Maratus playa

# *Maratus playa*, a new peacock spider in the *fimbriatus* group from Australia (Araneae: Salticidae: Euophryini)

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**Abstract.** *Maratus playa*, a new species of peacock spider from Australia, is described. Male courtship display by *M. playa* is also described.

Keywords. courtship, jumping spider

Recently (Otto & Hill 2022) we reviewed the four described, and two undescribed, members of the *fimbriatus* group within the salticid genus *Maratus* Karsch 1878. Here we add *Maratus playa*, a distinctive new species from the Australian interior (Figure 1), to that group.



**Figure 1.** Courtship display by a male *Maratus playa*, sp. nov. Display by this species is similar to that of other species in the *fimbriatus* group, but the distinctive pattern of setae on the dorsal opisthosoma (fan) of this species makes it easy to identify.

Maratus playa

## Genus Maratus Karsch 1878

Type species Maratus amabilis Karsch 1878

## Maratus playa, new species

*Etymology*. The species group name, *playa* (English, noun in apposition), is a reference to the flat desert basins inhabited by these spiders in the interior of Australia.

*Diagnosis*. Placement of *M. playa* in the *fimbriatus group* is based on common features of the male pedipalp (embolus shaped like a wheel rim) and courtship display (including display of the glabrous, somewhat green undersides of legs I to the female). The distinctive shape (sector spanning about 1/3 of a circle) and scale pattern of the dorsal opisthosoma (fan) of the male (Figure 1) can be used to identify this species.

*Description of male* (Figures 2-7). Type males (n=3) ranged from 3.3-3.6 mm in length. Males in the collection of the Australian Museum ranged from 3.4-3.8 mm in length. From the front, the pedipalps are covered with long, white to off-white setae. The chelicerae are dark brown to black, and glabrous. Long light brown setae, directed medioventrally, cover the clypeus. The anterior eyes (face) are surrounded by off-white to light brown setae. Across the eye region, and behind it, these setae are more sparse, with a thicker band running from front to back at the midline. Longer off-white to light brown setae cover the sides of the carapace, and a distinct but thin white marginal band is also present. The PME are closer to the PLE than to the ALE.

The opisthosoma, when flattened for display, is shaped like the sector of a circle, rounded and fringed with long setae at the rear of the fan. These setae are black proximally and white distally. The pattern of chevrons with white, light blue, light yellow and brown scales of the fan (Figure 1) is distinctive. The underside of the opisthosoma is covered with white to off-white setae.

Legs I and II are of similar length, shorter than legs III and IV, all with indistinct dark bands at the joints. Legs III are the longest. Above and on their sides, the legs have a cover of white to off-white setae. Below, the femora of legs I and II are mostly glabrous, brown to dull green in color. A distinct mid-ventral tract of light brown or off-white setae is present beneath each tibia I (Figure 3.5).

Sternum, labium and endites are dark brown to grey, mostly glabrous except for longer white to off-white setae radiating from the posterior and lateral margins of the sternum. The pedipalps (Figure 7) are similar to those of other members of the *fimbriatus* group, and are of little use for identification to species.



Figure 2 (continued on next page). Living male types for *Maratus playa*.



Figure 2 (continued from previous page). Living male types for *Maratus playa*.



**Figure 3.** Ventral view of living male types for *Maratus playa*. **5**, Note the midventral stripe on the underside of each tibia I (arrow).



Figure 4. Ventral view of male types for Maratus playa, in alcohol.



Figure 5. Male types for *Maratus playa*, in alcohol.



Figure 6. Anterior view of male types for *Maratus playa*, in alcohol.



Figure 7 (continued on next page). Medial to lateral views of the left pedipalp of male types for *Maratus playa*, in alcohol.



**Figure 7 (continued from previous page).** Medial to lateral views of the left pedipalp of male types for *Maratus playa*, in alcohol.

*Description of female* (Figures 8-13). Type females (n=3) ranged from 4.2-4.8 mm in length. One female in the collection of the Australian Museum was 4.6 mm in length. For the most part females are covered with white to off-white setae and any patterns, including the presence of small spots or mottling, tend to be subdued, but some individuals have more brown setae and an overall light brown colour. The chelicerae are mostly glabrous, each paturon proximally with a black anterolateral area (Figure 8.5). Longer white to off-white setae project anteromedially from the clypeus. The eye region is covered almost uniformly with white to off-white setae, as are the rear and sides of the carapace. An indistinct dorsomedial thoracic tract or stripe of white setae may be visible behind the eye region. There is a very thin marginal band of white setae extending along the posterolateral margins of the carapace, and above, and separate from this is a dense tract of vertically oriented white to off-white scales that is continuous with the scale cover of the sides of the carapace. The PME are closer to the PLE than to the ALE.

A white anal tuft of setae is present, and anterior to this by about 1/3 of the length of the opisthosoma is a central white spot, distinct from but continuous with the generally white to off-white setae that cover the dorsal opisthosoma. The ventral opisthosoma has a generally uniform cover of long white setae. The labium, endites, and sternum are glabrous and grey or brown, except for longer white to off-white setae around the posterior margins of the sternum.

The legs are generally covered with white to off-white setae, with some indistinct banding at the joints. As in the male, the undersides of legs I and II are mostly glabrous. The epigynum (Figure 13) is similar to that of other *Maratus* species, with separated anterior fossae (windows), and behind each a large posterior spermatheca of about the same size.





**Figure 8 (continued on next page).** Living female types for *Maratus playa*. **5**, Note the black pigment on the proximal anterolateral aspect of each paturon.



Figure 8 (continued from previous page). Living female types for *Maratus playa*.



Figure 9. Ventral view of living female types for *Maratus playa*.



**Figure 10.** Ventral view of female types for *Maratus playa*, in alcohol.



**Figure 11.** Female types for *Maratus playa*, in alcohol.



Figure 12. Anterior view of female types for *Maratus playa*, in alcohol.



Figure 13. Ventral (external) view of the epigynum of the female types for *Maratus playa*, in alcohol.

*Immatures*. Late stage immature males and females resemble adult females (Figure 14).

*Courtship display* (Figures 15-21). All observations described here are based on encounters between males and females in the laboratory, in a simulated natural environment. Courtship display by male *Maratus playa* is very similar to that of other members of the *fimbriatus* group (Otto & Hill 2022). Basically this involves pivoting or stepping (~2-3 Hz or slower) from side to side in front of the courted female, with legs I extended vertically to display their ventral surfaces, particularly the glabrous dull green to brown colour on underside of femur I and a stripe on the underside of tibia I. Often, but not always, one or both legs III is extended to the side during this display (Figures 15-17). Side to side movement during this display is intermittent, and most of the time the male is holding its position without movement. The fan is extended laterally and elevated during this display, but not fully elevated (at significantly less than a vertical position). Nonetheless it is visible to a female in front of the male.

Several variations on this general pattern of display can be seen in *M. playa* (Figures 18-21). Most frequently, a forward flick (up and down) of both metatarsi I can be observed at the onset of lateral movement. Less frequently, asynchronous movement of the pedipalps, up and down or to the side, can also be seen at the onset of movement (Figures 15.9, 19-20). A low amplitude wave of the fan can also be seen at the end of some, but not all, steps (Figures 18.13-14, 21.12-14).

Several mating positions are shown in Figure 22.



**Figure 14.** The types for *Maratus playa* in the penultimate stage. Juvenile males and females resemble adult females in colouration.



**Figure 15 (continued on next page).** Display positions by the male *Maratus playa* types in front of a female. **9**, Note movement of the pedipalps to expose the dark, glabrous surface of each paturon.



**Figure 15 (continued from previous page).** Display positions by the male *Maratus playa* types in front of a female. Note than male #3 (16-19) has more brown colouration than do the other two males.



**Figure 16.** Selected, sequential frames from a 25 fps video of courtship display by a male *Maratus playa*. Arrows indicate the direction of movement (stepping or pivoting at  $\sim$ 3 Hz) relative to the previous position.



**Figure 17.** Selected, sequential frames from a 25 fps video of courtship display by a male *Maratus playa*. Arrows indicate the direction of movement (stepping or pivoting at ~2.2 Hz) relative to the previous position.



**Figure 18.** Consecutive frames from a 100 fps video of courtship display by a male *Maratus playa*. Arrows indicate direction of movement by both legs I relative to the previous frame in this sequence (one cycle/step at ~11 Hz). **13-14**, At the end of lateral movement the fan was rotated in the direction of movement by  $\sim 7^{\circ}$ .



**Figure 19.** Consecutive frames from a 100 fps video of courtship display by a male *Maratus playa*. White arrows indicate direction of movement by both legs I relative to the previous frame in this sequence (one cycle/step at ~8 Hz). Green arrows indicate movement of each pedipalp relative to the previous frame (several cycles at ~12 Hz).



**Figure 20.** Consecutive frames from a 100 fps video of courtship display by a male *Maratus playa*. White arrows indicate direction of movement by both legs I relative to the previous frame in this sequence (one cycle/step at ~11 Hz). Green arrows indicate movement of each pedipalp relative to the previous frame (several cycles at ~10 Hz).



**Figure 21.** Consecutive frames from a 100 fps video of courtship display by a male *Maratus playa*. White arrows indicate direction of movement by both legs I relative to the previous frame in this sequence (one cycle/step at  $\sim$ 12 Hz). **12-14**, Small amplitude ( $\sim$ 3°) rotation of the fan in the direction of this pivot.



**Figure 22.** Positions assumed by a mating pair of *Maratus playa*. Here rotation of the female opisthosoma during mating was far less than the  $\sim$ 180° rotation observed for many other *Maratus* species.

*Habitat and distribution*. Localities where *Maratus playa* has been found are shown in Figure 23, and listed in Table 1. These are flat, arid plains in the Australian interior (Figure 24). Other photographic records related to this distribution are shown in Figures 25-27.



**Figure 23.** Localities associated with members of the *Maratus fimbriatus* group, after Otto & Hill 2022. Except for two localities near Lake Goongarrie in the interior of Western Australia (records 11-12 in Table 1), most localities for *M. playa* (8) are near the Darling River, or in the interior to the northwest of the Darling River.

Table 1.	Localities where	Maratus playa has been found.	. Records 11-12 courtesy	v of Mathew Hoursto	on, Stantec Australia, and
Ardea Re	esources Ltd.				

ref#	source	acq. #	locality		date	notes
1	Garry Deale		Wargan, Victoria	34.16073°S, 141.86884°E	22 NOV 2022	∂ #1
2	Shannon & Garry Deale		Lake Walla Walla, Victoria	34.16886°S, 141.17912°E	8 APR 2023	∂ #2-3, ♀ #1-3
3	Australian Museum	KS74130	Trilby Station, near Louth, New South Wales	30.57306°S, 144.84389°E	1 DEC 1999	
4	Australian Museum	KS74131	Trilby Station, near Louth, New South Wales	30.57306°S, 144.84389°E	21 DEC 1999	
5	Australian Museum	KS74132	Darling River, Kalyanka, near Wilcannia, NSW	31.55861°S, 143.50611°E	2 DEC 1999	
6	Australian Museum	KS83786	Sturt National Park, near Tibooburra, NSW	29.02194°S, 141.18278°E	28 SEP 1997	
7	Australian Museum	KS83822	Sturt National Park, near Tibooburra, NSW	29.06250°S, 141.29028°E	28 SEP 1997	
8	Australian Museum	KS83830	Sturt National Park, near Tibooburra, NSW	29.06250°S, 141.29028°E	28 SEP 1997	
9	Australian Museum	KS83875	Sturt National Park, near Tibooburra, NSW	29.20750°S, 141.04306°E	29 SEP 1997	
10	Melissa Abdallah		north of Fowlers Gap, New South Wales	31.02610°S, 141.67957°E	9 JAN 2022	
11	Mathew Hourston		Lake Goongarrie, Western Australia	29.99301°S, 121.18392°E	11 OCT 2022	
12	Mathew Hourston		Lake Goongarrie, Western Australia	29.98021°S, 121.14532°E	12 OCT 2022	



**Figure 24.** Localities where *M. playa* has been found. **1-2**, Sturt National Park, New South Wales (reference 6 in Table 1). **3-5**, Type locality near Mildura, Victoria (reference 2 in Table 1). **6**, Flat plain near Lake Goongarrie in Western Australia (references 11-12 in Table 1). Photo credits: 3-5, Shannon Deale; 6, Mathew Hourston.



**Figure 25.** *Maratus playa* specimens in the Australian Museum, corresponding to references 3-9 in Table 1.



**Figure 26.** *Maratus playa* male observed north of Fowlers Gap, in northwestern New South Wales. This corresponds to reference 10 in Table 1. Photo credits: 1-4, Melissa Abdallah (https://www.inaturalist.org/observations/104786140), used under a <u>CC BY-NC 4.0</u> license.



**Figure 27.** Male (1-2) *Maratus playa* and two other spiders (3-4) that may be *Maratus playa*, observed near Lake Goongarrie in the interior of Western Australia (references 11-12 in Table 1). **3**, This could be a penultimate male. **4**, Adult female. Since selection of immature and female colouration is thought be driven by their need for concealment rather than display, colouration might be expected to vary between localities. Photo credits: 1-4, Mathew Hourston.

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#### Reference

**Otto & Hill 2022.** Jürgen C. Otto and David E. Hill. 5 AUG 2022. *Maratus ammophilus*, a new peacock spider in the *fimbriatus* group from Western Australia (Araneae: Salticidae: Euophryini). Peckhamia 273.1: 1-65.