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First record of *Basilina mediterranea* Hürka, 1970 from Italy (Diptera: Nycteribiidae)

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Abstract. The presence of *Basilina mediterranea* Hürka, 1970, species with Western Mediterranean distribution, is reported for the first time from Italy. Two specimens, a male and a female, were collected from two bats belonging to the species *Pipistrellus pipistrellus* Schreber, 1774 captured with mist nets during a research on bats of Montecristo and Capraia islands (Tuscan Archipelago National Park, Central Italy).

Riassunto. *Prima segnalazione di Basilina mediterranea Hürka, 1970 per l'Italia (Diptera: Nycteribiidae).* Viene qui riportata la prima segnalazione per il territorio italiano di *Basilina mediterranea*, specie con distribuzione mediterranea occidentale. Due esemplari appartenenti a questa specie, un maschio ed una femmina, sono stati raccolti su individui di *Pipistrellus pipistrellus* Schreber, 1774 catturati con *mist net* durante una campagna di ricerca sulle popolazioni di pipistrelli delle isole di Montecristo e Capraia (Parco Nazionale dell'Arcipelago Toscano, Italia centrale).

Key words. Diptera, Nycteribiidae, *Basilina mediterranea*, *Pipistrellus pipistrellus*, Chiroptera, Italy, Tuscan Archipelago National Park.

Introduction

Nycteribiidae are highly specialized parasitic flies. Their biology and morphology are the result of the adaptation to the ectoparasitic life on bats. Adaptation to ectoparasitic habit is extreme: wings are completely absent, legs and claws are very strongly developed, eyes reduced or absent, and the body is flattened, especially the thorax, which is antero-dorsally grooved to receive the extraordinary, backwardly flexed head. The head is folded back at rest, so that its dorsal surface rests on the mesonotum. Head can be rotated forward through 180° for feeding.

Female ovaries produce one egg at time that descends into the uterus for developing after fertilization. The larva feeds and grows within the female uterus, where it is nourished by the secretion of the "milk gland". The female leaves the bat just before larviposition and usually deposits the larva on a vertical surface of the bat roost. The larva transforms into the pupal stage from which emerges after 20-40 days (THEODOR, 1975; LANZA, 1999; VANIN & VERNIER, 2009).

As in Streblidae, adults are blood-suckers, free-living in the bats' fur. Also, as in that family, females give birth to fully developed larvae, but these are glued to the wall of the bat roost where they pupate. Emergence of the adult is triggered by warmth of - or contact with - a bat in the proximity of the pupa (MORSE *et al.*, 2013). Most species seem to be host-specific. The family has more than 250 species, the majority with a tropical distribution (PETERSON & WENZEL, 1987).

Nine species, belonging to 4 genera are reported from Italy (PAPE *et al.*, 1995; SZENTIVÁNYI *et al.*, 2016).

The knowledge of the species of this family for the Italian territory has to be considered incomplete (LANZA, 1999).

In this note, the finding of two specimens of *Basilia mediterranea* Hürka, 1970, new species for the Italian fauna, is reported. The record is the result of a two-year research on bats of the Tuscan Archipelago (Montecristo and Capraia Islands) (Fig. 1) carried out in order to evaluate the species on each island and their conservation status (DONDINI *et al.*, 2016).

Montecristo Island is a granite, mountainous island of 10.39 km², located 65 km far from the Italian mainland, and 60 km from Corsica (France), with a maximum altitude of 645 m a.s.l. (Monte della Fortezza). The island, managed by the “Comando Unità Tutela Forestale, Ambientale e Agroalimentare dell’Arma dei Carabinieri” (C.U.T.F.A.A.), is a Natural Reserve since 1970 and fully included in the Tuscan Archipelago National Park.

Capraia Island has a volcanic origin and is 19.72 km². The Island is located 54 km far from the Italian mainland and about 26 km from Corsica (France) and the highest mountain, Monte Castello reaches 477 m a.s.l. The two islands are characterized by typical Mediterranean vegetation (Fig. 2).

Material and methods

The samples were collected from two bats (*Pipistrellus pipistrellus* Schreber, 1774) sampled from the islands of Montecristo and Capraia.

Bats, captured using a mist net, were measured, identified, inspected for ectoparasites and then released. All parasites were removed. Bat flies were carefully collected with tweezers and stored in single 1.5 ml Eppendorf in a 75% ethanol solution.

The two samples are stored in the collection of Dr. Stefano Vanin at Department of Biological Sciences, School of Applied Sciences, University of Huddersfield (UK).

Results

Two specimens, a male and a female of *Basilia mediterranea* Hürka, 1970 were collected from two individuals of *Pipistrellus pipistrellus* Schreber, 1774.

Collection data are here reported.

Tuscany. Montecristo Island (Nature Reserve of Montecristo), Livorno province: near Cala Maestra, [5 m a.s.l., 42°20'03" N 10°17'41" E, WGS84], 17.V.2016, leg. Dondini G., Vergari Si. and Vergari Se., 1 ♂, collected on a female of *Pipistrellus pipistrellus* Schreber, 1774 captured with mist-nets (Fig. 3a).

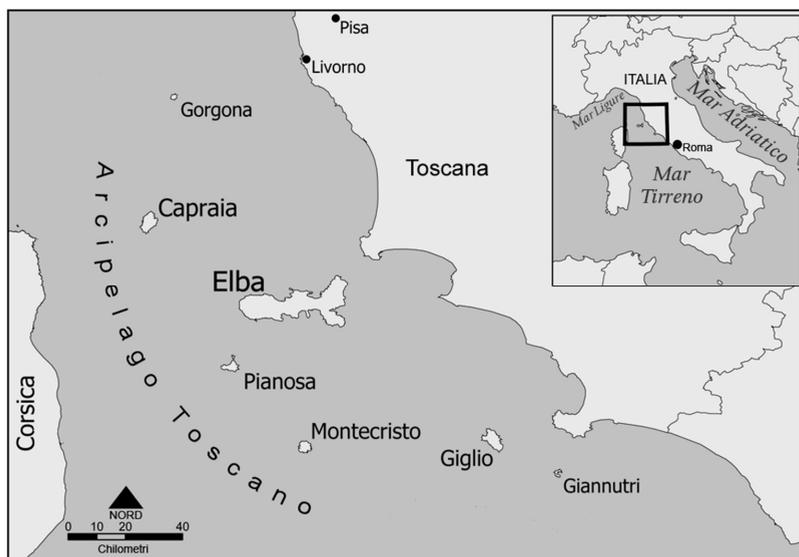


Fig. 1. Tuscan Archipelago. The islands on which the research is focused were Capraia and Montecristo.

Capraia Island, Livorno province: near Vado del Porto [28 m a.s.l., 43°02'42" N 09°50'02" E, WGS84], 17.VI.2016, leg. Dondini G., Vergari Si. and Vergari Se., 1 ♀, collected on a female of *Pipistrellus pipistrellus* Schreber, 1774 captured with mist-nets (Fig. 3b).

Discussion

Basilina mediterranea was almost exclusively collected on specimens of *Pipistrellus pipistrellus* and only occasionally on other bat genera (e.g.: *Hypsugo savii* Bonaparte, 1837) (LANZA, 1999). The species has Western Mediterranean distribution. It has never been reported for Italy despite a finding in the close island of Corsica (LANZA, 1999). However, *Basilina italica*, is the only species of *Basilina* found up to now in Italy (SZENTIVÁNYI *et al.*, 2016).



Fig. 2. Capraia Island characterized by typical Mediterranean vegetation.

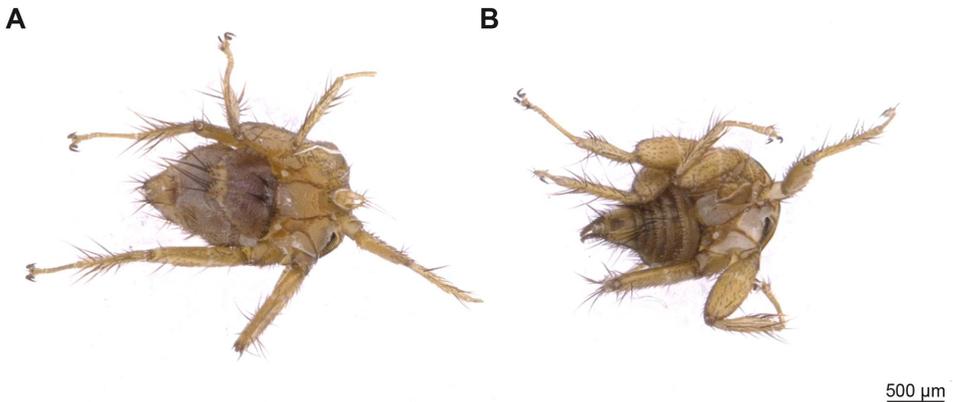


Fig. 3. *Basilina mediterranea* Hürka, 1970. A: male (Montecristo Island); B: female (Capraia Island).

Basilina mediterranea differs from congeneric *B. italica* Theodor, 1954, in the length of the tibiae (four to four and a half times longer than wide in *B. mediterranea*, three to three and half times longer than wide in *B. italica*), the shape of the first and second tergite in females (in *B. mediterranea* tergite 1 has two posterior processes and tergal plate 2 is heart-shaped), as well as in the shape of genitalia in males (clasper with pigmented apical part and one long seta on the basal external part in *B. mediterranea*) (THEODOR, 1975; HÜRKA, 1970).

Basilina mediterranea has also been reported from France and Spain, collected on *P. pipistrellus* and *H. savii* (BEAUCOURNU & NOBLET, 1985, 1994; HÜRKA, 1970). It is worth mentioning the finding of *B. mediterranea* on *H. savii*, that is considered as an ecological contamination (BEAUCOURNU & NOBLET, 1994).

This discovery increases the knowledge of these elusive bat ectoparasites and about the Italian biodiversity, in particular that of the Tuscan Archipelago.

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References

- BEAUCOURNU J.C. & NOBLET J.F., 1985. Une Nyctéribie (Diptera, Pupipara) nouvelle pour la fauna française: Présence de *Basilina mediterranea* Hürka, 1970 en Corse. *Annales de Parasitologie Humaine et Comparée*, 60: 635-638.
- BEAUCOURNU J.C. & NOBLET J.F., 1994. Presence in continental France of *Basilina mediterranea* Hürka, 1970 (Diptera, Nycteribiidae). *Bulletin de la Société Entomologique de France*, 99: 397-400.
- DONDINI G., VERGARI S., FICHERA G. & KIEFER A., 2016. First record of *Hypsugo cf darwini* (Tomes, 1859) in Tuscany, Italy. *Barbastella*, 9: 1-4.
- HÜRKA K., 1970. Revision der Nycteribiidae und Streblidae-Nycteriboscinae aus der Dipterenammlung des Zoologischen Museums in Berlin, II. Mit Beschreibung von *Basilina (Basilina) mediterranea* n.sp. *Mitteilungen aus dem Zoologischen Museum in Berlin*, 46: 239-246.
- LANZA B., 1999. I parassiti dei pipistrelli (Mammalia, Chiroptera) della fauna italiana. Monografia XXX, *Museo Regionale di Scienze Naturali*, Torino, 318 pp.
- MORSE S.F., BUSH S.E., PATTERSON B.D., DICK C.W., GRUWELL M.E. & DITTMARA K., 2013. Evolution, Multiple Acquisition, and Localization of Endosymbionts in Bat Flies (Diptera: Hippoboscoidea: Streblidae and Nycteribiidae). *Applied and Environmental Microbiology*, 79: 2952-2961.
- PAPE T., RICHTER V., RIVOSECCHI L. & ROGNES K., 1995. Diptera Hippoboscoidea, Oestroidea (pp. 1-35). In: MINELLI S., RUFFO S. & LA POSTA S. (ed.). Checklist delle specie della fauna italiana. *Calderini*, Bologna.
- PETERSON B.V. & WENZEL R.L., 1987. Nycteribiidae (pp. 1283-1291). In: MCALPINE J.F. (ed). Manual of Nearctic Diptera. Volume 2. *Agriculture Canada*, Ottawa, VI + 1332 pp.
- SZENTIVÁNYI T., ESTÓK P. & FÖLDVÁRI M., 2016. Checklist of host associations of European bat flies (Diptera: Nycteribiidae, Streblidae). *Zootaxa* 4205: 101-126.
- THEODOR O., 1975. Diptera Pupipara, Fauna Palaestina. Insecta I. *The Israel Academy of Sciences and Humanities*, Jerusalem, Israel, 170 pp.
- VANIN S. & VERNIER E., 2009. Contribution to the knowledge of the Nycteribiidae (Diptera) from Venetian Region. *Parassitologia*, 51: 61-64.

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