Two new Palaearctic species of *Eupeodes* similar to *E. bucculatus* (Diptera, Syrphidae)

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Mazánek, L., Láska, P., Bičík, V. (1999): Two new Palaearctic species of *Eupeodes* similar to *E. bucculatus* (Diptera, Syrphidae). – Volucella 4 (1/2), 1-9. Stuttgart.

Two closely related new *Eupeodes* species similar to *E. bucculatus* (Rondani, 1857) are described. *E. duseki* **spec. nov**. is described based on males and females from Scandinavia, *E. goeldlini* **spec. nov**. based on males from Central Europe and the Far East of Russia. In features of their male terminalia both new species differ from other *Eupeodes* species, but closely resemble each other. *E. duseki* may be separated from *E. bucculatus* using non-genitalic morphological features, but is very similar to specimens of *E. abiskoensis* (Dušek & Láska, 1973).

Zusammenfassung

Zwei neue nahe verwandte Arten der Gattung *Eupeodes* ähnlich *E. bucculatus* (Rondani, 1857) werden beschrieben. *E. duseki* **spec. nov**. wird nach männlichen und weiblichen Exemplaren aus Skandinavien, *E. goeldlini* **spec. nov**. wird nach Männchen aus Mitteleuropa und aus dem Fernen Osten Russlands beschrieben. Beide Arten unterscheiden sich von anderen Arten der Gattung *Eupeodes* durch die männlichen Genitalien, die bei beiden Arten sehr ähnlich sind. *E. duseki* ist im Gesamtaussehen der Art *E. abiskoensis* (Dušek & Láska, 1973) ähnlich und kann von *E. bucculatus* auch an der äußeren Morphologie unterschieden werden.

Introduction

When studying Palaearctic species of *Eupeodes* we recognized among the material examined one new species from northern Europe and a second, similar new species from central Europe and the Far East (temperate zone). The northern European taxon differs from all described *Eupeodes* species in its external morphology and was at first considered to be an intraspecific form of *E. abiskoensis* (Dušek & Láska, 1973). The central European one does not differ in external morphology from *E. bucculatus* (Rondani, 1857), but is well differentiated by features of the male terminalia. The two new species do not differ in their male terminalia. The males of both new species are described in the present paper, but the female of the temperate zone species remains undescribed, because it cannot at present be distinguished from the female of *E. bucculatus*.

Methods and terminology

Morphological characters were figured and measured using a drawing tube and ocular micrometer, using the Carl Zeiss Jena Citoval 2 microscope. The anterior angle of approximation of the male eyes and the length of the eye suture were measured from vertically above, towards the contact area of eyes (see fig. 1, p. 28 in Mazánek et al. 1998). Figs. 1 and 14 were also drawn from this direction. The width of the face and the width of the head were measured at the mid-point between the antennae and the facial tubercle. The maximum width and the minimal length of the clypeus were measured in vertical view, looking at the clypeal surface. Measurements of the maximum width and the minimal length of the third antennal segment were taken from its inner surface. The male terminalia were figured by using the demonstration tube on the Carl Zeiss Jena Laboval 3 microscope. The length of a paramere was measured from the base of the basal tooth to the apex, in lateral view. The maximum width of the hypandrium was measured in ventral view. Its height was normally measured from the apex of the distal lobe to the basal margin of the hypandrium, in lateral view. All characters were measured in most of the type material of both species, and the ranges given are from the minimal to the maximum measured values. The terminology used is that of Dušek & Láska (1976). The distal lobe of the hypandrium is the lobe distally projecting over the connection to the paramere (see figs. 10, 13).

Eupeodes duseki **spec. nov.**

Holotype: ♂, Sweden North, Abisko, 15.7.1986, leg. P. Láska. Length: body 8.1 mm, wing 7.1 mm, abdomen 4.6 mm, width of head 2.6 mm. Deposited in the collection of the Department of Entomology, the National Museum, Prague, Czech Republic.

Paratypes: Sweden: Abisko, Lpl., 14.7.1951, 1♂ (No. 1); 25.6.1951, 1♂ (No. 2, Paratype No. 1 of *M. abiskoensis*), leg. J.R. Vockeroth; T. Lpm. Abisko, 17.6.1973, 1♂ (No. 3) 1♀ (No. 18), leg. A. Fjellberg. Norway: STI, Oppdal, Kongsvoll, 1050 moh, EIS 79, MF, 13.7.-2.8.1995, 4♂ (No. 4-7) 1♀ (No. 19); MF2, 16.6.-13.7.1995, 1♂ (No. 8) 6♀ (No. 24-29); 900 moh, 19.6.1995, 1♂ (No. 9); 930 moh, MF1, 16.6.-13.7.1995, 2♂ (No. 10, 11), leg. John Skartveit; STI, Oppdal, Kongsvoll, EIS 79, willow scrub above mountain inn, 4.7.1994, 1♂ (No. 12); grass area at the railway station on *Potentilla crantzi*, 1.7.1994, 1♀ (No. 21), leg. Tore R. Nielsen; Vina, Gargia, FI, Alta, 16.7.1977, 2♂ (No. 13, 14), leg. Tore R. Nielsen; FN, Vadsø near camping ground (EIS 177), 9-10.7.1983, 1♂ (No. 15), leg. Tore R. Nielsen; Løkting, Elverum HEs, 13.5.1980, 1♂ (No. 16), leg. L. Aarvík; Pålgard, Bv, Hol, 12.6.1973, 1♂ (No. 17), leg. Tore R. Nielsen; Lakselv (EIS 174), Fn, Porsanger, on *Caltha palustris*, 26-27.6.1979, 1♀ (No. 22), leg. I. & T. Nielsen; Vaggetem, Fø, Sør-Varanger, 30.6.1977, 1♀ (No. 23), leg. I. & T. Nielsen.

Paratypes No. 1, 2 deposited in Canadian National Collection, Ottawa. Paratypes No. 3-23 deposited in collection of Tore R. Nielsen, Sandnes (Norway).

Other specimens studied (not type status): Sweden: Sverige, T. Lpm: Abisko, 17.6.1973, 2♂, leg. A. Fjellberg. Norway: Vina Gargia, Fi: Alta, 16.7.1977, 2♂, leg. Tore Nielsen; FV, Alta, Skjøragenta (EIS 165), 23.6.1984, 1♂, leg. Tore R. Nielsen.

Etymology: The specific epithet is dedicated to our colleague Jindra Dušek and derived from his name. He noted the differences in male terminalia of some specimens when *E. abiskoensis* (Dušek and Láska, 1973) was described.

Description

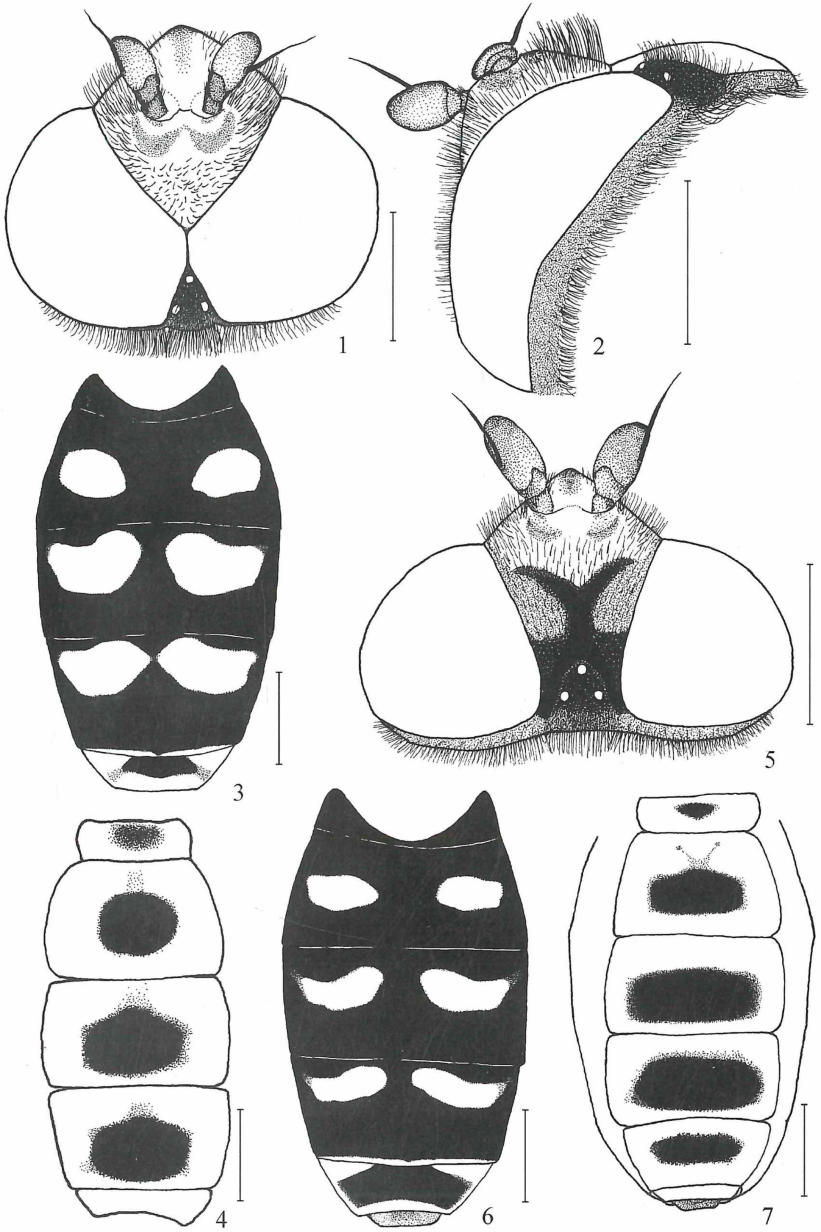
♂ (figs. 1-4, 8-10): Head: Eyes bare. Anterior angle of approximation of eyes about 90°. Eye suture usually shorter than longer black hairs on frons. Distance from anterior ocellus to nearest margin of yellow frons 0.37±0.07 mm (fig. 1). Dark spots above antennae more or less distinct. Antenna brown, darker in upper half. Third antennal segment oval, variable, usually about as long as wide. Lower part of facial tubercle dark medially. Oral margin completely or partly black. Clypeus usually a little longer (0.27±0.04 mm) than wide (0.23±0.04 mm). Face yellow haired, rarely with some black hairs intermingled. Width of face 45-51 % of width of head. Postocular orbit a little variable but usually broader than in *E. luniger* (Meigen, 1822), near vertex broader than half of its maximal width (fig. 2).

Thorax: Scutellum completely black haired on disc, some black hairs present also on hind margin. Entire surface of alula and 90-100 % of second basal cell covered in microtrichia. Fore and mid femora dark on basal 1/3-1/2, hind femur dark on basal 1/2-2/3. Fore femur with pale hairs prevailing on the dark basal part. Hind tibia entirely pale.

Abdomen: Yellow spots on tergites 3 and 4 (fig. 3) rather broadly separated, connected only rarely and narrowly, normally separated from lateral margins of tergites, but occasionally reaching lateral margins of tergites by elongate anterolateral corners. Tergite 5 with a black semicircular band separated from yellow lateral margins of tergite, or reaching lateral margins of tergite in dark specimens. Dark spots on sternites 3 and 4 rather oval and of equal size (fig. 4).

Male terminalia: Base of aedeagus (head of pyxis, fig. 8) narrow, broader on basal part, with a slender, pointed, large tooth and a small, or almost absent, blunt apical tooth. Angle between proximal edge of large tooth and edge of aedeagal base under the tooth about 90°. Paramere (fig. 9) rather angular, with large basal tooth (about 0.05 mm) which does not significantly overlap periphery of paramere in lateral view and with another, ventral tooth or process towards apex. Whereas, in other species of *Eupeodes*, the ventral tooth, including its basal unpigmented portion, is entirely covered by membraneous flange of paramere in internal view, this flange is strongly reduced in *E. duseki*, leaving the unpigmented basal portion of ventral tooth free, actually representing the ventral margin of paramere. Length of paramere from base of basal tooth to apex 0.22±0.02 mm. Hypandrium (fig. 10) similar to *E. nitens* (Zetterstedt, 1843), with well-developed distal lobes, rather angular and somewhat wrinkled, as broad as high, about 0.45 mm.

♀ (figs. 5-7): Head: Distance between posterior ocelli greater than distance between posterior ocellus and eye margin (fig. 5). Vertex as broad as distance between outer margins of antennal insertions. Dust spots on frons rather weak, occupying more than 2/3 of frontal width, elongate along eye margin anteriorly and narrowing ventrally (fig. 5). Hairs on face all yellow, oral margin partially or completely dark. Width of face about 46 % of width of head.



Figs. 1-7: *Eupeodes duseki* spec. nov. – 1-4: ♂ (holotype), 5-7: ♀ (5: paratype No.18; 6, 7: paratype No. 23) – 1. ♂, head, vertical view on the connection of eyes; – 2. ♂, postocular orbit, dorsolateral view; – 3, 6. ♂ and ♀, abdomen, dorsal view; – 4, 7. ♂ and ♀, sternites, ventral view; – 5. ♀, head, dorsal view. – Scales: 1 mm.

Thorax: Scutellum with black hairs on disc. Occasionally, some long hairs on scutellar hind margin also black. Entire surface of alula and 60-90 % of second basal cell covered in microtrichia. Fore and mid femora dark on basal 1/4-1/3, hind femur yellow to brown-black on about basal half. Long hairs on dark basal part of fore femur pale and usually shorter than width of femur.

Abdomen: Yellow spots on tergites 3 and 4 (fig. 6) separated and not normally reaching lateral margins of tergites, but in pale specimens rarely vaguely connected and reaching lateral margins of tergites. Spots of characteristic shape and rather large. Black spot on tergite 5 well-developed, not reaching pale lateral margins of tergite except in dark specimens. Dark spots on sternites 3 and 4 rather oval and of equal size. Sternite 5 with dark spot (fig. 7).

Length: Body 7.5-9.8 mm, wing 6.5-8 mm.

Differential diagnosis

♂: Very similar in general appearance to larger specimens of *E. abiskoensis* (Dušek & Láska, 1973), but with postocular orbits narrower near vertex, clypeus shorter (in *E. abiskoensis* clypeus is almost twice as long as broad) and sternites 3 and 4 with dark spots of equal size (in *E. abiskoensis* dark spot on sternite 4 smaller).

E. duseki differs from all species, except *E. goeldlini* spec. nov., in a characteristic paramere (fig. 9). The basal tooth is about two times longer than in other species (except *E. abiskoensis*) and does not overlap significantly the periphery of the paramere in lateral view (unlike in other species of *Eupeodes*). The ventral membraneous flange of paramere almost absent (other species have this flange well developed from the basal tooth of paramere).

E. duseki differs from *E. goeldlini* in having the spots on tergites 3 and 4 usually separated in the mid-line and not reaching the lateral margins of tergites, and by having 90-100 % of second basal cell covered in microtrichia. Postocular orbits usually broader than in *E. goeldlini*.

♀: *E. duseki* differs from northern *E. bucculatus* in having the spots on tergites 3 and 4 usually separated and not reaching the lateral margins of the tergites (in *E. bucculatus* usually connected and reaching lateral margins of tergites). About 60-90 % of second basal cell is covered in microtrichia (in northern *E. bucculatus* 20-50 %). Sternites 3 and 4 with rather oval dark spots (sternites of *E. bucculatus* with large and rather rectangular spots).

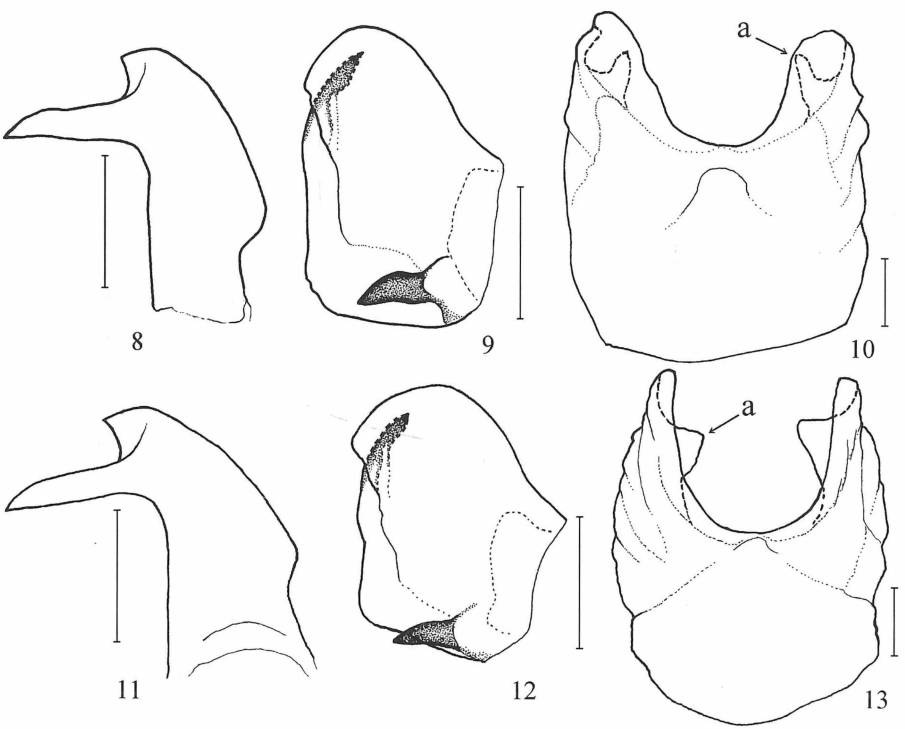
It differs from *E. curtus* (Hine, 1922) by having 60-90 % of second basal cell covered in microtrichia (in *E. curtus* 99-100 %), and by the presence of a distinct dark spot on sternite 5 (in *E. curtus* sternite 5 is pale or with a small vague spot only).

E. duseki can be separated from *E. punctifer* (Frey, 1934) and *E. abiskoensis* by the equal size of the dark spots on sternites 3 and 4 (in *E. punctifer* and *E. abiskoensis* sternite 4 is pale or with much smaller dark spot) and by the narrower vertex.

The female of *E. duseki* can probably be distinguished from the unknown female of *E. goeldlini* through having the spots on tergites 3 and 4 usually separated in the midline and not reaching lateral margins of tergites, and by rather rectangular spots on sternites 3 and 4 (in *E. goeldlini* female the spots of tergites 3 and 4 are probably connected and reaching lateral margins of tergites, and the dark spots on sternites 3 and 4 rather rectangular).

Eupeodes goeldlini **spec. nov.**

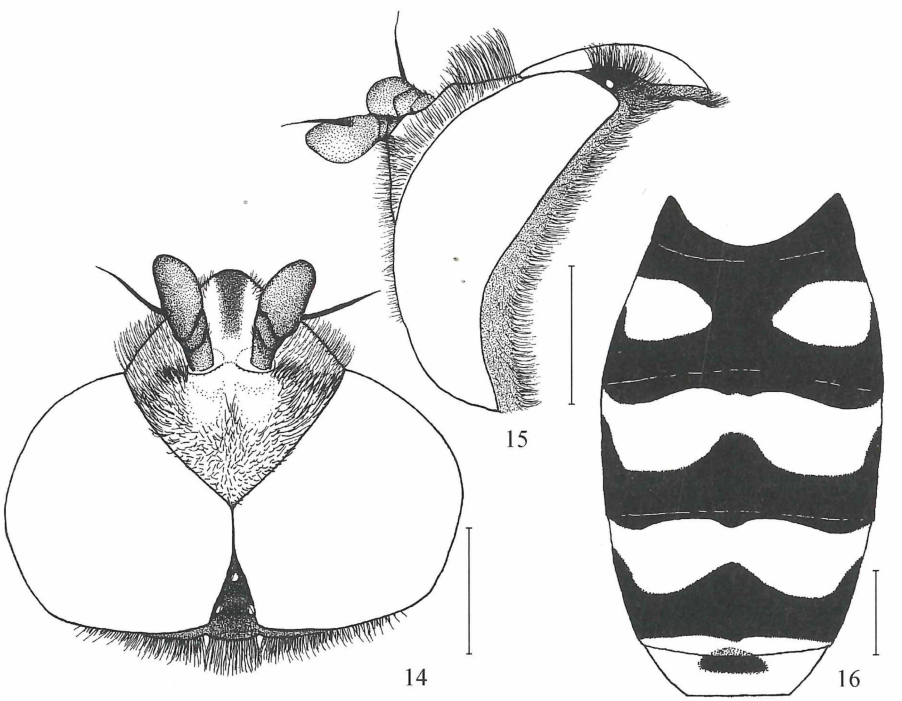
Holotype: ♂, Czech Republic, Moravia, Olomouc - Černovír, 1.5.1958, leg. J. Palásek. Length: body 10.6 mm, wing 8.9 mm, abdomen 6 mm, width of head 3.3 mm. Deposited in the collections of the Department of Entomology of the National Museum, Prague, Czech Republic.



Figs. 8-13: Male terminalia. – Figs. 8-10: *Eupeodes duseki* spec. nov. (holotype) – Figs. 11-13: *Eupeodes goeldlini* spec. nov. (paratype No. 1) – 8, 11. base of aedeagus, lateral view; – 9, 12. left paramere, inner lateral view; – 10, 13. hypandrium, ventral view. – a = connection of paramere. – Scales: 0.1 mm.

Paratypes: Czech Republic: locality as holotype, 23.8.1970, 1♂ (No. 1), leg. et coll. J. Martinovský. Slovak Republic: Kovacov, 16.7.1969, 1♂ (No. 13), leg. S. Štollár. Poland: Polonia-merid., Krzyżanowice, distr. Pińczów, 22.8.1956, 1♂ (No. 2), leg. J. Z. Ekipa. Germany: Baden-Württemberg, Altenheim bei Kehl, Polder Nr. 15, MU07, 12.8.1988, 1♂ (No. 14), leg. Dieter Doczkal. Switzerland: Suisse-Vaud, Les Dévens, filet, 5.5.1967, 1♂ (No. 3), leg. P. Goeldlin; Suisse-Valais Bramois, 6.4.1944, 1♂ (No. 4), leg. P. Bovet; Suisse-Valais, Col de Bretolet, 24.8.62, 11-12h,1♂ (No. 5), leg. J. Aubert; Suisse-Valais, Finges étang Est, Pfafforétsee, 6.7.1989, 1♂ (No. 6), leg. A. Maibach; Suisse-Vaud, Les Dévens, Bex, 29.7.1967, 1♂ (No. 7), leg. P. Goeldlin. Russia - Far East: Primorskij Kr. 30 km, S pos. Terney, 31.7.1982, 1♂ (No. 8); 1.8.1982, 2♂ (No. 9, 10); 2.8.1982, 1♂ (No. 11); Juzhnye, Primorje, okr. s. Kamenushka, Veroka, 2.7.1981, 1♂ (No. 12) leg. V.A. Mutin.

Paratypes No. 2, 3, 8, 13 deposited as Holotype. Paratypes No. 4-7 deposited in the Musée Zoologique Lausanne (Switzerland). Paratypes No. 9-12 deposited in the Zoological department Komsomolsk-na-Amure, State pedagogical Institute, Komsomolsk-na-Amure (Russia). Paratype No. 14 deposited in the collection of Dieter Doczkal.



Figs. 14-16: ***Eupeodes goeldlini*** **spec. nov.** ♂ (14, 15 holotype, 16 paratype No. 1) – 14. head, vertical view on the connection of eyes; – 15. postocular orbit, dorsolateral view; – 16. abdomen, dorsal view. – Scales: 1 mm.

Etymology: The specific epithet is dedicated to our esteemed colleague Pierre Goeldlin de Tiefenau, for his extraordinary contribution to syrphidology. He collected and sent us the greater part of the available material of this species.

Description

♂ (figs. 11-16): Head: Eyes bare. Anterior angle of approximation of eyes about 90°. Eye suture longer than long black hairs on frons. Front ocellus is 0.50±0.07 mm distant from margin of the yellow frons (fig. 14). Frons yellow without dark spots above antennae. Antenna brown to orange, darker above. Third antennal segment oval, variable, usually a little longer than wide. Facial tubercle with darkened median stripe. Oral margin usually rather pale, especially at sides, rarely continuously dark. Clypeus usually a little longer (0.31±0.04 mm) than wide (0.26±0.04 mm). Hairs on face varying from all yellow to almost all black. Width of face 43-49 % of width of head. Postocular orbit as narrow as in *E. luniger* or narrower, near vertex about 1/2 or less of its maximal width (fig. 15).

Thorax: Scutellum mostly black haired on disc, pale haired on margins. Entire surface of alula and 50-85 % of second basal cell covered in microtrichia. Fore and mid femora dark on basal 1/4 to 1/3 and hind femur dark to almost yellow on basal 1/3-2/3. Long hairs on dark basal part of front femur are pale. Hind tibia entirely pale.

Abdomen: Yellow spots on tergites 3 and 4 (fig. 16) large, usually connected across the mid-line and reaching or almost reaching lateral margins of tergites. In dark specimens the spots are separated in the middle and not reaching lateral margins of tergites. Tergite 5 with small black spot in the middle, lateral margins of tergite entirely yellow. Dark spots on sternites 3 and 4 oval and of equal size.

Male terminalia: Base of aedeagus (fig. 11) and hypandrium (fig. 13) almost identical with those of *E. duseki* spec. nov. (no consistent differences were observed, see above). Paramere (fig. 12) very similar to that of *E. duseki*, but somewhat broader and more rounded in distal part.

Length: body 8.5-11 mm, wing 7.5-9 mm.

Differential diagnosis

♂: In external morphology *E. goeldlini* is almost identical with *E. bucculatus*. From that and the other species, except *E. duseki* spec. nov., it clearly differs in characteristics of the male terminalia (see above).

From *E. duseki* it differs in having the spots on tergites 3 and 4 rather distinctly connected and reaching the lateral margins of the tergites, by having 50-85 % of the second basal cell covered in microtrichia and by usually narrower postocular orbit.

♀: The female of *E. goeldlini* is unknown. It is probably very similar to the female of *E. bucculatus*, from which we cannot yet seperate it.

Discussion

The two species described in this paper are probably closely related and are certainly very similar in their male terminalia. It seems possible that they represent two subspecies or geographical varieties of one new species, the occurence of great intraspecific variation within other related species of *Eupeodes* being well known (see Dušek & Láska 1976, Mazánek et al. 1998). However, the differences in external characters between the two species described are, in our judgement, greater than can be explained as intraspecific variation. We therefore prefer to describe the two as separate species.

Acknowledgements

We want to express our gratitude to Tore Randulff Nielsen, Sandnes (Norway) for his comments on our manuscript and for the available material, and to the following persons and institutions for letting us study types or specimens in their care: Pierre Goeldlin de Tiefenau, Musée Zoologique Lausanne (Switzerland); Valeri Mutin, Zoological department Komsomolsk-na-Amure, State pedagogical Institute, Komsomolsk-na-Amure (Russia); Jan Ježek, Department of Entomology of National Museum, Prague (Czech Republic); Jaroslav Martinovský, Olomouc (Czech Republic); J. R. Vockeroth, Biosystematics Research Institute, Research Branch, Ottawa (Canada); Sarah Whitman, Museo Zoologico de "la Specola" sezione del museo di storia naturale Firenze (Italy); Adrian Pont, Hope entomological collection University Museum, Oxford (Great Britain); Dieter Doczkal, Malsch (Germany). We are also indebted to Jaroslav Starý, Department of Zoology, Palacký University, Olomouc (Czech Republic) for his valuable information. Martin C.D. Speight (Ireland) has kindly checked the English.

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