Descriptions of two new species of Empidinae Schiner, 1862 (Diptera: Empididae) from the Mercantour National Park, France

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ABSTRACT
Two new species of Empidinae Schiner, 1862, belonging to the tribe Empidini Collin, 1961, are described. *Empis* (*Xanthempis*) *fusca* n. sp. was collected as part of the All Taxa Biodiversity Inventory (ATBI) conducted in the Mercantour National Park between 2009 and 2011, while *Rhamphomyia* (*Lundstroemiella*) *brevis* n. sp. was collected in autumn 2013 at 2100 m in one of the highest passes in Europe (Col de la Bonette).

KEY WORDS
Mercantour National Park,
All Taxa Biodiversity Inventory (ATBI),
Alps,
new species.

RÉSUMÉ
Description de deux espèces nouvelles d'Empidinae Schiner, 1862 (Diptera: Empididae) collectées dans le Parc national du Mercantour.
Deux espèces nouvelles d'Empidinae Schiner, 1862, appartenant à la tribu des Empidini Collin, 1961 sont décrites : *Empis* (*Xanthempis*) *fusca* n. sp. a été collectée dans le cadre de l'Inventaire biologique généralisé mis en place dans le Parc national du Mercantour entre 2009 et 2011, alors que *Rhamphomyia* (*Lundstroemiella*) *brevis* n. sp. a été collectée à l'automne 2013 à 2100 m d'altitude dans l'un des plus hauts cols d'Europe (col de la Bonette).

MOTS CLÉS
Parc national du Mercantour,
Inventaire biologique généralisé (IBG),
Alpes,
espèces nouvelles.

INTRODUCTION

Empidinae Schiner, 1862, (Diptera Linnaeus, 1758: Empididae Latreille, 1804), or empidine dance flies, form a strongly diversified subfamily of more than 2000 species. Their distribution is worldwide, with the exception of Antarctica, and they are especially found in temperate areas (Holarctic, Patagonia, South Africa, South Western and South Eastern Australia [including Tasmania] and New Zealand) and most mountainous regions of the world, where they probably play a key role as pollinators (Lefebvre *et al.* 2014). The number of species found in these areas is so large that the biodiversity of the group is only partially known, even in historically well-studied regions (Europe and North America).

The All Taxa Biodiversity Inventory (ATBI) conducted in the Mercantour National Park was an opportunity to sample the subfamily in an area where the climate and topography are particularly suitable for this group. Among the material collected during the ATBI (2009-2011) and several field trips that followed (2012-2014), a number of species were identified as new. The aim of this paper is to describe two of them, belonging to the tribe Empidini Collin, 1961.

MATERIAL AND METHODS

This study is primarily based on the material collected with Malaise traps in the framework of the "Terrestrial Invertebrates fieldwork module" of the ATBI Mercantour project between 2009 and 2011 (Deharveng *et al.* 2015) which greatly contributed to the biodiversity inventory undertaken in this national park (Villemant *et al.* 2015, this issue). Additional collections were made in or near the Park in spring and summer of 2012 and 2014, and the spring and autumn of 2013.

Morphological terminology follows McAlpine (1981), except for the antennal structure, which follows Stuckenberg (1999). Interpretation of male genital sclerites is based on Daugeron (1997). Male genitalia were dissected and then macerated in hot 10% KOH, positioned in glycerine and drawn using a camera lucida.

All the material studied in this work is deposited in the Diptera collection of the Muséum national d'Histoire naturelle.

Abbreviations

Abbreviations used in the figures

cer	cercus;
epn	epandrium;
ej ap	ejaculatory apodeme;
hyp	hypandrium;
ph	phallus.

Institution

MNHN	Muséum national d'Histoire naturelle, Paris.

SYSTEMATICS

Order DIPTERA Linnaeus, 1758
Family Empididae Latreille, 1804
Subfamily Empidinae Schiner, 1862
Genus *Empis* Linnaeus, 1758
Subgenus *Xanthempis* Bezzi, 1909

Empis* (*Xanthempis*) *fusca n. sp.
(Figs 1, 2)

Type material. — **Holotype.** Male, France, Larche (04), forêt de Boisset, Larch forest, 1986 m, 44.422731°N, 6.878456°E, 24.VI-8.VII.2011, Malaise trap (M11-LAR2000T3-M2), MNHN.
Paratypes. 23 ♂, 11 ♀, same data; 15 ♂, 24 ♀, same data except (M11-LAR2000T3-M1); 10 ♀, same data except 26.V-9.VI.2011 (M11-LAR2000T1-M2), MNHN.

Etymology. — From the Latin word *fuscus, a, um* meaning *dark*, with reference to the unusual dark blackish-brown colour of this *Xanthempis* species.

Description

Species of medium size; thorax blackish; abdomen, including male hypopygium, entirely brown (phallus and lower part of epandrial lamella yellowish); fore-femur bicolour, brown dorsally to yellow ventrally.

Male

Head. Occiput blackish, with 2 rows of rather strong, short setae. Ocellar triangle not very prominent, with a pair of fine, short setae. Antenna blackish, postpedicel long, stylus black and short. Frons as broad as face, with minute bristly hairs along margins of eyes. Dichoptic, all ommatidia of equal size. Gena narrow but visible, dark brown. Labrum yellowish, 1.5 × longer than head height, labium brownish, labella thick, with distinct setae, palpus yellow with a few short, bristly hairs.

Thorax. Dark, blackish-brown. Antepronotum bilobed, with about 6-7 rather strong, short setae on each side. Proepisternum bare, prosternum with a few yellowish, bristly hairs. Strong, long setae as follows: 1 postpronotal, 1 notopleural, 1 postalar, 2 scutellars. Acrostichals absent, dorsocentrals uniserial, distinct, short, ending in 2 stronger, longer setae in prescutellar depression. 1 finer, shorter notopleural. Laterotergite with fan of 5-6 strong, long setae.

Wing (about 5.5 mm). Rather clear, tinted brown with faint brown stigma, veins brown except for the yellowish base of Sc and R1. Halters whitish. A1 complete. Anal lobe not strongly developed, anal angle obtuse.

Legs. Coxae yellow, weakly brownish basally, trochanter yellowish-brown. Fore femur distinctly bicolour: dark brown dorsally, yellow ventrally. Mid and hind femora brown. Foretibia yellowish brown at base to dark brown apically. Mid and hind tibiae brownish, darker apically. All tarsi dark, blackish-brown. Legs covered with setulae, fore and mid tibiae with a few more distinct dorsal setae, never longer than tibia depth.

Abdomen. Entirely brownish, with very short, pale setae; stronger, longer blackish setae at posterior margin of segment 8.

Fig. 1. — *Empis* (*Xanthempis*) *fusca* n. sp. Male habitus, paratype. Length: about 6 mm.

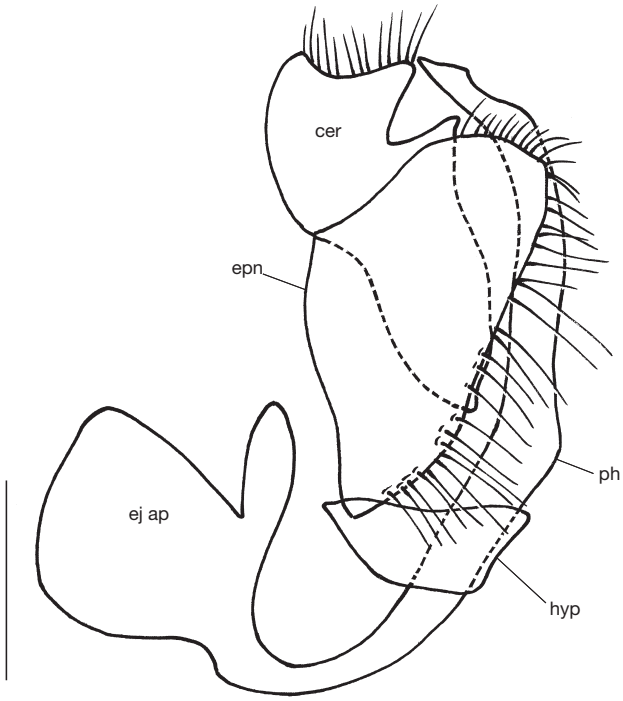

Fig. 2. — *Empis* (*Xanthempis*) *fusca* n. sp. Male hypopygium in lateral view. Scale bar: 0.35 mm.

Hypopygium (Fig. 2). Very similar to those of *E.* (*X.*) *semicinerea* Loew, 1867, *E.* (*X.*) *pseudosemicinerea* Daugeron, 2000 and *E.* (*X.*) *styriaca* Strobl, 1893, but entirely brown except for the yellowish phallus and the yellow lower part of the epandrial lamella. Cercus cleft posterodorsally, epandrial lamella somewhat rectangular, with distinct ventral setae, hypandrium bare, truncate at tip.

Female
Similar to male, except for usual sexual differences.

Remarks
The subgenus *Xanthempis* has been intensively investigated during the past twenty years (Chvála 1994, 1996; Daugeron 1997, 2000, 2009; Shamshev 1998, 2007; Shamshev & Kustov 2008) and the new species described here can be easily compared with the other known species using the extensive bibliography. This species is closely related to the greyish *Xanthempis* species found in the Alps, such as *E.* (*X.*) *styriaca*, *E.* (*X.*) *semicinerea* and *E.* (*X.*) *pseudosemicinerea* (see Daugeron 2000), which all have very similar male genitalia. However *E.* (*X.*) *fusca* n. sp. can be distinguished from them by its blackish thorax, entirely dark brown abdomen and bicoloured fore femur.

Genus *Rhamphomyia* Meigen, 1822
Subgenus *Lundstroemiella* Frey, 1922

Rhamphomyia* (*Lundstroemiella*) *brevis n. sp.
(Figs 3, 4)

Type material. — **Holotype.** Male, France, Parc national du Mercantour, Col de la Bonette, Larch forest, 2100 m, 44°21'32.90"N, 6°47'03.16"E, 01.X.2013, MNHN.
Paratypes. 7 ♂, 5 ♀, same data; 7 ♀, same data, except 3.X.2013, MNHN.

Etymology. — From the Latin word *brevis, e*, meaning *short*, with reference to the very short, C-shaped phallus of this species.

Description
Greyish to brown species with postpedicel elongated, male eyes dichoptic, legs dark brown to yellowish. Male genitalia closed with short phallus concealed between epandrial lamellae.

Fig. 3. — *Rhamphomyia* (*Lundstroemiella*) *brevis* n. sp. Male habitus, holotype. Length: about 5 mm.

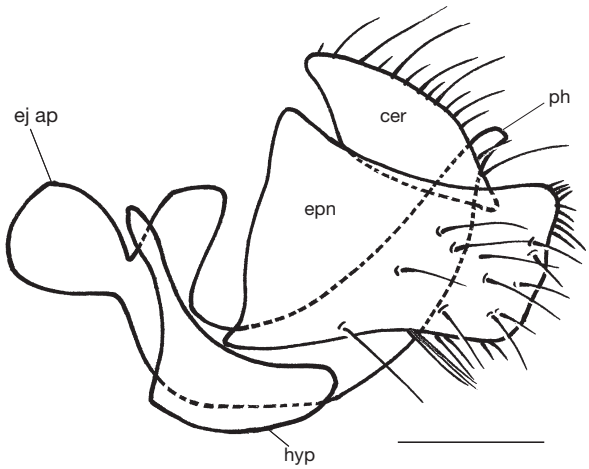

Fig. 4. — *Rhamphomyia* (*Lundstroemiella*) *brevis* n. sp. Male hypopygium in lateral view. Scale Bar: 0.1 mm

Male

Head. Occiput greyish, with distinct, black, postocular setae. Ocellar triangle prominent, with pair of distinct setae. Eyes dichoptic, all ommatidia of equal size. Frons broader than face, greyish, with bristly hairs along eye margin. Face greyish, bare. Antenna blackish, postpedicel elongated, stylus very short. Proboscis dark brown, labrum as long as head height, labium very thick, with labella bearing distinct fine setae, palpus blackish with distinct short setae.

Thorax. Antepronotum and proepisternum without distinct setae, prosternum with a few fine, short, yellowish setae. Scutum greyish. Acrostichals absent, dorsocentrals uniserial, strong, rather short, longer in prescutellar depression. Strong, long black setae as follows: 1 postpronotal, 1 anterior and 1 posterior supra-alars, 1 notopleural, 1 postalar, 4 scutellars. Notopleuron with 2 additional, finer, shorter setae. A few short anterior postpronotals. Laterotergite with fan of a few yellowish fine setae.

Wing (about 4.5 mm). Clear, with brown stigma. Anal lobe feebly developed, with anal angle very obtuse. R4+5 unforked. CuA1 (M3) distinctly stronger than M1 and M2. Halter whitish.

Legs. Coxae dark brown yellowish with distinct anterior yellowish setae. Femora dark brown to yellowish ventrally, tibiae dark brown, sometimes yellowish basally, tarsi dark, blackish-brown. All legs with only setulae, except for a few more distinct apical setae on femora.

Abdomen. Dark brown to blackish, with fine, rather short, whitish setae, marginal setae of tergites longer.

Hypopygium (Fig. 4) blackish. Cercus simple, small, without distinct seta, only short bristly hairs. Epandrial lamella subrectangular, with a few fine, short setae. Hypandrium simple, not divided into two lamellae, bare. Phallus yellowish, very short, C-shaped, concealed between epandrial lamellae and cerci.

Female

Similar to male, except for the usual sexual differences and the following characters: setae finer and shorter, especially on abdomen; wing tinted slightly brown.

Remarks

This species of the subgenus *Lundstroemiella* was probably overlooked until now because of its occurrence in autumn; Barták (1985, 1999, 2006) did not mention any species of this subgenus occurring in October. *Rhamphomyia* (*L.*) *brevis* n. sp. can only be compared to *R.* (*L.*) *magellensis* Frey, 1922, as the two species have their male genitalia closed with the phallus short and thick, concealed between epandrial lamellae, and the hypandrium simple and bare. The remaining *Lundstroemiella* species have their male genitalia more or less open, with the phallus long, thin and partly visible (see Barták 1985, 1999, 2006). However, *R.* (*L.*) *brevis* n. sp. and *R.* (*L.*) *magellensis* can be distinguished by

their very different coloration: the first is greyish to brown including brownish legs, while the second has yellowish legs, bicoloured brown/yellow tergites and only the thorax entirely brownish-black.

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