

# The family Simuliidae (Diptera) in Malta

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**ABSTRACT.** An account is given of the 3 species in the family Simuliidae that occur in Malta, including 1 new record.

**KEY WORDS.** Mediterranean, *Simulium*, faunistics, new record.

## INTRODUCTION

The Simuliidae (commonly known as blackflies) is a large family of diptera of global distribution with 2120 extant species listed by ADLER & CROSSKEY (2015), of which 231 occur in Europe (CROSSKEY, 2013). The immature stages are fully aquatic, nearly always developing in running water. Females of most species require a blood meal in order to mature their eggs and some species are vectors of important diseases. The family is therefore of medical, veterinary and economic importance. All stages form important parts of food chains and some species are useful in the monitoring of freshwater quality.

There are no records of Simuliidae from the central Mediterranean islands of Malta in the Catalogue of Palaearctic Diptera (RUBZOV & YANKOVSKY, 1988). The first mention of the family from the islands is that of SCHEMBRI & GAUCI (1984) who reported finding larvae in a streamlet in Migra l-Ferha, Malta. CROSSKEY & HOWARD (1997) subsequently recorded *Simulium* (*Eusimulium*) *velutinum* (Santos Abreu, 1922) and *Simulium* (*Nevermannia*) *ruficorne* Macquart, 1838 from adult material collected by the author and Dr Martin J. Ebejer (Cowbridge, UK) and identified by Dr Roger Crosskey of the Natural History Museum, London. These two species are the only ones in the family cited from Malta in the online database of Fauna Europaea (CROSSKEY, 2013). A third species, *Simulium* (*Simulium*) *intermedium* Roubaud, 1906 was later discovered and is newly recorded from the islands in the present work.

Collecting data for all three species are given for the first time. Species are listed in alphabetical order following ADLER & CROSSKEY (2015). An abbreviated geographical distribution and some comments are given for each species. Specimens are deposited in the private collections of the author (PG) in Essex, UK and of Dr Martin J. Ebejer (MJE) in Cowbridge, UK.

## ANNOTATED SPECIES LIST

Subfamily **Simuliinae** Newman, 1834

Tribe **Simuliini** Newman, 1834

### *Simulium* (*Eusimulium*) *velutinum* (Santos Abreu, 1922)

**Material examined:** Malta, Buskett, 3.iii.1992, 1 ♂, MJE; Gnejna, 27.ii.1998, 1 ♂, MJE; Wardija, hill topping close to the coast, 25.ii.1996, 3 ♂♂, MJE. Gozo, Ramla dunes, 23.iv.1992, 3 ♂♂, PG, 1 ♀, MJE.

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**Distribution:** Originally described from the Canary Islands, the species is widely distributed in Europe as far East as Ukraine. It also occurs in the Mediterranean, North Africa and the Middle East.

**Comments:** A primarily coastal species (RIVOSECCHI, 1978).

### *Simulium (Nevermannia) ruficorne* Macquart, 1838

**Material examined:** Malta, Bahrija, freshwater course, 19.iii.1996, 1 ♂, MJE; Fiddien, 28.iv.1996, 1 ♀, MJE; Gnejna, 11.ii.1996, 1 ♀, MJE; Mgiebah, coastal clay slopes, 16.iii.1996, 1 ♂, MJE; Rabat, Wied l-Isqof, *Phragmites*, stream, 3.v.1998, 1 ♂, MJE; Wardija, hill-topping, 25.ii.1996, 4 ♂♂ & 2 ♀♀, MJE; Wied Qannotta, 18.iii.1996, 3 ♂♂ & 3 ♀♀, MJE, 5.iii.2003, 5 ♂♂ & 2 ♀♀, 2 larvae & 1 pupa, PG, 6.iii.2003, 1 ♂ & 2 ♀♀, John C. Deeming.

**Distribution:** A very widely distributed species, occurring throughout Africa, Arabia and the Middle East. In Europe it has only been reported from Malta, southern Portugal and southern Spain.

**Comments:** This species is remarkable in that the immature stages can develop in bodies of water, often highly eutrophic, in which virtually no movement can be detected (CROSSKEY, 1967; RIVOSECCHI, 1978). According to CROSSKEY & CROSSKEY (2000), the usual habitats are small sun-warmed streams, irrigation ditches and aqueducts.

### *Simulium (Simulium) intermedium* Roubaud, 1906

**Material examined:** Malta, Balzan, 21.iv.1996, 1 ♀, MJE; Chadwick Lakes, 30.i.1977, 1 ♀, MJE; Fiddien, 14.iv.1996, 1 ♀, MJE. Gozo, Ramla dunes, 23.iv.1992, 1 ♂, MJE.

**Distribution:** Widely distributed in western Europe, known in the Mediterranean from the Balearic Islands, Spain, Portugal, France including Corsica, Italy including Sardinia and Sicily, Morocco and Tunisia. New record for the Maltese Islands.

**Comments:** Both RIVOSECCHI (1978) and CROSSKEY & CROSSKEY (2000) mention this species as developing in polluted waters, including degraded streams polluted by sewage effluent. RIVOSECCHI (1978) records it aggressively biting horses and cattle in pastures. RIVOSECCHI & MANCINI (2005) record it biting man.

## DISCUSSION

An account is given of the three species of Simuliidae (all in the genus *Simulium* Latreille, 1802) known to occur in Malta, including one new record. Collecting data are given for the first time for all species.

The fauna is small, as expected from a group of small, semi-arid islands where permanent bodies of flowing fresh water are small (springs and streamlets), very scarce, and, where they exist, heavily used for irrigation of farmland. The climate is typically Mediterranean, with long hot dry summers and short wet but mild winters. In years with abundant winter rainfall, small streamlets may persist temporarily till the end of spring. As can be seen from the data given, adult flies have only been seen and collected in small numbers in the winter of 1977 and spring of 1992, 1996, 1998 and 2003 and it would be interesting to investigate if these years were associated with higher than normal

rainfall. By contrast, 21 species are recorded from the much larger, wetter and ecologically diverse neighbouring island of Sicily (ADLER & CROSSKEY, 2015).

The species recorded here would appear to be severely threatened considering the degree of disruption of their natural habitat, including the indiscriminate use of fresh water for commercial purposes, that has been prevalent in recent years. It may reasonably be expected that intensive collecting (searching for immature stages, light trapping, hill-topping, Malaise trapping, pan trapping) might add a small number of widespread species to the simuliid fauna of the islands in future.

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### REFERENCES

- ADLER, P.H. & CROSSKEY, R.W. (2015) World blackflies (Diptera: Simuliidae): A comprehensive revision of the taxonomic and geographical inventory. <http://www.clemson.edu/cafls/biomia/pdfs/blackflyinventory.pdf> (accessed February 2015)
- CROSSKEY, R.W. (1967) A preliminary revision of the black-flies (Diptera: Simuliidae) of the Middle East. *Transactions of the Royal Entomological Society of London*, 119: 1–45.
- CROSSKEY, R.W. (2013) Fauna Europaea: Simuliidae. In: BEUK, P. & PAPE, T. [eds.], *Fauna Europaea: Diptera Nematocera*. Fauna Europaea. Version 2.6.2. <http://www.faunaeur.org> (accessed February 2015)
- CROSSKEY, R.W. & CROSSKEY, M.E. (2000) An investigation of the blackfly fauna of Andalusia, southern Spain (Diptera: Simuliidae). *Journal of Natural History*, 34: 895–951.
- CROSSKEY, R.W. & HOWARD, T.M. (1997) *A New Taxonomic and Geographical Inventory of World Blackflies (Diptera: Simuliidae)*. Department of Entomology, The Natural History Museum London. 144 pp.
- RIVOSECCHI, L. (1978) Diptera Nematocera, Simuliidae. *Fauna d'Italia*. Edizioni Calderini Bologna, Vol. 13. viii + 533 pp.
- RIVOSECCHI, L. & MANCINI, L. (2005) Insecta Diptera Simuliidae. In: RUFFO, S. & STOCH, F. [eds.], Checklist e distribuzione della fauna Italiana. *Memorie del Museo Civico di Storia Naturale di Verona – 2.serie, Sezione Scienze della Vita*, 16: 241–242.
- RUBZOV, I.A. & YANKOVSKY, A.V. (1988) Family Simuliidae (Pp.114–186). In: Soós, A. & Papp, L. [eds.], *Catalogue of Palaearctic Diptera (Ceratopogonidae–Mycetophilidae)*. Vol. 3. Akadémiai Kiadó, Budapest. 448 pp.
- SCEMBRI, P.J. & GAUCI, M. (1984) Blackflies (Diptera: Simuliidae) in the Maltese Islands. *Potamon*, 13: 75–76.

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