

Adult display by a penultimate male Coastal Peacock Spider (Araneae: Salticidae: Euophryinae: *Maratus speciosus*)

Jürgen C. Otto¹ and David E. Hill²

¹ 19 Grevillea Avenue, St. Ives, New South Wales 2075, Australia, *email* jurgenotto@optusnet.com.au

² 213 Wild Horse Creek Drive, Simpsonville, SC 29680-6513, USA, *email* platycryptus@yahoo.com

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Abstract: A penultimate male *Maratus speciosus* that had been reared in the laboratory courted and attempted to mate with an adult female. General features of the courtship display of this male, both as a penultimate and as an adult, were the same as those previously recorded for adult males of this species. Lacking adult colouration as a penultimate, this male was nonetheless accepted by the courted female, although mating was physically not possible due to the lack of physical development.

Maratus speciosus (O. Pickard-Cambridge 1874), or the 'Coastal Peacock Spider', is a colourful and distinctive inhabitant of coastal sand dunes along the southwestern coast of Western Australia (Hill & Otto 2011; Otto & Hill 2012a, 2012b). The courtship display of the adult male is characterised by alternation between *semaphore signalling* in place (with step-wise lowering of extended legs III, but no waving of the fan) and a *fan dance* while stepping to one side (with up and down flailing of the trailing leg III and rapid side to side waving of the extended and elevated fan). A typical sequence of this display might involve a semaphore, followed by a fan dance to the right, then a semaphore, then a fan dance back to the left, and then another semaphore. Often, at the end of a semaphore display, one leg III is rapidly elevated to a vertical position, closely followed by elevation of the contralateral leg III. This asymmetric semaphore signal is distinctive for male *M. speciosus* (Hill & Otto 2014).

The male and female *M. speciosus* subjects of this study were collected as immatures by David Knowles on 24 July 2014, 0.5 km south of Ocean Reef Boat Harbour, Western Australia. They were raised on a diet of crickets and vinegar flies. The male moulted to the penultimate stage between 12-24 October and was exposed to the adult female on 11 November 2014. After this male moulted to maturity in the first week of December 2014 his adult courtship display was also recorded, but he died shortly thereafter.

As shown in Figures 1-4, this male, as a penultimate, successfully courted and mounted an adult female *M. speciosus*. Because of his physical immaturity, however, mating was not possible. The courtship display of this male both as a penultimate and as an adult was comparable, including the distinctive semaphore and fan dance displays that characterise this species. The fact that a female accepted a male that did not exhibit the brilliant colours of the adult challenges our notion that these colours are a prerequisite for female acceptance. The fan of the penultimate, like that of the adult male, did bear three darker transverse figures (bands) against a lighter background, and this may have contributed to female acceptance. The artificial environment of this staged encounter and details related to rearing in captivity may also have affected this outcome.



Figure 1. Various display positions of this penultimate male *Maratus speciosus* in front of the adult female. Note the asymmetric positions of legs III in (9). As in the adult, the fan was expanded and bore three prominent transverse figures.



Figure 2. Sequential (1-28, not all consecutive) frames from a video clip (25FPS, 20msec exposure/frame) of the penultimate male displaying to the adult female *Maratus speciosus*. After stepwise lowering of legs III in a semaphore display (1-5), the fan was waved (6-10) and legs III were elevated asynchronously (11-12) at the start of fan dance to the spider's left (14-28).

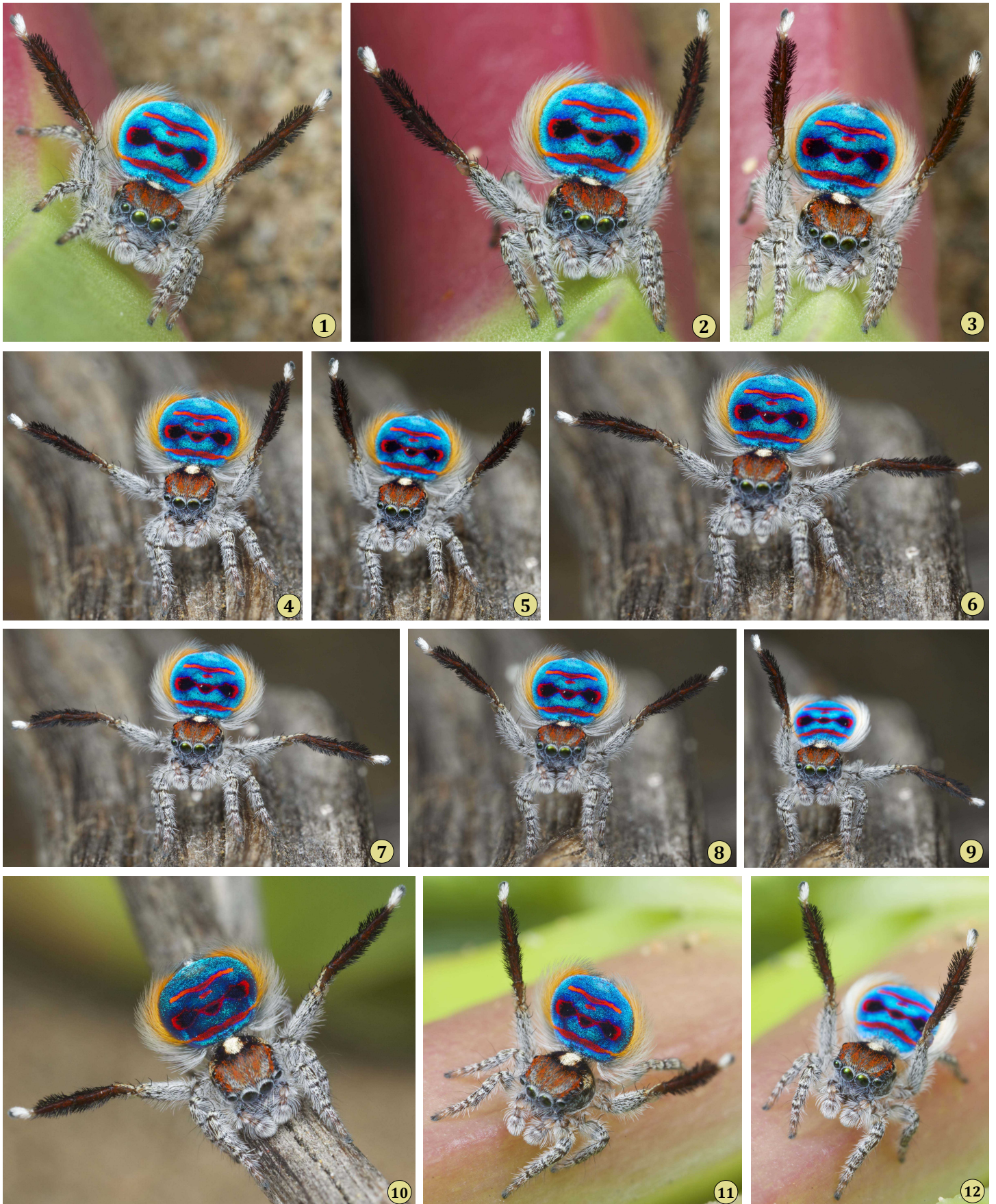


Figure 3. Display positions of the same male in front of the adult female, after moulting to the adult stage. **9**, Note the asymmetric position of legs III during a semaphore display with the fan partly expanded but depressed.



Figure 4. Other views of the penultimate male (1-3), the adult female (4), and the penultimate male attempting to mate with the adult female (5-6). As with adult males, during the final approach to the female this penultimate male extended legs III, touched the carapace of the female with legs I, and frequently bobbed or vibrated his opisthosoma up and down.

The combination of early (penultimate) adult behaviour, late change into adulthood, and short life-span in the adult stage suggests that development of behaviour and physical development of this male were somehow out of sync, perhaps also a result of rearing in captivity. However, we cannot rule out the possibility that display by penultimate *Maratus speciosus* might occur under natural conditions since display by these spiders has not been studied in the field. Even if this behaviour is the result of rearing and does not occur in nature, the fact that normal synchronization of behavioural and physical development *can* be violated is of interest. Although some elements of adult display have previously been observed in penultimate male spiders (*e.g.*, Crane 1949, Aspey 1975), successful completion of courtship display to the point of attempted mating is unusual.

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References

- Aspey, W. P. 1975.** Ontogeny of display in immature *Schizocosa crassipes* (Araneae: Lycosidae). *Psyche* 82: 174-180.
- Crane, J. 1949.** Comparative biology of salticid spiders at Rancho Grande, Venezuela. Part IV. An analysis of display. *Zoologica* 34: 159-214.
- Hill, D. E. and J. C. Otto. 2011.** Visual display by male *Maratus pavonis* (Dunn 1947) and *Maratus splendens* (Rainbow 1896) (Araneae: Salticidae: Euophryinae). *Peckhamia* 89.1: 1-41.
- Hill, D. E. and J. C. Otto. 2014.** Visual display by the male Coastal Peacock Spider [Araneae: Salticidae: Euophryinae: *Maratus speciosus* (O. Pickard-Cambridge 1874)]. *Peckhamia* 119.1: 1-18.
- Otto, J. C. and D. E. Hill. 2012a.** Notes on *Maratus* Karsch 1878 and related jumping spiders from Australia, with five new species (Araneae: Salticidae: Euophryinae). *Peckhamia* 103.1: 1-81.
- Otto, J. C. and D. E. Hill. 2012b.** Notes on *Maratus* Karsch 1878 and related jumping spiders from Australia, with five new species (Araneae: Salticidae: Euophryinae), version 2. *Peckhamia* 103.2: 1-82.
- Pickard-Cambridge, O. 1874.** On some new genera and species of Araneida. *The Annals and Magazine of Natural History*. Series 4, volume 14, Issue Number 81, Paper 24: 169–183, plate XVII.