

First record of *Megaselia rufipes* (Meigen, 1804) (Diptera: Phoridae) from Uruguay with notes on biology

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ABSTRACT: *Megaselia rufipes* (Meigen, 1804) is recorded for the first time in Uruguay, extending the Neotropical distribution of this taxon. The specimens were collected in a cemetery in Montevideo with ball-traps baited with carrion, placed inside crypts, from June to November 2011. Records of *M. rufipes* for the Neotropical Region tend to be sparse, but it is known from Brazil and Chile. According with its current distribution, *M. rufipes* tends to favour milder climates; our record from the more southern, cooler, part of the Neotropical Region is consistent with this perception.

The scuttle flies or Phoridae are one of the largest families of Diptera (Disney 1983). The genus *Megaselia* occurs throughout the world including more than 1,400 described species (Disney 1989). *Megaselia rufipes* (Meigen, 1804) like *M. scalaris* (Loew, 1866), is now virtually cosmopolitan through the agency of man (e.g. Borgmeier 1968). *M. rufipes* probably originated in Europe, where it is abundant while *M. scalaris* almost certainly originated in the southern Nearctic/northern Neotropical Regions (Disney 2008; Disney *et al.* 2009). *M. rufipes* is widespread in the Nearctic Region (Borgmeier 1966). Records of *M. rufipes* for the Neotropical Region tend to be sparse, but it is known from Brazil and Chile (Borgmeier 1966). Otherwise the records tend to be for the southern islands of the Atlantic, such as Nightingale Island (Hänel and Disney 2006) and Gough Island (Jones *et al.* 2003). Further north in the Atlantic it occurs in the Canary Islands and Atlantic islands to the north of these (Disney *et al.* 2010). It is not recorded from the cool climate Falkland Islands (Disney 2009) nor from the warm climate Cape Verde Islands in the Atlantic (Disney 1991) and it is also absent from the warm climate Galápagos Islands (Disney and Sinclair 2008) in the Pacific.

The larvae of *M. rufipes* exploit a wide range of, mainly decaying, organic materials that include the following records summarized in Disney (1994): decaying vegetation: rotting leaves and potatoes, flower heads of *Melandrium rubrum* and *Tragopogon pratensis*, germinating seeds of rye and wool-luzerne; ripe and rotting sporophores of fungi: *Agaricus campestris*, *Lactarius deliciosus* and *Phallus impudicus*; vertebrate dung: swallow (*Hirundo rustica*) dung, human excrement and bat guano; insect frass: e.g. of larval Lepidoptera, dead ticks (*Ixodes ricinus*) and moribund and dead insects such as some species of Coleoptera and Lepidoptera caterpillars and/or pupae; vertebrate carrion such as dead mice dead rats and meat baits and frequently reported in human corpses that are exposed above ground, such as under floorboards, or only shallowly or partly buried; detritus in beehives; food: old

cheese milk curds in discarded bottles, barbecue sauce imported into America from China, a freshly-purchased oven-ready rice-based meal and beet pickled in vinegar. Larvae have also been reported from a concentrated soap solution and from a sewage filter-treatment plant receiving a chemical (pharmaceutical) waste.

A project implemented since June 2011 to study the insects communities at the Buceo Cemetery in Montevideo, Uruguay, allowed us to find several specimens of *M. scalaris* and *M. rufipes*. The purpose of this paper is record *M. rufipes* for the first time from Uruguay. Specimens were collected with ISCA Ball Trap (ISCA Technologies, Inc., 2060 Chicago Avenue, #C2, Riverside, CA 92507), baited with 100 g of beef and filled with a solution of propylene glycol (50%). Propylene glycol is an odorless, non-toxic liquid used in insect trapping programs because of its preservative and evaporative advantages (Thomas 2008).

The sampling was carried out at Buceo Cemetery (34°54'14" S, 56°07'88" W), Montevideo, Uruguay, monthly, since June to October 2011. Ball traps were installed inside crypts with two to four human corpses; at least one body was one week old. Adults collected were preserved in 70% ethanol and were deposited in the Entomological Collection of Facultad de Ciencias, Universidad de la República (Montevideo): FCE-D107 (28 specimens), FCE-D119 (11 specimens), FCE-D135 (8 specimens), FCE-D149 (27 specimens), FCE-D162 (12 specimens), FCE-D179 (27 specimens). Another voucher specimen was deposited in University of Cambridge, Museum of Zoology, collection of slide mounted World Phoridae, male voucher, reference 17-4.

M. rufipes has been frequently reported in human corpses that are exposed above ground such as under floorboards, or only shallowly or partly buried (Disney 1994). Published examples include freshly emerged adults that were obtained from a four-month old corpse exposed beneath floorboards in Yorkshire (Erzinclioglu 1985). Pupae were obtained in a corpse exposed in a greenhouse in Belgium for 52 days (Disney 1994; Leclercq and

Verstraeten, 1993). In two cases of suicide victims, whose bodies were found in flats in Switzerland, the only insects breeding in the corpses were this species (Disney 2005). This species has proved of greatest forensic significance when blowflies (Calliphoridae) have been unable to gain access to a corpse (Disney, 2011). Scuttle flies (Phoridae) are notorious for entering situations through the smallest of openings (Disney, 1994). Finding this species inside crypts is consistent with this behavior.

According with its current distribution, *M. rufipes* tends to favour milder climates whereas *M. scalaris* favors warmer climates. Our record from the more southern, cooler, part of the Neotropical Region is consistent with this perception.

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LITERATURE CITED

- Borgmeier, T. 1966. Revision of the North American Phorid flies. Part III. The species of the genus *Megaselia*, subgenus *Megaselia* (Diptera, Phoridae). *Studia Entomologica* 8(1): 1-160.
- Borgmeier, T. 1968. A catalogue of the Phoridae of the world (Diptera, Phoridae), *Studia Entomologica* 11(1): 1-367.
- Disney, R.H.L. 1983. Scuttle flies. Diptera, Phoridae (except *Megaselia*). *Handbooks for the Identification of British Insects, Vol. 10, Part 6*. London: Royal Entomological Society of London. 81 p.
- Disney, R.H.L. 1989. Scuttle flies. Diptera, Phoridae (Genus *Megaselia*). *Handbooks for the Identification of British Insects, Vol. 10, Part 8*. London: Royal Entomological Society of London. 155 p.
- Disney, R.H.L. 1991. Scuttle flies of the Cape Verde Islands (Diptera, Phoridae). *Journal of African Zoology* 105: 205-241.
- Disney, R.H.L. 1994. *Scuttle Flies. The Phoridae*. London: Chapman & Hall. 480 p.
- Disney, R.H.L. 2005. Duration of development of two species of carrion-breeding scuttle flies and forensic implications. *Medical and Veterinary Entomology* 19: 229-235.
- Disney, R.H.L. 2008. Natural history of the scuttle fly, *Megaselia scalaris*. *Annual Review of Entomology* 53: 39-60.
- Disney, R.H.L. 2009. Scuttle flies (Diptera: Phoridae) from the Falkland Islands. *Entomologist's Monthly Magazine* 145: 125-128.
- Disney, R.H.L. 2011. Forensic science is not a game. *Pest Technology* 5: 16-22.
- Disney, R.H.L., R.S. Copeland and E. Murrell. 2009. The true identity of Copeland's aquatic scuttle fly (Diptera: Phoridae) from Indiana and recognition of a sibling species from Texas. *Proceedings of the Entomological Society of Washington* 111: 564-574.
- Disney, R.H.L., S. Prescher and N.P. Ashmole. 2010. Scuttle flies (Diptera: Phoridae) of the Canary Islands. *Journal of Natural History* 44: 107-218.
- Disney, R.H.L. and B.J. Sinclair. 2008. Some scuttle flies (Diptera: Phoridae) of the Galápagos Islands. *Tijdschrift voor Entomologie* 151: 115-132.
- Erzinclioglu, Y.Z. 1985. The entomological investigation of a concealed corpse. *Medicine, Science and the Law* 25: 228-230.
- Hänel, C. and R.H.L. Disney. 2006. Phoridae (Dipt.) from Nightingale Island, South Atlantic. *Entomologist's Monthly Magazine* 142: 127-128.
- Jones, A.G., S.L. Chown, T.J. Webb and K.J. Gaston. 2003. The free-living pterygote insects of Gough Island, South Atlantic Ocean. *Systematics and Biodiversity* 1: 213-273.
- Leclercq, M. and C. Verstraeten. 1993. Entomologie et médecine légale: l'entomofauna des cadavres humains: sa succession par son interprétation, ses résultats, ses perspectives. *Journal de Médecine Légale Droit Médicale* 36: 205-222.
- Thomas, D.B. 2008. A safe and effective propylene glycol based capture liquid for fruit fly (Diptera: Tephritidae) traps baited with synthetic lures. *Florida Entomologist* 91(2): 210-213.

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