis.* This species belongs to the *Maratus tasmanicus* group (Otto & Hill, 2017) with respect to the large triangular fan with lobate opisthosomal flaps, each flap bearing with a large black spot. The dorsal opisthosomal surface of the male *M. occasus* is marked with two longitudinal tracts of orange scales whereas males of *M. tasmanicus* and *M. australis* bear three (the middle stripe bifurcated in *M. australis*). Females of *M. occasus* are similar to other female *Maratus* species and identification may be problematic without association with a male.

*Description of male* (Figures 1:1-6, 2:1-3, 3:1-4, 6:1-5, 7:2). In life: Carapace dark brown, almost black and mostly glabrous; ocular quadrangle region covered thickly in grey scales and interrupted by stripes of red-orange scales which extend from behind each anterior eye to rear margin of ocular quadrangle (Figure 1:4); median thoracic tract comprised of white scales extends from rear slope of carapace to rear margin of ocular quadrangle region (may be worn in some specimens, see Figure 6); lateral tracts of white scales situated behind each PLE (Figure 3:3).

AME ringed with short, white scales; ALE ringed with short, red-orange scales on upper perimeter and short, white scales on lower perimeter; long white setae project downwards from below AME forming triangular shape (Figure 3:1); clypeus covered with short, white setae; chelicerae dark brown and glabrous; coxae, labium, and endites dark brown and glabrous; sternum dark brown with light covering of fine, white setae (Figure 3:4).

Dorsal opisthosoma patterned with complex figure comprised of orange scales on background of light blue scales by which two orange longitudinal tracts extend from anterior margin of opisthosoma meeting an orange oblong-like figure; transverse, curved band of orange scales runs parallel to posterior margin of opisthosoma; anterolateral edges of opisthosoma marked with tracts of orange/tan-orange scales (Figure 1:2-3); lateral opisthosomal lobes marked with two large black spots, upper perimeter encircled by orange scales; lateral opisthosomal lobes otherwise densely covered with dull blue-purple scales; opisthosomal plate thinly fringed with long, white setae, lateral lobes more thickly so (Figure 7:2); colular tuft of white setae situated above grey spinnerets (Figure 1:2-3); ventral opisthosoma dark brown and scattered with short, creamy coloured setae.

Legs I and II subequal in length; legs III and IV longer; legs III by far longest; legs I and II ringed with alternating white and brown/orange setae; legs IV similarly ringed but less distinctively so; femora and patellae of legs III lightly covered with white setae; tarsi of legs III white (Figure 1:1-6).

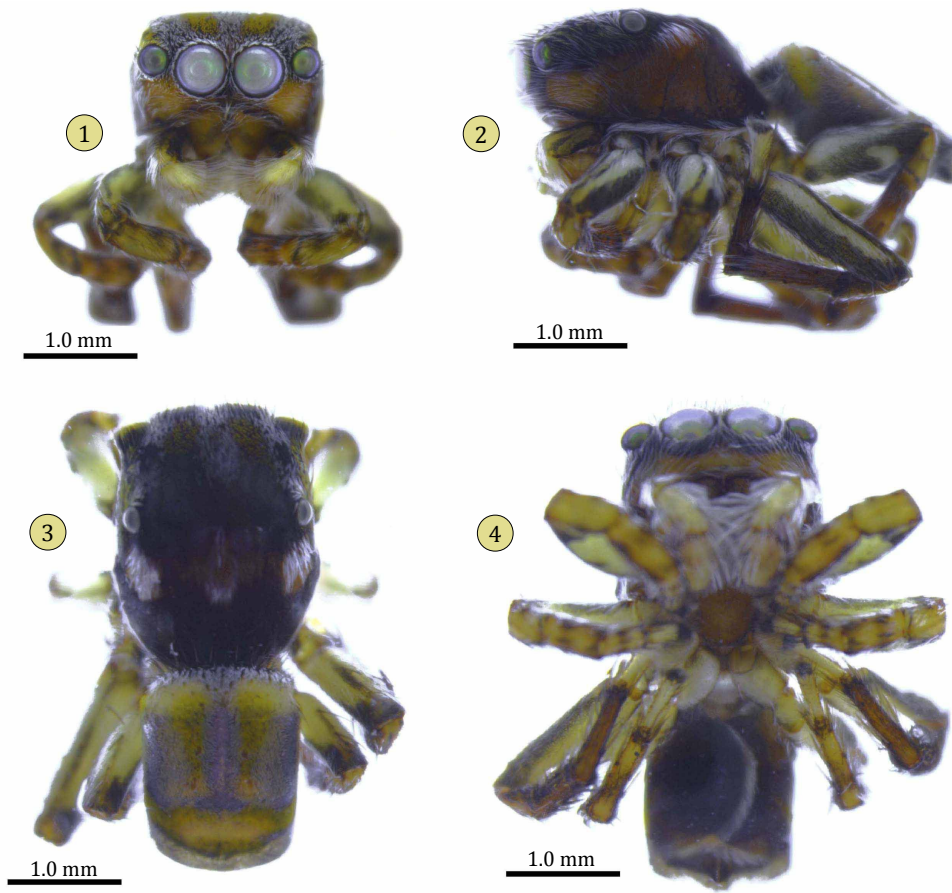
Pedipalp covered dorsally with long, off-white setae (Figure 1:1); relatively large male palpal bulb with retrolateral sperm duct loop, large retrobasal tegular lobe, finger-like retrolateral tibial apophysis, anticlockwise coiled embolus; distal embolus with two apices when viewed laterally; heavily sclerotized cuticle on tegulum, proximomedial to ring of embolus (Figure 2:1-3).



**Figure 1.** Habitus of living paratype male *Maratus occasus* sp. nov. 1, Anterior view. 2, Dorsal view. 3, Dorsolateral view. 4, Anterolateral view. 5, Lateral view. 6, Lateral view.



**Figure 2.** Images of left pedipalp of preserved paratype male *Maratus occasus* sp. nov. 1, Medioventral view showing embolic disc and tegular lobe. 2, Ventral view. 3, Retrolateral view showing finger-like retrolateral tibial apophysis and retrolateral sperm duct loop.



**Figure 3.** Images of the habitus of preserved holotype male *Maratus occasus*. **1**, Anterior view. **2**, Lateral view. **3**, Dorsal view. **4**, Ventral view.

*Female* (Figures 4:1-6, 5:1-4). Ocular quadrangle region dark brown with incomplete cover of red-brown and white setae; area posterior to ocular quadrangle light brown and lightly scattered with short, white scales, otherwise mostly glabrous; rim of carapace glabrous and lacking marginal band (Figure 4:4-6); anterior eyes bordered with red-brown and white scales (Figure 4:1); PME closer to PLE than to ALE; long white setae project downwards from below AME forming triangular shape; clypeus covered with short, white setae (Figure 4:1); chelicerae light brown and glabrous; coxae, endites, and labium dark brown, translucent and mostly glabrous; sternum medium-dark brown with light covering of fine, white setae.

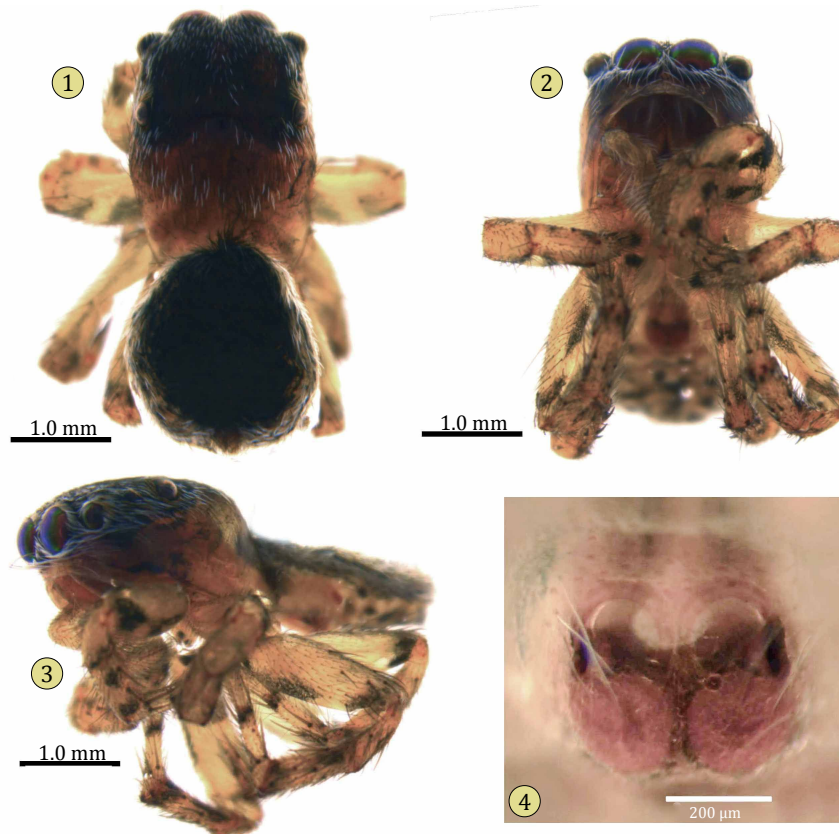
Dorsal opisthosomal surface dark brown and scattered with long, dark setae; anterior and lateral edges of opisthosoma light brown and covered with broad tracts of white setae (Figure 4:2-6); spinnerets dark brown; lateral and ventral opisthosoma light brown and mottled with small dark spots (Figure 5:2).

Legs I and II subequal in length; legs III and IV longer; legs III longest; all legs light brown and translucent with light covering of dark brown and white setae, legs III and IV slightly more heavily so; ventral femoral surface of legs I and II with distinct dark markings on cuticle (Figure 4:5-6); tarsi of each leg tipped with dark brown setae; pedipalps light brown and translucent with incomplete cover of dark brown and white setae (Figure 4:1).

Epigynum with pair of large ovate fossae separated by septum; ovate posterior spermatheca behind each fossa; sclerotized ducts present anterior to each spermatheca (Figure 5:4).

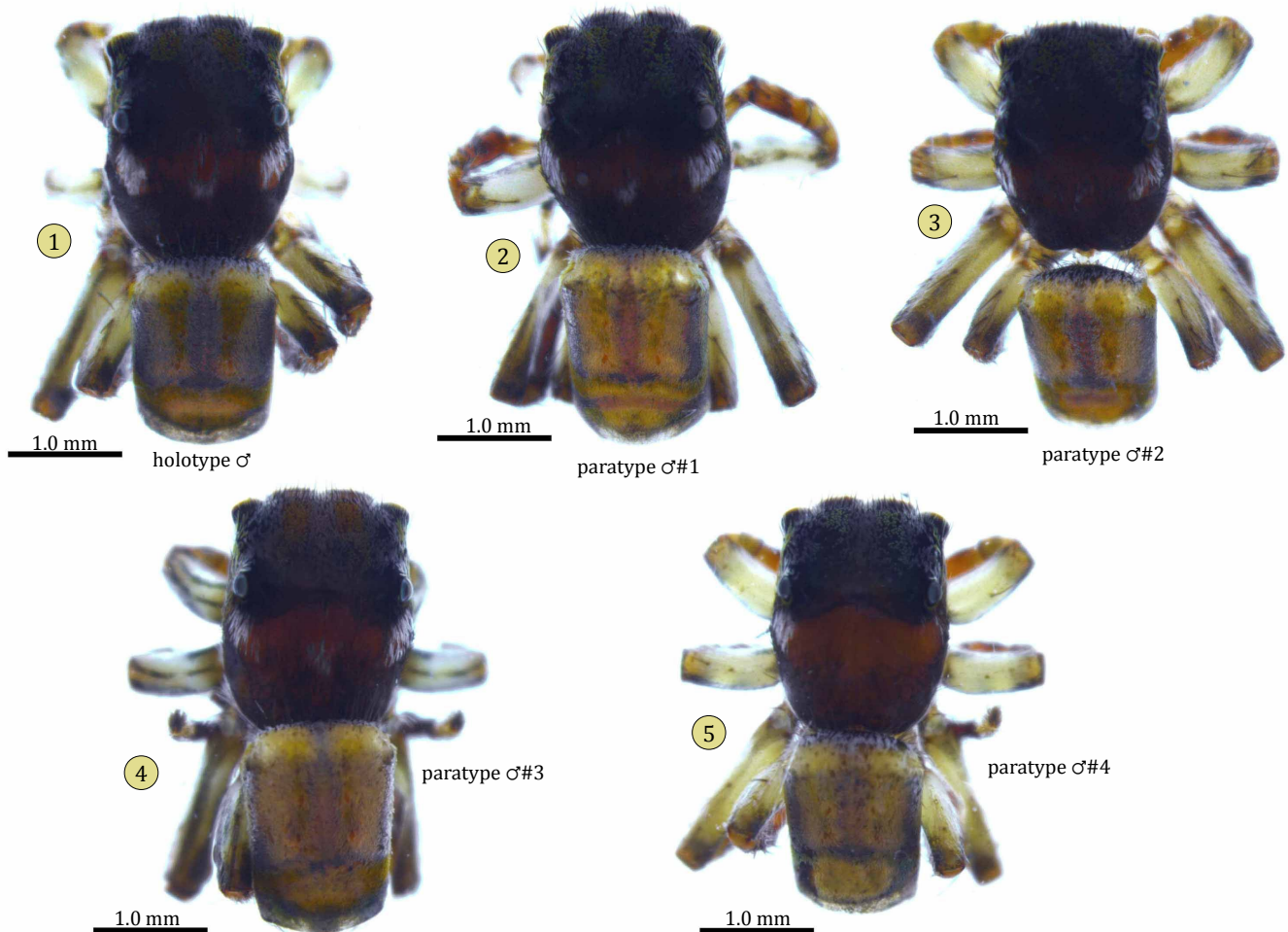


**Figure 4.** Habitus of living paratype female *Maratus occasus* sp. nov. 1, Anterior view. 2, Posterodorsal view. 3, Posterodorsolateral view. 4, Anterolateral view. 5, Lateral view. 6, Lateral view.



**Figure 5.** Images of preserved paratype female *Maratus occasus* sp. nov. 1, Dorsal view. 2, Ventral view. 3, Lateral view. 4, Epigyne.

*Variation.* In males, the median thoracic tract and lateral tracts of white scales on the carapace may be more distinct or indistinct between specimens due to rubbing and loss of scales. The longitudinal tracts of orange scales on the dorsal opisthosoma of the male vary in thickness between specimens (Figure 6) and the colours of these tracts and the background of blue/blue-green scales may be duller or more vibrant.



**Figure 6.** Variation in preserved holotype and paratype male *Maratus occasus* sp. nov. specimens.

*Dimensions of male (mm).* Total length: 3.41–3.85 ( $3.68 \pm 0.19$ ,  $n=5$ ). Carapace length 1.98–2.08 ( $2.00 \pm 0.05$ ,  $n=5$ ). Opisthosoma length 1.42–1.86 ( $1.65 \pm 0.15$ ,  $n=5$ ). Leg I length: 2.81–2.85 ( $2.84 \pm 0.02$ ,  $n=5$ ). Leg II length: 2.82–2.85 ( $2.83 \pm 0.01$ ,  $n=5$ ). Leg III length: 4.15–4.24 ( $4.19 \pm 0.04$ ,  $n=5$ ). Leg IV length: 3.77–3.84 ( $3.80 \pm 0.03$ ,  $n=5$ ).

*Dimensions of female (mm).* Total length: 4.23. Carapace length 2.15. Opisthosoma length 2.08. Leg I length 2.49. Leg II length: 2.51. Leg III length: 4.18. Leg IV length: 3.78.

*Courtship display* (Figure 7:2). During the courtship display, the male *Maratus occasus* sp. nov. raises and waves legs III, elevates the opisthosoma and extends the opisthosomal flaps. In many respects the courtship display strongly resembles that of *M. tasmanicus* (Otto & Hill 2013) and *M. australis* (Otto & Hill 2016).



**Figure 7.** Male peacock spiders of the *Maratus tasmanicus* group. **1**, *Maratus australis*. Photo by Jürgen Otto. **2**, *Maratus occasus* sp. nov. Photo by Michael Duncan. **3**, *Maratus tasmanicus*.

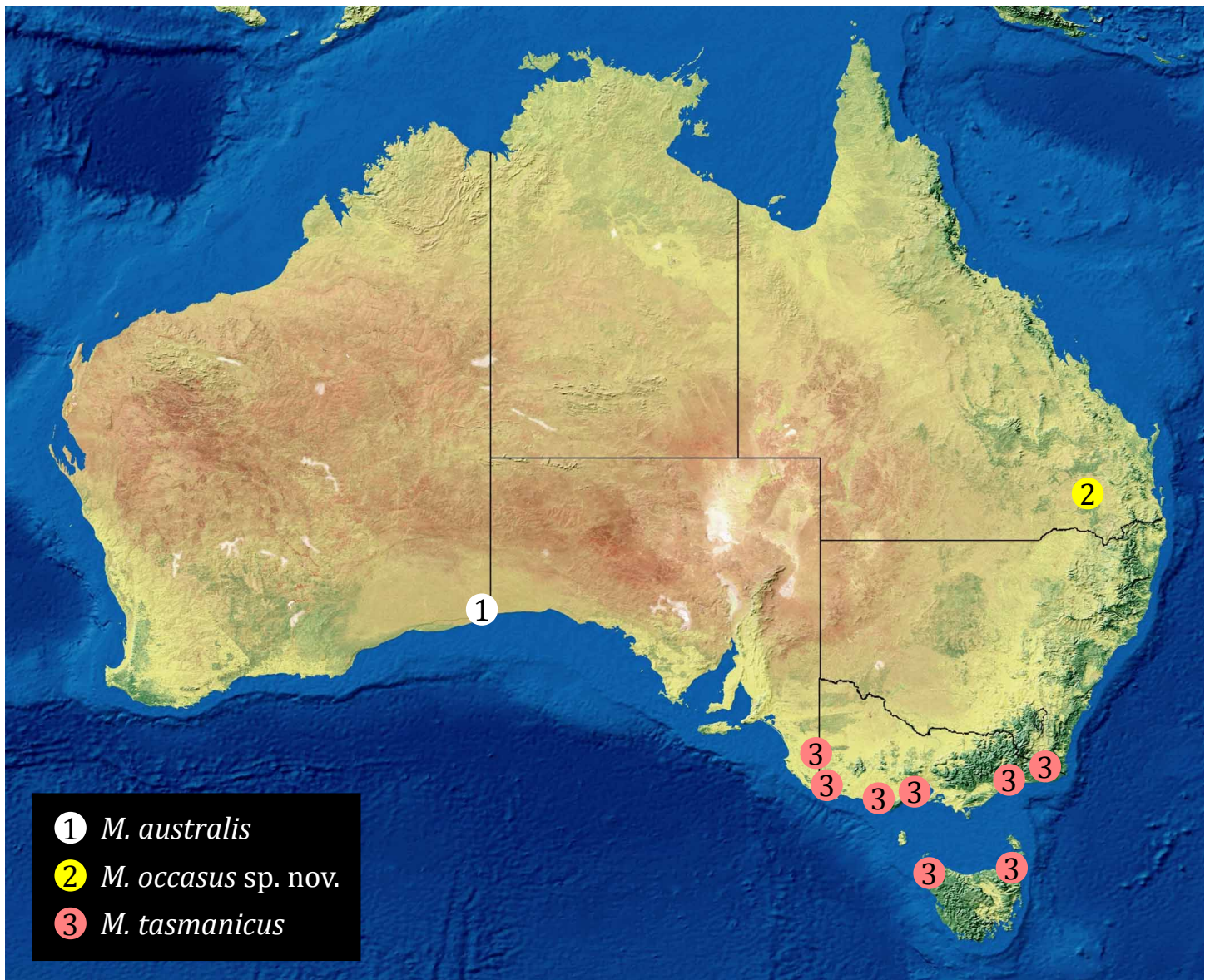
### The *Maratus tasmanicus* group

The males of each of the species in the *M. tasmanicus* group can be distinguished from other *Maratus* species by the presence of large triangular fans with lobate opisthosomal flaps, each flap bearing a large black spot, and by their opisthosomal markings which bear orange tracts of scales on a background of blue to blue-green scales (Figure 7; Otto & Hill, 2017). In addition to these diagnostic characters of species in the *M. tasmanicus* group, several other characters which are helpful for identification (not all exclusive to the *M. tasmanicus* group) are shown in Table 1.

**Table 1.** Important characters used for identifying males of the *M. tasmanicus* group (not all of which are exclusive to males of this group).

shared character	<i>M. australis</i>	<i>M. occasus</i>	<i>M. tasmanicus</i>
Tracts of red-orange scales extending from behind each anterior eye to rear margin of ocular quadrangle	Present	Present, tracts behind AME wider and disconnected from each ocular rim	Present with and additional distinct tract between the AME
Carapace with median thoracic tract and lateral thoracic tracts of white scales	Present, wider median thoracic tract	Present	Present
Large triangular fan with lobate opisthosomal flaps	Present	Present	Present
Fan background (between orange tracts) densely covered with iridescent blue to blue-green scales	Present, usually dull	Present	Present
Complex dorsal opisthosomal figure comprised of orange pigmented scale tracts	Three curved tracts, the median bifurcated	Two tracts bordered by tan-orange scales	Three tracts
Each opisthosomal flap bearing a large black spot of scales	Present, partially encircled with orange scales	Present, partially encircled with orange scales	Present
Pedipalp covered dorsally with long setae	Each pedipalp with dark dorsal stripe fringed with white setae	Pedipalps covered with off-white setae	Pedipalps covered with alternating bands of white and red-orange setae
Ornamentation of legs III	Black metatarsi III, tarsi III covered with white setae, tibiae III fringed with long white setae	Tarsi III covered with white setae, lacking fringe of long white setae on legs III	Tarsi III covered with white setae, tibiae and metatarsi III fringed with long white setae
Distal embolus of the pedipalp with two apices when viewed laterally	Present, two apices distinctly separated	Present, two apices separated	Present, two apices heavier and contiguous

*Distribution of species in the Maratus tasmanicus group.* *M. tasmanicus* is distributed across the coasts of Victoria and Tasmania and is often associated with coastal succulent vegetation. Previously, Otto & Hill (2013) identified *M. australis* as *M. tasmanicus* from a photograph taken by Volker Framenau in 2009, later describing it as a new species after they examined specimens from Esperance (Otto & Hill, 2016). Similar to *M. tasmanicus*, *M. australis* is associated with coastal habitats in southern Australia, while curiously *M. occasus* sp. nov. is only known from inland Queensland, at least 220 geodesic kilometres away from the nearest coastline (Figures 8-9).



**Figure 8.** Known distribution of peacock spiders in the *Maratus tasmanicus* group.





**Figure 9.** Habitat of *Maratus occasus* sp. nov. near Lake Broadwater, Queensland.

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