Three new peacock spiders from the southeast and southwest of Australia (Araneae: Salticidae: Euophryini: *Maratus*)

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Abstract: Two new species, *Maratus cuspis* (*linnaei* group) and *Maratus icarus* (*vespa* group), are described from the Southwest Australia Ecoregion of Western Australia. One new species, *Maratus sylvestris* (*pavonis* group) is described from wet forest near the coast of New South Wales. The courtship of each new species is also described.

Keywords: jumping spider, *linnaei* group, *Maratus cuspis*, *Maratus icarus*, *Maratus sylvestris*, *pavonis* group, *vespa* group.

Introduction

To date at least 74 species of jumping spiders in the genus *Maratus* Karsch 1878 have been described from Australia (Otto & Hill 2017b, 2018a, 2018b; Schubert 2019a, 2019b; Schubert & Whyte 2019). Here we add descriptions of three new species in this genus: *M. cuspis* (*linnaei* group) and *M. icarus* (*vespa* group) from the Southwest Australia Ecoregion of Western Australia, and *M. sylvestris* (*pavonis* group) from wet forest near the southeastern coast of Australia (Figure 1).



Figure 1. Localities associated with three new species of *Maratus* in Australia.

Maratus cuspis, new species

Type specimens. The holotype male (\circ #1), 15 paratype males (\circ #2-16), and 7 paratype females (\circ #1-7) were collected at Mount Frankland National Park, approximately 28 km NE of Walpole in Western Australia (S34.824326°, E116.969961°, 7 NOV 2018, coll. Jürgen C. Otto). All types will be deposited in the Western Australian Museum, Perth.

Etymology. The species group name (*cuspis*, Latin, f., noun, English translation *spear*, is a reference to the outline of a spear point on the dorsal opisthosoma of the adult male.

Diagnosis. Maratus cuspis resembles the other two species of the *linnaei* group, all from the southwestern corner of Australia (Figure 2). Although dark and lower in contrast, males have a middorsal figure comprised of branching lines ("evergreen tree pattern") like that of *M. linnaei* Waldock 2008. The male opisthosoma is more tapered than in that species, sharply truncated rather than rounded at the rear. The opisthosoma of *M. electricus* Otto & Hill 2017a is cylindrical and not tapered, lacking a middorsal figure.



Figure 2. Adult males representing the three *Maratus* species placed in the *linnaei* group. Note the dark middorsal figure and posterior truncation of the tapered opisthosoma (fan) of *M. cuspis* (1).

Description of male (Figures 2:1, 3-6). Adult males are 3.8-4.3 mm in length (n=16). The chelicerae are black and glabrous. The carapace is black, with a band of white to off-white or light brown setae covering the clypeus and extending under each AME and then between the AME and ALE on each side to form a distinct line extending across the eye region to the rear. Other than these two light bands, the eye region is covered with orange scales. On each side the carapace is covered with many irregular off-white setae, and a distinct lateral marginal band of white or off-white setae is present. To the rear of the eye region the carapace is mostly black to dark brown and glabrous. A thin middorsal line of white scales may be present in the thoracic region.

The opisthosoma (fan) is rounded or ovate anteriorly, tapering rapidly toward the rear where it is sharply truncated. The fan is decorated at the median with a dark, spear-shaped area pointed toward the rear, and within this area a less distinct outline of a dark "tree" pattern can be seen. On each side the fan is decorated with a series of curved bands of red to red-orange scales, separated by iridescent blue to blue-green scales. Below the fan and above the spinnerets a small triangular tuft of white setae is present. The spinnerets are grey. Below, the opisthosoma is covered with off-white setae.

Legs I and II are shorter, legs IV longer, and legs III by far the longest. All legs are covered with long offwhite to light orange setae. Legs I and II may be indistinctly banded, legs IV more distinctly banded. Very long setae project ventrally from the patella to metatarsus of each leg III. Long and darker, dark orange to black setae project dorsally from the tibia to metatarsus of each leg III. There are scattered off-white setae on the tarsus of leg III, but these are not brightly coloured as in many other *Maratus* species.



Figure 3 (continued on next page). Living adult male types for Maratus cuspis.



Figure 3 (continued from previous page, continued on next page). Living adult male types for *Maratus cuspis*.



Figure 3 (continued from previous page, continued on next page). Living adult male types for *Maratus cuspis*.



Figure 3 (continued from previous page). Living adult male types for *Maratus cuspis*.



Figure 4. Dorsal view of extended fan of living adult male types for *Maratus cuspis*. Each male was displaying to a nearby female.



Figure 5 (continued on next page). Adult male type specimens for *Maratus cuspis* in ethanol.



Figure 5 (continued from previous page, continued on next page). Adult male type specimens for *Maratus cuspis* in ethanol.



Figure 5 (continued from previous page, continued on next page). Adult male type specimens for *Maratus cuspis* in ethanol.



Figure 5 (continued from previous page). Adult male type specimens for Maratus cuspis in ethanol.

The pedipalps are covered dorsally with long off-white or light brown setae. When extended to the front each pedipalp extends the line of light-coloured setae that crosses the respective side of the eye region (Figure 3:1). The RTA, tegulum and embolus (Figure 6) are unremarkable and compare closely with those of other species in the *linnaei*, *vespa* and other *Maratus* groups in southwestern Australia. Both outer and inner apices of the embolus are heavy and black, and as in related species there is a distinct projection near the distal end of the outer apex (Figure 6:28).



Figure 6 (continued on next page). Medial to lateral views of the left pedipalp of the adult male type specimens for *Maratus cuspis* in ethanol.



Figure 6 (continued from previous page). Medial to lateral views of the left pedipalp of the adult male type specimens for *Maratus cuspis* in ethanol. **28**, Detail from (27), showing projection from the outer apex of the embolus.

Description of female (Figures 7-10). Adult females are 4.7-5.4 mm in length (n=7).



Figure 7 (continued on next page). Living adult female types for Maratus cuspis.



Figure 7 (continued from previous page, continued on next page). Living adult female types for *Maratus cuspis*.



Figure 7 (continued from previous page, continued on next page). Living adult female types for Maratus cuspis.



Figure 7 (continued from previous page). Living adult female types for *Maratus cuspis*.



Figure 8. Ventral views of living adult female types for *Maratus cuspis*.



Figure 9 (continued on next page). Adult female type specimens for Maratus cuspis in ethanol.



Figure 9 (continued from previous page, continued on next page). Adult female type specimens for *Maratus cuspis* in ethanol.



Figure 9 (continued from previous page). Adult female type specimens for Maratus cuspis in ethanol.



Figure 10. Ventral views of the epigynum of adult female type specimens for *Maratus cuspis* in ethanol.

The chelicerae are brown, translucent and glabrous. Long off-white setae extend from the clypeus over the proximal end of each paturon. The carapace is generally dark brown. There is a cover of off-white to brown setae over much of the carapace, including the eye region and the sides. The PME are closer to the PLE than to the ALE. There may be scattered off-white setae along each lateral margin of the carapace.

The opisthosoma, like the carapace, is generally dark brown with a cover of off-white to brown setae. Distinguishing patterns are present on the dorsal opisthosoma, but these are subtle and specimens should be compared closely with the photographs shown here. These include a small central white to off-white spot behind two brown chevrons. Some individuals have distinct, broad marginal bands of off-white to light brown setae. A small triangular tuft of white setae is present above the grey spinnerets. The underside of the opisthosoma is covered with off-white setae and irregular rows of small brown spots (mottling). The coxae, sternum, labium and endites are all translucent brown, with longer off-white setae projecting from the rear margin of the sternum.

Legs and pedipalps are uniform brown with regular to irregular segmental bands of off-white setae. Legs I and II are the shortest, legs IV longer, and legs III longest but close to legs IV in length. The epigynum (Figure 10) is typical for the group and of little use for identification, with a large posterior spermatheca behind each fossa, and darker, sclerotized ducts visible through the posterior part of each fossa.

Courtship (Figures 11-14). As with other members of the *linnaei* and *vespa* groups, females faced and approached courting males to closely observe each of their movements at a distance of only 2-4 millimeters (Figure 11). The male display included two different stages. In the first stage (Figure 13:1-17) the male centered his elevated fan in a symmetrical position behind legs III, with fully extended legs III in a vertical position with the tarsi in contact at the median. This transitioned to a second stage in which legs III were moved into a bracketing position to reveal more of the fan at the center, and the fan was moved from left to right or vice versa (Figure 13:18-50). Each time that the fan was rotated up toward a centered position it was moved very slowly but steadily through each of a series of very low amplitude (several degrees) increments. A change in the direction of fan rotation was initiated with a very rapid (<0.04s, blurred in a single frame at 25 FPS) lateral kick and partial return to center of one leg III in the new direction (indicated by arrow in Figures 13:18,33). When the fan was lowered toward one side or the other, however, movement was more complicated, combining incremental movement toward that side with low amplitude up and down bobbing of the opisthosoma at ~9 cycles/s (Figure 14).



Figure 11. Selected frames from a 25 FPS video showing a female *Maratus cuspis* (at left) advancing toward a displaying male. The small white square is a reference position to show forward movement of this female as the male retreated to the rear.



Figure 12 (continued on next page). Positions assumed during courtship display by living male types for *Maratus cuspis*.



Figure 12 (continued from previous page, continued on next page). Positions assumed during courtship display by living male types for *Maratus cuspis*. **10-11**, Centering during the first stage of display. **14-16**, Successive positions during the second stage of display in which the fan was rotated from side to side with legs III in a bracketing position.



Figure 12 (continued from previous page, continued on next page). Positions assumed during courtship display by living male types for *Maratus cuspis.* **27-28,** Extension of legs III in a vertical position during the first stage of display.



Figure 12 (continued from previous page). Positions assumed during courtship display by living male types for *Maratus cuspis*.



Figure 13 (continued on next page). Selected frames from a 25 FPS video of courtship display by a male *Maratus cuspis* directly in front of a female. Except for indicated stops, and rapid kicks to the side at the onset of fan rotation (18, 33) movement was continuous but only smooth when the fan was rotated toward a center position.



Figure 13 (continued from previous page). Selected frames from a 25 FPS video of courtship display by a male *Maratus cuspis* directly in front of a female. Fan elevation (e.g. 49-50) was slow and continuous. A detailed view of the more complicated movement of the fan as it was rotated down to the side (47-48) is shown in Figure 14.

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Figure 14. Video analysis of sequential frames during rotation of the fan to one side (25 FPS). The position of the fan in individual frames between positions (47) and (48) as shown in Figure 13 is shown here. In 39 frames (1.56s) there were 14 lo amplitude up/down cycles (bobs) of the opisthosoma, a rate of 9/s. This bobbing was superimposed on a slow and discontinuous rotation of the fan toward the spider's right side (red circles), and low-amplitude twisting of the fan. Toward the end of this sequence the twisting movement synchronized and alternated with each cycle of up/down bobbing, at 9/s. In contrast each increment of rotation of the fan back toward a vertical position was slow but continuous without low-amplitude bobbing or twisting.

Habitat and distribution. The types for this species were found at Mount Frankland National Park (Figures 1, 15). One male of this species was photographed but not collected near the Denmark-Mount Barker Road at Mount Lindesay National Park in Western Australia (15 OCT 2018, Jim Murray; Murray 2018).



Figure 15. Habitat of *Maratus cuspis* at Mount Frankland National Park in Western Australia.

Maratus icarus, new species

Type specimens. The holotype male ($\sigma #1$), 9 paratype males ($\sigma #2-10$), and 11 paratype females ($\varphi #1-11$) were collected at Mount Frankland National Park, approximately 16 km NW of Walpole in Western Australia (S34.912295°, E116.567454°, 9 NOV 2018, coll. Jürgen C. Otto). One additional male ($\sigma #11$) was previously photographed but not collected at Mount Frankland National Park, approximately 6 km from the type locality and 12 km NW of Walpole in Western Australia (S34.95950°, E116.60026°, 11 OCT 2017, Jürgen C. Otto). All types will be deposited in the Western Australian Museum, Perth.

Etymology. The species group name (*icarus*, Greek, m., noun in apposition) is a reference to the presence of a figure on the dorsal opisthosoma of the adult male that resembles the winged Icarus of Greek mythology.

Diagnosis. Based on the colour and distribution of scales and other setae of the male, *Maratus icarus* is most closely related to *M. cristatus* Otto & Hill 2017b, but also fairly close to *M. unicup* Otto & Hill 2018b (Figure 16). We place all three species in the *vespa* group. The opisthosomal flaps are more rounded in *M. cristatus* and more elongated in *M. icarus*. The middorsal tract of red scales on the fan of *M. icarus* extends almost all the way to the front margin, but in *M. cristatus* this is divided into two diverging lateral tracts well behind the front margin.



Figure 16. Comparison of the male *Maratus icarus* (center) with the closely related *M. cristatus* (left) and *M. unicup* (right), all members of the *vespa* group, endemic to southwestern Australia. Based on leg colour, there are brown and white forms of both *M. cristatus* and *M. icarus*.

Description of male (Figures 16:2, 17-20). Adult males are 3.6-4.3 mm in length (n=10). The chelicerae and carapace are black. Long white to off-white setae extend over the proximal end of each paturon. White to off-white setae surround the anterior eyes and also cover the eye region, interrupted there by 7 (5 in front, 2 to the rear) small patches of red scales. The PME are closer to the PLE than to the ALE. To the rear and on the sides the carapace is black and glabrous, except for a middorsal patch of white scales that may be found in the thoracic region, and a well-defined marginal band comprised of white scales.



Figure 17. Male *Maratus icarus* photographed at a second locality (not the type locality) at Mount Frankland National Park. This is the brown colour form.



Figure 18 (continued on next page). Living adult male types for *Maratus icarus*.



Figure 18 (continued from previous page). Living adult male types for Maratus icarus.



Figure 19 (continued on next page). Adult male type specimens for *Maratus icarus* in ethanol.



Figure 19 (continued from previous page). Adult male type specimens for *Maratus icarus* in ethanol.



Figure 20 (continued on next page). Medial to lateral views of the left pedipalp of the adult male type specimens for *Maratus icarus* in ethanol.



Figure 20 (continued from previous page). Medial to lateral views of the left pedipalp of the adult male type specimens for *Maratus icarus* in ethanol.
The dorsal opisthosomal plate (fan) has a prominent, lobate flap on either side that can be extended during courtship display. The pattern of scales on the fan closely resembles that of *Maratus cristatus*, but in *M. icarus* the dull to bright red anteromedian stripe extends almost completely to the front and is not divided as in *M. cristatus*. There is a diverging red stripe on either side of this median stripe, against a background of iridescent light blue to blue-green scales. Toward the rear a transverse line of light blue scales, usually interrupted to appear as four spots near the midline, extends from the lateral margin of one flap to the other. At the rear of the fan the cover of red scales is interrupted by three tufts of bright white setae on either side, and there is an additional tuft of white setae at the lateral margin of each flap.

Legs I and II are shorter, legs IV longer, and legs III by far the longest. The legs have a cover of brown or off-white or white setae, much longer on the patella and tibia of each leg III. Dorsally the pedipalps are covered with long off-white or white or brown setae. The RTA, tegulum and embolus (Figure 20) are unremarkable and compare closely with those of other species in the *linnaei*, *vespa* and other *Maratus* groups in southwestern Australia. Both outer and inner apices of the embolus are heavy and black, and as in related species there is a distinct projection near the distal end of the outer apex of the embolus.

Description of female (Figures 21-24). Adult females are 4.3-5.2 mm in length (n=11). The chelicerae are brown and glabrous with scattered off-white setae. The clypeus is covered with longer off-white setae that extend over the proximal part of each paturon. The eye region is covered with off-white to brown or red-brown scales. The PME are closer to the PLE than to the AME. Behind this the carapace is mostly black and glabrous except for a prominent medial stripe of white scales on the elevated thoracic region. The sides of the carapace are mostly glabrous, translucent and dark brown, except for a wide tract of off-white to white scales behind and below the posterior eyes on either side, and scattered off-white scales below this. These lateral tracts of white scales, in combination with the white mediothoracic stripe, are useful but not definitive for the identification of this species. Scattered off-white scales may be present near each lateral margin of the carapace, but there is no definitive marginal band of the carapace as in the male.

The dorsal opisthosoma is dark brown with scattered off-white to brown scales. On either side a broad marginal band of off-white to bright white scales runs to the rear, converging with the band of the opposite side at the rear. These bands have some dark brown mottling and in some individuals the medial margin of each band is well-defined and contrasting. There is a small triangular patch of white setae above the spinnerets. Below, the opisthosoma is covered with off-white setae. The coxae, sternum, labium and endites are brown and translucent, mostly glabrous with few scattered setae.

The pedipalps are uniform light brown, covered with longer off-white setae. Legs I and II are shorter, legs III and IV longer. The legs are brown to dark brown with indistinct banding comprised of off-white setae. The epigynum resembles that of related species in the *vespa* and *linnaei* groups, with a large posterior spermatheca behind each fossa. The fossae are separated by a septum of variable width. Darker, sclerotized ducts of variable appearance can be seen behind the posterior part of each fossa.



Figure 21 (continued on next page). Living adult female types for *Maratus icarus*.



Figure 21 (continued from previous page, continued on next page). Living adult female types for *Maratus icarus*.



Figure 21 (continued from previous page, continued on next page). Living adult female types for *Maratus icarus*.



Figure 21 (continued from previous page). Living adult female types for *Maratus icarus*.



Figure 22. Ventral views of living adult female types for *Maratus icarus*. **6**, Inset shows detailed ventral view of the extended spinnerets.



Figure 23 (continued on next page). Adult female type specimens for *Maratus icarus* in ethanol.



Figure 23 (continued from previous page, continued on next page). Adult female type specimens for *Maratus icarus* in ethanol.



Figure 23 (continued from previous page). Adult female type specimens for *Maratus icarus* in ethanol.



Figure 24. Epigynum of adult female type specimens for *Maratus icarus* in ethanol.

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Courtship (Figures 25-28). We have observed two primary modes of courtship display by male *Maratus icarus*. In one (Figures 25-27) the elevated and extended fan is rotated (waved) on one side and then the other through an amplitude of about 20°, with both legs III in an elevated and extended but not a bracketing position. At a greater distance from the female (Figure 26) this display can include fan-waving at \sim 3.2 cycles/s, bilaterally symmetrical up-and-down flicker of both pedipalps at \sim 5 cycles/s, and less frequent (~2 cycles/s, ~0.12s/cycle), low amplitude "calipers" movement (together and then apart, or apart and then together) of both extended legs III. Closer to a female (Figure 27) the male may wave the fan in a similar manner (~4.8 cycles/s) without movement of the legs or pedipalps, but with intermittent depression and rotation of the fan to either the right or left to display one of the flaps outside of the figure defined by the extended legs III (Figures 25:15, 27:39,50). In a second display mode (Figure 28) the fan was only slightly extended and partly elevated as it was waved from side to side at a low amplitude of several degrees and at a slower speed ($\sim 2.5/s$). The appears to represent an advertisement at a greater distance, and the advertising male may also step from side to side and wave the extended legs III. The two primary modes of display closely resemble those of *M. cristatus* (Otto & Hill 2017a), but in that species the flaps are not displayed at the side during the first mode, and the flaps are fully extended when the fan is depressed during the second mode of display.



Figure 25 (continued on next page). Display by adult male types for Maratus icarus.

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Figure 25 (continued from previous page). Display by adult male types for *Maratus icarus*.



Figure 26. Consecutive frames from a 25 FPS video showing continuous courtship display by an adult male *Maratus icarus*. White arrows indicate movement of the fan, legs III and the pedipalps relative to the preceding frame. The fan was waved through an amplitude of $\sim 20^{\circ}$ at ~ 3.2 cycles/s and the pedipalps were moved up and down at ~ 5 cycles/s.



Figure 27 (continued on next page). Selected frames from a 25 FPS video showing courtship display by an adult male *Maratus icarus*. The fan waved was through an amplitude of $\sim 20^{\circ}$ at a rate of ~ 4.8 cycles/s.



Figure 27 (continued from previous page). Selected frames from a 25 FPS video showing courtship display by an adult male *Maratus icarus*. Note display of flaps at either the left (39) or right (50) side of the spider.



Figure 28. Selected frames from a 25 FPS video showing courtship display by an adult male *Maratus icarus*. This shows low amplitude (several degrees, ~2.5 cycles/s) waving of the depressed and folded fan behind extended legs III.

Mating (Figure 29). As in other *Maratus*, the flexibility of the female opisthosoma is evident when these spiders mate.



Figure 29. Mating positions of *Maratus icarus.* **4-11**, Sequential frames from a 25 FPS video showing intermittent (\sim 12.5/s), rapid vibration of the opisthosoma as indicated by blurred images (arrows). The speed of this vibration was not measured.

Habitat and distribution. Maratus icarus was found at two localities (Figures 1, 30).



Figure 30. Habitat of *Maratus icarus*. **1-2**, Type locality at Mount Frankland National Park, about 16 km NW of Walpole in Western Australia. **3**, Second locality where this species was originally found, about 6 km from the type locality.

Maratus sylvestris, new species

Type specimens. The holotype male (\circ #1), 1 paratype male (\circ #2), and 2 paratype females (\circ #1-2) were collected in wet sclerophyll forest at Macquarie Pass National Park near Mount Murray in New South Wales (S34.54718°, E150.65387°, coll. Thomas Sayers). 1 paratype male (\circ #3) and 1 paratype female (\circ #3) were collected at Lady Fuller Park in Thirroul in a mixture of rainforest and wet sclerophyll forest (S34.30791°, E150.91338°, 24 NOV 2016, coll. Richard Jones). 4 paratype males (\circ #4-7) were collected at Tuckers Knob, Bindarri National Park in New South Wales (S30.32669722°, E152.942094°, 600 m elevation, 29 OCT 2016, coll. Jonas Bellchambers and Charlotte Miller). All types will be deposited in the Australian Museum, Sydney.

Etymology. The species group name (*sylvestris*, Latin, adjective, English translation *of the forest*) refers to the fact that this species lives in forested areas.

Diagnosis. Maratus sylvestris can be identified as a member of the *pavonis* group by its detailed genitalic structure as well as its general appearance and colouration. Compared to the most closely related species in that group (Figure 31), *M. sylvestris* males have a distinctive pair of broad red stripes across the eye region on a background of lighter brown setae, light, translucent and unbanded legs, and relatively long legs III, but lack a distinct red-orange central figure ("butterfly") on the fan. Unlike some members of the group, *M. sylvestris* males lack opisthosomal flaps but nonetheless flatten and expand the fan when it is elevated during courtship display. There are number of local forms of the related *M. pavonis* that need study (Figure 31:2-4), but in the east these have distinctly banded legs quite unlike those of *M. sylvestris*.

Description of male (Figures 31:6, 32-35). Adult males are 3.7-4.3 mm in length (n=7). The chelicerae are black and glabrous. White setae extend medially from the clypeus over the proximal chelicerae. The eye region is covered with light brown scales, interrupted by a wide band of red scales behind each AME. The PME are closer to the PLE than to the ALE. To the sides and rear the carapace is mostly black and glabrous. If not rubbed off, a wide brown to white mediothoracic band may be present. There is a well-defined white marginal band on either side of the carapace.



Figure 31. Comparison of (6) *Maratus sylvestris* to related species in the *pavonis* group. These include (1) *M. literatus* Otto & Hill 2014, (2-4) *M. pavonis* (Dunn 1947) and (5) *M. splendens* (Rainbow 1896).

The opisthosoma is ovate without flaps, with prominent red-orange parens bracketing the center which is mostly covered with light brown scales. Around the parens there is a background cover of iridescent blue-green scales. Some red-orange scale patches may be present near the centre of the fan. These can be seen in the southern males (Figure 32:1-25) but are absent in the northern males (Figure 32:26-36). In any case there is no distinct "butterfly" pattern at the centre. There is a small triangular tuft of white setae above the spinnerets. The underside of the opisthosoma is brown with darker mottling, but with relatively few setae. The coxae, sternum, labium and endites are brown to gray and mostly glabrous.

Legs I and II are shorter, legs IV longer, and legs III by far the longest. Legs I, II and IV are brown to dark brown and transparent with few setae and little banding. Legs III are darker with long fringes of dark setae on the dorsal and ventral sides of each tibia and metatarsus. The tarsi of legs III are covered with thick white setae, and the setae of the underlying footpads are grey. The pedipalps are covered with bright white setae above and in front. Three dark, sclerotized apices of each embolus may be visible in lateral views of the pedipalp. The outer two apices are close together and their separation may not be evident.



Figure 32 (continued on next page). Male types for Maratus sylvestris.



Figure 32 (continued from previous page, continued on next page). Male types for Maratus sylvestris.







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Figure 32 (continued from previous page). Male types for Maratus sylvestris.



Figure 33. Ventral view of living male types for *Maratus sylvestris*.



Figure 34 (continued on next page). Male type specimens for *Maratus sylvestris* in ethanol.



Figure 34 (continued from previous page, continued on next page). Male type specimens for *Maratus sylvestris* in ethanol.



Figure 34 (continued from previous page, continued on next page). Male type specimens for *Maratus sylvestris* in ethanol.



Figure 34 (continued from previous page). Male type specimens for Maratus sylvestris in ethanol.



Figure 35 (continued on next page). Medial to lateral views of left pedipalp of male type specimens for *Maratus sylvestris* in ethanol.



Figure 35 (continued from previous page). Medial to lateral views of left pedipalp of male type specimens for *Maratus sylvestris* in ethanol.

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Description of females (Figures 36-39). Adult females are 4.8-5.8 mm in length (n=3). The chelicerae are glabrous and brown. White to off-white setae extend medially from the clypeus and surround the lower half of each AME. Dull red-orange scales are present above the AME and extend around either side near the lateral eyes. Otherwise the eye region is dark brown and glabrous. The PME are closer to the PLE than to the ALE. A narrow off-white mediothoracic stripe is present. Otherwise the sides and rear of the carapace are dark brown, translucent and glabrous.

The dorsal opisthosoma is dark brown with a row of lighter spots on either side of the midline and around each lateral margin. In some individuals these spots merge to form a series of three forward-pointing chevrons toward the rear. The underside of the opisthosoma is also dark brown. The coxae, sternum, labium and endites are all lighter brown, translucent and glabrous.

Legs I and II are the shortest, legs III and IV longer. All legs and the pedipalps are uniform brown in color and translucent with some scattered, off-white setae. There is no banding. The epigynum (Figure 39) is unremarkable, with a large posterior spermatheca behind each large fossa, and darker, sclerotized ducts visible behind the posterior part of each fossa.



Figure 36 (continued on next page). Living female types for *Maratus sylvestris*.



Figure 36 (continued from previous page, continued on next page). Living female types for Maratus sylvestris.



Figure 36 (continued from previous page). Living female types for *Maratus sylvestris*.



Figure 37. Ventral view of living female types for *Maratus sylvestris*. **4**, Note series of dragline attachment disks.



Figure 38 (continued on next page). Female type specimens for *Maratus sylvestris* in ethanol.



Figure 38 (continued from previous page). Female type specimens for Maratus sylvestris in ethanol.



Figure 39. Epigynum of three female type specimens for Maratus sylvestris in ethanol.

Courtship (Figures 40-46). The courtship display of male *Maratus sylvestris* is very much like that of other members of the *pavonis* group, including *M. pavonis* and *M. splendens* (Hill & Otto 2011). For the present study we have been able to resolve respective movements at a much higher rate of speed (180 FPS). These spiders frequently wave one or two legs III as an apparent advertisement to draw the attention of females in the vicinity. There are three distinct modes of courtship display. Only the first of these (*fan dance*, Figures 41-42) includes display of the elevated fan between the fully extended legs III, held in a V-shape. In this display the fan is bobbed up and down through a small amplitude in a partly elevated position at a variable speed, observed at 16-66 cycles/s. This low amplitude movement includes slow side-stepping and waving of legs III at the tibiometatarsal joint, with the pedipalps held in position in front, concealing the chelicerae. In the second display mode (*semaphore*, Figures 43-44), usually seen just before the third display mode begins, extended legs III are brought rapidly to a vertical position and then bilaterally lowered to a horizontal position at the sides over the course of about 0.4-0.5s. The third mode of display (*lunge*, Figures 45-46) includes very rapid (observed at 23-28 cycles/s) and almost continuous back-and-forth movement of the entire body and legs III. Each cycle of this display is interrupted briefly at each front (advance) and rear (retreat) position. This is the final phase of approach before mating.



Figure 40 (continued on next page). Display by male types for *Maratus sylvestris* in the laboratory. **3-4,** Note movement of pedipalps as legs III were lowered in this intermediate fan dance/semaphore display. **8-9,** Unilateral leg wave (advertisement).



Figure 40 (continued from previous page). Display by male types for *Maratus sylvestris* in the laboratory.



Figure 41. Sequential high speed (180 FPS) video frames showing the fan dance of a male *Maratus sylvestris*. Arrows identify low amplitude movement of the fan, legs III and the entire side-stepping spider during this almost continuous movement. Movement was interrupted between frames (15) and (16). The opisthosoma was bobbed at ~16 cycles/s.



Figure 42. Sequential high speed (180 FPS) video frames showing the fan dance of a male *Maratus sylvestris*. Here the opisthosoma was bobbed up at down at a high speed (~66 cycles/s). **19-25**, Flexion of the RIII metatarsus.



Figure 43. Three high speed video frames (180 FPS) showing steady, bilaterally symmetrical lowering of extended legs III over 0.422s during semaphore display by a male *Maratus sylvestris*.



Figure 44. Selected high speed video frames (180 FPS) showing rapid elevated of legs III to a vertical position followed by slower movement down to a horizontal position during the semaphore display of a male *Maratus sylvestris*. **4-15**, Note intermittent low amplitude movement of the extended legs III (arrows).


Figure 45 (continued on next page). Selected video frames (180 FPS) showing alternating forward and rearward positions (~28 cycles/s) of a lunging male *Maratus sylvestris* in front of a female.



Figure 45 (continued from previous page). Selected video frames (180 FPS) showing alternating forward and rearward positions (~28 cycles/s) of a lunging male *Maratus sylvestris* in front of a female.



Figure 46 (continued on next page). Selected video frames (180 FPS) showing alternating forward and rearward positions (~23 cycles/s) of a lunging male *Maratus sylvestris* in front of a female.







14. 0.283s -













19. 0.389s

22. 0.456s







Figure 46 (continued from previous page). Selected video frames (180 FPS) showing alternating forward and rearward positions (~23 cycles/s) of a lunging male *Maratus sylvestris* in front of a female.

Habitat and distribution (Figures 1, 47). The occurrence of *Maratus sylvestris* in rainforest and wet sclerophyll forest is unusual for the genus. In addition to the type localities of record, this species has also been observed at Oakes State Forest in New South Wales in a similar habitat (pers. comm., Jonas Bellchambers & Charlotte Miller), and it should be found at other wet forest locations along the southeastern coast of Australia in the future.



Figure 47. Habitat of *Maratus sylvestris.* **1-2**, Mixture of rainforest and wet sclerophyll forst at Lady Fuller Park in Thirroul. Photographs by Richard Jones. **3-5**, Wet sclerophyll forest at Macquarie Pass National Park near Mount Murray in New South Wales. This is the designated type locality. Photographs by Thomas Sayers.

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