

**First Report of Gynandromorphism in *Temnothorax curvispinosus* (Mayr, 1866) (Hymenoptera: Formicidae)**

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NOTE

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Gynandromorphism is when an organism possesses tissue that is genotypically and phenotypically male and female (Laugé 1985). A gynandromorph can have bilateral symmetry, in which one side is male and one is female, or be a mosaic, in which case male and female tissues are spread in patches across the body and may not be clearly defined (Campos et al. 2011). While this phenomenon has been reported in vertebrates (Brodkorb 1935, Patten 1993), it is most commonly reported from invertebrates, especially insects (Turrisi and Foucart 2008).

Gynandromorphism has been described from 69 families of insects across 13 orders (Cui and Cai 2003). Within Hymenoptera the condition has been reported from Agaonidae (Pereira et al. 2003), Andrenidae (Xu and Cui 2007), Apidae (Wcislo et al. 2004), Braconidae (Whiting and Whiting 1927), Chalcididae (Haltead 1988), Colletidae (Wcislo et al. 2004), Diprionidae (Martini et al. 1999), Encyrtidae (Zhang and Zhu 2007), Halictidae (Wcislo et al. 2004), Ichneumonidae (Tarasco 1996), Megachilidae (Gerber and Akre 1969), Melittidae (Wcislo et al. 2004), Mutillidae (Turrisi and Foucart 2008), Scelionidae (Huggert 1977), Sphecidae (Schneider and Feitz 2003), Tenthredinidae (Peacock 1925), Trichogrammatidae (Beserra et al. 2003), and Vespidae (Turrisi and Borsato 2008).

However, the condition has most often been reported in Formicidae, with gynandromorphs described in *Acromyrmex octospinosus* (Reich) (Wheeler 1937), *Anergates atratulus* (Schenck) (Wheeler 1914), *Aphaenogaster picea* Wheeler (Wheeler 1903), *Camponotus (Colobopsis) albocinctus* (Ashmead) (Wheeler 1919), *Camponotus ligniperdus* (Latreille) (Wheeler 1903), *Cardiocondyla batesi* Forel (Kugler 1983), *Cardiocondyla kagutsuchi* Terayama (Yoshizawa et al. 2009), *Cardiocondyla nigra* Forel (Wheeler 1914), *Diacamma* Mayr (Dobata et al. 2012), *Formica microgyna* Wheeler (Wheeler 1903), *Formica rufa* Linnaeus (Forel 1874; Forbes 1954), *Formica sanguinea* Latreille (Wheeler 1914), *Lasius (Acanthomyops) latipes* (Walsh) (Wheeler 1919), *Monomorium floricola* (Jerdon) (Donisthrope 1929; Campos et al. 2011), *Monomorium pharaonis* (Linnaeus) (Berndt and Kremer 1983), *Myrmecia gulosa* (Fabricius) (Crosland et al. 1988), *Myrmica sabuleti* Meinert (Scupola 1994), *Myrmica scabrinodis* Nylander (Wheeler 1914), *Pheidole dentata* Mayr (Jones and Phillips Jr. 1985), *Pheidole inquilina* (Wheeler) (Wheeler 1903), *Pheidole morrissi* Forel (Yang and Abouheif 2011), *Pogonomyrmex occidentalis* (Cresson) (Taber and Francke 1986), *Polyergus rufescens* (Forel 1874; Forbes 1954); *Solenopsis aurea* Wheeler (Cokendolpher and Francke 1983), *Solenopsis fugax* (Latreille)

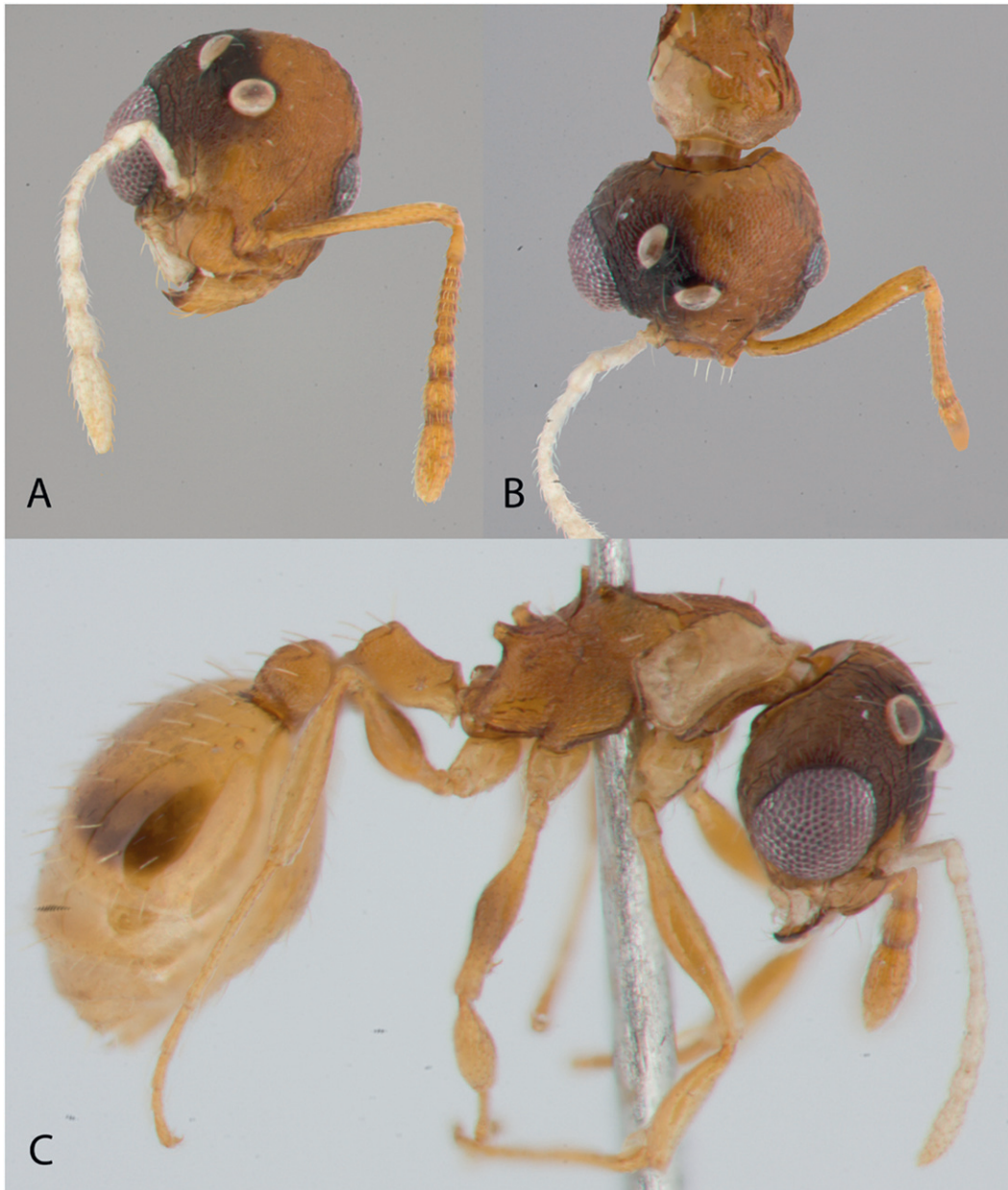


Fig. 1. A, Head. Male tissue to the left, female worker tissue to the right; B, Head and prothorax, dorsum. Male tissue to the left, female worker tissue to the right; C, Profile, dextral. Male tissue can be seen on the head and pronotum; the rest of the body is composed of female worker tissue.

(Wheeler 1914), *Solenopsis invicta* Buren (Hung et al. 1975), *Solenopsis quinquecuspis* (Forel) (Pitts 2002), *Stenamamma* Westwood (Munsee 1994), *Temnothorax*

*obturator* (Wheeler) (Wheeler 1903), *Tetramorium guineense* (Bernard) (Wheeler 1926), and *Tetramorium simillimum* (Smith) (Wheeler 1903).

Because a cast system exists in ants, different combinations of male and female tissue can occur, for which Campos et al. (2011) proposed the names gynandromorph (queen-male), ergatandromorph (worker-male), and dynergatandromorph (soldier-male). “Intercaste” individuals, in which different female castes are combined (e.g., queen-worker [gynergatandromorph], queen-soldier [ergatogynandromorph], and worker-soldier [androergatogynomorph]), also occur, but are not true gynandromorphs because both castes are female (Yang and Abouheif 2011).

Although found in numerous species as described above, the probability of encountering a gynandromorph is very low. Out of the 14,442 ant specimens examined and identified, only a single specimen displaying signs of gynandromorphy was collected.

We report for the first time a *Temnothorax curvispinosus* ergatandromorph. The specimen was collected in a purple pan trap between 15–29 May, 2013 in the Steel Creek Wilderness Area of the Buffalo National River in Newton County, Arkansas (36°02.231' N, 93°20.461'W) and is deposited in the University of Arkansas Arthropod Museum.

The specimen exhibits male characteristics on the right side of the head – darker brown pigmentation, enlarged eye, ocelli present, reduced mandible, and 12-segmented antennae – and pronotum – lighter sclerotization – (Fig. 1) and female worker characteristics on the left side of the head – lighter yellow pigmentation, smaller eye, ocelli absent, larger mandible, and 11-segmented antennae – and pronotum – heavier, darker sclerotization (Fig. 2). The remaining thoracic segments, including the prothoracic leg, and abdominal segments are characteristic of a female worker (Fig. 3). The internal anatomy of the head and prothorax were not examined.

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