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# A case of gynandry and intersexuality in *Phidippus regius* C. L. Koch, 1846 (Araneae: Salticidae)

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**Abstract.** A type 1 gynandromorph with intersexuality of the sexually dimorphic jumping spider *Phidippus regius* C. L. Koch, 1846 is reported, with photographs of the specimen (including documentation of ontogenetic colour change) both preserved and *in vivo*.

## Introduction

Gynandry and intersexuality are anomalies that have been studied extensively in spiders (Hull, 1918; Bonnet, 1934; Exline, 1938; Kaston, 1961; Roberts & Parker, 1973; Sherwood & Azarkina, 2026). Salticidae Blackwall, 1841, commonly known to the public as jumping spiders, is the most speciose spider family and is distributed on essentially all landmasses where spiders occur (World Spider Catalog, 2026). Hitherto, sexual anomaly has been recorded in twelve salticid species: *Carrhotus xanthogramma* (Latreille, 1819), *Euophrys frontalis* (Walckenaer, 1802), *Heliophanus cupreus* (Walckenaer, 1802), *Mendoza canestrinii* (Ninni *in* Canestrini, Pavesi 1868), *Myrmarachne formicaria* (De Geer, 1778), *Naphrys pulex* (Hentz, 1846), *Neon reticulatus* (Blackwall, 1853), *Pelegrina flavipes* (G. W. Peckham & E. G. Peckham, 1888), *Phiale gratiosa* C. L. Koch, 1846, *Philaeus chrysops* (Poda, 1761), *Talavera aequipes* (O. Pickard-Cambridge, 1871), and *Thyene inflata* (Gerstaecker, 1873) (Falconer, 1917; Balogh, 1936; Kaston, 1961; Roberts & Parker, 1973; Cooper, 1975; Galiano, 1985; Maekawa & Ikeda, 1992; Currie, 2014; Suzuki *et al*., 2019; Sherwood & Azarkina, 2026).

In this work, we report a thirteenth species exhibiting sexual anomaly, exemplified by a case of gynandry in the spider *Phidippus regius* C. L. Koch, 1846.

## Material and methods

*Material examined*. 1 gynandromorph *Phidippus regius* C. L. Koch, 1846 (MMUE G.7742), captive bred spiderling, born 2024 and died March 2026, parents commercially imported from Apalachicola, Florida, United States in 2023, donated by P. Hatchard.

Classification of sexual anomalies follows Sherwood & Azarkina (2026). The specimen was examined and photographed by DS, using an Olympus SZX16 with an Olympus DP27-CU-1-2 camera, with images stacked in Helicon Focus, and is deposited in the Manchester Museum, Manchester, UK (MMUE). Photographs of the same specimen whilst *in vivo* were taken by PH using an iPhone 16 Pro, and by Rob Burton using an Olympus OM-1 mk11.

## Remarks

Abnormality in the specimen was first identified by PH via split pattern and difference in chelicera colouration in July 2024. This was evident early on, in instar 4 the abdomen pattern and colouration was split, half of the sling was orange and half white. By instar 5 (Figures 1A–B), the difference in cheliceral colouration was very obvious with the female side displaying pink and the male side displaying green. At instar 6 (Figures 1B–C), some very subtle changes were noted, specifically the left pedipalp appeared to be less setose than a typical male palp would have at this stage, and the top of the carapace close to the clypeus showed slight differences in density of setae. By instar 7, the pattern became more prominent, and the male pedipalp can be seen to be slightly incrassate, as is normal for male palps in species at this life stage. At instar 8 (Figures 1E–F), the left pedipalp became increasingly incrassate and more sparingly setose, and the corresponding chelicera became essentially asetose. The asymmetry in colouration on the abdomen was pronounced, and the left-hand appendages became elongated, particularly leg I. By the subadult (instar 9) stage (Figures 1G–H), the two sides are easily identified as male and female strongly taking on the typical traits of each sex for each side typical at this life stage. The left palp now showed classic characteristics of a penultimate male palp, with the palpal tarsus strongly incrassate, and part of the developing bulb visible subcutaneously. The right side of the spider was now densely hirsute, in this regard taking on the typical form of the female.

The specimen reached sexual maturity (Figures 2A–E) and exhibited typical adult colouration for males on the left side and females on the right, congruent with previous colouration observations made in the specimen in prior life stages. Throughout all non-adult stages, the specimen behaved normally and notably in the subadult stage was not affected by the difference in incongruent lengths of the appendages on the opposing sides of the body. Upon adulthood, on infrequent occasions, the specimen exhibited sudden, brief bursts of movement and flicks of the pedipalps and legs, reminiscent of the behaviour demonstrated by males when exhibiting interest in their surroundings, initiating courtship displays, or detecting the presence of a female. These movements involved flicking of leg pair I, and were accompanied by increased reclusiveness compared to the females. Additionally, there was a marked reduction in food consumption and active hunting behaviour as the individual aged within maturity, following behavioural patterns analogous to those observed in normal male specimens. The webbing produced by the specimen resembled that of males, presenting as a looser, tangle-like hammock rather than a dense, substantial web structure. There was no evidence of nesting or egg-laying behaviours.

When presented alongside conspecific females, the specimen appeared to show minimal to no interest in displaying, including courtship, territoriality (despite the species generally being nomadic, with some males temporarily defending small areas), or any form of aggression. The visual interactions between females of the same species and males did not differ until webbing was introduced. Following unsuccessful responses to visual stimuli alone, PH subsequently introduced well-webbed panels derived from both a mature female and a mature male, presented separately, to determine whether pheromones contained within the drag lines and hammock webbing might elicit a behavioural response. The webbing from the male did not provoke any observable behaviours. In contrast, the female webbing elicited a marginal interest; the spider interacted with it using its pedipalps and engaged in erratic, twitch-like movements. The specimen also waved its forelimbs in a manner suggestive of interest, however these behaviours did not progress into full courtship postures or displays. Throughout these observations, the females appeared to stalk and pounce upon the web material of the specimen as if perceiving it as prey, indicating a lack of recognition of the webbing as that of a (normal) mate. The specimen exhibited little to no interest in the webbing or the presence of the females.

The specimen died of natural causes in February 2026 and was sent to DS for classification and study. The specimen (Figures 3A–J) is a type 1 gynandromorph with intersexuality, evident from the upper left quadrant being unambiguously male, the upper right being intersexual with a preponderance of female tissue, the bottom left quadrant being unambiguously male and the bottom right being intersexual (external epigyne absent but wide opening of epigastric furrow characteristic of females present), but with a preponderance of female tissue.

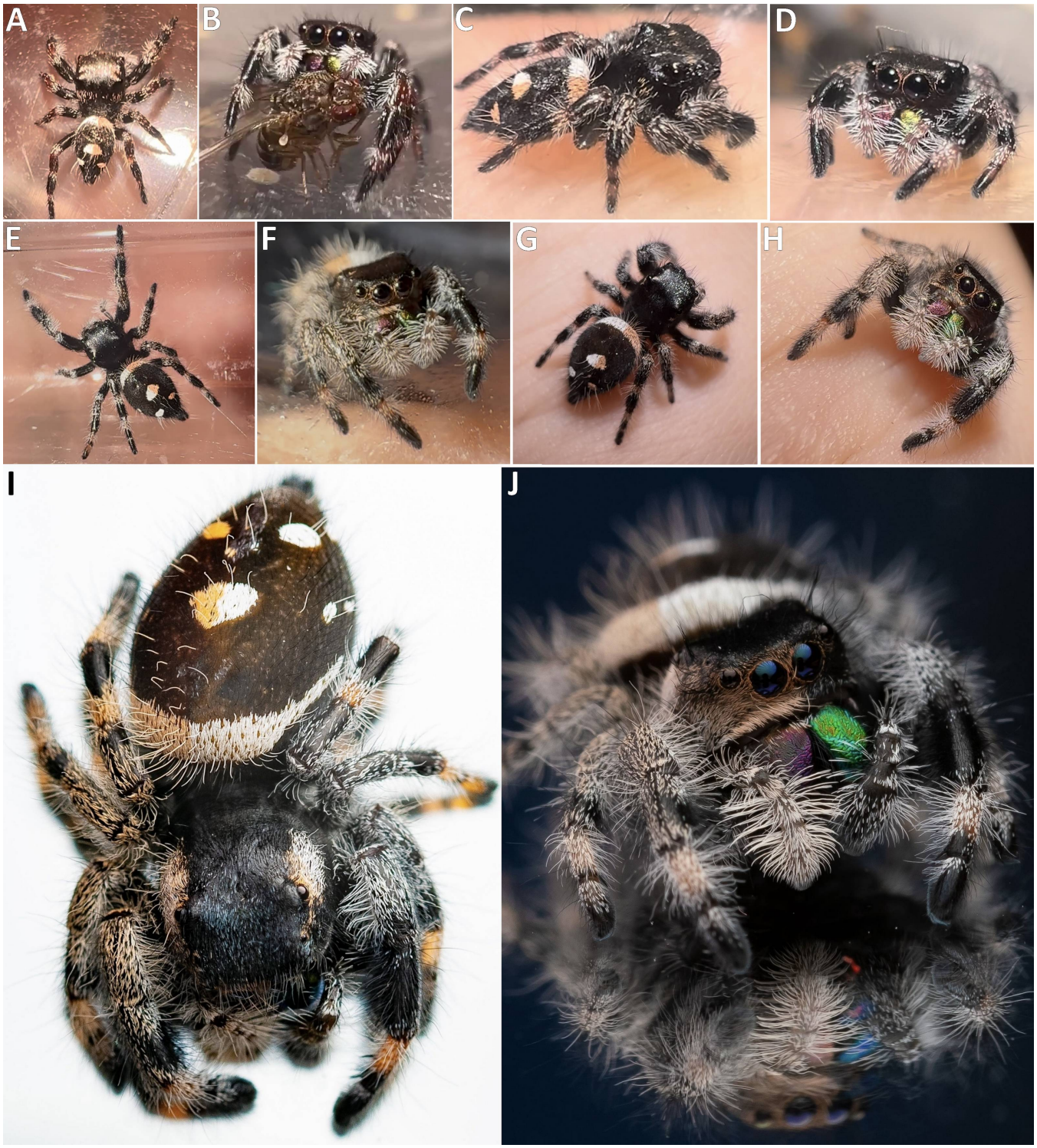


**Figure 1.** *Phidippus regius* C. L. Koch, 1846 type 1 gynandromorph with intersexuality, *in vivo*. **A–B** = instar 5, **C–D** = instar 6, **E–F** = instar 7, **G–H** = instar 8 (subadult), **I–J** = instar 9 (penultimate).


**Figure 2.** *Phidippus regius* C. L. Koch, 1846 type 1 gynandromorph with intersexuality, *in vivo*. **A–F** = adult specimen (instar 10).

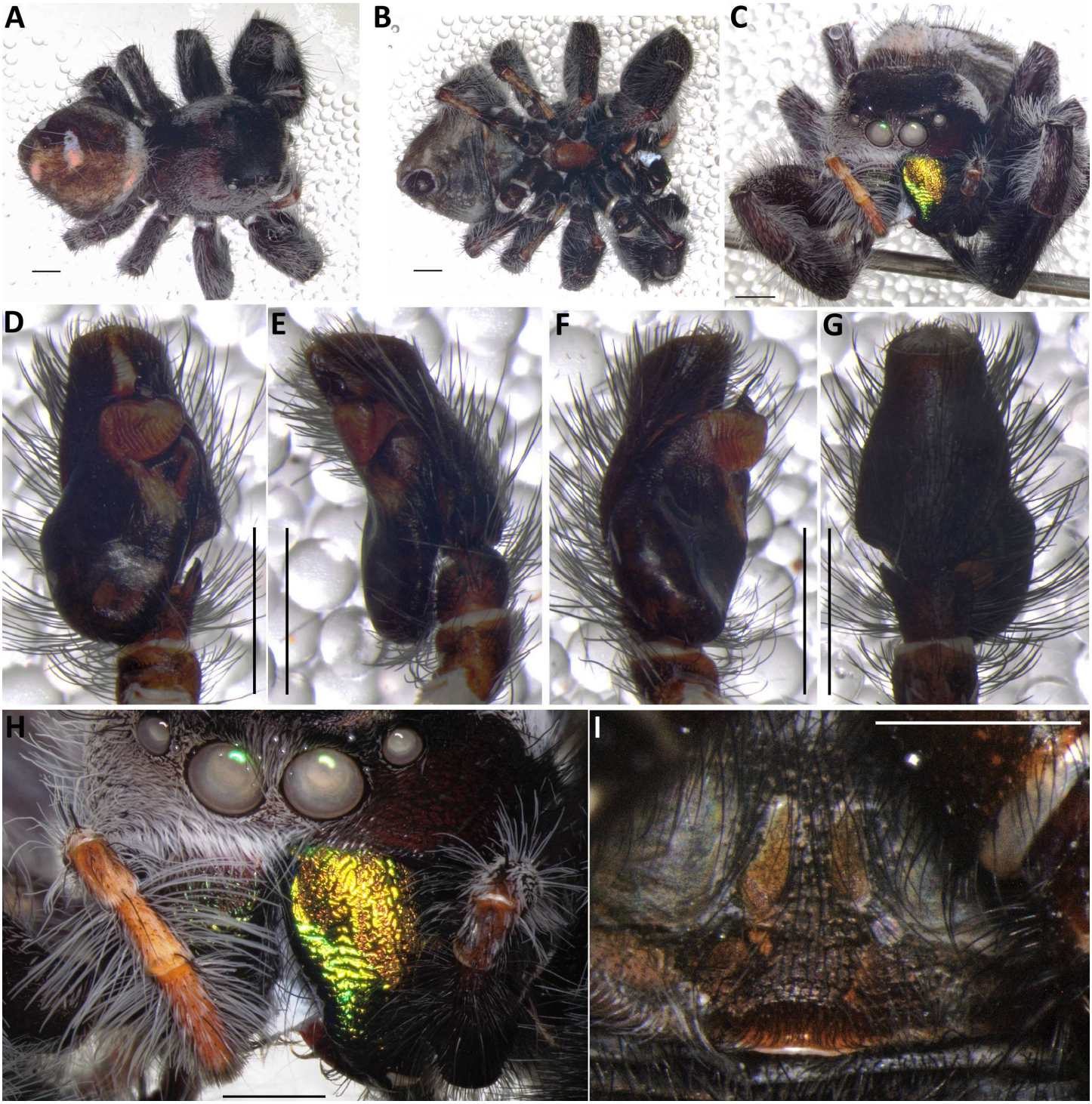


**Figure 3.** *Phidippus regius* C. L. Koch, 1846 type 1 gynandromorph with intersexuality, preserved specimen (MMUE G.7742) following natural death. **A** = habitus, dorsal view, **B** = Idem, ventral view, **C** = Idem, frontal view, **D** = palp (left-hand side), ventral view, **E** = Idem, retrolateral view, **F** = Idem, prolateral view, **G** = Idem, dorsal view, **H** = close-up of eyes, chelicerae, and palps, frontal view, **I** = close-up of genital region, ventral view. Scale bars: 1 mm.

## Discussion

Gynandry and intersexuality are poorly known phenomena, with overlapping definitions (Fusco & Minelli, 2023), despite the large number of morphological cases reported in spiders (Kaston, 1961; Roberts & Parker, 1973; Sherwood & Azarkina, 2026). *Phidippus regius* is sexually dimorphic (Edwards, 2004), as are most congeners, and this assisted in the present report, as it not only allowed PH to identify early on that the specimen was gynandrous, but also allowed DS to ascertain that the upper right quadrant was certainly intersexual based on colouration of the right chelicera. Despite salticids being the most speciose group of spiders, only thirteen cases of sexual anomaly have been recorded, an interesting contrast to the nearly as diverse Linyphiidae Blackwall, 1859 which has many more reported cases (Sherwood & Azarkina, 2026). Whether this is artefactual or shows a real pattern or trend should be investigated by future workers if possible.

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