



Five species under *Dicranomyia (Dicranomyia) mitis* (Meigen, 1830) (Diptera, Limoniidae)

JAROSLAV STARÝ¹ & ALAN E. STUBBS²

¹Neklanova 7, CZ-779 00 Olomouc-Nedvěži & Silesian Museum, Nádražní okruh 31, CZ-746 01 Opava, Czech Republic.

E-mail: stary.cranefly@gmail.com

²181 Broadway, Peterborough, Cambs PE1 4DS, England, U.K. E-mail: alan.stubbs@buglife.org.uk

Abstract

Five species previously usually treated as *Dicranomyia (Dicranomyia) mitis* (Meigen, 1830) are redescribed and named with already existing names, viz. *D. (D.) mitis* [s. str.], *D. (D.) affinis* (Schummel, 1829), *D. (D.) quadra* (Meigen, 1838), **sp. restit.**, *D. (D.) lutea* (Meigen, 1804), and *D. (D.) imbecilla* Lackschewitz in Lackschewitz & Pagast, 1941, **stat. n.** All important characters of the wing, male tarsi and male and female terminalia are illustrated. A key to *D. (D.) mitis* and allies is appended.

Key words: Diptera, Limoniidae, *Dicranomyia (Dicranomyia) mitis* and allies, nomenclature, taxonomy, redescrptions, key

Introduction

The *Dicranomyia (Dicranomyia) chorea* (Meigen, 1818) species group, as defined recently (Starý 1993), is a species-rich cluster, with still many unnamed species in the West Palaearctic, including Europe. About a dozen species were described or reinstated from synonymy recently (Geiger 1985, Starý 1993, 2006, 2009, Starý & Freidberg 2007), but all of these are distinctly different in the wing pattern and/or the structure of the male terminalia from what has been considered *D. (D.) mitis* (Meigen, 1830).

Dicranomyia (D.) mitis was long regarded as a common, widely distributed, and extremely variable European species. It was distinguished from other species of the *D. (D.) chorea* species group by having, on the wing, at most two distinct spots at the anterior margin, one over the origin of Rs and the other over the distal part of R₁ (pterostigma) (Figs 16–20). Another spot at the anterior margin of the wing, proximal to the two, at Sc₂, is well-developed in some species of the *D. (D.) chorea* species group. It is, however, quite tiny in what was considered *D. (D.) mitis* and is here not referred to. Male terminalia have the ventral (inner) gonostylus rather long-ovoid in dorsal outline, about twice as long as broad, with the rostral spines long, distinctly longer than the rostral prolongation of the ventral gonostylus (Figs 6–10). In the first half of the last century, some attempts were made to subdivide *D. (D.) mitis*. Edwards (1938) distinguished three “varieties”, viz. the typical variety of *D. (D.) mitis*, var. *affinis* Schummel, and var. *lutea* Meigen. Lackschewitz (1928) and Lackschewitz & Pagast (1941) added some other varieties. None of the above authors disturbed the species integrity of *D. (D.) mitis*, because they failed to find differences in the structure of the male terminalia. Subsequent European authors mostly did not differentiate among the forms of *D. (D.) mitis*. Stubbs (1998a) was the first to divide *D. (D.) mitis* into five separate species in his key, using Edwards’s (1938) concept of the names for three of them and denoting the two remaining species as “A” and “B”. This classification did not get into the British Diptera Checklist (Stubbs 1998b) and has only been accepted by some British authors because of inaccessibility of the relevant paper (Stubbs 1998a).

In addition to the characters mentioned by Stubbs (1998a) for separating the five species we here give further distinctions in the structure of the male terminalia and also describe the female terminalia. The shape of the male tarsal claws and two distal tarsomeres appear to be additional important criteria (Figs 1–5), independent of genital

characters, therefore reinforcing and justifying separation at the species level. Tarsi of the hind leg are illustrated, but no variation was observed in this respect.

The second author has gained some experience of the differences in ecology of the species in Great Britain, and this knowledge is mentioned here. This may serve to support the status of distinct species. Multiple occurrence of the species on the same site was experienced by both authors.

Hence, we here distinguish, redescribe, and illustrate five species previously treated as *D. (D.) mitis*. Since nomenclatural circumstances are highly complicated within the *D. (D.) chorea* species group we have adopted a pragmatic, unorthodox nomenclatural approach (see below). Any of the names proposed here as valid may be contestable for this or that reason, but we simply prefer to distinguish and to name what we think are species rather than to get stuck in formal problems of nomenclature. Future taxonomists may propose a different nomenclatural solution.

Material and methods

The morphological terminology adopted here essentially follows McAlpine (1981). Some special parts are referred to in Fig. 11. Colour characters are described from dry-mounted specimens. Unless otherwise stated in the sections on Material examined, the specimens under study are collected by netting and dry-mounted. Where pertinent in the text, the particular contributions of the co-authors are indicated by the initials JS or AS.

The following abbreviations for museums and collections are used in the text: ASP—Collection of A.E. Stubbs, Peterborough, England, U.K.; BMNH—The Natural History Museum [formerly British Museum (Natural History)], London, England, U.K.; JSO—Collection of J. Starý, Olomouc, Czech Republic; UAEM—Université Abdelmalek Essaâdi, Faculté des Sciences, Tétouan, Morocco.

Nomenclatural approach

Four of the five species presented here (the exception being *D. (D.) affinis*) are common and widely distributed throughout Europe, and they may have been described by some of the oldest authors. Synonyms under *D. (D.) mitis*, and within the *D. (D.) chorea* species group as a whole, are difficult to decipher because of superficial descriptions. In fact, in a cluster as uniform as those species under *D. (D.) mitis*, even more detailed descriptions might not have been adequate. Moreover type specimens, such as those of Meigen and Schummel, are either non-existent or, if extant and recognizable as such, are so severely damaged as to be useless taxonomically. We try not to load nomenclature with new names but rather employ existing names for the five species in question, based on some characters inferred from relevant descriptions and available illustrations (Morge 1976), supported by common usage. We use the following names for the five species under *D. (D.) mitis*:

***lutea* Meigen, 1804**—This is the oldest relevant available name. It is used here in the sense of Edwards (1938) (*mitis* var. *lutea*) and Stubbs (1998a). Based on the original description (Meigen 1804) this is generally a yellow species, with the basal segments of the antenna yellow, the tips of the femora and tibiae pale brown, and the wing stigma pale brown. Lackschewitz (1928) considered *lutea* to be a synonym of *D. (D.) chorea*, but we think that he was referring to the second description of *lutea* by Meigen (1818: 133) in which the tips of the femora and tibiae are described as being brown. The latter description is considered here a separate proposal of a new species. What was illustrated by Meigen as *lutea* (see Morge 1976, Plate 178, Fig. 3) is most probably the second species (*chorea*).

***affinis* Schummel, 1829**—The present concept of the species conforms to that proposed by Edwards (1938) for his *mitis* var. *affinis* and is so used at the species level by Stubbs (1998a) and other British authors. The original description (Schummel 1829) is rather detailed and fits this species very well.

***mitis* Meigen, 1830**—This name is used here in the sense of the typical variety of *mitis* as established by Edwards (1938) and, in fact, followed by subsequent authors, including Stubbs (1998a). Unfortunately, according to the original description (Meigen 1830), this is described as a generally yellow species, with brownish yellow legs and the wing without any pattern. The same is shown in Meigen's figure (see Morge 1976, Plate 178, Fig. 13). Since, however, *D. (D.) mitis* is sufficiently variable even in its restricted sense and because of common usage, the name is retained.

quadra Meigen, 1838—This name is reinstated here as valid for the species denoted by Stubbs (1998a) as “species A”. Previously, *quadra* had been considered to be a synonym of *D. (D.) chorea* (see Lackschewitz 1928). The original description (Meigen 1838), however, presents this species as having the legs brownish but yellowish at base, and the wing with a quadrangular stigma. In *D. (D.) chorea*, only the tips of the femora are brown. In addition, Meigen’s figure (see Morge 1976, Plate 178, Fig. 6) is suggestive of the general appearance of Stubbs’s “species A”. Based on the length of the gonocoxite compared to the ventral gonostylus and the structure of the male tarsal claws (Vaillant 1952, Figs 11, 13) *hygropetrica* Vaillant, 1952 seems to be another available name for this species. [*D. (D.) mitis* as interpreted in that paper probably is *D. (D.) didyma* (Meigen, 1804) (see Vaillant 1952, Figs 12, 15)].

imbecilla Lackschewitz in Lackschewitz & Pagast, 1941—This name, a comparatively recent one, is here newly introduced as valid for the species denoted by Stubbs (1998a) as “species B”, based on the figure in Lackschewitz & Pagast (1941, Plate 7, Fig. 56). This figure shows very well a rather long tergite 9, a caudally curved rostrum of the ventral gonostylus, and the rostral spines positioned apart. In some yellow *Dicranomyia*, the abdomen is pale green in teneral state, as it was described for this variety (see Lackschewitz & Pagast 1941: 30). This species may have also been described by an earlier author, but the identity has not been traced.

Redescriptions

Dicranomyia (Dicranomyia) mitis (Meigen, 1830)

Figs 1, 6, 11, 16

Limnobia mitis Meigen 1830: 278 (description).

Limonia (Dicranomyia) mitis: Edwards 1938: 35 (short redescription), Text-fig. 5b (male terminalia).

Limnobia mitis: Morge 1976, Plate 78, Fig. 13 (general view).

Dicranomyia mitis: Stubbs 1998a: 22 (key), Figs (femora, macrotrichia on Sc₁, male terminalia).

Diagnosis. Medium-sized species. Body colouration greyish-brown, variegated with yellow. Wing pattern mostly fairly distinct, consisting of two spots at anterior wing margin, with additional markings especially along so-called outer cord. Sc₁ with row of macrotrichia posteroventrally. Two last male tarsomeres long, parallel-sided; male tarsal claws moderately long, with two teeth fairly distinct. Male terminalia with rostral prolongation of ventral gonostylus truncate close beyond medial spine; rostral spines gently curved, separated at base by their own breadth. Female terminalia with cercus slightly shorter than tergite 10; space between cerci wide, subequal in width to cercus breadth at base. Wing length 6.2–9.4 mm.

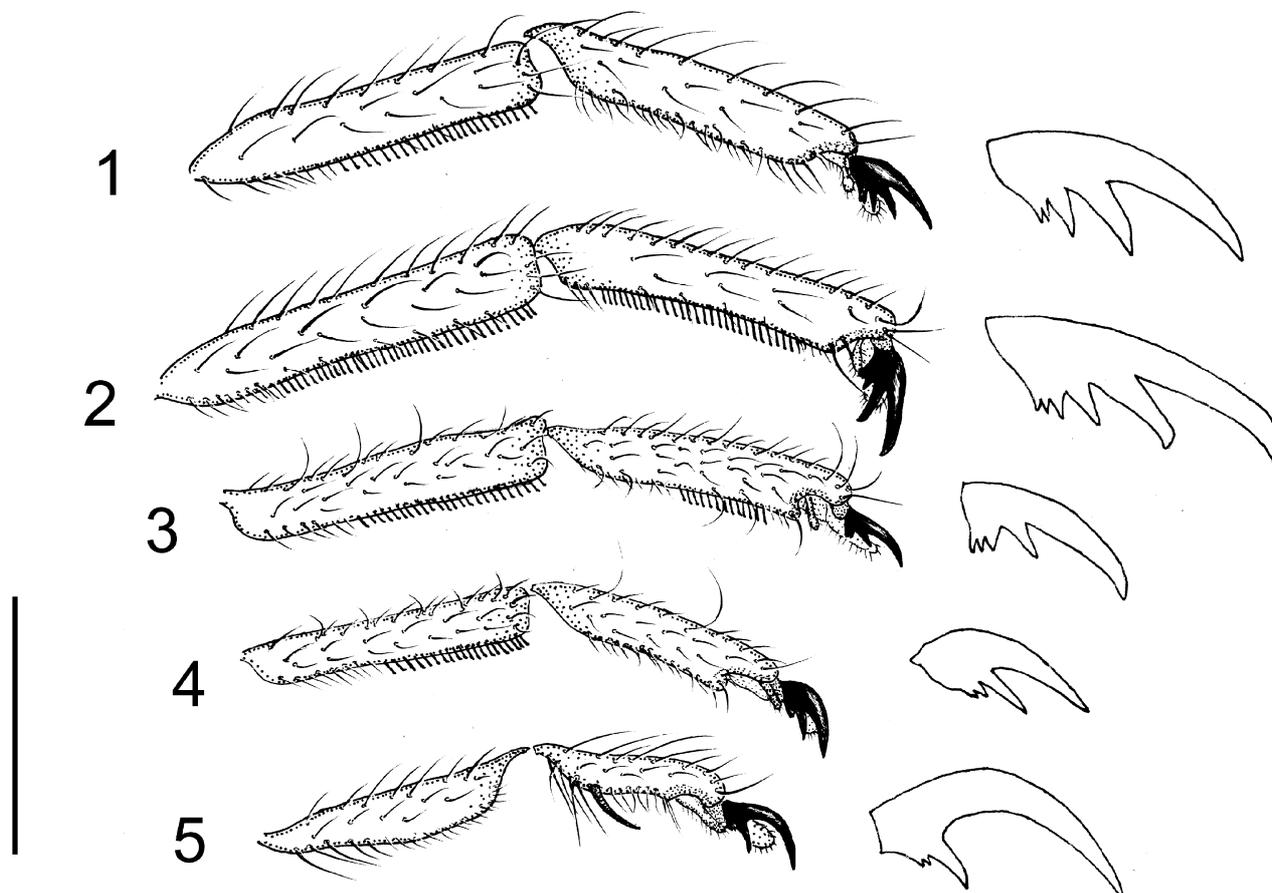
Redescription. Male. Head with grey pruinosity on frons and vertex, rostrum yellowish-brown. Antenna dark brown, reaching to about anterior margin of prescutum. Flagellomeres short-ovoid, gradually narrowed towards apex of antenna, with verticils shorter than to subequal in length to respective segments. Palpus dark brown.

Thorax generally greyish-brown, restrictedly yellowed. Pronotum brown, yellowed laterally. Prescutum brown, with heavy grey pruinosity; scutal lobes, scutellum, and mediotergite variously yellowed laterally. Pleuron mostly brown, yellowed on dorsopleural membrane, with pale grey pruinosity. Wing pattern of varying intensity, often distinct, consisting of two spots at anterior margin, one, smaller, over origin of Rs and another, much larger and quadrangular, over distal part of R₁ (pterostigma), and additional markings over apex of Rs (sometimes confluent with pterostigma) and along so-called outer cord; another seam along distal margin of discal cell (Fig. 16). Sc₁ with row of macrotrichia posteroventrally. Halter with knob infuscated. Legs with coxae and trochanters yellow. Femora yellow with brown subapical ring, sometimes darkening extending to apex, resulting in long ring. Tibiae and tarsi darker. Two last tarsomeres long, subequal in length, straight, parallel-sided, rod-like; tarsomere 4 with longitudinal row of stiff, short, suberect setae ventrally; setae indistinctly hooked at tip. Tarsal claws moderately long, slightly less than one third length of tarsomere 5, with well-developed tooth proximal to mid-length, this tooth rather pointed, and another one still fairly distinct. Other teeth little-distinct (Fig. 1).

Abdomen dark brown dorsally, paler ventrally. Male terminalia (Fig. 6): Tergite 9 rather long, about twice as broad as long, with shallow, often V-shaped, median emargination at posterior margin and mostly complete median suture. Gonocoxite moderately long, about half length of ventral gonostylus. The latter long-ovoid, about twice as

long as broad. Rostral prolongation of ventral gonostylus truncate close beyond medial spine. Rostral spines gently curved, separated at base by their own breadth, or somewhat less so.

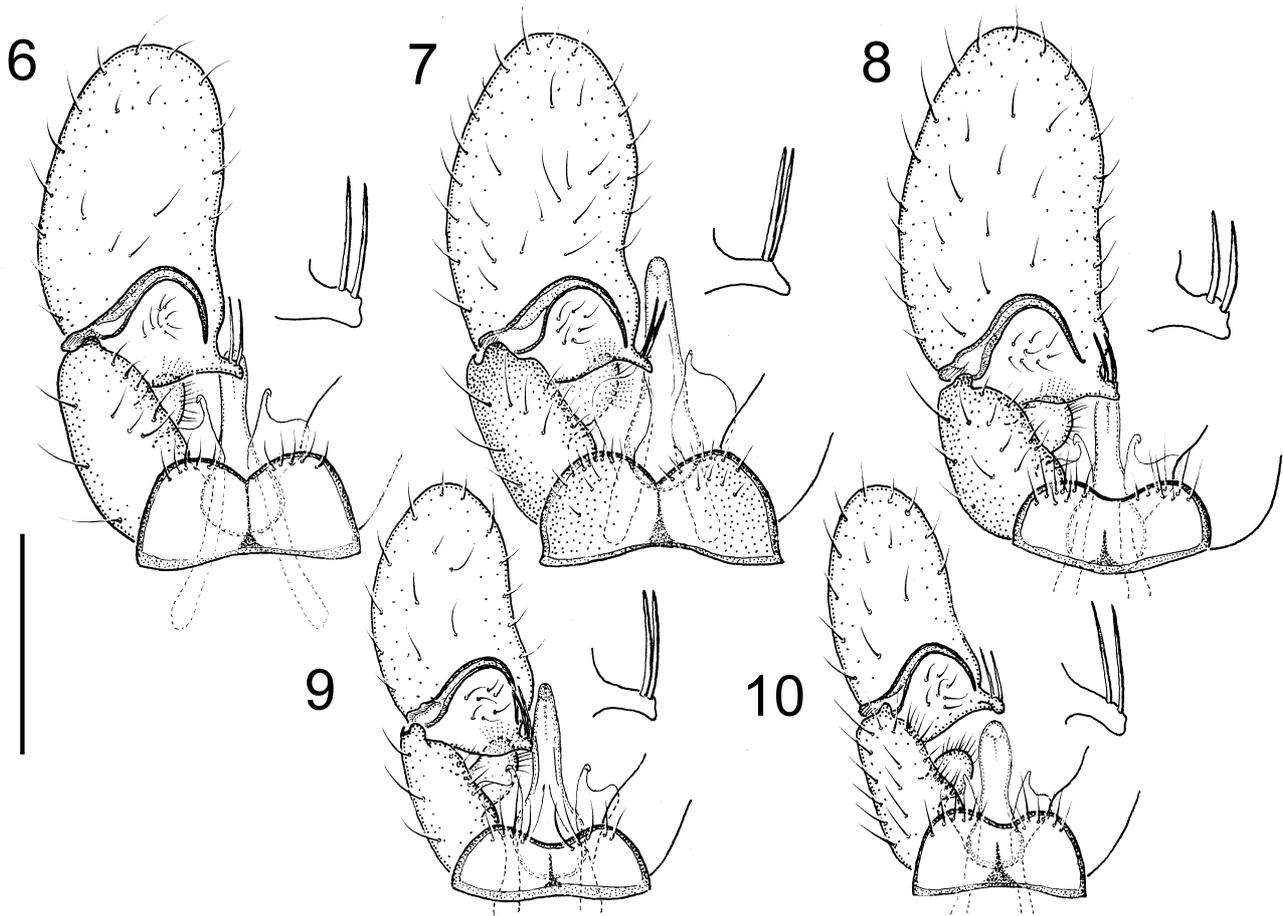
Female. Resembling male in general appearance, including structure of tarsi and tarsal claws. Female terminalia (Fig. 11): Cercus gently upturned, slightly shorter than tergite 10. Space between cerci wide, subequal in width to cercus breadth at base, but shorter than that of *D. (D.) affinis*. Genital fork (vaginal apodeme) triangular, extending to posterior margin of tergite 10. Sternum 9 moderately long, about one third length of tergite 10.



FIGURES 1–5. Two distal tarsomeres and tarsal claw (with details of tarsal claw). 1—*D. (D.) mitis* (Czech Republic: Bohemia: Šumava Mts). 2—*D. (D.) affinis* (Morocco: Rif Mts). 3—*D. (D.) quadra* (Czech Republic: Moravia: Hrubý Jeseník Mts). 4—*D. (D.) lutea* (Czech Republic: Moravia: Moravskoslezské Beskydy Mts). 5—*D. (D.) imbecilla* (Czech Republic: Moravia: Hrubý Jeseník Mts). Scale bar 0.25 mm.

Material examined (58 ♂, 23 ♀). **Austria:** Niederösterreich: Gutenstein env., 17.v.1994, 1 ♂ (J. Starý leg., JSO). **Bulgaria:** Sofia, Vitosha Mt., 8.v.1981, 1 ♂; Ostar Kamak, 3.v.1980, 3 ♂, 2 ♀, 5.v.1980, 1 ♀, 6.v.1980, 4 ♂, 1 ♀ (all W. Krzemiński leg., all JSO). **Czech Republic:** Bohemia: Bílina, Vršíček, 24.v.1996, 1 ♀ (M. Barták leg.); Šumava Mts, Pěkná, Vltava shores (750 m), 4.vi.2004, 2 ♂; Zvíčina [hill] nr. Dvůr Králové, 24.v.1972, 1 ♂ (all J. Starý leg., all JSO). Moravia: Hrubý Jeseník Mts (= Jeseníky Mts), Rejvíz (700 m), 2.vi.1971, 1 ♂, 17.v.2000, 4 ♂; Hrubý Jeseník Mts, Kouty nad Desnou, Divoká Desná valley, “Zámčisko” (970 m), 14.vi.2004, 1 ♂; Hrubý Jeseník Mts, Vidly, “Jelení bučina” (900 m), 16.vi.1998, 1 ♂; Hrubý Jeseník Mts, Petrovy kameny, peat-bog (1330 m), 2.vi.1998, 2 ♂; Hrubý Jeseník Mts, Karlova Studánka (900 m), 2.vi.1998, 1 ♂, 1 ♀, 13.v.1999, 1 ♂; Domašov nad Bystřicí, 29.v.1969, 1 ♂; Libavá env., Nové Oldřůvky, Odra valley, 2.vi.1993, 1 ♂; Hrubá Voda nr. Olomouc, 15.v.1969, 2 ♂; Hlubočky nr. Olomouc, 6.v.1967, 1 ♀; Střeň nr. Olomouc, 17.v.1967, 1 ♂; Slatinice, Kosíř, 14.v.1967, 1 ♂; Bukovec nr. Jablunkov, 25.vi.1997, 1 ♀; Moravskoslezské Beskydy Mts (= Beskydy Mts), Pustevny (1000 m), 26.vi.1985, 2 ♂, 2 ♀; Moravskoslezské Beskydy Mts, “Malinová” (700–800 m), 15.vi.1989, 1 ♀, 27.vi.1991, 1 ♀; Moravskoslezské Beskydy Mts, Prostřední Bečva (500–600 m), 13.v.1992, 1 ♂, 3.v.1994, 2 ♂, 1 ♀, 10.v.1994, 4 ♂, 1 ♀; Moravskoslezské Beskydy Mts, Košařiska, 7.–8.vi.1995, 1 ♂ (at light); Moravskoslezské Beskydy Mts, Ostrý (500–1000 m), 7.vi.1995, 1 ♂; Moravskoslezské Beskydy Mts, Šance, “Vřesová stráň”, 25.vi.1997, 1 ♂; Lešná nr. Zlín (= nr. Gottwaldov), 23.v.1967, 1 ♂; Hostýnské vrchy [hills], “Bernardka” (500 m),

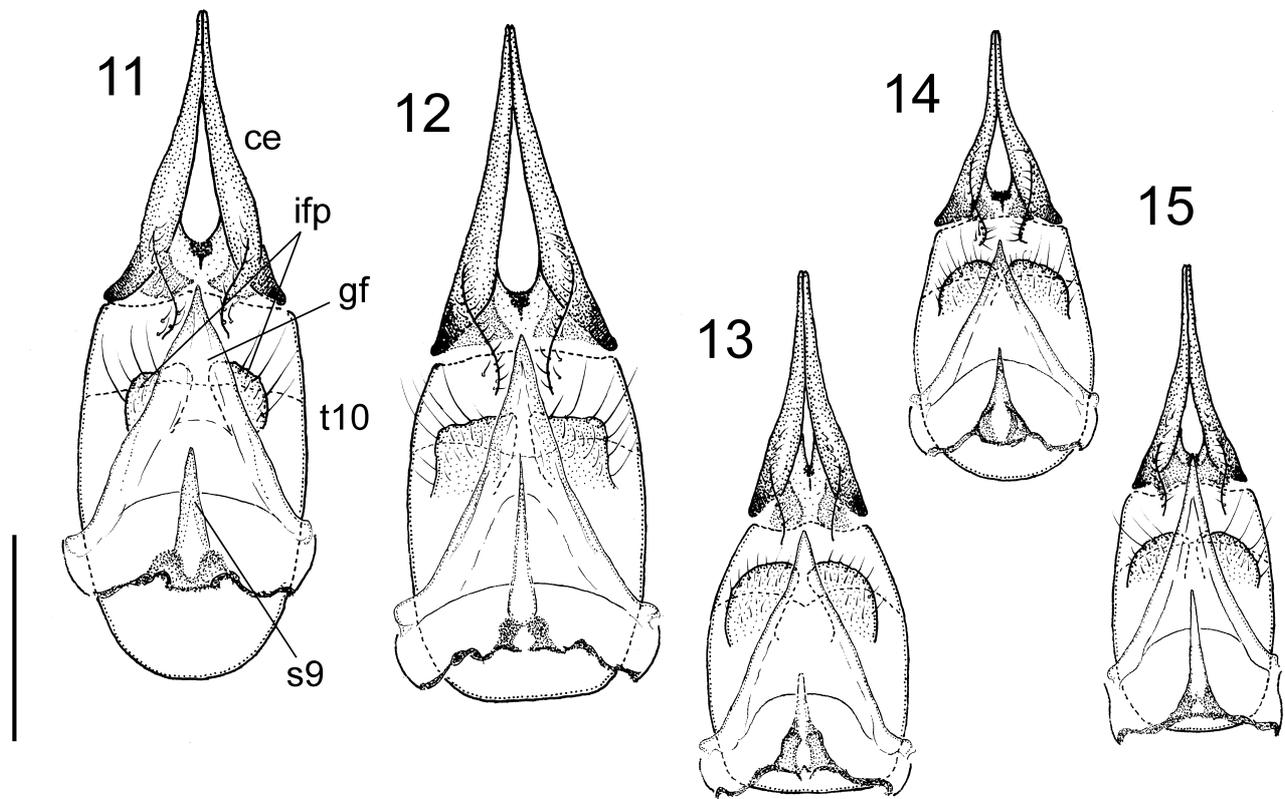
12.vi.1992, 2 ♂; Nejdeček nr. Lednice, 22.v.2002, 1 ♂ (at light) (all J. Starý leg., all JSO). **Great Britain:** England: Hertfordshire, Letchworth, v.1918, 1 ♂, 1 ♀; Hertfordshire, Radwell, v.1918, 1 ♀; Hertfordshire, Felden, 10.v.1897, 1 ♀ (all F.W. Edwards leg.); Herefordshire, Pentelow (Glen) (part of Haugh Wood), 16.v.1878, 1 ♂ (J.H. Wood leg.); Hampshire, Frant, 16.vi.1886, 1 ♂ (G.H. Verrall leg.); Middlesex, Harrow, 6.v.1915, 1 ♀ (F.W. Edwards leg.) (all BMNH). Scotland: Nethy Bridge, 1.vii.1906, 1 ♀; Aviemore, 26.vi.1903, 1 ♀ (all J.J.F.X. King leg., all BMNH). **Slovakia:** Malá Fatra Mts, Biela (700 m), 28.v.1992, 2 ♂; Zuberec, Pálenica Mt., 25.vi., 1998, 1 ♂; Belianske Tatry Mts, Tristárska valley, 26.v.1976, 2 ♂, 1 ♀; Poľana Mts, Kyslinky, “Majerová” (850 m), 18.vi.2003, 2 ♂, 1 ♀; Poľana Mts, Čierny Potok (700 m), 25.v.2005, 1 ♂ (at light); Slovenský kras, Zádiel, plain, 22.v.1978, 1 ♂; Ruský Potok, 14.vi.1991, 1 ♀; Nová Sedlica, “Stužica”, 16.vi.1991, 1 ♂ (all J. Starý leg., all JSO).



FIGURES 6–10. Male terminalia, general view, dorsal (with details of rostral prologation of ventral gonostylus). 6—*D. (D.) mitis* (Czech Republic: Bohemia: Šumava Mts). 7—*D. (D.) affinis* (Morocco: Rif Mts). 8—*D. (D.) quadra* (Czech Republic: Moravia: Hrubý Jeseník Mts). 9—*D. (D.) lutea* (Czech Republic: Moravia: Moravskoslezské Beskydy Mts). 10—*D. (D.) imbecilla* (Czech Republic: Moravia: Hrubý Jeseník Mts). Scale bar 0.5 mm.

Discussion. The two species, *D. (D.) mitis* and *D. (D.) affinis*, are distinctive in having a row of setae on Sc_1 posteroventrally, whereas the other three species (*D. (D.) quadra*, *D. (D.) lutea*, and *D. (D.) imbecilla*) have Sc_1 smooth, devoid of setae. Even if the setae are rubbed off in dry-mounted material their sockets are always fairly distinct under higher magnification. At the first sight *D. (D.) mitis* and *D. (D.) affinis* are different in general body colouration. This is greyish-brown in *D. (D.) mitis*, with predominant brown hue, but much darker, rather dark brownish to bluish-grey in *D. (D.) affinis*, with the ground colour black. Slight differences may also be seen in the structure of the male tarsomeres 4 and 5 and the male tarsal claws. In *D. (D.) mitis*, only tarsomere 4 bears stiff, short, suberect setae ventrally and the first tooth of the claw is rather pointed, whereas, in *D. (D.) affinis*, both tarsomeres 4 and 5 have the stiff setae and the first tooth of the claw is somewhat truncate (cf. Figs 1 and 2). The male terminalia of *D. (D.) mitis* have the rostral prolongation of the ventral gonostylus truncate close beyond the medial spine and the rostral spines separated at base by their own breadth. In contrast, in *D. (D.) affinis*, as the single species within the cluster, the rostral prolongation is slightly produced beyond the medial spine, and the

rostral spines are separated at base by less than their own breadth (cf. Figs 6 and 7). The female terminalia of *D. (D.) mitis* have the cerci slightly shorter than tergite 10, and sternum 9 is about one third the length of tergite 10, whereas, in *D. (D.) affinis*, the cerci are subequal in length to tergite 10 and sternum 9 is more than half the length of tergite 10 (cf. Figs 11 and 12).



FIGURES 11–15. Female terminalia, internal structures, ventral. 11—*D. (D.) mitis* (Czech Republic: Moravia: Moravskoslezské Beskydy Mts). 12—*D. (D.) affinis* (Morocco: Rif Mts). 13—*D. (D.) quadra* (Czech Republic: Moravia: Hrubý Jeseník Mts). 14—*D. (D.) lutea* (Czech Republic: Moravia: Moravskoslezské Beskydy Mts). 15—*D. (D.) imbecilla* (Czech Republic: Moravia: Hrubý Jeseník Mts). Scale bar 0.5 mm. ce—cerci; gf—genital fork (vaginal apodeme); ifp—infra-anal plate; s9—sternum 9; t10—tergite 10.

Ecology. In Great Britain, the species is widespread in the southern half of England, mainly on well-drained clay or limestone soils. It is absent on acid soils, can be present under mesotrophic conditions, but shows greatest affinity to mild or strong calcareous situations, preferring scrub edges associated with calcareous grassland. It is found more patchily to the north and west. The species can occur within woodland, but rarely in numbers. It is a member of the vernal fauna (May–early June), but, on an exceptional occasion, it was found in the autumn (October) (AS). In the Czech Republic and Slovakia, this is the commonest and most widespread species occurring from high altitudes to lowland (JS).

Distribution. The species has been recorded from the whole of Europe, including adjacent territories as far south as Morocco and Algeria and as far east as Turkmenistan (Oosterbroek 2014). Although confirmed here for Austria, Bulgaria, Czech Republic, Great Britain, and Slovakia only (Germany should also be included as a country of a probable type locality of *mitis*, see Meigen 1830), occurrence of the species throughout Europe is to be expected.

Dicranomyia (Dicranomyia) affinis (Schummel, 1829)

Figs 2, 7, 12, 17

Limnobia affinis Schummel 1829: 127 (description).

Limonia (Dicranomyia) mitis var. *affinis*: Edwards 1938: 36 (diagnosis), Plate 2, Fig. 19 (wing).

Dicranomyia affinis: Stubbs 1998a: 22 (key), Fig. (male terminalia).

Diagnosis. Medium-sized species. Body colouration dark brownish-grey to bluish-grey, variegated with obscure yellow. Wing pattern with pterostigma dark brown, fairly conspicuous; other markings little-distinct. Sc₁ with row of macrotrichia posteroventrally. Two last male tarsomeres long, parallel-sided; male tarsal claws moderately long, with two teeth fairly distinct. Male terminalia with rostral prolongation of ventral gonostylus slightly produced beyond medial spine; rostral spines almost straight, separated at base by less than their own breadth. Female terminalia with cercus subequal in length to tergite 10; space between cerci wide, subequal in width to cercus breadth at base. Wing length 6.1–8.5 mm.

Redescription. Male. Head with dark grey pruinosity on frons and vertex, rostrum brown. Antenna dark brown, reaching to about anterior margin of prescutum. Flagellomeres ovoid, gradually narrowed towards apex of antenna, with verticils shorter than respective segments. Palpus dark brown.

Thorax generally dark brownish-grey to bluish-grey, restrictedly yellowed. Pronotum dark greyish-brown, more shiny medially. Prescutum almost black with heavy dark brownish-grey to bluish-grey pruinosity and with shiny, dust-free, black median stripe; sometimes short lateral stripes apparent; other dorsal parts of thorax much as prescutum, dark brownish-grey to bluish-grey; scutellum somewhat brownish. Pleuron mostly concolorous with prescutum, yellowed on dorsopleural membrane. Wing with pterostigma dark brown, fairly conspicuous, other markings little-distinct and less extensive than in *D. (D.) mitis* (Fig. 17). Sc₁ with row of macrotrichia posteroventrally. Halter with knob infuscated. Legs with coxae and trochanters obscure yellow. Femora obscure yellow at base, more darkened distally, with vaguely defined subapical ring. Tibiae obscure yellow merging into darker apex. Tarsi dark brown. Two last tarsomeres long, subequal in length, straight, parallel-sided, rod-like, both with longitudinal row of stiff, short suberect setae ventrally; setae indistinctly hooked at tip. Tarsal claws moderately long, slightly less than one third length of tarsomere 5, with well-developed tooth at mid-length, this tooth somewhat truncate at apex, and another one still fairly distinct. Other teeth little-distinct (Fig. 2).

Abdomen dark brown dorsally, paler ventrally. Male terminalia (Fig. 7): Tergite 9 rather long but slightly shorter than that in *D. (D.) mitis*, more than twice as broad as long, with shallow, often V-shaped emargination at posterior margin and incomplete median suture. Gonocoxite mostly darker than that in *D. (D.) mitis*, moderately long, about half length of ventral gonostylus. The latter long-ovoid, about twice as long as broad. Rostral prolongation of ventral gonostylus slightly produced beyond medial spine. Rostral spines almost straight, positioned close beside or even behind one another, sometimes equidistant from apex of rostrum, separated at base by less than their own breadth.

Female. Resembling male in general appearance, including structure of tarsi and tarsal claws. Female terminalia (Fig. 12): Cercus gently upturned, subequal in length to tergite 10. Space between cerci wide, subequal in width to cercus breadth at base, but longer than that in *D. (D.) mitis*. Genital fork (vaginal apodeme) triangular, extending to posterior margin of tergite 10. Sternum 9 long, more than half length of tergite 10.

Material examined (28 ♂, 21 ♀). **Great Britain:** England: Hertfordshire, Knebworth, vi.1922, 1 ♂ (F.W. Edwards leg.); Herefordshire, Cusop Dingle (Herefordshire/Wales boundary), 3.vi.1899, 1 ♀ (J.H. Wood leg.); Hampshire, Lyndhurst (New Forest), 9.vi.1885, 1 ♀, 10.vi.1885, 1 ♀ (G.H. Verrall leg.); Hampshire, Lyndhurst (New Forest), 18.iv.1894, 1 ♀ (J.W. Yerbury leg.); New Forest, 16.v.1899, 1 ♂, 1 ♀ (F.C. Adams leg.) (all BMNH). Scotland: Isle of Rhum (West Scotland), stream below Halival, 24.v.1960, 1 ♂ (A. Brindle leg.); Aviemore, 7.vii.1903, 1 ♀; Argyll, Ardentinn, 13.vi.1903, 1 ♀ (all J.J.F.X. King leg.); Isle of Arran, Catacoul, 29.–30.v.1919, 3 ♂; Isle of Arran, Brodrick, 22.–25.v.1919, 2 ♂; Isle of Arran, Sannox, 26.–28.v.1919, 1 ♀ (all F.W. Edwards leg.) (all BMNH). **Italy: Sardinia:** Monti 3 km SE, road 389 (maquis) (550 m), 40°48'N 9°21'E, 7.v.2014, 2 ♀; Monti 8.1 km S, Rio de s'Éleme, road bridge (riverside vegetation) (465 m), 40°44'N 9°22'E, 10.v.2014, 1 ♀; Mazzinaiu nr. Alà dei Sardi, 3.5 km NE (maquis) (504 m), 40°44'N 9°24'E, 7.v.2014, 1 ♂, 2 ♀ (all J. Starý leg., JSO). **Morocco:** Rif Mts: Jbel Bouhachem, Daya Mtahen, marsh, 27.iv.2012, 4 ♂, 1 ♀; Jbel Bouhachem, Oued Asmlil, 27.iv.2012, 1 ♂, 1 ♀; Jbel Bouhachem, Oued Tkaraâ, 10.iii.2011, 1 ♂; Jbel Khizana, Azghar, brook, 27.iv.2013, 1 ♂, 27.iv.2014, 1 ♂, 1 ♀; Jbel Khizana, Oued near Ain Ima Bared, 6.v.2014, 1 ♂; Jbel Zem Zem, marsh, 25.iv.2014, 1 ♂; Ain Sibi Brahim Ben Arrif, 17.iv.2013, 2 ♂, 1 ♀, 25.iv.2014, 2 ♂, 3 ♀; Parc National Talassemtane, 17.v.2014, 1 ♂; Daya Tazia, marsh, 25.iv.2014, 4 ♂, 1 ♀ (all B. Belqat & O. Driauach leg., partly in ethanol, JSO, UAEM).

Discussion. Although the two species, *D. (D.) affinis* and *D. (D.) mitis*, are very different in general appearance, they are most similar structurally, and closely related to each other. The differences are specified in Discussion of *D. (D.) mitis*. In females of *D. (D.) affinis*, the two parts of the infra-anal plate may not be as angled as in Fig. 12.



FIGURES 16–20. Wing. 16—*D. (D.) mitis*. 17—*D. (D.) affinis*. 18—*D. (D.) quadra*. 19—*D. (D.) lutea*. 20.—*D. (D.) imbecilla* (photo by J. Roháček). Scale bar 1.0 mm.

Ecology. In Great Britain, the species is found most commonly on acid soils, especially in damp places and high rainfall situations. This results in a patchy distribution in much of England, but with more widespread habitat in the north and west of Britain. On heathland and moorland, *D. (D.) affinis* can occur among heather and at scrub edges or in the shelter of rocks, ravines, and tree-lined streams. In woodland, it is most frequent in open-structured canopy where damp spots are situated, or it is to be found along rides. Apart from sand, gravel and other typically acid rocks, some clay soils provide acid conditions. In the south, where drought conditions can be intense, there can be a strong affinity with bush-shaded ditches. The flight period can begin early, in April, and extends into early summer (July) (AS).

Distribution. Great Britain, Ireland, Poland; Morocco (Oosterbroek 2014). In fact, no primary data from Morocco were published (see Driauach *et al.* 2013, Oosterbroek 2014). First record for Italy (Sardinia).

***Dicranomyia (Dicranomyia) quadra* (Meigen, 1838), sp. restit.**

Figs 3, 8, 13, 18

Limnobia quadra Meigen 1838: 29 (description).

? *Dicranomyia hygropetrica* Vaillant 1952: 250 (description), Figs 11 (tarsal claw), 13–14 (male terminalia).

Limnobia quadra: Morge 1976, Plate 78, Fig. 6 (general view).

Species A: Stubbs 1998a: 23 (key), Fig. (wing, male terminalia).

Diagnosis. Medium-sized species. Body colouration ochreous to yellowish-brown, variegated with yellow. Wing pattern with only quadrangular pterostigma fairly distinct; other markings feebly indicated. Sc₁ without any macrotrichia. Two last male tarsomeres long, parallel-sided; male tarsal claws with only one tooth fairly distinct. Male terminalia with rostral prolongation of ventral gonostylus truncate close beyond medial spine; rostral spines shorter than those of other species treated here, gently curved, separated at base by their own breadth. Female terminalia with cercus subequal in length to tergite 10; space between cerci very narrow, about one third width of cercus breadth at base. Wing length 6.5–9.5 mm.

Redescription. Male. Head with silvery grey pruinosity on frons and vertex, yellowish-brown at base, rostrum yellowish-brown. Antenna brown, reaching to about anterior margin of prescutum. Flagellomeres ovoid, with verticils slightly shorter than respective segments. Palpus dark brown.

Thorax generally ochreous to yellowish-brown. Pronotum ochreous, sometimes slightly darker posteromedially. Prescutum ochreous, with pale grey pruinosity, sometimes darker medially as well as on scutal lobes; scutellum and mediotergite yellowed anteriorly. Pleuron ochreous, slightly paler than dorsum of thorax. Wing with pterostigma moderately distinct, quadrangular; narrow, sometimes little-distinct seam along so-called outer cord (Fig. 18). Sc₁ without any macrotrichia. Halter with knob infuscated. Legs generally yellow to yellowish-brown, tips of femora, tibiae and tarsal segments slightly darkened. Two last tarsomeres darker, rather long, subequal in length, straight, parallel-sided, rod-like, both with longitudinal row of stiff, short, suberect setae on distal half ventrally; setae indistinctly hooked at tip. Tarsal claws shorter than those in *D. (D.) mitis* and *D. (D.) affinis*, about one fourth length of tarsomere 5, with one well-developed tooth at one third length, other teeth little-distinct (Fig. 3).

Abdomen brown dorsally, paler ventrally. Male terminalia (Fig. 8): Tergite 9 distinctly shorter than in *D. (D.) mitis* and rather narrow, more than twice as broad as long, with shallow, rather U-shaped, median emargination at posterior margin and usually incomplete median suture. Gonocoxite enlarged laterally at base, comparatively short, distinctly less than half length of ventral gonostylus. The latter long-ovoid, about twice as long as broad. Rostral prolongation of ventral gonostylus truncate close beyond medial spine. Rostral spines shorter and broader than in other species treated here, gently curved, separated at base by their own breadth.

Female. Resembling male in general appearance, including structure of tarsi and tarsal claws. Female terminalia (Fig. 13): Cercus gently upturned, subequal in length to tergite 10. Space between cerci very narrow, about one third width of cercus breadth at base. Genital fork (vaginal apodeme) triangular, extending to posterior margin of tergite 10. Sternum 9 short, about one third length of tergite 10.

Material examined (55 ♂, 25 ♀). **Bulgaria:** Kresna nr. Simitli, 30.v.1976, 1 ♂ (K. Majer leg.); Ostar Kamak, 6.v.1980, 2 ♂, 1 ♀ (W. Krzemiński leg.) (all JSO). **Czech Republic:** Bohemia: Šumava Mts, Horská Kvilda, Hamerský brook, 6.vii.1992, 1 ♂ (J. Starý leg., JSO). Moravia: Hrubý Jeseník Mts, Branná, “Dembauda”,

17.vii.1972, 1 ♂; Hrubý Jeseník Mts, Kouty nad Desnou, Divoká Desná valley, “Zámčisko” (970 m), 26.vi.2003, 3 ♂, 2 ♀, 21.vii.2003, 1 ♂, 1 ♀, 21.vii.2009, 1 ♂; Hrubý Jeseník Mts, Praděd, Bílá Opava valley (900–1000 m), 26.vii.1994, 1 ♂; Bedřichov nr. Oskava, 11.vi.1975, 1 ♂; Rešov, waterfall, 17.vi.1969, 1 ♀; Jívová nr. Olomouc, 27.vi.1969, 1 ♂, 14.vi.1978, 1 ♂; Hrubá Voda nr. Olomouc, 23.vi.1970, 1 ♂; Moravskoslezské Beskydy Mts, Tanečnice (900–1000 m), 18.vii.1985, 1 ♂, 2 ♀, 15.vi.1989, 1 ♂, 23.vi.1989, 1 ♂, 12.vii.1990, 1 ♂; Moravskoslezské Beskydy, “Malinová” (700–800 m), 27.vi.1991, 1 ♂, 17.vii.1991, 1 ♂, 24.vi.1993, 3 ♂; Moravskoslezské Beskydy Mts, Prostřední Bečva (500–600 m), 4.vi.1992, 1 ♂, 30.vii.1992, 1 ♀, 9.vi.1993, 2 ♂, 18.vi.1993, 3 ♂, 1 ♀, 23.vi.1993, 1 ♂, 2 ♀, 7.vi.1994, 1 ♂ (all J. Starý leg., all JSO). **Great Britain:** England: Westmorland, Loughrigg, 3.vi.1968, 1 ♂; Westmorland, Stock Ghyll, 3.vi.1968, 1 ♂, 3 ♀ (all A.M. Hutson leg., all BMNH). Scotland: Kinlochewe, 4.vii.1953, 1 ♀; Kinlochewe, Ben Eighe, 11.vii.1953, 1 ♂, 1 ♀ (all O.W. Richards leg.); Eigg Isle (West Scotland), Cleadale, by stream, 28.v.1970, 6 ♂, 1 ♀ (A.M. Hutson leg.); Glenshiel, 30.VI.1934, 2 ♂ (O.W. Richards leg.); Balmoral Forest, 24.vi.–13.vii.1951, 1 ♂ (R.L. Coe leg.); Isle of Arran, Catacoul, 29.–30.v.1919, 2 ♂ (F.W. Edwards leg.); Glen Lyon, 14.vii.1955, 1 ♀ (L. Parmenter leg.) (all BMNH). Wales: Flint, Frith, 7.–9.vi.1919, 2 ♂, 1 ♀ (F.W. Edwards leg., BMNH). **Greece:** Region Pieria: Olympos Mts, Prionia (1000–1200 m), 1.vi.2007, 2 ♂, 6.vi.2007, 2 ♂, 4 ♀ (J. Starý leg., JSO). **Italy: Sardinia:** Monte Albo Mts, Siniscóla 5 km W, nr. Sant’Anna (maquis) (715 m), 40°35’N 9°38’E, 9.v.2014, 1 ♀; Monte Albo Mts, Simiscóla 4.3 km W (brook) (570 m), 40°35’N 9°39’E, 9.v.2014, 1 ♀ (all J. Starý leg., all JSO). **Slovakia:** Zuberec env., 23.vi.1998, 1 ♂; Vysoké Tatry Mts, Nové Štrbské pleso, 22.vii.1969, 1 ♂; Belianske Tatry Mts, Skalné Vratá, 24.vii.1969, 1 ♂ (all J. Starý leg., all JSO).

Discussion. By its size and general body colouration *D. (D.) quadra* somewhat resembles pale specimens of *D. (D.) mitis*, but it lacks setae on Sc₁. Male tarsal claws are shorter than those in *D. (D.) mitis* and *D. (D.) affinis*, about one fourth the length of tarsomere 5 (Fig. 3). Male terminalia of *D. (D.) quadra* show traits not seen in the other species treated here: tergite 9 proportionally small; gonocoxite comparatively short and broad, distinctly less than half the length of the ventral gonostylus, enlarged laterally at base; rostral spines shorter than in the other species (Fig. 8). Female terminalia have the space between cerci very narrow, about one third the width of cercus breadth at base, which is not the case for the other species treated here (Fig. 13).

Ecology. In Great Britain, this is a northern and western species though locally present in more southerly parts. It can occur in abundance by woodland streams and modest-sized rivers, including ravines. It can be found in company with *D. (D.) lutea* and *D. (D.) imbecilla*. The flight season can extend from June to August (AS).

Distribution. The species is here recorded for Bulgaria, Czech Republic, Great Britain, Greece, Italy (Sardinia), and Slovakia; other country records are Germany (probable type locality of *quadra*, see Meigen 1838) and possibly Algeria (type locality of *hygropetrica*, see Vaillant 1952). Probably widespread throughout Europe.

Dicranomyia (Dicranomyia) lutea (Meigen, 1804)

Figs 4, 9, 14, 19

Limonia lutea Meigen 1804: 55 (description).

Limonia (Dicranomyia) mitis var. *lutea*: Edwards 1938: 37 (diagnosis).

Dicranomyia lutea: Stubbs 1998a: 23 (key), Fig. (male terminalia).

Diagnosis. Small species. Body colouration yellow to ochreous. Wing clear, with only sometimes feebly indicated pterostigma. Sc₁ without any macrotrichia. Two last male tarsomeres long, parallel-sided; tarsal claws with only one tooth fairly distinct. Male terminalia with rostral prolongation of ventral gonostylus truncate close beyond medial spine; rostral spines gently curved, separated at base by less than their own breadth. Female terminalia with cercus shorter than in other species, about two thirds length of tergite 10; space between cerci subequal in width to cercus breadth at base. Wing length 5.5–8.0 mm.

Redescription. Male. Head with grey pruinosity on frons and vertex, yellowed at base, rostrum yellowish-brown. Antenna dark brown, reaching to about anterior margin of prescutum, with flagellomere 1 yellowed proximally. Flagellomeres short-ovoid, gradually narrowed towards apex of antenna, with verticils shorter than respective segments. Palpus yellowish-brown on palpomere 1, otherwise dark brown.

Thorax generally yellow to ochreous. Pronotum ochreous. Prescutum ochreous, sometimes darker medially and yellowed laterally, with thin pale grey pruinosity, scutal lobes darker medially; scutellum paler, mediotergite

usually dark brown. Pleuron concolorous with prescutum, darker on katapisternum and paler on dorsopleural membrane. Wing clear except for at most feebly indicated pterostigma (Fig. 19). Sc₁ without any macrotrichia. Halter with slightly infuscated knob. Legs with coxae and trochanters yellow. Femora yellow, with slightly darker apical ring. Tibiae yellow, darker on both ends, tarsi darker. Two last tarsomeres rather long, former slightly longer than latter, both straight, parallel-sided, rod-like; tarsomere 4 with longitudinal row of stiff, short, suberect setae on distal half ventrally; setae indistinctly hooked at tip. Tarsal claws shorter than those in *D. (D.) mitis* and *D. (D.) affinis*, less than one third length of tarsomere 5, with one well-developed tooth proximal to mid-length, other teeth little-distinct (Fig. 4).

Abdomen brown dorsally, paler ventrally. Male terminalia (Fig. 9): Tergite 9 short, about three times as broad as long, with shallow, rather U-shaped, median emargination at posterior margin and incomplete median suture. Gonocoxite moderately long, about half length of ventral gonostylus. The latter long-ovoid, about twice as long as broad. Rostral prolongation of ventral gonostylus truncate close beyond medial spine. Rostral spines gently curved, close together, separated at base by less than their own breadth.

Female. Resembling male in general appearance, including structure of tarsi and tarsal claws. Female terminalia (Fig. 14): Cercus gently upturned, shorter than in other species treated here, about two thirds length of tergite 10. Space between cerci subequal in width to cercus breadth at base. Genital fork (vaginal apodeme) generally triangular, not reaching to posterior margin of tergite 10. Sternum 9 short, about one third length of tergite 10.

Material examined (33 ♂, 24 ♀). **Czech Republic:** Moravia: Hrubý Jeseník Mts, Rejvíz (700 m), 17.v.2000, 1 ♀; Horní Údolí nr. Zlaté Hory, 9.vii.1991, 1 ♀; Hrubý Jeseník Mts, Karlova Studánka (900 m), 13.v.1999, 1 ♂, 25.v.1999, 1 ♂, 2 ♀; Hrubá Voda nr. Olomouc, 25.vi.1992, 1 ♀; Grygov, quarries, 16.vi.1994, 2 ♂, 1 ♀; Moravskoslezské Beskydy Mts, Pustevny (1000 m), 26.vi.1985, 1 ♂; Moravskoslezské Beskydy Mts, “Malinová” (700–800 m), 19.vii.1990, 1 ♀, 24.vii.1990, 1 ♀, 22.v.1991, 1 ♂, 24.vi.1993, 1 ♂; Moravskoslezské Beskydy Mts, Prostřední Bečva (500–600 m), 4.vi.1992, 1 ♂, 30.vii.1992, 1 ♀, 18.vi.1993, 1 ♂, 1 ♀, 23.vi.1993, 3 ♂, 10.v.1994, 5 ♂, 1 ♀, 1.vi.1994, 2 ♂, 7.vi.1994, 1 ♂; Moravskoslezské Beskydy Mts, Horní Bečva, “Kladnatá”, 14.vi.1989, 1 ♀; Hostýnské vrchy [hills], “Bernardka” (500 m), 12.vi.1992, 1 ♂; Mohelno, 10.vi.1972, 1 ♂ (all J. Starý leg., all JSO). **Great Britain:** England: Staffordshire, Alton Towers, 23.vi.1911, 1 ♀; Hertfordshire, Baldock, vi.1918, 1 ♀; Hertfordshire, Letchworth, 8.vi.1928, 1 ♀; Bedfordshire, Barton, 8.–9.vii.1928, 1 ♀ (all F.W. Edwards leg.); Avon Gorge, 18.vi.1908, 2 ♀ (J.J.F.X. King leg.); East Sussex, Frant, 16.vi.1886, 1 ♂; East Sussex, Loughton, 5.vi.1888, 1 ♂, 2 ♀ (all G.H. Verrall leg.); South Devon, Dartmouth, 28.–31.v.1920, 1 ♂, 1 ♀ (F.W. Edwards leg.) (all BMNH). Wales: Flintshire, Ffrith, 7.–9.vi.1919, 1 ♀; Denbighshire, Llangollen, 30.vi.1914, 1 ♀ (all F.W. Edwards leg., all BMNH). **Slovakia:** Malá Fatra Mts, Biela (700 m), 28.v.1992, 2 ♂; Bielanske Tatry Mts, Tatranská Kotlina, Biela valley (750 m), 26.vi.1977, 1 ♂; Poľana Mts, Kyslinky, “Majerová” (850 m), 18.vi.2003, 1 ♀; Slovenský kras, Zádiel, 12.vi.1982, 1 ♂ (at light); Nová Sedlica env., 10.vi.1996, 1 ♂, 13.vi.1996, 3 ♂ (all J. Starý leg., all JSO).

Discussion. Both *D. (D.) lutea* and *D. (D.) imbecilla* are rather similar to each other in their small size and rather pale general appearance. They have overall body colouration mostly yellow to ochreous (pale green to greenish yellow in teneral specimens), restrictedly darker in dry-mounted material, and the wings clear, with at most feebly indicated pterostigma. The males of the two species are best separated on the structure of the tarsomeres and tarsal claws. In *D. (D.) lutea* the two last tarsomeres are rod-like (much as in the other species except for *D. (D.) imbecilla*) and the tarsal claws less than one third the length of tarsomere 5 (as in *D. (D.) quadra*), with one well-developed tooth. In *D. (D.) imbecilla*, these characters are quite different from those of the other species treated here; tarsomere 5 is distinctly shorter than tarsomere 4, somewhat flattened and with a pair of long, unusually stout setae ventrally, and the tarsal claws are about half the length of tarsomere 5, with a single well-developed tooth at base (cf. Figs 4 and 5). Male terminalia of *D. (D.) lutea* have tergite 9 short, about three times as broad as long, and the rostral spines close together, separated at base by less than their own breadth. In *D. (D.) imbecilla*, on the contrary, tergite 9 is longer, about twice as broad as long, and the rostral spines are separated at base by more than their own breadth (cf. Figs 9 and 10). In the female terminalia of *D. (D.) lutea*, the cerci are shorter than in the other species, about two thirds the length of tergite 10, the genital fork does not reach to the posterior margin of tergite 10, which also is a feature not seen in the other species, and sternum 9 is short, about one third the length of tergite 10. In the female terminalia of *D. (D.) imbecilla*, the cerci are longer than in *D. (D.) lutea*, subequal in length to tergite 10, the genital fork extends beyond the posterior margin of tergite 10, which is unique within the species treated here, and sternum 9 is long, more than half the length of tergite 10 (cf. Figs 14 and 15).

Ecology. In Great Britain, the species is common in the southern half of England, mainly on well-drained calcareous clay or limestone soils, preferring scrub edges associated with calcareous grassland. A widespread distribution extends over much of Great Britain where non-acid soils are present. Both *D. (D.) lutea* and *D. (D.) mitis* can be found together, but the former species is the less restricted one. *D. (D.) lutea* can occur within woodland, but rarely in numbers, and notably it can occur by shaded streams where *D. (D.) quadra* also lives. *D. (D.) lutea* flies from late April to June, and its peak of occurrence is in common with *D. (D.) mitis*, but *D. (D.) lutea* may extend into July (AS).

Distribution. Austria, Germany, Great Britain, Ireland (Oosterbroek 2014). It should be noted that this species has so far been interpreted as described by Meigen (1818). It is here recorded for the first time for the Czech Republic and Slovakia, but it seems to be widespread throughout Europe.

***Dicranomyia (Dicranomyia) imbecilla* Lackschewitz in Lackschewitz & Pagast, 1941, stat. n.**

Figs 5, 10, 15, 20

Dicranomyia (Dicranomyia) mitis var. *imbecilla*: Lackschewitz in Lackschewitz & Pagast 1941: 30 (description), Plate 7, Fig. 56 (male terminalia).

Species B: Stubbs 1998a: 23 (key), Figs (male tarsus, male terminalia).

Diagnosis. Small species. Body colouration ochreous to yellowish-brown, very pallid in life. Wing clear, with only sometimes feebly indicated pterostigma. Sc_1 without any macrotrichia. Male tarsomere 5 distinctly shorter than tarsomere 4; male tarsal claws with single well-developed tooth at base. Male terminalia with rostral prolongation of ventral gonostylus truncate close beyond medial spine; rostral spines almost straight, separated at base by more than their own breadth. Female terminalia with cercus subequal in length to tergite 10; space between cerci subequal in width to cercus breadth at base. Wing length 5.3–7.6 mm.

Redescription. Male. Head with light grey pruinosity on frons and vertex, rostrum brown. Antenna brown to dark brown, reaching to about anterior margin of prescutum. Flagellomeres short-ovoid, gradually narrowed towards apex of antenna, with verticils distinctly shorter than respective segments. Palpus dark brown.

Thorax generally ochreous to yellowish-brown, sometimes rather dark dorsally. Pronotum ochreous to dark brown. Prescutum yellowish-brown, with thin pale grey pruinosity, darker medially as well as on scutal lobes; scutellum yellowed anteriorly, mediotergite usually dark brown. Pleuron ochreous, generally paler than dorsum of thorax. Wing clear, practically without any pattern, with at most vaguely indicated pterostigma (Fig. 20). Sc_1 without any macrotrichia. Halter with knob infuscated. Legs practically yellow throughout, with only distal tarsomeres slightly infuscated. Two last tarsomeres short, quite different from those of other species treated here. Tarsomere 5 distinctly shorter than tarsomere 4, somewhat flattened, with sinuous ventral margin and, ventrally, with pair of long unusually stout setae at about two fifths of its length and a few similarly long but fine setae at base. Tarsal claws moderately long, about half length of tarsomere 5, with single well-developed tooth at base (Fig. 5).

Abdomen brown dorsally, paler ventrally. Male terminalia (Fig. 10): Tergite 9 rather long, about twice as broad as long, with shallow, rather U-shaped, median emargination at posterior margin and incomplete median suture. Gonocoxite moderately long, about half length of ventral gonostylus. The latter long-ovoid, about twice as long as broad. Rostral prolongation of ventral gonostylus truncate close beyond medial spine. Rostral spines almost straight, separated at base by more than their own breadth.

Female. Resembling male in general appearance, except that tarsal claws are quite different, much as in females (and also males) of other species treated here. Female terminalia (Fig. 15): Cercus gently upturned, subequal in length to tergite 10. Space between cerci subequal in width to cercus breadth at base. Genital fork (vaginal apodeme) triangular, extending beyond posterior margin of tergite 10. Sternum 9 long, more than half length of tergite 10.

Material examined (85 ♂, 16 ♀). **Bulgaria:** Varna, Pobiti kamni, 28.v.1968, 1 ♂ (J. Starý leg., JSO). **Czech Republic:** Hrubý Jeseník Mts, Branná, Klepáčský brook (700 m), 9.vii.2002, 1 ♂, “Dembauda” (900 m), 21.vii.1999, 1 ♂ (at light), 10.viii.1999, 1 ♂; Horní Údolí nr. Zlaté Hory, 14.viii.1992, 1 ♂, Příčný vrch [hill] (850 m), 11.viii.1992, 1 ♀; Hrubý Jeseník Mts, Kouty nad Desnou, Divoká Desná valley, “Zámčisko” (970 m), 21.vii.2003, 6 ♂, 30.viii.2005, 8 ♂, 2 ♀, 26.viii.2008, 1 ♂, 20.viii.2009, 4 ♂, 1 ♀ (all at light); Hrubý Jeseník Mts, Praděd, Bílá Opava valley (1200–1250 m), 23.ix.1971, 1 ♂, 15.ix.1976, 1 ♂, 7.x.1997, 3 ♂, 17.viii.1998, 3 ♂ (at

light), 27.viii.2002, 2 ♂, 1 ♀ (at light); Hrubý Jeseník Mts, Velká kotlina (over 2000 m), 26.viii.1987, 1 ♂; Hrubý Jeseník Mts, Karlova Studánka (900 m), 5.xi.1993, 2 ♂, 26.viii.1998, 2 ♂; Libavá env., Údolná, Odra valley, 21.vii.1995, 1 ♂; Javoříčko, Špranek valley, 8.vii.1987, 3 ♂, 1 ♀, 10.viii.1995, 1 ♂; Štramberk, Kotouč—quarry, “Mokřadlo”, 10.vii.2001, 1 ♂, 15.viii.2001, 1 ♂ (at light), 30.vi.2003, 1 ♂ (at light), 27.vii.2005, 7 ♂ (at light); Moravskoslezské Beskydy Mts, Tanečnice (900–1000 m), 11.ix.1984, 1 ♂; Moravskoslezské Beskydy Mts, “Malinová” (700–800 m), 19.vii.1990, 1 ♂; Moravskoslezské Beskydy Mts, Prostřední Bečva (600 m), 30.vii.1992, 1 ♂, 19.viii.1992, 1 ♀; Hostýnské vrchy [hills], “Valaška” (500–600 m), 23.vii.1992, 2 ♂; Bílé Karpaty Mts, Javorník, “Machová”, 1.vii.1993, 1 ♂ (all J. Starý leg., all JSO). **Great Britain:** England: Yorkshire, Hayburn Wyke, 18.vii.1996, 1 ♂; Yorkshire, Kilnsey, 13.vii.1995, 3 ♂, 1 ♀ (all A.E. Stubbs, all ASP); Derbyshire, Dovedale, 25.vi.1911, 1 ♂ (F.W. Edwards leg., BMNH); Northumberland, Billamoor, 1.viii.1976, 1 ♂ (A.E. Stubbs leg., ASP). Scotland: Berwickshire, Coldingham Bay, 12.vii.1988, 1 ♂, 2 ♀ (A.E. Stubbs leg., ASP). Wales: Cwm Clyddach (South Wales), 25.viii.1972, 2 ♂, 1 ♀ (A.E. Stubbs leg., BMNH). **Slovakia:** Veľká Fatra Mts, Lubochnianska valley, 15.ix.1985, 1 ♂; Vysoké Tatry Mts, Mlynická valley, 27.viii.1972, 1 ♂; Vysoké Tatry Mts, Mengusovská valley (1200–1250 m), 12.viii.2003, 1 ♂; Vysoké Tatry Mts, Velické pleso (1665 m), 12.viii.2003, 1 ♂; Belianske Tatry Mts, Tristárska valley (1100 m), 5.ix.1977, 3 ♂, 5 ♀; Ždiar, Magura hotel, (900 m), 3.viii.1999, 1 ♂ (at light); Slovenský kras, Zádielska valley, 8.vii.1970, 1 ♂ (all J. Starý leg., all JSO). **Switzerland:** Canton Neuchâtel: Le Cachot, peat-bog, 6.ix.1995, 1 ♂; Chambrelieu, 1.ix.1995, 1 ♂ (all J. Starý leg., all JSO). Canton Vaud: Bex, Pont de Nant (1250 m), 31.viii.1994, 1 ♂ (J. Starý leg., JSO). Canton Fribourg: Schwarzsee, 11.ix.1995, 4 ♂ (J. Starý leg., JSO).

Discussion. *D. (D.) imbecilla* is clearly separated from the other species treated here based on the structure of the male tarsal claws (Fig. 5). This and other distinctions from *D. (D.) lutea* are specified in Discussion of the latter.

Ecology. In Great Britain, this is a rare species of western and northern districts, currently only known from northern England and south-west Scotland. Most localities have calcareous seepages depositing tufaceous substrate. The species can occur along spring-fed streams associated with seepage complexes, and, in one site, it was abundant beside a large woodland stream well below the source. June–July. (AS). It should be noted that, in the Czech Republic and Slovakia, all the species (except for *affinis* which has not been recorded there) seem to prefer mountainous areas, but none is strictly confined to the mountains. *D. (D.) imbecilla* appears to be most prone to occur there, exceeding altitude 1600 m in the Vysoké Tatry Mts (Slovakia). At the locality Prostřední Bečva (Czech Republic: Moravskoslezské Beskydy Mts), it was collected together with *D. (D.) mitis*, *D. (D.) quadra*, and *D. (D.) lutea*, with two latter species on the same date (30.vii.1992) (JS).

Distribution. The species is here recorded for Bulgaria, Czech Republic, Great Britain, Slovakia, and Switzerland; another country record is Germany (type locality of *imbecilla*, see Lackschewitz & Pagast 1941). Probably more widely distributed in Europe.

Key to *Dicranomyia (Dicranomyia) mitis* and allies

- | | | |
|---|--|---|
| 1 | Vein Sc ₁ with row of macrotrichia posteroventrally. Prescutum mostly greyish-brown to bluish-grey | 2 |
| - | Vein Sc ₁ without any macrotrichia. Prescutum mostly yellow to ochreous | 3 |
| 2 | Prescutum with heavy, greyish-brown pruinosity. For male tarsi, male and female terminalia, and wing, see Figs 1, 6, 11, 16. | <i>Dicranomyia (Dicranomyia) mitis</i> (Meigen, 1830) |
| - | Prescutum with heavy, dark brownish-grey to bluish-grey pruinosity and with three dust-free, shiny black stripes. For male tarsi, male and female terminalia, and wing, see Figs 2, 7, 12, 17 | <i>Dicranomyia (Dicranomyia) affinis</i> (Schummel, 1829) |
| 3 | Medium-sized species (wing length 6.5–9.5 mm). Wing with pterostigma distinct (Fig. 18). Male terminalia with rostral spines shorter than those of other species (Fig. 8). Female terminalia with space between cerci very narrow, about one third width of cercus breadth at base (Fig. 13). For male tarsi, see Fig. 3. | <i>Dicranomyia (Dicranomyia) quadra</i> (Meigen, 1838) |
| - | Small species (wing length 5.3–8.0 mm). Wing clear except for at most feebly indicated pterostigma (Figs 19, 20). Male terminalia with rostral spines normally long (Figs 9, 10). Female terminalia with space between cerci subequal in width to cercus breadth at base (Figs 14, 15) | 4 |
| 4 | Two last male tarsomeres long, subequal in length, parallel-sided; tarsal claws short, with only one tooth fairly distinct (Fig. 4). Male terminalia with rostral spines gently curved, separated at base by less than their own breadth (Fig. 9). Female terminalia with cercus about two thirds length of tergite 10 (Fig. 14). For wing, see Fig. 19. | <i>Dicranomyia (Dicranomyia) lutea</i> (Meigen, 1804) |

- Male tarsomere 5 distinctly shorter than tarsomere 4; male tarsal claws moderately long, with single well-developed tooth at base (Fig. 5). Male terminalia with rostral spines almost straight, separated at base by more than their own breadth (Fig. 10). Female terminalia with cercus subequal in length to tergite 10 (Fig. 15). For wing, see Fig. 20. *Dicranomyia (Dicranomyia) imbecilla* Lackschewitz, 1941

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References

- Edwards, F.W. (1938) British short-palped craneflies. Taxonomy of adults. *Transactions of the Society for British Entomology*, 5, 1–168.
- Driauach, O., Belqat, B. & De Jong, H. (2013) A first checklist of the short-palped crane flies (Diptera: Limoniidae, Pediciidae) of Morocco. *Boletín de la Sociedad Entomológica Aragonesa (S.E.A.)*, No. 53, 187–190.
- Geiger, W. (1985) Two new species of *Dicranomyia* Stephens, 1829, with notes on related species (Diptera, Limoniidae). *Bulletin Zoologisch Museum, Universiteit van Amsterdam*, 10, 53–60.
- Lackschewitz, P. (1928) Die palaearktischen Limnobiinen (Diptera) des Wiener Naturhistorischen Museums. *Annalen des Naturhistorischen Museums in Wien*, 42, 195–244.
- Lackschewitz, P. & Pagast, F. (1941) 16. Limoniidae. In: Lindner, E. (Ed.), *Die Fliegen der palaearktischen Region*, 3 (5), 2, Lief. 139, pp. 17–32.
- McAlpine, J.F. (1981) Morphology and terminology—adults. In: McAlpine, J.F., Peterson, B.V., Shewell, G.E., Teskey, H.J., Vockeroth, J.R. & Wood, D.M. (Eds.), *Manual of Nearctic Diptera. Vol. 1. Monograph No. 27*. Research Branch, Agriculture Canada, Ottawa, pp. 9–63.
- Meigen, J.W. (1804) *Klassifikation und Beschreibung der europäischen zweiflügeligen Insekten (Diptera Linn.)*. Vol. 1. & 2. Braunschweig, 314 pp. [pp. i–xxviii+1–152 & pp. i–vi + 153–314]
- Meigen, J.W. (1818) *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. Vol. 1*. Aachen, xxxvi + 333 pp.
- Meigen, J.W. (1830) *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. Vol. 6*. Hamm, xiv + 401 pp.
- Meigen, J.W. (1838) *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. Vol. 7*. Aachen, xii + 435 pp.
- Morge, G. (1976) Dipteren-Farbtafeln nach den bisher nicht veröffentlichten Original-Handzeichnungen Meigens: „Johann Wilhelm Meigen: Abbildung der europaischen zweiflügeligen Insecten, nach der Natur“, Pars III. *Beiträge zur Entomologie, Berlin*, 26, 543, Farbtafeln CLXI–CCCXV.
- Oosterbroek, P. (2014) Catalogue of the Craneflies of the World (Insecta, Diptera, Nematocera, Tipuloidea). Version 8 Sept. 2014. Available from: <http://ip30.eti.uva.nl/ccw/> (accessed 1 September 2014)
- Schummel, T.E. (1829) Beschreibung der, in Schlesien einheimischen, Arten einiger Dipteren-Gattungen. I. *Limnobia*. Meigen. *Beiträge zur Entomologie, Breslau*, 1. Heft, 97–201.
- Starý, J. (1993) Two new European species of *Dicranomyia* Stephens, 1829, related to *D. (s. str.) chorea* (Meigen, 1818) (Diptera, Limoniidae). *Bulletin Zoologisch Museum, Universiteit van Amsterdam*, 13, 175–182.
- Starý, J. (2006) New information resulting from a study of Strobl's types of Limoniidae (Diptera). *Acta Universitatis Carolinae, Biologica*, 49 (2005), 187–203.
- Starý, J. (2009) The identity of *Dicranomyia (Dicranomyia) luteipennis* Goetghebuer (Diptera, Limoniidae). *Zootaxa*, 2155, 55–68.
- Starý, J. & Freidberg, A. (2007) The Limoniidae of Israel. *Israel Journal of Entomology*, 37, 301–357.
- Stubbs, A.E. (1998a) Cranefly recording scheme. Test key to subfamily Limoniinae. Peterborough. *Cranefly Recording Scheme Newsletter*, Dipterists Forum, 1–30.
- Stubbs, A.E. (1998b) Limoniidae. In: Chandler, P.J. (Ed.), *Checklists of Insects of the British Isles (new series). Part 1. Diptera. Handbooks for the Identification of British Isects, 12*. Royal Entomological Society, London, pp. 4–9.
- Vaillant, F. (1952) Quelques Limoniidae à larves hydropétriques. *Revue Française d'Entomologie*, 19, 244–251.