

***Eristalis obscura* (Loew) (Diptera, Syrphidae): synonyms and morphological variation in the Holarctic region**

HEIKKI HIPPA, TORE R. NIELSEN & F. CHRISTIAN THOMPSON

Hippa, H., Nielsen, T. R. & Thompson, F. C., 2009. *Eristalis obscura* (Loew) (Diptera, Syrphidae): synonyms and morphological variation in the Holarctic region. *Norw. J. Entomol.* 56, 32–36.

Eristalis obscura Loew, 1866, is Holarctic in distribution and *E. pseudorupium* Kanervo, 1938 and *E. beltrami* Telford, 1970 are junior synonyms of it. *E. obscura* shows a great morphological variation of the superior lobe in the male genitalia, which is documented by illustrations. The distinguishing characters of *E. obscura* and other similar species are briefly discussed. The male genitalia of *E. saxorum* Wiedemann, 1830 are illustrated.

Key words: Diptera, Syrphidae, *Eristalis*, taxonomy, new synonyms, Holarctic region.

Heikki Hippa, Swedish Museum of Natural History, Box 50007, SE-104 05, Stockholm, Sweden. E-mail: heikki.hippa@nrm.se

Tore R. Nielsen, Sandvedhagen 8, NO-4318 Sandnes, Norway. E-mail: tore@nielsen.cc

F. Christian Thompson, Systematic Entomology Laboratory, ARS, USDA, Smithsonian Institution MRC-0169, PO Box 37012, Washington, D, C. 20013-7012, USA. E-mail: Chris.Thompson@ars.usda.gov

Introduction

During a recent revision of the West-Palaeartic species of *Eristalis* Latreille, 1804 (Hippa & al. 2001) *E. pseudorupium* Kanervo, 1938 was found to be a widespread species in the Palaeartic region and it was reported even from Canada. Two Nearctic species, *E. obscura* Loew and *E. beltrami* Telford, 1970, were found similar to *E. pseudorupium* and synonymy of the two latter was suspected. Afterwards, the study of a more extensive material revealed a rather unexpected morphological variation, which ultimately led us to a belief that only one species is in question. The aim of this paper is to demonstrate the morphological variation in the male genitalia of *E. obscura* in the Holarctic region as well as to propose the synonymy of *E. pseudorupium* and *E. beltrami* with it.

Material and methods

The male genitalia were studied from specimens in liquid after treating with potassium hydroxide. The illustrations in Figure 1 were made by a drawing tube attached to a stereomicroscope. From part of the specimens the right side superior lobe was detached and slide-mounted in “Euparal”, between two round pieces of cover glass, 10 mm in diameter. The separate illustrations of the superior lobe (Figure 2) were drawn from these mini-slides by the aid of a drawing tube attached to a compound microscope. The slides are now enclosed in paper envelopes and they are stuck on the same pin bearing the other parts of the fly.

The material studied is deposited in the following collections: Canadian National Collections, Ottawa (*E. obscura*), Zoological Museum, University of Helsinki, Helsinki (*E. obscura*), Zoological

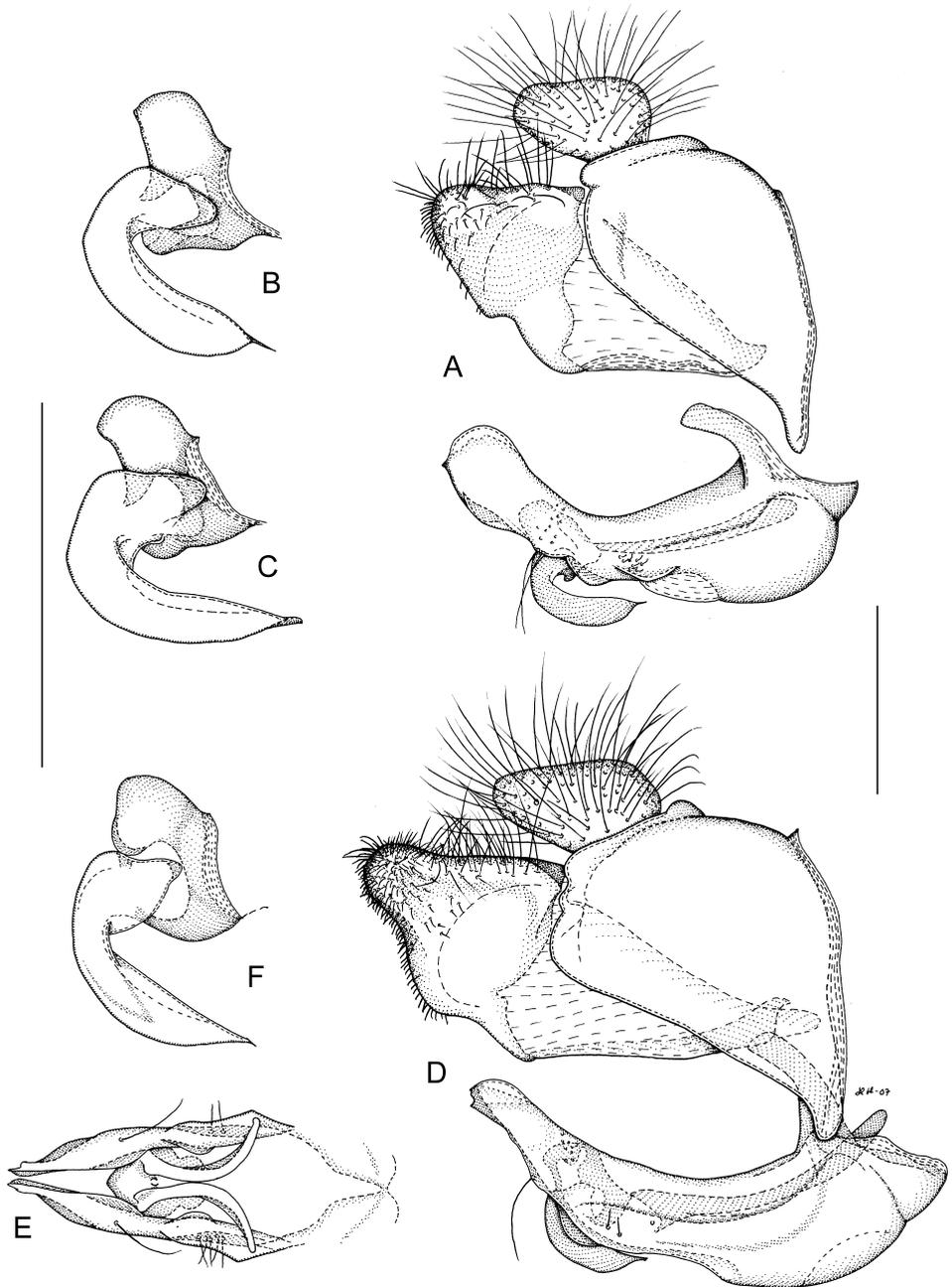


Figure 1. Male genitalia (A and D) and aedeagus (B, C and F), dextralateral view, and posterior part of hypandrium (E), ventral view. A, B and C: *Eristalis obscura* Loew (A and B from USA: New Hampshire, C from Sweden). D, E and F: *E. saxorum* Wiedeman (D and E syntype, F from USA: Phoenix). Scale 0.05 mm.

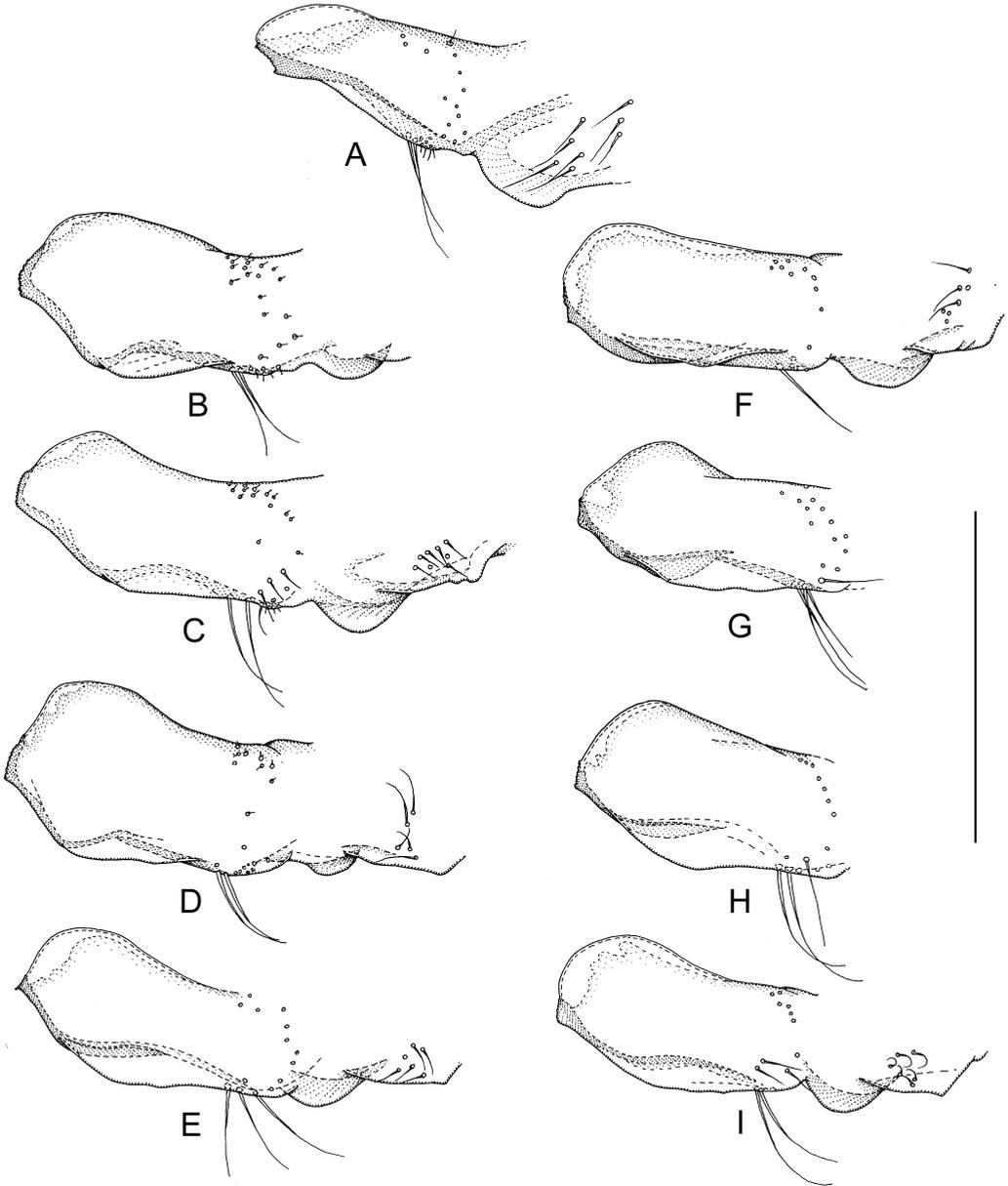


Figure 2. Superior lobe, dextralateral view. A: *Eristalis saxorum* Wiedemann (from USA, Phoenix). B – I: *E. obscura* Loew (B and C from Sweden, D from Russia: Yakutiya, E from Canada: Ontario, F from Canada: Newfoundland, G and H from USA: Massachusetts, I from USA: Alaska). Scale 0.05 mm.

museum, University of Turku, Turku (*E. obscura*), Smithsonian Institution, Washington, D.C. (*E. obscura*, *E. saxorum*), University of Minnesota Collection, Minneapolis (holotype of *E. beltrami*), Museum of Comparative Zoology, Cambridge, Massachusetts (lectotype and three syntypes of *E. obscura*), Naturhistorisches Museum Wien, Vienna (two syntypes of *E. saxorum*), Swedish Museum of Natural History, Stockholm (*E. obscura*), and the private collections of Hans Bartsch (*E. obscura*) and Tore R. Nielsen (*E. dimidiata* Wiedemann, 1830, *E. obscura* and *E. saxorum*).

***Eristalis obscura* and its synonyms**

***Eristalis obscura* Loew, 1866**

E. obscura was described from specimens collected by Kennicott, in the Red River area of Manitoba, Canada. The type material (in Museum of Comparative Zoology) consists of four females, erroneously mentioned as males by Telford (1970). They are labeled “Red R., Kennii; Type 4071, 4071², 4071³, and 4071⁴”. The specimen 4071² was designated as lectotype by Telford (1970). The type material is in a poor condition, especially the lectotype. It fits well with the male from Alaska which we have studied (Figure 2 I). The pilosity on the posterior part of abdominal tergite 3 seems a little more erect than in the females from Fennoscandia but quite similar to a studied female from Russia: Yakutiya, from where we have studied several strictly sympatric males (Figure 2 D).

***Eristalis beltrami* Telford, 1970**

E. beltrami was described on the basis of the holotype male from Minnesota, the allotype female and three paratype males from Ontario and an additional female from Manitoba. Of these we have studied the holotype (in University of Minnesota Collection) (Hippa & al. 2001). It has the superior lobe rather narrow and parallel sided (Hippa & al. 2001, Figure 10 A), not essentially different from many other American

specimens we have seen (e.g. Figures 2 F, H and I) and a specimen from Sweden in Figure 2 C. The paratype specimen illustrated by Telford (1970) has the superior lobe broader and angular, not much dissimilar to our Figure 2 H. Both the holotype and the paratype fit well within the general Holarctic variation pattern of *E. obscura*. New synonymy.

***Eristalis pseudorupium* Kanervo, 1938**

E. pseudorupium was described as *E. vitripennis* var. *pseudorupium* (Kanervo 1938) and was given a species rank by Hippa & al. (2001). Because the original type material is lost a neotype male (in Helsinki) was designated from southern Finland. The neotype fits well within Holarctic variation pattern of *E. obscura*. **New synonymy.**

Morphological variation of *E. obscura*

Material studied. In addition to the above mentioned type material, we have studied male specimens from the following roughly given localities (number of male specimens in parenthesis): BELGIUM (5), DENMARK (numerous), FINLAND (numerous), NORWAY (numerous), RUSSIA: Karelia (numerous), Yakutiya (5), CANADA: Alberta (2), British Columbia (3), Manitoba (2), Newfoundland (2), Ontario (2), Quebec (2), Yukon (1), USA: Alaska (1), Colorado (2), Massachusetts (4), Montana (1), New Hampshire (3), Tennessee (1), Wyoming (1).

Variation. There is a certain variation in the colouration, both in the pilosity and in the integumental colouration of different body parts, which we have not analyzed in detail here (but see Hippa & al. 2001). The pale basal part of femur 3 is rather variable in extent and clearness, but can always be traced. In the male genitalia the shape of the surstylus is the same throughout the range of the species. Sometimes the apical part appears a little more elongate (Hippa & al. 2001: Figure 10 A) than usual (Figure 1A, Hippa & al. 2001: Figure 9 A). The small observed

differences are usually due to varying angles of view. Also the aedeagus is similar throughout the range. The aedeagal lobes may in lateral view appear shorter (Figure 1 B; Hippa & al. 2001: Figure 9 D) or longer (Figure 1 C; Hippa & al. 2001: Figure 10 D) because they are curved and are movable. The characters of the superior lobe (paramere), instead, are variable to the extent to cause confusion if that variation is not known. The superior lobe may be narrow, straight (Figure 2 F) or slightly curved dorsally (Figures 2 C, I) and with nearly parallel dorsal and ventral outline or it may be broadening posteriorly with more or less distinctly angulate outline (Figures 2 B, D, E, G, H). The more sclerotized apex may appear anything between a simple narrow point (Figure 2 E) and a serrate small apical lobe (Figures 2 B, G). The membranous apico-dorsal part varies greatly in its extent (Figures 2 B–I). What we have seen, the variable elements are independent from each other and there is a complete continuum between all the extreme forms. The exact geographical nature of the variation is not clear to us. It seems that a narrow superior lobe is more common, or frequent, in North America, the broad one in the Old World. Years ago, Bean (1949) reported similar variation in the superior lobe of *E. hirta* Loew.

Diagnostic characters

E. obscura is similar to *E. dimidiata* Wiedemann (Nearctic), *E. hirta* Loew (Holarctic), *E. picea* Fallén (Palearctic), *E. rupium* Fabricius (Holarctic), and *E. saxorum* Wiedemann (Nearctic). It (as *E. pseudorupium*) can be distinguished from the Palearctic and Holarctic species by the characters given by Hippa & al (2001). From *E. dimidiata* it is distinguished by the following characters: 1) pterostigma is ca. 2x as long as wide, in *E. dimidiata* it is 3–3.5x that, 2) anterior half of tergite 3 is all shiny, in *E. dimidiata* there is a drop-like dull patch medially, 3) tergite 4 is all shiny, in *E. dimidiata* there is a dull patch antero-medially and 4) the lobe-like projection at the postero-ventral margin of the surstylus is broad and rounded (Figure 1 A), not narrow and

almost finger-like (Telford 1970: Figure 14) as in *E. dimidiata*, and 5) the superior lobe is narrower and narrowing, not broadening, towards the apex (cf. Figures 2 A–I and Telford 1970: Figure 14). *E. obscura* is distinguished from *E. saxorum* by: 1) the wing vein R4+5 is less looped, 2) tergites 3 and 4 are black, in *E. saxorum* there is a metallic, often bluish, transverse band at the middle, 3) the basal part of wing (from humeral cross vein) is greyish-brown, in *E. saxorum* dark brown, 4) the apical part of surstylus is narrower, and hence the lobe at its postero-ventral margin is more strongly expressed (Figures 1 A, D), and 5) the superior lobe is narrowing, not broadening, towards the apex, and its ventral margin, anterior to the more sclerotized apical structures, is concave instead of convex (Figures 1 A, D).

Acknowledgements. We wish to thank the following persons for loan of material: H. Bartsch, Järfälla, P. D. Perkins, Cambridge, Massachusetts, P. Sehnal, Wien and J. R. Vockeroth, Ottawa.

References

- Bean, J. L. 1949. A study of the male hypopygia of the species of *Tubifera* (Syrphidae, Diptera) that occur north of Mexico. *Canad. Entomol.* 81, 140–152.
- Hippa, H., Nielsen, T.R. & van Steenis, J. 2001. The West Palearctic species of the genus *Eristalis* Latreille (Diptera, Syrphidae). *Norw. J. Entomol.* 48, 289–327.
- Kanervo, E. 1938. Zur Systematik und Phylogenie der Westpaläarktischen *Eristalis*-Arten (Dipt.) mit einer Revision derjenigen Finlands. *Annals Univ. Turkuensis (A)* 6, 5–54.
- Loew, H. 1866: *Diptera Americae Septentrionalis indigena*. Centuria sexta. Berlin. *Ent. Zeit.* (1965) 9, 127–186.
- Telford, H.S. 1949: *Eristalis* (Diptera: Syrphidae) from America North of Mexico. *Annals of the Ent. Soc. Am.* 63 (5), 1201–1210.
- Walker, F. 1849: List of the specimens of dipterous insects in the collection of the British Museum. Vol. 3, 485–687. London.
- Wiedemann, C.R.W. 1830: *Aussereuropäische zweiflügelige Insekten*. Hamm. 2, XII + 1–684.

Received: 30 December 2008
Accepted: 28 February 2009