

A Gynandromorph and Teratological Case in *Spilomicrus* sp. (Hymenoptera, Diaprioidea, Diapriidae)

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Abstract. This study reports the occurrence of antennae with female and male characteristics in a female of *Spilomicrus* sp. (Hymenoptera, Diaprioidea, Diapriidae) collected in Parque Estadual Intervales, Ribeirão Grande, São Paulo, Brazil, as well as malformations in one of the antennae, which are described and illustrated.

Keywords: Diapriinae; Gynandromorphs; Morphological Abnormality; Spilomicrini; Teratology.

Um Caso de Ginandromorfia e Teratologia em *Spilomicrus* sp. (Hymenoptera, Diaprioidea, Diapriidae)

Resumo. Este estudo relata a ocorrência de antenas com características femininas e masculinas em um exemplar fêmea de *Spilomicrus* sp. (Hymenoptera, Diaprioidea, Diapriidae) coletado no Parque Estadual Intervales, Ribeirão Grande, São Paulo, Brasil, assim como malformações em uma das antenas, que são aqui descritas e ilustradas.

Palavras-Chave: Anomalia Morfológica; Diapriinae; Ginandromorfismo; Spilomicrini; Teratologia.

Gynandromorphs are sexually abnormal individuals that show deviant phenotypes in the expression of female and male characters, exhibited in the same tagmata or part of them. They are normally rare or very rare in nature, thus not frequently collected (TURRISI & BORSATO 2008).

Among Hymenoptera, the gynandromorphism has been documented in Formicidae (WHEELER 1903; ADLERZ 1908; BERNDT & KREMER 1983; SCUOLA 1994), Diprionidae (MARTINI *et al.* 1999), Siricidae (NEUMANN 1970), Tenthredinidae (PEACOCK 1925), Trichogrammatidae (BESERRA *et al.* 2003), Encyrtidae (CALTAGIRONE 1970; ZHANG & ZHU 2007), Scelionidae (HUGGERT 1977), Chalcididae (HALSTEAD 1988), Agaonidae (PEREIRA *et al.* 2003), Ichneumonidae (TARASCO 1996), Braconidae (WHITING & WHITING 1927), Mutillidae (MAEKLIN 1956; TURRISI 1999), Eumenidae (COOPER 1959; TURRISI & BORSATO 2008), Sphecidae (SCHNEIDER & FEITZ 2003), Platygastriidae (SAFAVI 1968) and Apoidea (LAIDLAW 1932; LECLERQ 1953; AKRE *et al.* 1982; NILSSON 1987; CELARY & WISNIOWSKI 2001; ORNOSA *et al.* 2001; GONZÁLEZ 2004; WCISLO *et al.* 2004; ENGEL 2007; LUCIA *et al.* 2009; MICHEZ *et al.* 2009).

Teratology is the study of structural abnormalities, especially monstrosities and malformations (TORRE-BUENO 1989). BALAZUC (1948) defined it as the study of monsters and SAVINI & FURTH (2004) defined as monsters the specimens of a particular species with one or more exceptional anatomical particularities, incompatible with the generic characters or with characters of the suprageneric taxon to which the species belongs.

In Hymenoptera, teratological cases were reported by BALAZUC (1957), FABRITIUS (1968), ACOSTA & MARTINEZ (1984), MICHEL (1985), BORDERÁ & TORMOS (1986), TUSSAC & BALAZUC (1991), BESSART (1993), TUSSAC (1994), BORSATO (1995), PENTEADO-DIAS *et*

al. (2005) and POPOVICI *et al.* (2014).

In Diapriidae (Hymenoptera), abnormalities were reported in *Trichopria verticillata* (Letreille) that showed one male and one female antenna (FOERSTER, 1845); CHITTY (1905) reported a gynandromorph species of Spilomicrinae; CEBALLOS (1921) reported a specimen of *Basalys macroptera* (Kieffer) with the left side of the body with female characteristics and the right with male ones; OGLOBIN (1936) reported a female of *Acanthopria* sp. with the antennae male features; SZABÓ (1959) reported a case of a female of *Monelata cincta* (Haliday) with a male antenna with deformed antennomeres; BIN (1972) reported a gynandromorph female of *Trichopria* Ashmead with a male antenna; BIN (1976) reported a female of *Trichopria* with teratological processes in head with only one compound eye, antenna and ocelli and left mandible stunted; RAJMOHANA & NARENDRAN (1999) reported a gynandromorph female of *Trichopria* with teratological segments in one antenna.

A This paper report teratological and gynandromorph female of *Spilomicrus* (Figure 1) collected in January 2010 in area of Atlantic Rainforest at Parque Estadual Intervales (24°16'27.7"S / 48°25'19.3"W), Ribeirão Grande, São Paulo State, Brazil. Both antennae of the studied specimen had 13 segments. The right antennae, with female characteristics, has moderate, nonabrupt, multisegmented clava, antennomere 12 subequal in length to antennomere 13, with lateral pit, clavomeres slightly flattened ventrally, antennomeres 8 and 9 abnormal, not distinctly separated, and antennomere 3 with a teratoma (Figures 2. a,b);

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the left one, with male characteristics, wastypically filiform, with scattered short hairs, and antenommere 4 abnormal, without typical sharp longitudinal keel (Figure 2c). The others morphological characteristics were normal to females of *Spilomicrus*.

The examined specimen have been deposited in the collection LRRP - Coleção Entomológica do Laboratório de Sistemática e Bioecologia de Parasitoides e Predadores da APTA Ribeirão Preto, Ribeirão Preto, SP, Brazil (N.W. Periotto, curator). Permanent license to collect zoological material (IBAMA) number 16473-1.



Figure 1. Gynandromorph female of *Spilomicrus*, habitus.

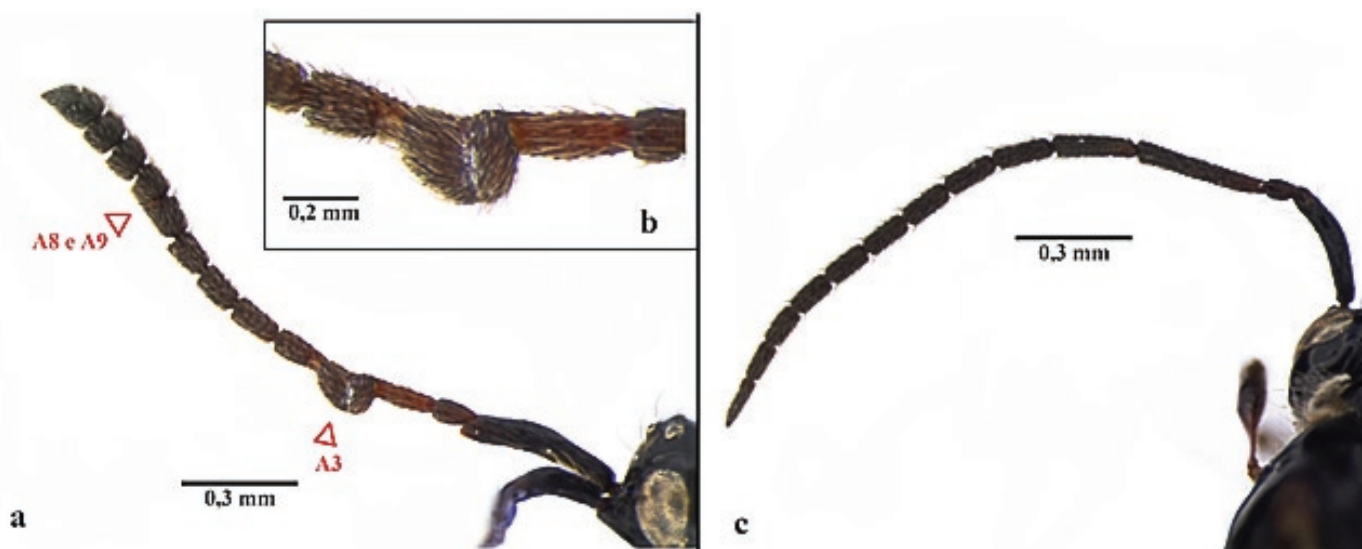


Figure 2. Antennae of studied exemplar of *Spilomicrus*. a) Female antenna . b) Teratoma in the female antenna. c) Male antenna .

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REFERENCES

- Acosta, F.J. & M.D. Martinez, 1984. Algunas anomalias en *Leptothorax rabaudi* Bond., 1818 (Hym., Formicidae). Boletín de la Asociación Española de Entomología, 8: 41-45.
- Adlerz, G., 1908. Zwei Gynandromorphen von *Anergates atratulus* Schenk. Arkiv för Zoologi, 5: 1-6.
- Akre, R.D., E.P. Catts, R.S. Zack & X.C. Klostermeyer, 1982. Gynandromorphs of *Megachile otundata* (Fab.)

- (Hymenoptera: Megachilidae). *Entomological News*, 93: 85-94.
- Balazuc, J., 1948. La tératologie des coléoptères et expériences de transplantation sur *Tenebrio molitor* L. Mémoires du Muséum National d'Histoire Naturelle, 25: 1-293.
- Balazuc, J., 1957. The tératologie des Hyménoptéroïdes. *Annales de la Société Entomologique de France*, 126: 167-203.
- Berndt, K.P. & G. Kremer, 1983. New categories in the gynandromorphism of ants. *Insectes Sociaux*, 30: 461-465.
- Beserra, E.B., Querino, R.B. & J.R.P. Parra, 2003. Ocorrência de ginandromorfismo em *Trichogramma pretiosum* Riley (Hymenoptera: Trichogrammatidae). *Neotropical Entomology*, 32: 507-509.
- Bessart, P., 1993. Un *Conostigmus* et un *Ceraphron* a antennes teratologiques (Hymenoptera: Ceraphronoidea). *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique Entomologie*, 63: 51-58.
- Bin, F., 1972. Un nuovo caso di ginandromorfismo in *Ashmeadopria* Kieffer (Hymenoptera, Proctotrupeoidea, Diapriidae). *Entomologica*, 8: 55-59.
- Bin, F., 1976. Record of a teratological *Trichopria* Ashm. (Hymenoptera, Diapriidae) *Entomologica*, 12: 67-70.
- Borderá, S. & J. Tormos., 1986. Un braconído y tres ichneumonídeos teratológicos (Hym., Ichneumonoidea). *Boletín de la Asociación Española de Entomología*, 10: 335-338.
- Borsato, W., 1995. Segnalazione di una teratologia su *Sulcopolistes sulcifer* Zimmermann (Hymenoptera, Vespidae). *Bollettino del Museo Civico di Storia Naturale di Verona*, 19: 453-455.
- Caltagirone, L.E., 1970. Gynandromorphism in the polyembryonic encyrtid *Pentalitomastix plethoricus* Cali. (Hymenoptera, Encyrtidae). *Bollettino del Laboratorio di Entomologia Agraria Filippo Silvestri*, 28: 98-112.
- Ceballos, G., 1921. Nota sobre un himenóptero ginandromorfo. *Memorias de la Real Sociedad Española de Historia Natural*, tomo extraordinario: 79-81.
- Celary, W. & B. Wisniowski, 2001. An interesting case of gynandromorphism in *Andrena helvola* (L., 1758) (Hymenoptera: Apoidea: Andrenidae). *Folia Biologica*, 49: 291-293.
- Chitty, A.J., 1905. Exhibition of a hermaphrodite Proctotrupid. *Transactions of the Entomological Society of London*, 57: 65.
- Cooper, K.W., 1959. A bilaterally gynandromorphic *Hypodynerus*, and a summary of cytologic origins of such mosaic Hymenoptera. *Biology of Eumeninae wasps*, VI. *Bulletin of the Florida State Museum, Biological Science*, 5: 25-40.
- Engel, M.S., 2007. A lateral gynandromorph in the bee genus *Thyreus* and the sting mechanism in the Melectini (Hymenoptera: Apidae). *American Museum Novitates*, 3553: 1-11.
- Fabritius, K., 1968. Eine anomalie des abdomes bei der gattung *Trimorus* (Hym. Scelionidae). *Analele Stiintifice ale Universitatii "Al. I. Cuza"*, 14: 1-2.
- Foerster, A., 1845. Notiz ueber einem Zwitter *Diapria elegans* Nees. *Stettiner Entomologische Zeitung*, 6: 390-392.
- González, V., 2004. A gynandromorph of *Megachile (Austromegachile) montezuma* Cresson (Hymenoptera: Apoidea, Megachilidae). *Entomotropica*, 19: 155-156.
- Halstead, J.A., 1988. A gynandromorph of *Hockeria rubra* (Ashmead) (Hymenoptera Chalcididae). *Proceedings of the Entomological Society of Washington*, 9: 258-259.
- Huggert, L., 1977. Three gynandromorphic specimens of *Idris piceiventris* (Kieffer) (Hymenoptera, Proctotrupeoidea: Scelionidae). *Entomologica Scandinavica*, 8: 158-160.
- Laidlaw, W.B.R., 1932. A gynandromorphic form of *Bombus*, with other notes on bees and wasps in Scotland. *Scottish Naturalist*, 193: 25-27.
- Leclercq, J., 1953. Un cas extraordinaire de gynandromorphisme chez *Halictus sexcinctus* (Hym. Apidae). *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique Entomologie*, 29: 1-4.
- Lucia, M., A.H., Abrahamovich & L.J. Alvarez, 2009. A gynandromorph of *Xylocopa nigrocincta* Smith (Hymenoptera: Apidae). *Neotropical Entomology*, 38: 155-157.
- Maeklin, F.W., 1956. Gynandromorphism in insects, with a description of a gynandromorphic *Mutilla obscura* Nyl. found in Helsingfors (Swedish). *Linzer Biologische Beiträge*, 3: 110-112.
- Martini A., N. Baldassarri & P. Baronio, 1999. Gynandromorphism and its manifestations in Diprionid Hymenoptera. *Bollettino dell'Istituto di Entomologia "Guido Grandi" dell'Università di Bologna*, 53: 87-107.
- Michel, B., 1985. Observations d'un cas de schistomélie antennaire chez *Tenthredosis stigma* F. (Hym., Tenthredinidae). *L'Entomologiste*, 41: 241-242
- Michez, D., P. Rasmont, M. Terzo & N.J. Vereecken, 2009. A synthesis of gynandromorphy among wild bees (Hymenoptera: Apoidea), with an annotated description of several new cases. *Annales de la Société Entomologique de France*, 45: 365-375.
- Neumann, F.G., 1970. Abnormal *Sirex noctilo* F. (Hymenoptera: Siricidae). *Journal of the Australian Entomological Society*, 9: 168.
- Nilsson, G.E., 1987. A gynandromorphic specimen of *Evylaeus albipes* (Fabricius) (Hymenoptera, Halictidae) and a discussion of possible causes of gynandromorphism in haplo-diploid insects. *Notulae Entomologicae*, 67: 157-162.
- Ogloblin, A.A., 1936. Un ginandromorfo de *Acanthopria* (Diapriidae, Hym.). *Revista de la Sociedad Entomológica Argentina*, 1: 33-36.
- Ornosa, C., Cascales E. & F.J. Ortiz-Sánchez, 2001. Nuevos casos teratológicos en Apoidea. *Anales de Biología*, 12: 19-24.
- Peacock A.D., 1925. Studies in the parthenogenesis and sexuality of saw-flies (Tenthredinidae). II. A gynandromorph of *Pterinoidea (Nematus) ribesii* Scop. with observations on gynandromorphism and saw-fly sexuality. *British Journal of Experimental Biology*, 2: 61-84.
- Penteado-Dias, A.M., Nunes, J.F. & E.M. Shimbori, 2005. Observations on some teratological Braconidae (Hymenoptera, Ichneumonoidea) from Brazil. *Entomotropica*, 20: 113-114.
- Pereira, R.A.S., A.P. Prado & F. Kjellberg, 2003. Gynandromorphism in pollinating fig wasps (Hymenoptera: Agaonidae). *Entomological News*, 114: 152-155.
- Popovici, O.A., Mircea-Dan, M. & N. David, 2014. New teratological cases in Platygastriidae and Pteromalidae (Hymenoptera). *Turkish Journal of Zoology*, 38: 491-499. doi:10.3906/zoo-1312-30
- Rajmohana, K. & T.C. Narendran, 1999. An interesting teratological *Trichopria* Ashmead (Diapriidae: Proctotrupeoidea) from India. *Zoos Print Journal*, 14: 94-96.
- Safavi, M., 1968. Etude biologique et écologique des Hyménoptères parasites des oeufs des punaises des céréales. *Entomophaga*, 13: 381-496.
- Savini, V. & D. Furth, 2004. Teratologia en Coleoptera: un caso en *Gioia bicolor* (Blake, 1969) (Chrysomelidae, Alticinae) de Jamaica. *Entomotropica*, 19: 165-167.
- Schneider, N. & F. Feitz, 2003. Malformations observées chez quatre abeilles et neuf guêpes du Luxembourg (Hymenoptera, Aculeata). *Bulletin de la Société des Naturalistes Luxembourgeois*, 104: 95-98.
- Scupola, A., 1994. Un caso di ginandromorfismo in *Myrmica* Latr. (Hymenoptera Formicidae). *Bollettino della Società Entomologica Italiana*, 125: 252-254.
- Szabó, J.B., 1959. Notes on gynandromorph diapiiid wasp from Hungary (Hym. Proct. Diapr.). *Folia Entomologica Hungarica*, (S.N.), 12-33: 495-496.
- Tarasco, E., 1996. Un caso di ginandromorfismo in *Coelichneumon rudis* (Boyer de Fonscolombe, 1847) (Hymenoptera, Ichneumonidae). *Entomologica*, 30: 101-104.
- Torre-Bueno, J.R., 1989. The Torre-Bueno glossary of entomology; compiled by Stephen W. Nichols; including Supplement A by Georges S. Tulloch. New York. The New York Entomological

- Society, xxii + 840 p.
- Turrisi, G.F. & W. Borsato, 2008 Description of two gynandromorphic Eumenidae (Hymenoptera Vespoidea). *Linzer Biologische Beiträge*, 40: 951-957.
- Turrisi, G.F., 1999. Un caso di ginandromorfismo in *Myrmilla bison* (A. Costa, 1887) Hymenoptera Mutillidae). *Bollettino dell'Accademia Gioenia di Scienze Naturali di Catania*, 31: 331-334.
- Tussac, H. & J. Balazuc, 1991. Anomalies de l'appareil visuel chez des Hyménoptères Apocrites. *L'Entomologiste*, 47: 49-52.
- Tussac, H., 1994. Une anomalie antennaire chez un Hyménoptère Symphyte. *L'Entomologiste*, 50: 313-314.
- Wheeler, W.M., 1903. Some new gynandromorphous ants, with a review of the previously recorded cases. *Bulletin of American Museum of Natural History*, 19: 653-683.
- Whiting, P.W. & A.R. Whiting, 1927. Gynandromorphs and other irregular types in *Habrobracon*. *Biological Bulletin*, 52: 89-120.
- Weislo, W.T., V.H. Gonzales & L. Arneson, 2004. A review of deviant phenotypes in bees in relation to brood parasitism, and a gynandromorph of *Megalopta genalis* (Hymenoptera: Halictidae). *Journal of Natural History*, 38: 1443-1457.
- Zhang, Y.Z. & C.D. Zhu, 2007. A gynandromorph of *Microterys ishiii* (sic!) Tachikava (Hymenoptera: Chalcidoidea: Encyrtidae). *Acta Entomologica Sinica*, 50: 868-870.

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