

A review of the genus *Diazosma* (Diptera: Trichoceridae)

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Taxonomy, 1 new species, 2 redescriptions, male and female genitalia, nomenclature, Diptera, Trichoceridae, *Diazosma* Bergroth

Abstract. Within the genus *Diazosma*, previously considered monotypic, three species are recognized, two European and one North American. *D. seclusum* sp. n. is described from the Czech Republic. The other species, *D. hirtipenne* (Siebke) and *D. subsinuatum* (Alexander), are redescribed and male and female genitalia are illustrated for all the three species. Nomenclature within the genus is discussed from various aspects.

INTRODUCTION

Diazosma Bergroth, 1913 was believed to contain a single species, *D. hirtipenne* (Siebke, 1863), sometimes overstated as one of the rarest craneflies in Europe. Two further species were described, recognized as belonging to the genus, viz. *Trichoptera picea* Strobl, 1880 from Austria and *Trichocera (Diazosma) subsinuata* Alexander, 1916 from the USA and Canada, which, however, have so far been regarded as identical with *D. hirtipenne*. The former was synonymized, shortly after its erection, by Mik (1882) and its author (Strobl, 1895). The latter was placed in synonymy by Edwards & Keilin (1928), while used as valid by Alexander until 1967 (Alexander, 1967). Finally, general agreement was achieved about the monotypy of *Diazosma* (Dahl, 1966; Dahl & Alexander, 1976; Pratt & Pratt, 1984; Martinovský, 1987).

It may be said that the monotypy of a genus generally brings a damping influence upon the taxonomic activity devoted toward it. Generic peculiarities used to be misinterpreted as specific characters and identification is based largely on them. If, moreover, as with *Diazosma*, several originally established species are united into a singleton, taxonomic attention at species level becomes suppressed.

In the above concept, *D. hirtipenne* was recorded in Europe from Great Britain (Edwards, 1921, 1938), Norway (Siebke, 1863, 1877; Dahl, 1969), Sweden (Wahlgren, 1905, 1922; Dahl, 1966), Finland (Hackman, 1980), Poland (Bergroth, 1913), Czech Republic and Slovak Republic (Kowarz, 1894; Vimmer, 1913; Czižek, 1931; Martinovský, 1987) and Austria (Strobl, 1880, 1895). In the Nearctic region, records are available from Canada and the USA, particularly from British Columbia, Ontario, Quebec, New Brunswick and from Washington, Oregon, California, Utah, Colorado, Wisconsin, New York and Vermont respectively (Alexander, 1916, 1919, 1942, 1943, 1948, 1949, 1954, 1967; Pratt & Pratt, 1984; Pratt, 1992).

Two additional genus-group names are applied to *Diazosma*, viz. *Trichoptera* Strobl, 1880 (type species: *Trichoptera picea* Strobl, 1880; mon.) and *Diazoma* Wallengren, 1882

(type species: *Trichocera hirtipennis* Siebke, 1863; mon.). Both proved to be junior homonyms. The former is preoccupied by *Trichoptera* Meigen, 1803 (Diptera), the latter by *Diazoma* Lamarck, 1816 (Mollusca). Therefore, *Diazosma* was proposed by Bergroth (1913) specifically as the replacement name for *Diazoma*. Since some uncertainty exists about the treatment of the species-group names combined with *Diazosma*, the following should be stated. *Diazosma* is a Greek noun that means a band, strip or the like and is neuter. (The same is true for *diazoma*, the more common equivalent of the former.) Thus, the genus *Diazosma* is to be treated as this word, with the particular gender (ICZN, 1985, Art. 26 and 30a). The species-group names combined here with *Diazosma*, being adjectives or participles in nominative singular, must agree in gender with the generic name (cf. Art. 31b). Accordingly, their spellings must be *hirtipenne*, *piceum*, *seclusum* and *subsinuatum*. Otherwise, Bergroth (1913), establishing *Diazosma* and combining it with its type species (*D. hirtipenne*), used the correct spelling, having thus implied the gender of the genus-group name, his usage being followed by others, e.g., Strobl, Edwards and Alexander. Recently, however, incorrect spellings have prevailed.

Examination of the material at our disposal revealed that two *Diazosma* species occur in the former Czechoslovakia which differ from each other distinctly in the structure of the male and female genitalia. Slight distinctions in the body coloration and other external characters, detected subsequently, enabled the association of the sexes of the two species. When Nearctic specimens were examined these proved to represent a separate species, distinct from the two former.

Thus, in this paper, three species are treated within the genus *Diazosma*. Although the present contribution is concerned, primarily, with taxonomy, indicating the main differences between the species, the nomenclature of the taxa has to be solved. Type specimens of *D. hirtipenne* and *D. piceum* were indicated as non-existent by Dahl & Alexander (1976). With reference to *D. piceum*, Prior P. Bruno Hubl (Admont) kindly informed us that the type of this species (a single male) had not been traced in the Strobl collection deposited at Admont, Austria. Therefore, the following nomenclatural approach was adopted.

The relatively more widely distributed species is treated here as *D. hirtipenne*. Besides in the former Czechoslovakia, where it is reported from several localities (see below), its occurrence could also be confirmed in Sweden, on the basis of the figure of the male genitalia provided by Dahl (1966, Fig. 1). The type localities of *D. hirtipenne* lie in Scandinavia (Dovre Mt. near Drivstua and Drivdalen Valley, Norway, cf. Siebke, 1863, 1877). There are not any statements in the original description (Siebke, 1863) that would contradict this interpretation in the light of newly established specific characters. On the contrary, there is a slight indication supporting the present concept. Siebke (1863) described the vein A_2 as being double-bent ("bis flexuosus"). Thereby, in our opinion, the condition is indicated that may be observed in the species treated here as *D. hirtipenne* in which A_2 is bent beyond mid-length and then gently and broadly arcuated contrariwise. However, in *D. seclusum* sp. n., the distal portion of A_2 is almost straight, not arcuated, nor sinuous, and the vein can hardly be regarded as double-bent.

In the original description of *D. piceum* (cf. Strobl, 1880), no indication can be found as to the identity of the species. However, in a subsequent paper by Mik (1882), synonymizing *D. piceum* with *D. hirtipenne*, a drawing of a wing is presented. From the relevant text

it follows that the wing of the type specimen (holotype) of *D. piceum* was illustrated. In this figure, actually the first one of *Diazosma* ever published, the venation of what is here interpreted as *D. hirtipenne* is depicted in every detail including, above all, two features pointed out below as diagnostic, namely the position of the tip of Sc_1 (opposite or slightly before the verticalized R_2 in *D. hirtipenne*) and the course of A_2 (distal portion broadly arcuated).

On the basis of the facts brought together above, we prefer, in accordance with the other authors, to retain *D. piceum* in the synonymy of *D. hirtipenne* and to describe *D. seclusum* sp. n. Designation of neotypes of *D. hirtipenne* and *D. piceum* would naturally stabilize the situation. However, we feel that, at the moment, this could be somewhat premature.

The North American species is treated here as *D. subsinuatum*. It will be necessary to examine the type of this species, which, we understand, will be done by our American colleagues in due time.

Diazosma hirtipenne (Siebke, 1863)
(Figs 1, 4, 5, 10, 13)

Trichocera hirtipennis Siebke, 1863: 184.

Trichoptera picea Strobl, 1880: 64.

Diazoma hirtipenne; Mik, 1882: 142 (Fig.).

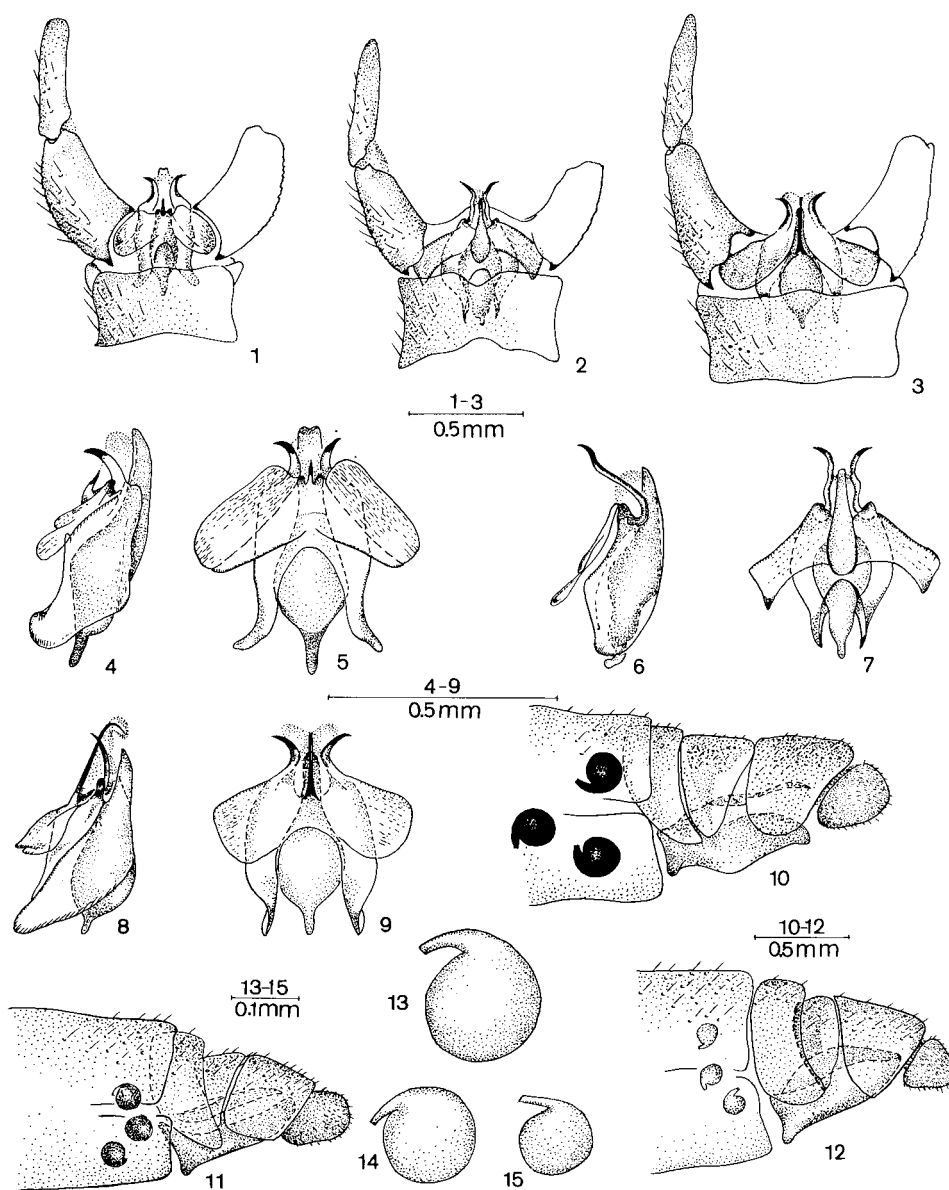
Diazosma hirtipennis; Dahl, 1966: 97 (Fig.).

Body generally dark brown, shining, with a slight pruinosity, especially on the pleurae. Hind margins of abdominal segments paler, giving the abdomen a banded appearance. In contrast with *Trichocera*, meron is reduced in *Diazosma*, consisting of two roughly triangular, sclerotized plates, the upper quite minute, the lower well developed, attached to the posterior margin of the mid coxa, while the rest of the area between the mid and hind coxae is membranous. (Within the Trichoceridae, a similar condition is observable in *Paracladura*.) The plates of meron are brown in *D. hirtipenne*, as are most of the other thoracic sclerites, thus differing in coloration from yellowish brown to dirty yellow coxae. The wing venation has the following features that appear to be taxonomically important: Sc_1 ending opposite or slightly before vertical R_2 (mostly referred to as cross-vein r in the literature); A_2 bent beyond mid-length, then gently and broadly arcuated contrariwise, fused to the costa at a very acute angle, or, exceptionally, slightly sinuous at extreme tip.

Male genitalia (Figs 1, 4, 5): Basistyle relatively stout and distinctly curved. Dististyle likewise stout, comparatively short, nearly parallel-sided, broadly obtuse at apex. Distal part of parameres short, curved and upturned. A short spine-like projection may be seen between parameres and above penis. Penis very stout, considerably long, exceeding tips of parameres. Vesica oval, with apodeme comparatively long and well-sclerotized.

Female genitalia (Figs 10, 13): The most distinctive features appear to be the shape of cerci and the size and pigmentation of spermathecae. Cerci roughly triangular in lateral view, with ventral margin representing the longest side of the triangle. Spermathecae large, strongly pigmented, with attached parts of ducts very conspicuous, thickened, strongly pigmented and curved.

MATERIAL EXAMINED (8 ♂♂, 4 ♀♀): CZECH REPUBLIC: Moravia: Hrubá Voda nr. Olomouc, 22.vi.1974, 1 ♂ (Martinovský leg.), 6.vii.1976, 1 ♂, 1 ♀ (Starý leg.), 26.vii.1980, 1 ♂ (Martinovský leg.), 24.vi.1981, 1 ♀, 24.viii.1981, 1 ♂, 27.vi.1985, 1 ♂, 1 ♀ (all Starý leg.); Javoříčko (district Olomouc), Špranek valley, 8.vii.1987, 1 ♂, 1 ♀ (Starý leg.). SLOVAK REPUBLIC: Kvetnica nr. Poprad, 1.vii.1979, 1 ♂ (Starý



Figs 1–9: Male genitalia of *Diazosma hirtipenne* (Siebke) (Czech Republic, Hrubá Voda nr. Olomouc), *D. seclusum* sp. n. (Paratype) and *D. subsinuatum* (Alexander) (USA, Utah): General view, dorsal: 1 – *D. hirtipenne*, 2 – *D. seclusum* sp. n., 3 – *D. subsinuatum*; aedeagal complex, lateral: 4 – *D. hirtipenne*, 5 – *D. seclusum* sp. n., 6 – *D. subsinuatum*; aedeagal complex, dorsal: 7 – *D. hirtipenne*, 8 – *D. seclusum* sp. n., 9 – *D. subsinuatum*. Figs 10–15: Female genitalia of *D. hirtipenne* (Czech Republic, Hrubá Voda nr. Olomouc), *D. seclusum* sp. n. (Paratype) and *D. subsinuatum* (USA, Utah): General view, lateral: 10 – *D. hirtipenne*, 11 – *D. seclusum* sp. n., 12 – *D. subsinuatum*; spermatheca: 13 – *D. hirtipenne*, 14 – *D. seclusum* sp. n., 15 – *D. subsinuatum*.

leg.); Vysoké Tatry Mts., Velká Studená dolina, 23.vii.1969, 1 ♂ (Martinovský leg.). All specimens in coll. J. Martinovský and J. Starý, Olomouc.

Besides the male and female genitalia, the species may readily be differentiated from *D. seclusum* sp. n. on the basis of the above-mentioned external characters, particularly the coloration of meron and mid coxa. Wing venation was decisive in confirming the above synonymy. In addition, it can be stated that the wing photographed by Edwards (1938, Pl. I, Fig. 13) appears to belong to this species. As already mentioned, the figure of the male genitalia, provided by Dahl (1966, Fig. 1), was, according to the structure of the aedeagal complex, clearly determined as belonging to *D. hirtipenne*, despite the fact that the dististyle appears somewhat different.

Diazosma seclusum sp. n.

(Figs 2, 6, 7, 11, 14)

Body coloration somewhat paler than in *D. hirtipenne*. Abdomen not banded. Setae on thorax, especially prescutum, appearing longer and denser than in the latter. Meron pale, concolorous with mid coxa. Wing venation with Sc_1 ending well before vertical R_2 , about twice as long as the latter or more. Beyond the main bend, A_2 is more abrupt than in *D. hirtipenne*, essentially straight, not arcuated, nor sinuous, the vein fused to the costa at an angle less acute than in the latter.

Male genitalia (Figs 2, 6, 7): Basistyle, in comparison with that of *D. hirtipenne*, more slender and less curved. Dististyle distinctly more slender. Distal part of parameres very long and slender, strongly undulated, rather flagelliform and exceeding considerably tip of penis. No sclerotized structure may be seen between parameres. Penis shorter and much more slender than in *D. hirtipenne*. Vesica narrowed caudally, producing a bulbous shape, with a short apodeme.

Female genitalia (Figs 11, 14): Cerci rather different in outline from those of *D. hirtipenne*, very broadly rounded and partly concealed by tergite 10. Spermathecae much smaller than in *D. hirtipenne*, about half the diameter of the latter, and somewhat less pigmented. Attached parts of ducts short and inconspicuous, curved.

HOLOTYPE ♂: CZECH REPUBLIC, Moravia, Bedřichov (district Šumperk), Oskava valley, 16.vii.1970 (Martinovský leg.); in coll. Slezské muzeum, Opava.

PARATYPES: same data as for holotype, 16 ♂♂ (Martinovský leg.); SLOVAK REPUBLIC, Drienovec (district Košice-vidiek), 3.ix.1980, 1 ♀ (Starý leg.); in coll. Slezské muzeum, Opava, and J. Martinovský and J. Starý, Olomouc.

The new species is very distinctive in the structure of the male genitalia, particularly the aedeagal complex, it may, however, be easily differentiated from *D. hirtipenne* also on the female genitalia and the above-mentioned external characters. It should be emphasized that Czižek (1931, Fig. 92) almost certainly illustrated the wing of *D. seclusum* sp. n. under *D. hirtipenne*.

Diazosma subsinuatum (Alexander, 1916)

(Figs 3, 8, 9, 12, 15)

Trichocera (*Diazosma*) *subsinuata* Alexander, 1916: 124 (Fig.).

Body coloration generally dark brown, much as in *D. hirtipenne*. Abdomen not banded. Setae on thorax still shorter than in the latter. Meron darker than mid coxa. Mutual

position of tip of Sc_1 and R_2 appearing somewhat intermediate, in comparison with *D. hirtipenne* and *D. seclusum* sp. n., but variation beyond this cannot be excluded. Distal portion of A_2 considerably arcuate, more so than in *D. hirtipenne*.

Male genitalia (Figs 3, 8, 9): Basistyle more slender and less curved than in *D. hirtipenne*, similar to that of *D. seclusum* sp. n. Dististyle relatively long and, in contrast with the two above species, tapering to an obtuse tip just before apex. Distal part of parameres curved, approximately as in *D. hirtipenne*, but less upturned. Structure between parameres seen as a long thin rod embedded in a delicate membranous shelf, that may be confused with penis. However, the latter is distinctly shorter, not reaching tips of parameres and much more slender and shorter than in *D. hirtipenne*, being concealed by the above-described structure. Vesica of much the same shape as in the latter, with apodeme shorter and less sclerotized.

Female genitalia (Figs 12, 13): Cerci shorter than in *D. hirtipenne*, producing the shape of an equilateral triangle, with ventral side slightly concave. Spermathecae still somewhat smaller than in *D. seclusum* sp. n. and distinctly less pigmented, with attached parts of ducts rather straight.

MATERIAL EXAMINED: USA, Utah, Cache Co, Cowly Cany sum., 23.–31.viii.1978, 2 ♂♂, 1 ♀ (Hanson leg., Mal. tr.); in coll. H.D. Pratt, Atlanta, and J. Starý, Olomouc.

In both external and genitalic characters, *D. subsinuatatum* resembles *D. hirtipenne* more than *D. seclusum* sp. n., however, it differs from the former in details of the structure of the male and female genitalia, as described above. It is probable that illustrations provided by Pratt & Pratt (1984) and Pratt (1992) pertain to this species, although the dististyle appears different in Fig. 8 of the former paper.

ACKNOWLEDGEMENTS. Gifts and loans of North American specimens, arranged by Dr H.D. Pratt (Atlanta), are greatly acknowledged. Prior P. Bruno Hubl (Admont) kindly provided information on the type of *D. piceum*. We are grateful also to Dr Ruth Contreras-Lichtenberg (Wien) and Mrs Lita Greve Jensen (Bergen) who sent copies of rare papers. Dr J. Janoušek (Olomouc) was consulted regarding usage of the Greek language.

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Received April 30, 1992; accepted September 28, 1992