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The Bibionidae of Corsica (Diptera)

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Abstract. – Knowledge of the fauna of Bibionidae of Corsica is summarized, with 13 species reported from the island. Four species are recorded for the first time from Corsica, *Bibio pomonae* (Fabricius, 1775), *Dilophus femoratus* Meigen, 1804, *D. sardous* Haenni, 2009, and a possibly undescribed species, *B.* aff. *johannis* (Linnaeus, 1767). A key for the identification of Corsican Bibionidae is provided.

Résumé. – **Les Bibionidae de Corse (Diptera)**. Les connaissances sur les Bibionidae de Corse sont réactualisées, avec 13 espèces signalées de l'île. Trois d'entre elles, *Bibio pomonae* (Fabricius, 1775), *Dilophus femoratus* Meigen, 1804 et *D. sardous* Haenni, 2009 sont signalées pour la première fois de Corse, de même qu'un quatrième taxon, *B.* aff. j*ohannis* (Linnaeus, 1767), représentant possiblement une espèce nouvelle pour la science. Une clé en français pour l'identification des Bibionidae de Corse est proposée.

Keywords. – *Our Planet Reviewed* program, expedition, faunistics, new records, identification key

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The Bibionidae Fleming, 1821, are a small family of robust nematoceran Diptera with marked sexual dimorphism. Nearly all European species of the family belong to subfamily Bibioninae Fleming, 1821, and are recognizable at first sight by the fore tibiae bearing either a strongly developed apical spur or transverse rows of small spines. The adults are often abundant in various habitats but they are most frequent and diverse in semi-open and mosaic agricultural/wooded landscapes. Males of some species may form large aerial mating swarms in search for females. The larvae of most species live in mass aggregations of up to several hundreds of specimens issued of oviposition by one female. They are phytosaprophagous and develop mainly in leaf litter and soils rich in humus (Skartveit, 1997).

About 45 bibionid species are known in Europe (Skartveit, 2013). The fauna of the European French territory (mainland France and Corsica) includes 27 species (Skartveit, 2013, complemented by Haenni, unpubl. data). However, the study of the Bibionidae of Corsica has been nearly completely neglected until now, with only two general articles dating back to the beginning of the XXth century quoting representatives of this family. The first of them listed the Corsican Diptera collected in 1899 by W. Schnuse (Kuntze, 1913), including five bibionid species, while the second produced a revised list of Corsican nematoceran Diptera known at that time (Edwards, 1928), adding one bibionid species. Séguy (1940) mentioned six species recorded from Corsica on the base of the two previous papers but did not add any new information. More recently, three additional bibionid species were recorded by Haenni (1982,

2009), as by-products of articles with different focuses. These additions raised the number of species known from the island to nine. The present paper is the first entirely devoted to the Corsican Bibionidae. Its starting point was the invitation of the first author to study the Bibionidae collected in Corsica during the *La Planète Revisitée* (*Our Planet Reviewed*) survey of 2019-2021 (see http://laplaneterevisitee-corse.mnhn.fr). This expedition is the most recent edition of these surveys organised in several under sampled biodiversity hotspots around the world since 2007 (https://www.mnhn.fr/fr/recherche-expertise/lieux/planete-revisitee), by e.g., the Muséum national d'Histoire naturelle (MNHN, Paris, France). Next to the identification of this material, a round-up was made of hitherto unpublished material of various origins, the results of which are presented here. This allowed us to significantly increase our current knowledge of the Corsican fauna of Bibionidae.

Material and methods

Part of the material for this study was collected during the *Our Planet Reviewed* (LPR) expedition in Corsica (2019-2021). Touroult *et al*. (2023) describe the general framework, studied areas, sampling methodologies, and preliminary results of this survey. Nineteen sites in the north and southeast of the island were surveyed according to a semi-standardised protocol, and a large-scale trapping scheme was organised in three sites. Sampling efforts mainly focused on forested habitats at higher altitudes (2019) and on coastal dune and marshland habitats (2021). They included a vast array of methods to collect invertebrates, with a special effort on flight-interception traps and pan traps. Two Diptera experts were actively involved in

Fig. 1-4. – Selection of pan trap sampling sites as part of the *Our Planet Reviewed in Corsica* survey. – **1**, Oak forest at Campo di Bonza, Serra-di-Scopamène and Sorbollano, habitat of *Dilophus bispinosus* Lundstroem, 1913. – **2**, Pozzine landscape at Castellu d'Ornucciu, Serra-di-Scopamène, habitat of *Dilophus femoratus* Meigen, 1804. – **3**, Marshland at Lavu Santu, Zonza. – **4**, Coastline of Air Base 126, Ghisonaccia. *(Photos M. Pollet).*

fieldwork activities, i.e., the second author (MP) as Diptera coordinator and taxonomic expert of Dolichopodidae, and Thomas Lebard as taxonomic expert of Syrphidae/Stratiomyidae. During 2019 and 2021 the Diptera coordinator concentrated sampling efforts on the use of pan traps, while both researchers also used sweep nets for collecting. In each of these years (23-30.VI.2019, 18-26.V.2021), a total of 16 sampling sites at four different locations were selected for pan trapping. In each site, five trap units were operational for 3-4 days. A trap unit is composed of one blue, one yellow and one white plastic bowl (inner diameter: 15 cm, depth: 4 cm), that are installed close together at soil surface level. Traps are fixed to the soil with metal pins and filled for 2/3 with a mild formalin solution and detergent. In 2019, this approach was applied in the mountainous region of Alta Rocca (south) (fig. 1-2) whereas lowland marshes and dune habitats were investigated in this way in the coastal area of southeast Corsica (fig. 3-4) in 2021.

Next to that, additional material was gathered from various sources: material collected on the island by the first author (JPH) in 1999, the fourth author (CQ) in 2020-21, the fifth author (MCAR) in 1992, and Corsican Bibionidae material of the following entomological collections:

– **ETHZ**, Entomological collections of the Eidgenossische Technische Hochschule, Zürich, Switzerland;

– **MHNG**, Muséum d'histoire naturelle de Genève, Switzerland;

Table I. – Records of species of Bibionidae from Corsica in literature and in present material (first records of species for Corsica are in bold).

	Kuntze (1913)	**Edwards (1928)**	**Haenni (1982)**	**Haenni (2009)**	***Our Planet Reviewed in Corsica 2019-2021* expedition (this paper)**	**Other material (this paper)**
Bibio clavipes Meigen, 1818	**X**					X
B. aff. *johannis* (Linnaeus, 1767)						**X**
B. lanigerus Meigen, 1818	**X**					
B. marci (Linnaeus, 1758)		**X**		X	X	X
B. nigriventris Haliday, 1833	**X**					X
B. pomonae (Fabricius, 1775)						**X**
B. sardocyrneus Haenni, 2009				**X**	X	X
B. varipes Meigen, 1830	**X**				X	X
Dilophus bispinosus Lundström, 1913				**X**	X	
D. febrilis (Linnaeus, 1758)	**X**	X				
D. femoratus Meigen, 1804					**X**	
D. humeralis Zetterstedt, 1850			**X**			
D. sardous Haenni, 2009						**X**
First records of species	5	1	1	2	1	3
Cumulated number of species	5	6	7	9	10	13

– **MHNN**, Muséum d'histoire naturelle de Neuchâtel, Switzerland ;
– **MNHN**, Muséum national d'histoire naturelle, Paris, France;
– **CCQ**, private collection Clovis Quindroit, Mons-en-Baroeul, France.

All the identifications were done by the first author (JPH), while pictures in the field have been provided by the fourth author (CQ).

Results

Faunistic list

In the list below, four species are reported for the first time from Corsica. The evolution of our knowledge of the Corsican fauna of Bibionidae is summarized in table I which contains all published data from the literature together with unpublished data from present material, either collected by the Our Planet Reviewed Corsica expedition, or originating from other sources.

Species in square brackets have not been detected in newly examined material. Species records are presented in the following format: Corsican department: number of males and/or females, locality (location, collecting site, latitude, longitude), altitude, habitat description, sampling date/period, collecting method, collector's name, (sample code(s)), depository.

Bibio clavipes Meigen, 1818 (fig. 5)

Bibio clavipes Meigen, 1818: 317. Duda, 1930: 49; Krivosheina, 1986: 320.

Literature records. – Corsica (Kuntze, 1913).

Material examined. – Haute-Corse: 1 ♂, Vivario, 800 m, *Castanea* forest, 14-24.IX.1981, light trap, *leg. C. Dufour & al*. (MHNN). Corse-du-Sud: 1 ♂, Bastelica, Pozzi, val d'Ese, 42.00676°N, 9.14123°E, 1700 m, 23.IX.2021, *leg. C. Quindroit* (CCQ); 1 ♂, Bastelica, val d'Ese, bergerie des Pozzi, 42.03266°N, 9.14466°E, 1800 m, 23.IX.2021, *leg. C. Quindroit* (CCQ).

Fig. 5. – *Bibio clavipes* (Meigen), ♂. Corse-du-Sud, Bastelica, Pozzi, val d'Ese, 23.IX.2021, *leg. C. Quindroit*. Scale bar: 1 mm. *(Photo J.-P. Haenni)*.

Distribution and ecology. – A species with an autumnal flight period frequent in various wooded or semi-open environments, like heathlands, in whole Europe. The altitudes of the few known Corsican localities range from 800 to 1800 m.

Taxonomic note. – The two male specimens from Bastelica have the posterior veins of the wing slightly pigmented, contrasting with the wing membrane (fig. 5), but otherwise all characters match those of continental *B. clavipes*.

Bibio* aff. *johannis (Linnaeus, 1767) (fig. 6-7)

Material examined. – Corse-du-Sud: 1 ♂, Grosseto-Prugna, Porticcio, collège, sous-bois marécageux, 20.III.2020, *leg. C. Quindroit* (CCQ). **First record for Corsica.**

Descriptive notes. – Small-sized, body length 5 mm, wing length 4.5 mm; black, except for a rufous subapical area on anterior and posterior side of all femora, and tibiae and tarsomeres 1-3 of all

legs yellow (fig. 6); thorax, all abdominal tergites, and sternites 1-4 with long golden yellow pilosity (fig. 6), black pilosity only present on occiput, eyes, ventral side of all femora and abdominal sternites 5-8; tibiae and tarsi with short black hairs; antennae with seven flagellomeres; wings (fig. 7) with brown anterior veins and dark brown pterostigma, posterior veins light brownish, slightly contrasting with yellowish pale wing membrane except for light rufous brown costal cell; hind legs (fig. 6) with femur narrowed in basal third, tibia gradually widening from base towards apex, bearing a very conspicuous longitudinal patch of dark sensillae on ventral surface; tarsomeres 1-3 slightly inflated, decreasing in thickness from first to third tarsomere, with first tarsomere (fig. 6) parallel-sided, almost cylindrical (not shuttle-shaped as in *B. johannis*).

Ecology. – The only known specimen of this species was swept from undergrowth of a marshy forest (fig. 8) in the vicinity of a marshy meadow, about 500 m from the sea-shore.

Taxonomic note. – At first sight, this unique male strongly resembles *Bibio johannis*, a common and widespread vernal species present all over Europe. It differs, however, from continental *B. johannis* by some characters, the most important being the parallel-sided, almost cylindrical shape of the hind metatarsus (fig. 6) (more inflated, spindle-shaped in *B. johannis*), and the mostly golden yellow colour of the pilosity of thorax and abdomen of the Corsican specimen (entirely black in *B. johannis*). However, the colour of the pilosity is usually of little taxonomic value in the genus *Bibio* (Skartveit, 2006). Duda (1930: 61) pointed out the variability of *B. johannis*: "Die Art variiert sehr regionär." ["The species is very variable regionally."]. However, the differences he mentioned between the nominotypical form and the named varieties *jacobi* Villeneuve, 1924, and *nigrifemur* Strobl, 1900, only concern the coloration of hind femora. Regardless, *B. johannis* and *B. aff. johannis* are clearly related and the latter might well be the geographical vicariant or subspecies of *B. johannis,* as the result of speciation on the island. It is interesting to note that *B. johannis* has not been found in Sardinia either. Despite the obvious differences in morphological characters at this moment we refrain to describe this taxon as new until more material of both sexes is collected and examined.

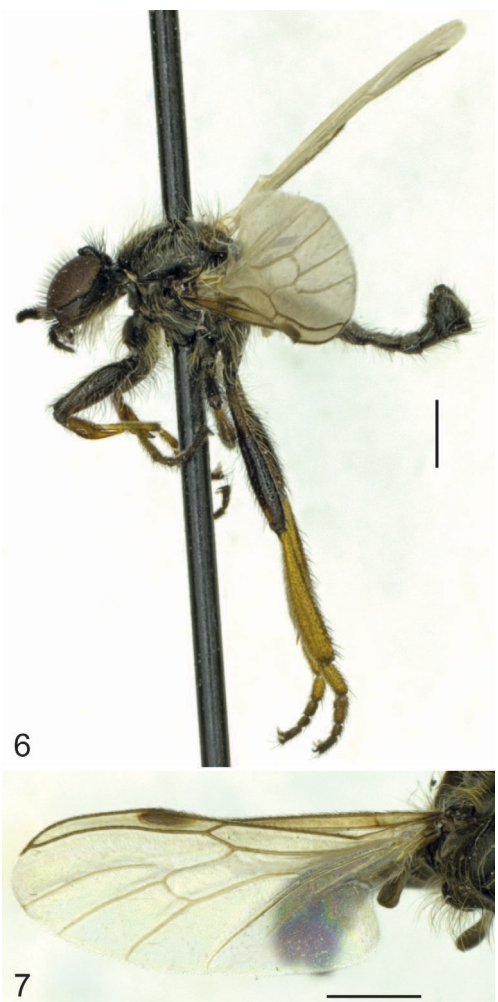

Fig. 6-7. – *Bibio* aff. *johannis* (Linnaeus), ♂. Corse-du-Sud, Grosseto-Prugna, Porticcio, 20.III.2020, *leg. C. Quindroit*. – **6**, Habitus. – **7**, Left wing. Scale bar: 1 mm. *(Photos J.-P. Haenni).*

[***Bibio lanigerus*** Meigen, 1818]

Bibio lanigerus Meigen, 1818: 317. Duda, 1930: 61; Krivosheina, 1986: 323.

Literature records. – Corsica (Kuntze, 1913).

Material examined. – No recently collected Corsican specimen.

Fig. 8. – Marshy forest in Porticcio (Corse-du-Sud: Grosseto-Prugna), capture locality of *Bibio* aff. *johannis* (Linnaeus). *(Photo C. Quindroit).*

Note. **–** There is no reason to doubt of the identification by KUNTZE (1913) of this well-characterized species which is common and widespread in Europe.

Bibio marci (Linnaeus, 1758)

Tipula marci Linnaeus, 1758: 588.
Bibio hortulanus var. *marci* (Linnaeus); DUDA, 1930: 59.
Bibio marci (Linnaeus); KRIVOSHEINA, 1986: 323.

Literature records. – Corsica (EDWARDS, 1928); Corse-du-Sud, Spelunca (HAENNI, 2009).

Material examined. – HAUTE-CORSE: 1 ♂, Calenzana, Bocca di Marsolinu, 443 m, 11.IV.1992, *leg. M.-C. Andrei-Ruiz* (MHNN). CORSE-DU-SUD: 4 ♂, Serra-di-Scopamène, Campu di Bonza, Punta di i Vaccili, chablis chênaie, 41.77287°N, 9.12159°E, 930 m, 22.II-6.VI.2020, Malaise trap, *leg. J. Touroult* (FR-COR/2020/139/MNHN, S1-ML2 (06/06)) (MNHN); 3 ♂, Quenza, 41.79649°N, 9.22338°E, 1214 m, 27.V.2021 (collected on sight), *leg. B. Santos* (FR-COR/2021/202/MP, AU-HC-BFS-04) (MNHN).

Distribution and ecology. – The commonest species of the genus in Europe, widespread and present in various environments, from the sea-shore to submontane sites in the mountains, with flight period in spring. In Corsica the few known localities range from 443 to 1214 m.

Bibio nigriventris Haliday, 1833

Bibio nigriventris Haliday, 1833: 157. DUDA, 1930: 65; KRIVOSHEINA, 1982: 324.
Syn. *Hirtea lacteipennis* Zetterstedt, 1850: 3384.

Literature records. – Corsica (KUNTZE, 1913, as *B. lacteipennis* Zett.); Haute-Corse: Vizzanova (EDWARDS, 1928).

Material examined. – HAUTE-CORSE: 1 ♀, lac de Nino, 1750 m, 10.VII.1975, *leg. I. Löbl* (MHNG).

Distribution and ecology. – A widespread European species. In Corsica, it seems to be restricted to mountainous areas (900 to 1750 m). The flight-period covers the end of spring to summer.

Bibio pomonae (Fabricius, 1775)

Tipula pomonae Fabricius, 1775: 754.
Bibio pomonae (Fabricius); DUDA, 1930: 66; KRIVOSHEINA, 1986: 325.

Material examined. – CORSE-DU-SUD: 1 ♀, Ajaccio, coll. Huguenin (ETHZ). **First record for Corsica.**

Distribution and ecology. – A species with aestival flight period, widespread in all mountainous regions in Europe including Scandinavia.

Note. – The only known Corsican specimen was collected in XIXth century but there is little doubt that collecting in convenient areas during summer months will lead to the rediscovery of this easily recognizable species.

Fig. 9. – *Bibio sardocyrneus* Haenni, ♂. Corse-du-Sud, Grosseto-Prugna, 16.III.2020. *(Photo C. Quindroit).*

Bibio sardocyrneus Haenni, 2009 (fig. 9)

Bibio sardocyrneus Haenni, 2009: 430.

Literature records. – Corse-du-Sud: Ajaccio, Filitosa (Haenni, 2009).

Material examined. – Haute-Corse: 1 ♀, Ventiseri, Airbase BA 126, 41.92991°N, 9.39456°E, 19-27.V.2021, Malaise Trap, *leg. B. Santos* (sample-codes: FR-COR/2021/310, BA-MT-BFS-01) (MNHN). Corse-du-Sud: 2 ♂, Grosseto-Prugna, embouchure du Gravona, 5 m, 16.III.2020, *leg. C. Quindroit* (CCQ) (fig. 9); 1 ♂, Coti-Chiavari, plage Mare e Sol, 3 m, 19.IV.2020, *leg. C. Quindroit* (CCQ).

Ecology. – The known Corsican localities are all situated at a low altitude (from sea-level up to 375 m) in wooded or semi-wooded environments. *B. sardocyrneus* is a vernal species with flight period extending from March to May.

Note. – This still poorly known species, recorded till now only from some localities in Sardinia and Corsica, is apparently a sardo-corsican endemic element.

Bibio varipes Meigen, 1830

Bibio rufitarsis Meigen, 1818: 313.
Bibio varipes Meigen, 1830: 317. Duda, 1930: 70; Krivosheina, 1986: 326.

Literature records. – Corsica (Kuntze, 1913, as *B. rufitarsis* Meigen).

Material examined. – Haute-Corse: 3 ♂, 4 ♀, Galeria, Vallée du Fango, maquis haut à chêne vert / futaie de chêne vert sur maquis, 315-360 m, 2.V.1992, *leg. M.-C. Andrei-Ruiz* (MHNN). Corse-du-Sud: 3 ♂, 1 ♀, Serra-di-Scopamène, Campu di Bonza, Punta di i Vaccili, chablis, chênaie, 41.77287°N, 9.12159°E, 930 m, 22.II-6.VI.2020, Malaise Trap, *leg. J. Touroult* (sample codes: FR-COR/2020/139/MNHN, S1-ML2 (06/06)) (MNHN).

Distribution and ecology. – This widespread European species is frequently encountered in wooded and semi-wooded environments. The same holds true for Corsica where all known localities are situated in oak woods, from 315 to 930 m. Flight-period is spring.

Dilophus bispinosus Lundström, 1913 (fig. 10)

Dilophus bispinosus Lundström, 1913: 392. Duda, 1930: 27; Krivosheina, 1986: 327.

Literature records. – Corse-du-Sud: Tavera; Haute-Corse: Corte, Saint-Pierre-de-Venaco (Haenni, 2009).

Material examined. – Corse-du-Sud: 1 ♂, Sorbollano, 41.76987°N, 9.12493°E, 890m, 5-19.IX.2019, *leg. J. Touroult* (FR-COR/2019/222, S5-ML2) (MNHN); 1 ♀, same locality, 19.IX-3.X.219, *leg. J. Touroult* (FR-COR/2019/209, S5-ML2) (MNHN); 2 ♂, Sorbollano, Campu di Bonza, chênaie,

Fig. 10. – *Dilophus bispinosus* Lundström, ♀, anterior tibia. Corse-du-Sud, Serra-di-Scopamène, 19.IX-3.X.2019, *leg. J. Touroult*. Scale bar: 0.5 mm. *(Photo J.-P. Haenni).*

41.77182°N, 9.122923°E, 940 m, 22.VIII-19.IX.2019, PolyTrap, *leg. J. Touroult* (FR-COR/2021/395) (MNHN); 5 ♂, 2 ♀, Sorbollano, chênaie, 41.77182°N, 9.12293°E, 988 m, 19.IX-3.X.2019, PolyTrap, *J. Touroult* (FR-COR/2019/397) (MNHN); 3 ♂, 1 ♀, Sorbollano, chênaie, 41.77178°N, 9.12287°E, 985 m, 19.IX-3.X.2019, Lindgren Funnel trap, *leg. J. Touroult* (FR-COR/2021/386), MNHN; 1 ♂, Sorbollano, Campu di Bonza, maquis, 41.76987°N, 9.12493°E, 890 m, 3-31.X.2019, Malaise trap, *leg. E. Poirier, R. Poncet & J. Touroult* (FR-COR/2020/153, S5-ML2) (MNHN); 1 ♂, 3 ♀, Serra-di-Scopamène, 41.77287°N, 9.12159°E, 979 m, 5-19.IX.2019, Malaise trap, *leg. J. Touroult* (sample code: FR-COR/2019/227, S1-ML2) (MHNN); 6 ♂, 13 ♀, same site, 19.IX-3.X.2019, Malaise trap, *leg. J. Touroult* (FR-COR/2019/210, S1-ML2) (MNHN/MHNN); 1 ♂, Serra-di-Scopamène, aulnaie, 41.77272°N, 9.12107°E, 976 m, 22.VIII-19.IX.2019, Lindgren Funnel trap, *leg. E. Poirier, R. Poncet & J. Touroult* (FR-COR/2021/339) (MNHN); 3 ♂, 5 ♀, Serra-di-Scopamène, chênaie, 41.77227°N, 9.12280°E, 977 m, 19.IX-3.X.2019, PolyTrap, *leg. J. Touroult* (FR-COR/2021/374) (MNHN); 1 ♀, Serra-di-Scopamène, Campu di Bonza, Punta di i Vaccili, chablis chênaie, 41.77287°N, 9.12159°E, 930 m, 3.-31.X.2019, Malaise trap, *leg. J. Touroult* (FR-COR/2020/146, S1-ML2) (MNHN). Haute-Corse: 1 ♀, Oletta, 42.65378°N, 9.29426°E, 44 m, 18.X.2020, *leg. C. Villemant* (FR-COR/2020/091/MNHN) (MNHN).

Distribution and ecology. – A southern European species, currently extending its range to the north in Central Europe. *D. bispinosus* generally occurs in wooded areas. This is also the case in Corsica where it was caught in oak and alder forests. Corsican records originate from altitudes of about 800-1000 m, except for one at 44 m. A generally autumnal species in the Mediterranean Basin. This is also the case in Sardinia (Haenni, 2009) and in Malta (Ebejer, 2021). Its flight period in Corsica extends from late July till the end of October with a marked peak in the second half of September (about ¾ of the LPR captures).

[***Dilophus febrilis*** (Linnaeus, 1758)]

Tipula febrilis Linnaeus, 1758: 588.
Dilophus febrilis (Linnaeus); Duda, 1930: 29; Haenni, 1982: 342; Krivosheina, 1986: 328.
Syn. *Dilophus vulgaris* Meigen, 1818: 306.

Literature records. – Corsica (Kuntze, 1913, as *D. vulgaris* Meigen; Edwards, 1928, as *D. vulgaris* Meigen).

Distribution and ecology. – A widespread and very common species, abundant in all kinds of habitats in Europe, from low to high elevations. Bivoltine in Central and Southern Europe.

Note. – Surprisingly, *D. febrilis* was not present in the material studied, but the species is easily recognizable and its presence in Corsica is very likely.

Dilophus femoratus Meigen, 1804

Dilophus femoratus Meigen, 1804: 116. Duda, 1930: 30; Haenni, 1982: 344; Krivosheina, 1986: 328.
Syn. *Dilophus albipennis* Meigen, 1830: 315.

Material examined. – Corse-du-Sud: 1 ♂, Serra-di-Scopamène, Castellu d'Ornucciu, maquis at alder forest edge: brooms, juniper, 41.83328°N, 9.157206°E, 1631 m, 26.VI.2019, sweep net, *leg.*

C. Villemant (FR-COR/2019/202, CoHcCV02) (MNHN); 1 ♀, same location, in shady sites along stream in pozzine landscape, 41.83347°N, 9.15767°E, 1568 m, 26-30.VI.2019, white pan traps, *leg. M. Pollet* (FR-COR/2019/151) (MNHN); 1 ♂, same site, in shady sites along stream in pozzine landscape, 41.83347°N, 9.15767°E, 1568 m, 26-30.VI.2019, yellow pan traps, *leg. M. Pollet* (FR-COR/2019/150) (MHNN); 1 ♂, same location, in higher *Alnus* forest, 41.83294°N, 9.15725°E, 1580 m, 26-30.VI.2019, yellow pan traps, *leg. M. Pollet* (FR-COR/2019/144) (MNHN); 2 ♀, same site, in higher *Alnus* forest, 41.83294°N, 9.15725°E, 1580 m, 26-30.VI.2019, white pan traps, *leg. M. Pollet* (FR-COR/2019/145) (MNHN/MHNN); 1 ♂, Zonza, Samulaghia, on dry rocks near seep in Sapinière [silver fir] forest, 41.76172°N, 9.22748°E, 1208 m, 24-28.VI.2019, yellow pan traps, *leg. M. Pollet* (FR-COR/2019/99) (MNHN). **First record for Corsica.**

Distribution and ecology. – A widespread European species occurring in a variety of habitats, more frequent in mountainous areas. This is also the case in Corsica where *D. femoratus* was caught during LPR investigations at altitudes ranging from 1208 to 1630 m, almost exclusively in pozzine habitats (typical Corsican altitude peat-bogs) (fig. 2), in July.

[***Dilophus humeralis*** Zetterstedt, 1850]

Dilophus humeralis Zetterstedt, 1850: 3393. Duda, 1930: 32 (*p. p.*); Haenni, 1982: 345; Krivosheina, 1986: 328.

Literature records. – Corse-du-Sud: Ajaccio (Haenni, 1982).

Distribution and ecology. – A widespread European species, although generally uncommon. This is possibly also the case in Corsica where the species has not been observed since the end of xixth century (2 ♀ in coll. Huguenin, ETHZ: Haenni, 1982).

Dilophus sardous Haenni, 2009

Dilophus sardous Haenni, 2009: 435.

Material examined. – 1 ♂, Suarella-Eccica: Eccica, 400 m, 14.IX.2021, *leg. C. Quindroit* (CCQ). **First record for Corsica.**

Distribution and ecology. – Little is known about this recently described species which was caught in Sardinia at altitudes ranging from 480 to 700 m, in wooded or semi-wooded habitats. These habitats appear quite similar to the single Corsican locality —an evergreen oak forest— where this species was discovered.

Taxonomic note. – Until present, *D. sardous* was only known from Sardinia, and has been considered a probable endemic element to this island, although its presence in Corsica was expected (Haenni, 2009), which is confirmed herewith. However, the discovery of a male that possibly belongs to this species in Northern Greece (Haenni & Ramel, 2017) questions its presumed status of endemic species of the Thyrrenian islands.

Identification key to Bibionidae of Corsica

Preliminary remark. – It should be kept in mind that sexual dimorphism is strong in Bibionidae, affecting the colour of body, legs and wings, the shape of the head and —in *Dilophus*— the size of the spines on the fore tibiae. It is recommendable to have specimens of both sexes as the identification of isolated specimens, either males or females, may sometimes proves to be tricky. For *Dilophus* specimens with only one median row of spines on the fore tibiae, the identification should better be confirmed by the study of cleared male genitalia (compare with figures in Haenni, 1982, 2009).

1. Fore tibiae prolonged apically in a strong acute outer spur (fig. 5) and an usually much shorter inner spur; pronotum devoid of dorsal rows of short spines ..... Genus ***Bibio*** **2**

– Fore tibiae with one or two more or less transverse rows of spines and a circlet of apical spines (fig. 10) ; pronotum with two incurved dorsal rows of short spines ..... Genus ***Dilophus*** **9**

2. Basal section of R_{4+5} about twice as long as R-M cross-vein (fig. 9); generally medium-sized flies (body size rarely below 8 mm) **3**
– Crossvein R-M about as long as basal section of R_{4+5} or even longer (fig. 5, 7); small flies (body size rarely over 7 mm, and generally smaller) **5**
3. Red to rufous femora, legs otherwise black ..... ***Bibio pomonae*** (Fabricius)
– Legs entirely black **4**
4. Male, hind legs: basitarsus swollen, about four times as long as wide, tarsomeres 2-3 also somewhat inflated, decreasing in size, femora clearly clavate, with narrow basal part reaching slightly beyond middle. Female wings with membrane darkened only along the anterior margin, hind veins not contrasting with membrane (see Haenni, 2009: figures 1-3, 5-8) .... ***Bibio sardocyrneus*** Haenni
– Male, hind legs: basitarsus elongate, not swollen, about six times as long as broad, femora gradually widening towards apex. Female: wings infuscate, blackish brown, with hind veins darker, contrasting with membrane (see Haenni, 2009: figures 4, 9) ..... ***Bibio marci*** (Linnaeus)
5. Male: hind legs (fig. 5) distinctly elongate, with both femora and tibiae clavate, basitarsus strongly swollen, as wide as apex of tibia, tarsomeres 2-5 also swollen, with decreasing thickness (fig. 5). Female: hind legs elongate and slender. With autumnal flight period ..... ***Bibio clavipes*** (Meigen)
– Male: hind femora and tibiae not distinctly slender in basal half and clavate apically, at least hind tibiae gradually widening from base to apex (fig. 6); hind basitarsus less swollen, never as wide as tibia at apex (fig. 6). Female: hind legs not particularly elongate. Spring flight period **6**
6. Antennae short, with 5-segmented flagellum ..... ***Bibio nigriventris*** Haliday
– Antennae with 7-segmented flagellum **7**
7. Wings with pterostigma pale brown, concolorous with costal cell, hardly contrasting with light yellowish brown wing membrane; hind veins brownish ..... ***Bibio lanigerus*** Meigen
– Wings with pterostigma dark, strongly contrasting with membrane (fig. 7), and in doubtful cases always much darker than costal cell **8**
8. Male: hind basitarsus hardly swollen, parallel-sided, twice as long as wide (fig. 6); pilosity of thorax and abdomen pale golden (fig. 6); hind tibiae with elongate patch of dark sensillae on inner face (very conspicuous on yellow ground colour of tibiae). Female unknown, but the patch of sensilla of inner face of hind tibia certainly present ..... ***Bibio* aff. *johannis*** (Linnaeus)
– Male: hind basitarsus slightly swollen about four times as long as wide; pilosity of abdomen pale, except on sides of first segment with a tuft of dark pilosity (best observed against a light background). A less extended and poorly visible patch of sensilla present on inner side of hind tibiae ... . ***Bibio varipes*** Meigen
9. Fore tibiae with two rows of two spines each (one subbasal, one median) and an apical crown of spines (fig. 10). Male: with at least pedicel of antennae yellow. Female: body and legs predominantly yellow ..... ***Dilophus bispinosus*** Lundström
– Fore tibiae with only one median transverse row of spines (the inner spine may be positioned more apically than the other ones) and an apical crown of spines. Male: antennae entirely black. Female: legs and body never extensively yellow (at most side of pronotum, coxae and femora of fore legs yellowish rufous) **10**
10. Median row on fore tibiae with only three spines (see Haenni, 2009: figures 12-13) .... ***Dilophus sardous*** Haenni
– Median row on fore tibiae always with four spines (the inner spine may be positioned more apically) **11**
11. Wing membrane milky white in both sexes, with hind veins hyaline, not contrasting with membrane; median row of spines on fore tibiae oblique ..... ***Dilophus femoratus*** Meigen
– Wing membrane hyaline in males, more or less tinged with yellowish brown in females, with hind veins contrasting with membrane, or almost entirely blackish in females **12**
12. Median row of spines on fore tibiae with inner spine placed more apically. Female: wings mostly smoky black except for the more or less hyaline wing apex. Part of head in front of the eyes normally developed, distinct in lateral view. Body entirely black in both sexes .... ***Dilophus febrilis*** (Linnaeus)

– Median row of spines on fore tibiae transverse, with all spines more or less in line. Female: wing membrane pale yellowish brown, with somewhat darker, contrasting hind veins. Part of head in front of the eyes very short, hardly visible in lateral view. Body of male black, never entirely black in female, with fore coxae and femora rufous yellow and abdomen entirely brownish .... ***Dilophus humeralis*** Zetterstedt

Clé d'identification des Bibionidae de Corse

Remarque préliminaire. – Il faut se souvenir que le dimorphisme sexuel est très marqué chez les Bibionidae, affectant la couleur du corps, des pattes et des ailes, la forme de la tête ainsi que, dans le genre *Dilophus,* la taille des épines des tibias antérieurs. Il est toujours recommandé d'avoir des spécimens des deux sexes car l'identification de spécimens isolés, qu'ils soient mâles ou femelles, peut parfois être délicate. Pour les *Dilophus* avec une seule rangée médiane d'épines sur les tibias antérieurs, l'identification devrait être confirmée par l'étude des genitalia mâles éclaircis (cf. figures dans Haenni, 1982, 2009).

1. Tibias des pattes antérieures prolongés à l'apex en un fort éperon externe (fig. 5) et avec une épine interne plus courte ; pronotum dépourvu de rangées dorsales de courtes épines Genre ***Bibio*** **2**
– Tibias des pattes antérieures portant une ou deux rangées transversales d'épines et une couronne d'épines apicales (Fig. 10) ; pronotum avec deux rangées dorsales incurvées de courtes épines .. .. Genre ***Dilophus*** **9**
2. Partie basale de R4+5 environ deux fois plus longue que la nervure transverse R-M (fig. 9) ; mouches de taille moyenne (rarement moins de 8 mm) **3**
– Nervure transverse R-M à peu près aussi longue, ou plus longue que la section basale de R4+5 (fig. 5, 7) ; petites mouches (rarement plus de 7 mm, généralement plus petites) **5**
3. Fémurs rouges ou d'un roux vif, contrastant avec le reste des pattes noir .. ***Bibio pomonae*** (Fabricius)
– Pattes entièrement noires **4**
4. Basitarse des pattes postérieures du mâle épaissi, environ quatre fois plus long que large ; tarsomères suivants également quelque peu épaissis, décroissant en épaisseur du second au cinquième ; fémurs des pattes postérieures du mâle nettement claviformes, la partie basale étroite dépassant à peine le milieu ; membrane alaire de la femelle assombrie seulement le long de la marge antérieure de l'aile, à nervures postérieures non contrastantes (voir Haenni, 2009 : figures 1-3, 5-8) .... ***Bibio sardocyrneus*** Haenni
– Basitarse des pattes postérieures du mâle non épaissis, environ six fois plus long que large ; fémurs postérieurs allant en s'élargissant régulièrement vers l'apex ; ailes de la femelle enfumées, brun-noirâtre, à nervures postérieures contrastantes (voir Haenni, 2009 : figure 4, 9) .... ***Bibio marci*** (Linné)
5. Pattes postérieures du mâle très allongées, à fémur et tibia claviformes, basitarse fortement renflé, tarsomères suivants renflés également et décroissant en épaisseur (Fig. 5) ; femelle à pattes postérieures allongées ; période de vol automnale ..... ***Bibio clavipes*** (Meigen)
– Fémurs et tibias des pattes postérieures du mâle non claviformes (fig. 6), au moins les tibias s'élargissant régulièrement à partir de la base vers l'apex, basitarse postérieur non particulièrement renflé, jamais aussi élargi que l'apex des tibias (fig. 6) ; pattes postérieures pas particulièrement allongées chez la femelle ; période de vol printanière **6**
6. Antennes courtes, à flagelle antennaire de cinq articles seulement ..... ***Bibio nigriventris*** Haliday
– Antennes plus longues, à flagelle antennaire de sept articles **7**
7. Ailes à ptérostigma brun pâle, de même couleur que la cellule costale, contrastant à peine avec la membrane alaire d'un brun jaunâtre, à nervures postérieures brunâtres ..... ***Bibio lanigerus*** Meigen
– Ailes à ptérostigma foncé, contrastant fortement avec la membrane alaire (fig. 7), et, dans les cas douteux, toujours nettement plus sombre que la cellule costale **8**
8. Mâle : basitarse des pattes postérieures à peine renflé, à bords parallèles, deux fois plus long que large (fig. 6) ; pilosité du thorax et de l'abdomen claire, d'un jaune doré (fig. 6) ; une zone allongée de sensilles sombres présente sur la face interne des tibias postérieurs (bien visibles sur

la couleur jaune des tibias). Femelle inconnue, mais la zone de sensilles des tibias postérieurs est certainement présente également ..... ***Bibio* aff. *johannis*** (Linné)

– Mâle : basitarse des pattes postérieures légèrement renflé, environ quatre fois plus long que large ; pilosité de l'abdomen claire, sauf sur les côtés du premier segment qui porte une touffe de poils noirâtres (observer sur un fond clair) ; une zone de sensilles moins étendue et peu visible présente sur la face interne des tibias postérieurs ..... ***Bibio varipes*** Meigen

9. Tibias des pattes antérieurs avec deux rangées de deux épines chacune (une sub-basale, une médiane) et une couronne apicale d'épines (fig. 10) ; mâle avec au moins le pédicelle des antennes jaune contrastant, corps et pattes de la femelle en grande partie jaunes ... ***Dilophus bispinosus*** Lundström

– Tibias des pattes antérieures avec une seule rangée transverse médiane d'épines (l'épine interne peut être décalée apicalement par rapport aux autres) et une couronne apicale d'épines ; antennes du mâle entièrement noires, corps et pattes de la femelle jamais en grande partie jaunes (au maximum côté du pronotum, coxae et fémurs antérieurs roux jaunâtre) **10**

10. Seulement trois épines dans la rangée médiane d'épines des tibias antérieurs (voir Haenni, 2009 : figures 12-13) ..... ***Dilophus sardous*** Haenni

– Toujours quatre épines dans la rangée médiane d'épines des tibias antérieurs (l'épine interne peut être décalée apicalement) **11**

11. Membrane alaire d'un blanc laiteux dans les deux sexes, à nervures postérieurs hyalines, ne contrastant jamais avec la membrane ; rangée médiane d'épines des tibias antérieurs oblique .... ***Dilophus femoratus*** Meigen

– Membrane alaire hyaline chez les mâles ; chez les femelles, membrane plus ou moins teintée de brun jaunâtre clair avec les nervures postérieures contrastant, ou presque entièrement noirâtre **12**

12. Rangée médiane d'épines des tibias antérieurs avec l'épine interne nettement décalée apicalement ; ailes de la femelle enfumées, presque entièrement noirâtres, à l'exception de l'apex plus ou moins clair ; corps entièrement noir dans les deux sexes ..... ***Dilophus febrilis*** (Linné)

– Rangée médiane d'épines des tibias antérieurs transverse, avec toutes les épines plus ou moins placées au même niveau ; membrane alaire de la femelle brun jaunâtre clair, à nervures postérieures légèrement contrastantes ; partie de la tête en avant des yeux très courte, à peine visible en vue latérale ; corps noir chez le mâle, jamais entièrement sombre chez la femelle qui a les coxas et les fémurs antérieurs d'un roux jaunâtre et l'abdomen entièrement brunâtre .... ***Dilophus humeralis*** Zetterstedt

Discussion

Four of the 13 species thus far recorded from the island were not present in the recently studied material. The only records of these four species, namely *Bibio lanigerus, B. pomonae, Dilophus febrilis* and *D. humeralis*, date back from the last quarter of XIXth century and the first quarter of XXth century, i.e., about at least 100 years ago. Even common species as *D. febrilis* have not been found again in recent collections. There is, however, little doubt that further collecting in Corsica might lead to rediscoveries, together with the detection of some possible additional species, especially *Bibio hortulanus* (Linnaeus, 1758) and *Dilophus antipedalis* Wiedemann *in* Meigen, 1818, both recorded from Sardinia (Haenni, 2009). With 13 species recorded in our preliminary report, the Bibionidae fauna of Corsica appears considerably richer than that of other neighbouring Mediterranean islands: Sardinia (eight, possibly nine species; Haenni, 2009), Sicily (seven species; Haenni, 2021), Malta (six species; Ebejer, 2021), and the Balearic Islands (four species; Haenni & Báez, 2002). However, except for Sardinia where an extensive survey of arthropod biodiversity was conducted in 2003-2006 in the SW of the island (Bardiani, 2011), the sampling efforts on the other islands is probably not comparable to that on Corsica. Eventually, the presence of at least one, maybe three, endemic sardo-corsican elements, (*B. sardocyrneus*, and possibly *D. sardous* and *B.* aff. *johannis*) is noticeable and deserves special mention from a biodiversity and conservation point of view.

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References

Bardiani M., 2011. – Introduction (p. 15-56). *In* : Nardi G., Bardiani M., Birtele D., Mason F., Spada L. & Cerretti P. (eds), *Biodiversity of Marganai and Montimannu (Sardinia). Research in the framework of the ICP forests network. Conservazione Habitat Invertebrati 5*. Sommacampagna, Verona : Cierre Edizioni.

Duda O., 1930. – 4. Bibionidae. *In* : Lindner E. (ed.), *Die Fliegen der palaearktischen Region*, **2** (1). Stuttgart : Schweizerbart, 75 p.

Ebejer M. J., 2021. – The families Bibionidae and Scatopsidae in Malta (Diptera: Nematocera). *Entomologist's Monthly Magazine*, **157** (1) : 35-37.

Edwards F. W., 1928. – The Nematocerous Diptera of Corsica. *Encyclopédie Entomologique, Série B., II, Diptera,* **4** : 57-189.

Fabricius J. C., 1775. – *Systema entomologiae, sistens insectorum classes, ordines, genera, species, adiectis synonymis, locis, descriptionibus, observationibus.* Flensburgi et Lipsiae, 832 p. https://doi.org/10.5962/bhl.title.36510

Haenni J.-P., 1982. – Révision des espèces européennes du groupe de *Dilophus febrilis* (L.), avec description d'une espèce nouvelle (Diptera, Bibionidae). *Revue suisse de Zoologie,* **89** (2) : 337-354. https://doi.org/10.5962/bhl.part.82447

Haenni J.-P., 2009. – The Bibionidae (Diptera) of Sardinia, with description of two new species. *In* : Ceretti P., Mason F., Minelli A., Nardi G. & Whitmore D. (eds), *Research on the Terrestrial Arthropods of Sardinia (Italy)*. *Zootaxa,* **2318** : 427-439. https://doi.org/10.11646/zootaxa.2318.1.17

Haenni J.-P., 2021. – Insecta Diptera Anisopodidae, Bibionidae, Hesperinidae. *In* : Bologna M. A., Zapparoli M., Oliverio M., Minelli A., Bonato L., Cianferoni F., Stoch F. (eds), *Checklist of the Italian Fauna. Version 1.0.* Last update: 2021-05-31. https://www.lifewatchitaly.eu/en/initiatives/checklist-fauna-italia-en/checklist/

Haenni J.-P. & Báez M., 2002. – Bibionidae. *In* : Carles-Tolrá-Hjorth-Andersen M. (coord.), Catálogo de los Diptera de España, Portugal y Andorra (Insecta). *Monografias S.E.A.*, **8** : 16-18.

Haenni J.-P. & Ramel G., 2017. – The Bibionidae (Diptera) from the Kerkini area (Macedonia, Northern Greece). *Parnassiana Archives,* **5** : 35-44.

Haliday A. H., 1833. – Catalogue of the Diptera occurring about Holywood in Downshire. *Entomologist's Magazine,* **1** : 147-180.

Krivosheina N. P., 1986. – Family Bibionidae (p. 319-330). *In* : Soós Á. & Papp L. (eds), *Catalogue of Palaearctic Diptera*, *Volume 4*. Budapest : Akadémiai Kiadó.

Kuntze A., 1913. – Dipterologische Sammelreise in Korsika des Herrn W. Schnuse in Dresden in Juni u. Juli 1899. *Deutsche Entomologische Zeitschrift*, **20** : 544-552.

Linnaeus C., 1758. – *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum caracteribus, differentiis, synonymis, locis. Tomus 1, Editio decima, reformata.* Holmiae, 578 p. https://doi.org/10.5962/bhl.title.542

Lundström C. 1913. – Neue oder wenig bekannte paläarktische Bibioniden. *Annales Musei nationalis Hungarici,* **11** : 388-397, tab. xvii.

Meigen J. W., 1804. – *Klassifikation und Beschreibung der europäischen zweiflügeligen Insekten. Diptera Linn. Erster Band, erste Abtheilung.* Braunschweig : Reichard, xxviii + 152 p., 8 pl.

Meigen J. W., 1818. – *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten, Erster Theil*. Aachen : F. W. Forstmann, xxxvi + 332 p., 11 pl. https://doi.org/10.5962/bhl.title.12464

Meigen J. W., 1830. – *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten, Sechster Theil.* Hamm : Schulzische Buchhandlung, iv + 401 p., 12 pl.

Séguy E., 1940. – Diptères Nématocères (Fungivoridae. Lycoriidae. Hesperinidae. Bibionidae. Scatopsidae. Phrynidae. Pachyneuridae. Blepharoceridae). *Faune de France*, **36** : 361 p.

Skartveit J., 1997. – 2.5. Family Bibionidae (p. 41-49). *In* : Papp L. & Darvas B. (eds), *Contributions to a Manual of Palaearctic Diptera (with special reference to flies of economic importance). Volume 2. Nematocera and Lower Brachycera*. Budapest : Science Herald, 592 p.

Skartveit J., 2006. – Synonymy notes in the Bibionidae (Diptera). *Dipterists Digest*, **13** (1) : 23-25.

Skartveit J., 2013. – Fauna Europaea: Bibionidae. *In* : Pape T. & Beuk P. (eds), *Fauna Europaea: Diptera Nematocera*. Fauna Europaea version 2017.06, https://fauna-eu.org

Touroult J., Ichter J., Pollet M., Pascal O., Poirier E., Rougerie R., Decherf B., Andrei-Ruiz M.-C., Hugot L. & Dusoulier F., 2023. – *Our Planet Reviewed in Corsica 2019-2021*: a large-scale survey of neglected biodiversity on a Mediterranean island. *Bulletin de la Société entomologique de France,* **128** (4) : 353-382. https://doi.org/10.32475/bsef_2285

Zetterstedt J. W., 1850. – *Diptera Scandinaviae disposita et descripta. Tomus nonus.* Lundae : Officina Lundbergiana, **9** : 3367-3710.