

New gynandromorphic Opiliones and Scorpiones

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Summary

The holotype of the phalangiid harvestman *Mitopus scaber* Roewer is found to be a transverse gynandromorph, with the anterior portion being male. Examination of this specimen as well as a normal female paratype reveals that *M. scaber* is a junior synonym of *M. morio* (Fabricius), **new synonymy**.

Two gynandromorphic diplocentrid scorpions, *Didymocentrus comondae* (Stahnke) and *Cazierius gundlachii* (Karsch), are illustrated and described. Both are classified as irregular lateral or mosaic gynandromorphs.

Introduction

Gynandromorphs are individuals in which both sexes are discretely combined. These combinations can occur either laterally, transversely, quarterly, or in patches as mosaics. Intersexuality is a condition in which the entire body including reproductive system is intermediate between the sexes.

Gynandromorphism and intersexuality are relatively rare occurrences in members of the Arachnida. Slightly over 50 cases have been recorded for spiders (Kaston, 1961; Roberts & Parker, 1973) and only nine cases for Opiliones (Tsurusaki, 1982). Gynandromorphy is apparently very rare in scorpions, solpugids and ticks (Francke, 1978; Maury, 1983; Delle Cave, 1979; Schulze, 1933), or possibly because of reduced sexual dimorphism gynandromorphic individuals are overlooked.

The purpose of the present contribution is to report the findings of two new gynandromorphic arachnids, one an opilionid and one a scorpion. In addition, the first known gynandromorphic scorpion (reported by Francke, 1978) is described in greater detail.

Results

Opiliones

There are currently five recorded cases of harvestman gynandromorphs, all from the superfamily Phalangioidea. Suzuki (1980a) illustrated four cases of gynandry in *Leiobunum globosum* Suzuki (Gagrellidae: Leiobuninae), and Tsurusaki (1982) described one case in *Melanopa grandis* Roewer (Gagrellidae: Gagrellinae). Known cases of intersexuality in harvestmen are slightly fewer with only four reported cases. Two of the cases of intersexuality were reported by Błaszak (1968) in *Phalangium opilio* Linné (Phalangiidae). The remaining two cases are from the genus *Gagrellula* (Gagrellidae: Gagrellinae): one reported by Suzuki (1980b) in *G. ferruginea* (Loman) and one reported by

Tsurusaki (1982) in *G. montana* Sato & Suzuki.

During revisionary studies of the harvestman genus *Mitopus* (Phalangiidae), an examination of the types of *M. scaber* Roewer, 1912, revealed two remarkable things. First, the holotype and female paratype (Senckenberg Natur-Museum, Frankfurt, RII/744) are properly members of *Mitopus morio* (Fabricius), **new synonymy**. Secondly, the holotype (reported as a male by Roewer, 1912) is a gynandromorph. Both specimens are from Bosnia, central Yugoslavia. In the key (Roewer, 1912) to the species of *Mitopus*, *M. "bosnicus* n. sp." [name corrected to *M. scaber* by Roewer (1912:281)] is separated from *M. morio* by the degree and placement of tubercles and pigmentation on the dorsum of the abdomen. The stated characters are well within the observed variation (Jennings, 1983; Suzuki & Tsurusaki, 1983; J.C.C. pers. obs.) of *M. morio*. *Mitopus morio* is one of the most widely distributed harvestmen, occurring throughout much of the Holarctic zone. Although considerable variation is observed in external morphology, the genitalia are notably constant. The ovipositors and seminal receptacles of the *M. scaber* types differ little from those of topotypical *M. morio*. From a label placed in the vial with the type specimens, it is clear that Dr W. Starega also found the specimens to represent "*Mitopus morio* (Fabricius) 2♀...STAREGA rev. 1979", but he has never published these findings.

Following the classification used for spiders (Roberts & Parker, 1973), the holotype would be a regular type 3 gynandromorph. The specimen is functionally a female; the ovipositor and seminal receptacles appear normal, and the abdomen is full of partially developed ova. Only the pedipalps are characteristic of a male. The denticles on the palpal tarsi ventrally are not as numerous and the rows are not as organised as on normal males, but otherwise no differences were detected. Both the gynandromorph and the paratype are large robust animals which are similarly coloured and, excluding the pedipalps, unlike males.

This type of transverse gynandry, in which the anterior half was male, has only been recorded once before in opilionids by Suzuki (1980a). The remaining harvestman gynandromorphs are lateral or mosaic in character.

Scorpiones

Only two recorded cases of gynandry in Scorpiones are available. Francke (1978) examined a subadult gynandromorph of *Cazierius gundlachii* (Karsch) (Diplocentridae), but gave no details as to the type or morphology of his specimen. Maury (1983) described a gynandromorph of *Brachisosternus pentheri* Mello-Leitão (Bothriuridae).

The gynandromorph reported by Francke (1978) was re-examined and dissected. The specimen has a male pectine (bearing eight pectinal teeth) on the right side of the body and a female pectine (bearing seven pectinal teeth) on the left (Fig. 1); genital papillae are lacking. In other features, such as carinal morphology of the pedipalps and granulation of the carapace and

tergites, the specimen is similar to females. Although reported earlier as a subadult gynandromorph (apparently based on size considerations), the specimen possesses a pair of poorly developed hemispermatophores and a symmetrical ovariu-terus with diverticula (not containing embryos). The lamellae of the hemispermatophores are folded over the medial side of the trunk, indicating that they were non-functional; no testicular tubules were observed. The internal organs were not well preserved and were destroyed upon dissection; therefore, further observations were not possible. The specimen was collected by L. F. de Armas from El Morro, Santiago de Cuba, Provincia de Santiago de Cuba (formerly Oriente), on 22 May 1972 and is deposited in the American Museum of Natural History, New York, as part of the O. F. Francke collection.

A second gynandromorphic diplocentrid scorpion was discovered by Dr S. C. Williams among material of *Didymocentrus comondae* (Stahnke) collected near La Paz, Estado de Baja California Sur, México. The gynandromorph was one of 1,681 individuals collected between 31 July and 3 August 1968 in the vicinity of La Paz by S. C. Williams, M. A. Cazier, and M. Bentzien (Williams & Lee, 1975). The specimen, as in the case above, exhibits unusual pectines (Fig. 2), with a male pectine (bearing nine pectinal teeth) on the left and a female pectine (bearing eight pectinal teeth) on the



Fig. 2: Pectinal region of the gynandromorphic scorpion *Didymocentrus comondae* (Stahnke) from La Paz, Estado de Baja California Sur, México: male pectine on left side, female pectine on right side.



Fig. 1: Pectinal region of the gynandromorphic scorpion *Cazierius gundlachi* (Karsch) from El Morro, Cuba: male pectine on right side, female pectine on left side.

right. Carination and granulation of the pedipalp chelae are similar to the conditions found in females; no genital papillae are present. Females of *D. comondae* are typically larger than males, with proportionately longer pedipalp chela fingers; the gynandromorph also resembles females in these features. Dissection of the specimen revealed a well developed ovariu-terus only on the right side of the body; diverticula were present, but did not appear to contain embryos. No signs of the ovariu-terus on the left side or testicular tubules anywhere in the body cavity were found. A pair of very poorly formed hemispermatophores were present, but were broken during dissection; they were weakly sclerotised, but otherwise appeared normal. The specimen is deposited in the California Academy of Sciences, San Francisco.

Both diplocentrid scorpions are classified as irregular lateral or mosaic gynandromorphs. The bothriurid reported by Maury (1983) is unusual in that it shows lateral gynandry (right side is female, left side is male), intersexuality and hermaphroditism. The specimen has well developed embryos and hemispermatophores.

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Nomenclatural Note

The following Opinion was published by the International Commission on Zoological Nomenclature in *Bull.zool.Nom.* **45** (2) on 24 June 1988.

Opinion 1488 *Heriaeus* Simon, 1875 (Arachnida, Araneae): *Thomisus hirtus* Latreille, 1819 confirmed as type species.

Editor
