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Redescription of three species of *Anastrepha* (Diptera, Tephritidae) rediscovered in Brazil, with the establishment of a new synonym

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Abstract

The descriptions of *Anastrepha matertela* Zucchi and *A. tenella* Zucchi were based exclusively on the holotypes (female). Based on additional specimens collected in Brazil since their original descriptions, both species are redescribed and illustrated. A lectotype is designated for *Anastrepha bivittata* (Macquart, 1843), which also is redescribed and considered to be the senior synonym of *A. fumipennis* Lima, 1934.

Key words: Diptera, Tephritidae

Introduction

The genus *Anastrepha* Schiner, 1868 comprises approximately 270 known species distributed in the American tropics and subtropics (Norrbom *et al.* 2012), of which 115 are recorded in Brazil (Zucchi 2008). Although some species are frequently collected, particularly those that are economically important, others are recovered rarely. For various species of *Anastrepha*, the only taxonomic information is based on the type specimen, and for some of these species, the original descriptions are very brief.

Despite numerous surveys of the species of *Anastrepha* with traps or by fruit sampling in many Brazilian localities during the last decades, some species have been recovered rarely. Among these species are *A. matertela* Zucchi, 1979 and *A. tenella* Zucchi, 1979. Both species were collected originally in Cruz das Almas, state of Bahia. Although *Anastrepha* fruit fly surveillance in this municipality has been carried out since the 1980s, no specimens of these species have been reported. However, 35 years after the original descriptions of *A. matertela* and *A. tenella*, we here report the first subsequent specimens collected in Bahia and redescribe both species in greater detail.

Anastrepha bivittata (Macquart, 1843) is another poorly known species, presumed to occur in Brazil. It has been known only from the brief original description. We located and examined the single known syntype and here provide a comprehensive redescription. The data from these redescriptions will be used to treat all three of these species more adequately in an interactive system which is being developed for the species of *Anastrepha* (Norrbom *et al.* 2012).

Material and methods

The morphological terminology follows White *et al.* (1999), and the methods used for the measurements of the wing, oviscapae, and aculeus, and for image recording were as described in Uramoto & Zucchi (2010). Also, the following ratios were taken: vein M ratio (distance from bm-cu to r-m/distance from bm-cu to dm-cu); S-band distal section width ratio (width of S-band/width of cell r_{2+3}); cell c: pterostigma ratio (cell c length/

Female terminalia (Figs. 26–29). Oviscape entirely yellow to orange brown; straight; entirely microtrichose; 2.0 mm long; length ratio (oviscape length/mesonotum length) 0.8; spiracle at basal 0.38. Eversible membrane (Fig. 29) with 35–50 denticles (all sclerotized) in triangular to semicircular or suboval pattern. Aculeus (Fig. 26) 1.49–1.50 mm long; in ventral view extreme base expanded (0.21 mm wide); lateral margins broadened at midlength and distal gradually tapering. Aculeus length/oviscape length 0.75. Aculeus tip (Figs. 27, 28) 0.17–0.18 mm long. Aculeus tip length/aculeus length 0.27–0.28; width at base 0.09 mm, 4.45–4.78 times as long as wide; lateral margins gradually tapering; distal 0.17–0.18 mm with 12–13 serrations (7 small sized serrations distally, and 5–6 poorly defined serrations basally); serrate part not extending onto dorsal side basally, serrated part 0.40–0.45 times length of tip. Spermathecae sclerotized.

Host. Unknown.

Distribution. Known only from Brazil, state of Bahia.

Type Data. Holotype female, Brazil: Bahia: Cruz das Almas, McPhail trap, no collection date, A. S. Nascimento (coll), (MZSP) (examined).

Other specimen examined. BRAZIL: Bahia: Itaberaba, McPhail trap, 02.VI.2009, M. C. A. Nunes, 1♀ (ESALQ).

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References

- Bezzi, M. (1909) Le specie dei generi *Ceratitis*, *Anastrepha* e *Dacus*. *Bollettino del Laboratorio di Zoologia Generale e Agraria della Regia Scuola Superiore d'Agricoltura, Portici*, 3, 273–313.
- Foote, R.H. (1967) Family Tephritidae (Trypetidae, Trupaneidae). In: Papavero, N. (Ed.), *A catalogue of the Diptera of the Americas south of the United States*. 57. Departamento de Zoologia, Secretaria da Agricultura, São Paulo, pp. 6–17.
- Greene, C.T. (1934) A revision of the genus *Anastrepha* based on a study of the wings and on the length of the ovipositor sheath (Diptera: Trypetidae). *Proceedings of the Entomological Society of Washington*, 36, 127–179.
- Hendel, F.G. (1914) Die Bohrfliiegen Südamerikas. Übersicht und Katalog der bisher aus der neotropischen Region beschriebenen Tephritinen. *Abhandlungen und Berichte des Königlichen Zoologischen und Anthropologisch-Ethnographischen Museums zu Dresden* (1912), 14, 1–84.
- Lima, A.M. da Costa (1934) Moscas de frutas do genero *Anastrepha* Schiner, 1868 (Diptera: Trypetidae). *Memórias do Instituto Oswaldo Cruz (Rio de Janeiro)*, 28, 487–575.
- Loew, H. (1873) Monographs of the Diptera of North America. Part III. *Smithsonian Miscellaneous Collections*, 11 (3 [= pub. 256]), i–vii + 1–351 + I–XIII.
- Macquart, J.P.M. (1843) Diptères exotiques nouveaux ou peu connus [2(3)]. *Memoires de la Societe Royale de Sciences, de l'Agriculture et des Arts de Lille*, 1842, 162–460 + 36 pls.
- Norrbom, A.L. (1991) The species of *Anastrepha* (Diptera: Tephritidae) with a grandis- type wing pattern. *Proceedings of the Entomological Society of Washington*, 93, 101–124.
- Norrbom, A.L., Carroll, L.E., Thompson, F.C., White, I.M. & Freidberg, A. (1999a) Systematic database of names. In: Thompson, F.C. (Ed.), *Fruit Fly Expert Identification System and Systematic Information Database. Myia* (1998), 9, 65–251 & *Diptera Data Dissemination Disk (CD-ROM)* (1998), 1.
- Norrbom, A.L., Zucchi, R.A. & Hernández-Ortiz, V. (1999b) Phylogeny of the genera *Anastrepha* and *Toxotrypana* (Trypetinae: Toxotrypanini) based on morphology. In: Aluja, M. & Norrbom, A.L. (Eds.), *Fruit flies (Tephritidae): Phylogeny and evolution of behavior*. CRC Press, Boca Raton, pp. 299–342.
- Norrbom, A.L., Korytkowski, C.A., Zucchi, R.A., Uramoto, K., Venable, G.L., McCormick, J. & Dallwitz, M.J. (2012) *Anastrepha* and *Toxotrypana*: descriptions, illustrations, and interactive keys. Version: 29 May 2012. <http://delta-intkey.com/anatox/intro.htm> (accessed 29 July 2014)

- Steyskal, G.C. (1977) *Pictorial key to species of the genus Anastrepha (Diptera: Tephritidae)*. Entomological Society of Washington, Washington, D.C., 35 pp.
- Stone, A. (1942) The fruitflies of the genus *Anastrepha*. *United States Department of Agriculture Miscellaneous Publication*, 439, 1–112.
- Uchôa, M.A.F. & Pontes, A.V. (2011) Conhecimento sobre moscas-das-frutas no estado do Mato Grosso. In: Silva, R.A., Lemos, W.P. & Zucchi, R.A. (Eds.), *Moscas-das-frutas na Amazônia Brasileira: diversidade, hospedeiros e inimigos naturais*. Embrapa Amapá, Macapá, pp. 253–258.
- Uramoto, K., Martins, D.S., Lima, R.A. & Zucchi, R.A. (2008) Host plant record for the fruit flies, *Anastrepha fumipennis* and *A. nascimento* (Diptera, Tephritidae). *Journal of Insect Science*, 1–4. [published online]
<http://dx.doi.org/10.1673/031.008.4501>
- Uramoto, K., Martins, D.S. & Zucchi, R.A. (2008) Fruit flies (Diptera, Tephritidae) and their associations with native host plants in a remnant area of the highly endangered Atlantic Rain Forest in the State of Espírito Santo, Brazil. *Bulletin of Entomological Research*, 98, 457–466.
<http://dx.doi.org/10.1017/S0007485308005774>
- Uramoto, K. & Zucchi, R.A. (2010) New species of *Anastrepha* Schiner (Diptera, Tephritidae) from remnant area of the Atlantic Rain Forest and surroundings in the state of Espírito Santo, Brazil. *Zootaxa*, 2535, 49–60.
- White, I.M., Norrbom, A.L., Headrick, D.H. & Carroll, L.E. (1999) Glossary. In: Aluja, M. & Norrbom, A.L. (Eds.), *Fruit flies (Tephritidae): Phylogeny and evolution of behavior*. CRC Press, Boca Raton, pp. 881–924.
<http://dx.doi.org/10.1201/9781420074468.sec8>
- Zucchi, R.A. (1979) Novas espécies de *Anastrepha* Schiner 1868 (Diptera, Tephritidae). *Revista Brasileira de Entomologia*, 23, 35–41.
- Zucchi, R.A. (2000) Taxonomia. In: Malavasi, A. & Zucchi, R.A. (Eds.), *Moscas-das-frutas de importância econômica no Brasil. Conhecimento básico e aplicado*. Holos, Riberão Preto, pp. 13–24.
- Zucchi, R.A. (2008) Fruit flies in Brazil - *Anastrepha* species their host plants and parasitoids. Available from: <http://www.lea.esalq.usp.br/Anastrepha/> (accessed 29 July 2014)