

Entomological surveillance for bluetongue on Malta: first report of *Culicoides imicola* Kieffer

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Summary

A survey for *Culicoides* Latreille, 1809, was made on Malta in 2002 to establish whether *Culicoides imicola* Kieffer, 1913, the principal vector of bluetongue virus (BTV) in the Mediterranean Basin, or any other suspected vector species, was present. The collections and analyses were performed in accordance with the protocols of the National Reference Centre for Exotic Diseases (CESME *Centro Studi Malattie Esotiche*) in Teramo, Italy. Eighty-four catches were made between May and October at six permanent sites, namely: Mellieha, Rabat, San Gwann, Zejtun (Malta), Gharb and Sannat (Gozo island). The traps were placed near cattle (four farms), cattle and sheep (one farm: Rabat) and sheep and goats (one farm: Mellieha).

Culicoides midges were found in 91.66% (77/84) of the catches and the highest number of midges per catch was 1 726. *Culicoides imicola* was confirmed on Malta for the first time in October 2002 and was found at four sites (San Gwann, Sannat, Gharb and Mellieha) but at very low abundance levels (<0.1% of the total *Culicoides* collected). *Culicoides paolae* Boorman, 1996 was the most widespread and abundant species (more than 80% of total *Culicoides*). Midges of the *Obsoletus* Complex were rare, with less than 10 individuals captured. Other species of *Culicoides* identified in the collections were: *C. submaritimus* Dzshafarov, 1962, *C. cataneii* Clastrier, 1957, *C. circumscriptus* Kieffer, 1918, *C. jumineri* Callot and Kremer, 1969, *C. kingi* Austen, 1912, *C. maritimus* Kieffer, 1924 and *C. newsteadi* Austen, 1921.

Keywords

Bluetongue – *Culicoides* – *Culicoides imicola* – *Culicoides paolae* – Entomological surveillance – Malta.

Introduction

The Maltese islands are located in the middle of the Mediterranean Basin, where bluetongue (BT) disease occurred recently in several countries. Significant populations of *C. imicola* have been discovered in Italy (4) and Corsica (3). *Culicoides imicola* is the principal vector of BT virus (BTV) in this area but occurs fragmentarily across the Mediterranean Basin. Little data are available on the Maltese *Culicoides* fauna, and *C. imicola* has never been reported to occur there (1). A survey for *Culicoides* was organised on the islands in 2002 to establish whether *Culicoides imicola* Kieffer, 1913 (or any other suspected vector

species) was present. The authors report on and discuss the results of collections made between May and October 2002.

Materials and methods

Six farms were chosen as permanent sites in the districts of Mellieha, Rabat, San Gwann, Zejtun (Malta island), Gharb and Sannat (Gozo island) (Fig. 1). The traps were placed near cattle (four farms), cattle and sheep (one farm: Rabat) and sheep and goats (one farm: Mellieha). A total of 84 catches was made between May and October (Table I). The collections and analyses were performed in

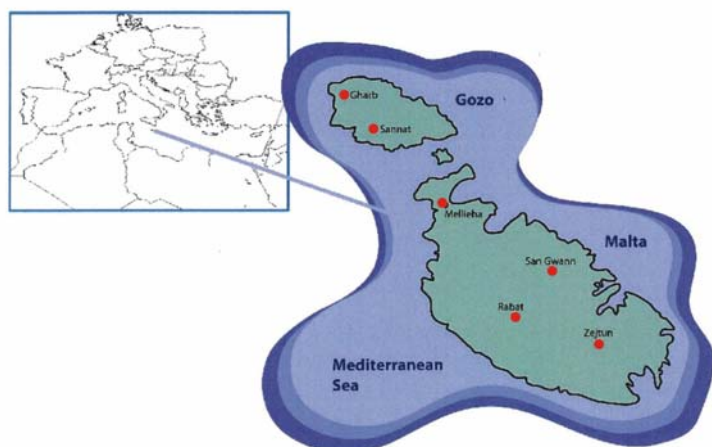


Figure 1
Location of the collection sites on the Maltese islands, 2002

Table 1
Sites positive for *Culicoides imicola* on the Maltese islands, May-October 2002

Collection sites	Positive collections of <i>C. imicola</i> /total collections (%)	<i>C. imicola</i> /total <i>Culicoides</i> (%)
Gharb	1/12 (8.33)	1/256 (0.39)
Meliieha	3/20 (15)	5/10484 (0.048)
Rabat	0/16 (0)	0/454 (0)
San Gwann	1/8 (12.5)	1/161 (0.62)
Sannat	1/16 (6.25)	4/287 (1.39)
Zejtun	0/12 (0)	0/414 (0)
Total	6/84 (7.14)	11/12056 (0.09)

accordance with the protocols of the National Reference Centre for Exotic Diseases (CESME: *Centro Studi Malattie Esotiche*) in Teramo, Italy (5).

Results

Total *Culicoides* and total *C. imicola* for each site are reported in Figure 2. *Culicoides* midges were found in 91.7% (77/84) of the catches and the highest number of midges per catch was 1 726. *C. imicola* was identified on Malta for the first time in October 2002 and was found at four sites (San Gwann, Sannat, Gharb and Meliieha) but at very low abundance levels (<0.1% of total *Culicoides* collected and always less than five specimens per catch). *Culicoides paolae* Boorman, 1996 was by far the most widespread and abundant species (more than 80% of total *Culicoides*) (Fig. 3). Midges of the Obsoletus Complex were rare

(<10 individuals were captured). In a single catch (Meliieha in October), a species of the Schultzei Complex was found to be as abundant as *C. paolae* and was identified as *C. kingi* Austen, 1912. The other species of *Culicoides* found on Malta were: *C. submaritimus* Dzhafarov, 1962, *C. cataneii* Clastrier, 1957, *C. circumscriptus* Kieffer, 1918, *C. jumineri* Callot and Kremer, 1969, *C. maritimus* Kieffer, 1924 and *C. newsteadii* Austen, 1921.

Discussion and conclusions

The presence of *C. imicola* indicates that if BTV was introduced, it could circulate on the islands of Malta and Gozo. The absence of comparable historical data on the *Culicoides* fauna does not enable an assessment to be made as to whether or not the vector has colonised the Maltese Islands recently.

Other vectors of orbiviruses (including BTV) also occur on the Maltese Islands and include species of the Obsoletus, Pulicaris and Schultzei Complexes. However, in most instances, their abundances were extremely low.

Culicoides paolae has been suspected in the past to feed on horses (and thus classed as a potential vector of arboviruses) (2), but its antennal and palpal morphology would indicate it to feed preferentially on birds (6). This species may prove to be a synonym of the Central American *C. jamaicensis* Edwards, 1922 (6). It is important to now establish the host preference and larval habitat of *C. paolae*, since this species is very widespread and abundant on the islands of Malta.

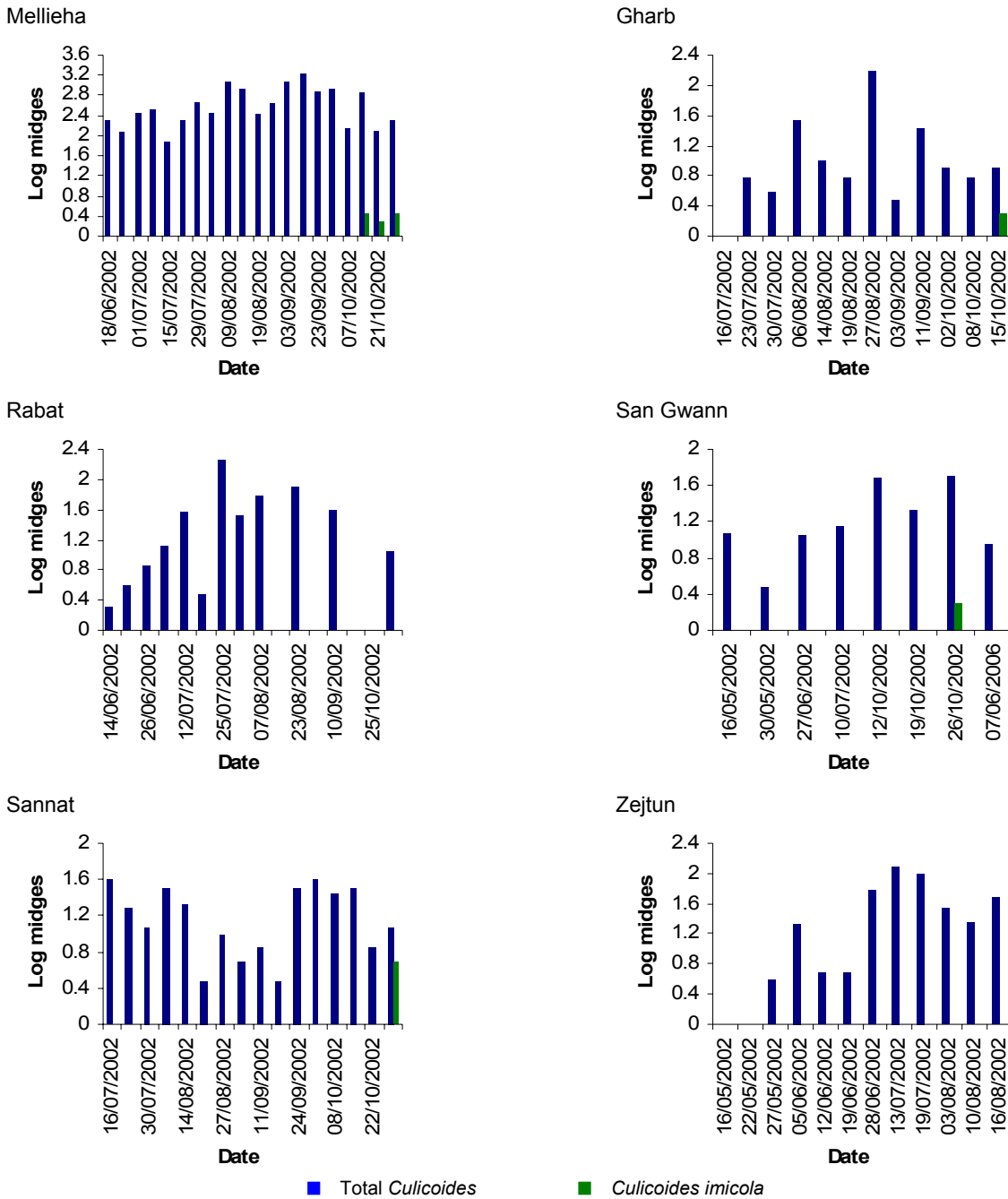


Figure 2
Abundance of *Culicoides* biting midges on the Maltese islands, 2002



Figure 3
Culicoides paolae Boorman, 1996: the most abundant and widespread *Culicoides* species on the Maltese islands

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