

Notes on some Scandinavian Palpomyiini (Diptera: Ceratopogonidae)

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Records of ten species of Palpomyiini (Diptera: Ceratopogonidae) new to the faunas of Sweden [*Palpomyia brachialis* (Hal.), *P. luteifemorata* Edw., *P. nigripes* (Meig.), *P. semifumosa* Gtgh., *P. spinipes* (Panzer), *Phaenobezzia rubiginosa* (Winn.), *Bezzia albicornis* (Meig.), *B. nobilis* (Winn.), *B. taeniata* (Hal. in Walker)] and Norway [*P. pubescens* Kieff.] are given along with the diagnoses allowing for their recognition. Data on general distribution of each species are presented. The genus *Phaenobezzia* is reported for the first time in Scandinavia.

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Introduction

The Ceratopogonidae or biting midges are small (length 1-4 mm) nematoceros flies. Except for hematophagous forms attacking man and livestock they have received little attention. Even relatively big in size predaceous species, such as those belonging to the tribe Palpomyiini, that in immature stages are common inhabitants of various aquatic and semi-aquatic situations, are still poorly known.

Scandinavian biting midges have been studied by several authors. Data concerning species of Palpomyiini were given by Staeger (1839), Zetterstedt (1838, 1850, 1855), Lundström (1910, 1916, 1917), Kieffer (1915, 1916), Edwards (1931), Storå (1939) and more recently by Clastrier (1962a, b), Hackman (1980) summarized Finnish species in a check list. A total number of 27 species of Palpomyiini have been encountered in Scandinavia (Tab. 1.). The present paper reports additional species new to the faunas of two countries of the region.

Material studied

The present study is based upon the examination of Swedish and Norwegian specimens of Palpomyiini. In Swedish material (from the col-

lection of the Zoological Museum, University of Lund) 19 species have been determined, among them 9 species of *Bezzia*, *Palpomyia* and *Phaenobezzia* not recorded in this country as yet. In the collection of biting midges in the Natural History Museum (London) one species of *Palpomyia* from Norway new to the fauna of this country has also been found. Specimens belonging to each species were carefully compared with existing types (listed in the paper) and other specimens from outside Scandinavia, data of which are not included here.

Results

All species new to the Scandinavian fauna are reported below. Diagnoses and other notes allowing for their recognition as well as data on their general distribution are given along with the records. *P. pubescens*, *P. semifumosa* and *P. spinipes* are presented in the new interpretation, justification of which is given in a revisionary paper on *Palpomyia* of Central Europe (in preparation). The abbreviations for parts of Russia follow "Catalogue of Palaearctic Diptera". For the explanation of the special terms used in the paper, see Szadziewski et al. (in print).

Tab. 1. A list of species of *Palpomyiini* recorded from Scandinavia (D - Denmark, S - Sweden, F - Finland, N - Norway).

Arter av svidknott ur gruppen *Palpomyiini* som rapporterats från Norden (D - Danmark, S - Sverige, F - Finland, N - Norge).

	D	S	F	N
<i>Palpomyia armipes</i> (Meigen)	+	+	+	+
<i>P. aterrima</i> Goetghebuer			+	+
<i>P. bispinosa</i> Kieffer		+		
<i>P. concoloripes</i> Clastrier				+
<i>P. distincta</i> (Haliday)		+	+	
<i>P. flavipes</i> (Meigen)	+	+	+	+
<i>P. lineata</i> (Meigen)	+	+	+	
<i>P. lundstroemi</i> Remm	+		+	
<i>P. pubescens</i> Kieffer		+	+	
<i>P. rufipes</i> (Meigen)		+		
<i>P. serripes</i> (Meigen)		+	+	
<i>P. spinipes</i> (Panzer)	+			
<i>P. tibialis</i> (Meigen)	+	+	+	
<i>Bezzia affinis</i> (Staeger)	+			
<i>B. annulipes</i> (Meigen)	+	+	+	
<i>B. bicolor</i> (Meigen)		+	+	
<i>B. coracina</i> (Zetterstedt)		+	+	
<i>B. flavicornis</i> (Staeger)	+			
<i>B. leucogaster</i> (Zetterstedt)	+	+	+	
<i>B. nigrata</i> Clastrier				+
<i>B. nigrifulva</i> (Zetterstedt)		+	+	+
<i>B. ornata</i> (Meigen)		+		
<i>B. pilipennis</i> Lundström		+		
<i>B. signata</i> (Meigen)		+		
<i>B. solstitialis</i> (Winnertz)			+	
<i>B. transfuga</i> (Staeger)	+	+	+	
<i>B. winnertziana</i> Kieffer			+	

Palpomyia brachialis (Haliday)

(Fig. 1.)

Ceratopogon brachialis Haliday, 1833: 152.

Palpomyia brachialis (Haliday); Kieffer, 1906.

Palpomyia longipennis Kieffer, 1919: 104.

Palpomyia fusciclava Kieffer, 1919: 109.

Palpomyia nemorivaga Goetghebuer, 1920: 85.

Diagnosis. Legs almost totally yellow, only hind femur black at apex, knees brownish black, distal end of hind tibia brown; fore femur slightly thickened, with 7-11 spines. Body covered with simple, not modified setae. Halteres brown. Gonostyle weakly bent, with straight end.

Types. Three female syntypes of *P. nemorivaga* Goetghebuer in IRScNB, Brussels.

Scandinavian specimens. SWEDEN: Sk: Forsakar, 2.08.1981, 1 ♀; T. Hällestad, Grytängen, 21.07.1975, 1 ♀; Kullaberg, 6.08.1975, 2 ♀; Kullaberg, 22.08.1983, 2 ♀. All specimens H. Andersson leg. (ZML).

Distribution. *P. brachialis* is an arboreal European species known from ?Spain, Great Britain, Belgium, Germany, ?Austria, Hungary, Slovakia, Lithuania, Byelorussia, Ukraine and Russia (CET). For the first time recorded from Sweden.

Note. In colour of legs and somewhat swollen fore femur *P. brachialis* resembles *P. distincta* (Haliday) the most. However, the latter species differs in broadly dark apices of mid and hind femora, furthermore female in yellow scutellum, claws with small basal inner tooth and presence of two lobes arising from the eighth sternum, and male in setose aedeagus and the presence of mesoventral lobe on gonocoxite.

Palpomyia luteifemorata Edwards

Palpomyia luteifemorata Edwards, 1926: 419.

Diagnosis. Body covered with numerous small spear-shaped setae. Femora yellow; fore and mid tibiae brownish yellow or brown (mid tibia lighter than fore one), hind tibia blackish brown.

Types. Female holotype of *P. luteifemorata* Edwards, paratypes - 3 females and 2 males in NHM, London.

Scandinavian specimens. SWEDEN: Dlr: Leksand, Sångån, 18.07.1979, T. Tjeder leg., 1 ♀ (ZML).

Distribution. This is an arboreal European species known from Great Britain, Belgium, Germany, Estonia and Ukraine (Crimea). For the first time recorded from Sweden.

Note. Among European species of *Palpomyia* only *P. luteifemorata* and *P. floralis* (Meigen) have spear-shaped setae. However, *P. floralis* can be easily distinguished by darker legs (at least hind femur is dark in distal half).

Palpomyia nigripes (Meigen)

Ceratopogon nigripes Meigen, 1830: 265.

Palpomyia nigripes (Meigen); Kieffer, 1906: 63.

Ceratopogon pratensis Meigen, 1830: 264.

Palpomyia pratensis (Meigen); Kieffer, 1906: 63.

Palpomyia bryocrypta Kieffer, 1925a: 425.

Diagnosis. Legs brownish black; fore femur yellow or light brown in a proximal half, mid and hind femora yellowish at bases. Fore femur with 4-5 slightly elevated spines. Female claws without basal inner tooth; 9th sternum of female abdomen very narrow, not divided, heavily sclerotized. Parameres fused, forming a slender median process basally and widened, spoon-shaped distal portion; aedeagus greatly reduced; gonocoxite recurved 90° basally.

Types. Four female syntypes of *C. nigripes* Meigen in MNHN, Paris.

Scandinavian specimens. SWEDEN: Ha: Breared, Klövberget, 19.06.1984, H. Andersson leg., 1 ♀ (ZML).

Distribution. This is arboreal European species known from Great Britain, France, Belgium, the Netherlands, Germany, ?Czech, ?Slovakia, Poland and Russia (CET). Recorded for the first time from Sweden.

Note. *P. nigripes* belongs to a complex of four species, the females of which are characterized by the shape of ninth sternum and males by highly characteristic structure of genitalia described above. Besides *P. nigripes* two other species, *P. remmi* Havelka and *P. globulifera* Remm inhabit the Palaearctic Region; the fourth, *P. canadensis* Grogan & Wirth is known from the Nearctic Region. *P. nigripes* differs from other members of the complex in dark colour of legs, mainly in entirely dark tibiae.

Palpomyia pubescens Kieffer

Palpomyia pubescens Kieffer, 1919: 105.

Palpomyia crassipes Goetghebuer, 1920: 112.

Palpomyia spinipes sensu Goetghebuer nec Panzer, 1922: 53.

Palpomyia turfacea Kieffer, 1925b: 155.

Diagnosis. Small insects, wing length (measured from the basal arculus to the wing tip) 1.55-2.18 mm in female and 1.23-1.32 mm in male. Body black. Halter yellow. Legs yellow; fore femur with black tip, distal 1/3 of mid and 1/2 of hind femora brown or black; fore and mid tibiae with brown distal end, hind tibia totally brown or black. Fore femur greatly swollen, with 11-15 spines. Male anepisternum with 1-7 setae, katepisternum bare; parameres gradually narrowing in the distal part, with undivided, more or less sharp, setose tip. Male antennal ratio (sum of the lengths of distal

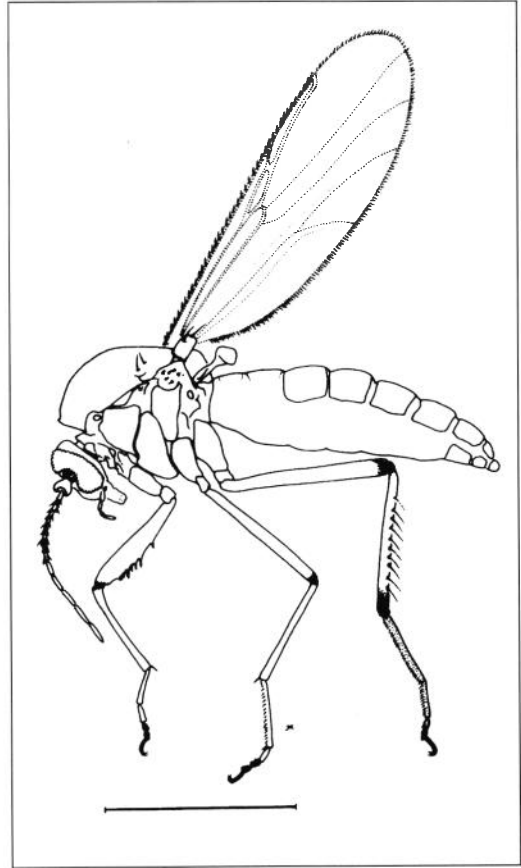


Fig. 1. *Palpomyia brachialis*, female habitus (length bar below = 1 mm). Drawing: J. Krzywinski.

Hona av svidknottet *Palpomyia brachialis* (skalstreck = 1 mm). De 1-4 mm långa honorna av gruppen *Palpomyiini* fångar sina byten i flykten. De attackerar nästan enbart hannar av andra myggor eller mindre dagsländor. Honan äter vanligen också upp hannen under parningen, varvid hans kropp reduceras till en tom kutikula. Därutöver livnär sig honorna av blomnektar (främst av familjen flockblomstriga växter), liksom hannarna, som inte är predatorer.

four flagellomeres divided by the sum of the lengths of the preceding nine) lower than 1.10.

Types. Female syntype of *P. crassipes* Goetghebuer in IRScNB, Brussels.

Scandinavian specimens. NORWAY: Laerdal, 24-27.07.1923, F. W. Edwards leg., 1 ♀ (NHM).

Distribution. According to Remm (1976) *P. pubescens* inhabits cold situations – north taiga and the mountains in the south. Known from Great Britain, Belgium, the Netherlands, Germany, Austria, ?Hungary, Czech, Slovakia, Poland, Sweden, Finland, Estonia, Latvia, Ukraine (Crimea) and Russia (Kaliningrad Distr., NET, ES, FE). This is the first record from Norway.

Note. From other species of *distincta* group of *Palpomyia* with pale halteres females of *P. pubescens* differ in totally dark hind tibia, male in small size, lack of setae on katapisternum, and parameres undivided in distal part. Male of *P. distincta*, which is the most similar to *P. pubescens*, differs from this species in higher value of antennal ratio (over 1.10) and bigger size (wing length 1.27-1.68 mm).

Palpomyia semifumosa Goetghebuer

Palpomyia semifumosa Goetghebuer, 1922: 53 (= *hortulana* sensu Goetghebuer, 1920).

Palpomyia hortulana sensu Goetghebuer nec Meigen, 1920: 82.

Diagnosis. Body covered with small simple setae. Legs yellow; fore femur with black extreme tip; distal 1/3 of mid and hind femora dark brown; mid tibia yellowish brown, in proximal half and distal end darkened, hind tibia totally blackish brown; hind tarsus brown. Fore femur with 4-7 slightly elevated spines. Wing narrow, darkened in a distal half. Female with small, spherical spermathecae. Male: gonostyle weakly bent, with straight end; aedeagus narrow above basal arms; distal portion of parameres slender, with slightly bulbous tip.

Types. Two female syntypes of *P. semifumosa* Goetghebuer in IRScNB, Brussels.

Scandinavian specimens. SWEDEN: Sk: Torna Hällestad, 11.06.1982, C. Hansson leg., 1 ♂ (ZML).

Distribution. Species known from Belgium, the Netherlands, Great Britain, Armenia and Georgia. This is the first record from Sweden.

Note. *P. semifumosa* is very similar to *P. flavipes* Meigen and *P. floralis* (Meigen) in leg coloration, but is easily distinguished by the presence of small simple unmodified setae. *P. citrinipes* Kieffer and *P. puberula* Remm, that are probably closely related to *P. semifumosa* are much smaller in size.

Palpomyia spinipes (Panzer)

Ceratopogon spinipes Panzer, 1806: 14.

Palpomyia spinipes (Panzer); Kieffer, 1901: 157.

Ceratopogon fulvus Macquart, 1826: 181.

Palpomyia fulva (Macquart); Kieffer, 1906: 63.

Ceratopogon ferrugineus Meigen, 1830: 265.

Palpomyia ferruginea (Meigen); Kieffer, 1901: 157.

Palpomyia parviforceps Kieffer, 1925a: 98.

Diagnosis. Female: head reddish, thorax yellowish red or red, abdomen whitish. Legs yellow; distal 1/5 of mid femur and 1/4 of hind femur black, fore and mid tibiae brown apically, distal 1/5 of hind tibia black; femora slender; fore femur bearing 8-13, mid 0-3 and hind 2-5 spines. Male: body brown; legs similar to female in colour, however distal 1/4 of mid and 1/3 of hind femora brown; parameres fused at base and deeply divided in a distal half.

Types. Female holotype of *C. ferrugineus* Meigen in MNHN, Paris.

Scandinavian specimens. SWEDEN: Sk: Norr Krankesjön, 3.07.1975, 4 ♀; Norr Krankesjön, Fukt. Lövskog, 3.08.1974, 1 ♀; Norr Krankesjön, Sjöstrand, sand, 3.07.1975, 3 ♀; Norr Krankesjön, Torrhed, 23.07.1980, 2 ♀. Kullaberg, 11.07.1976, 1 ♀; 22.07.1978, 1 ♀; 5.08.1982, 1 ♀. All specimens H. Andersson leg. (ZML).

Distribution. This is an arboreal Palaearctic species, known from Great Britain, France, Belgium, the Netherlands, Germany, Austria, Italy, Hungary, Poland, Denmark and Georgia. For the first time recorded from Sweden.

Note. *P. fulvescens* Kieffer described from Hungary is similar to *P. spinipes*, but differs in dark brown halteres and slightly thickened fore femora.

Phaenobezzia rubiginosa (Winnertz)

Ceratopogon rubiginosus Winnertz, 1852: 72.

Bezzia rubiginosa (Winnertz); Kieffer, 1901: 153.

Probezzia rubiginosa (Winnertz); Kieffer, 1925a: 121.

Bezzia glyceriae Kieffer, 1913: 9.

Probezzia nitidiventris Goetghebuer, 1923: 104

Diagnosis. Head, thorax, and abdomen as well as halteres brown. Legs brownish yellow or light brown. Femora unarmed.

Scandinavian specimens. SWEDEN: Sk: Norr Krankesjön, Fukt. Lövskog, 30.07.1974, H. Andersson leg., 1 ♀ (ZML).

Distribution. *P. rubiginosa* is an arboreal Pa-

laearctic species known from Great Britain, Belgium, the Netherlands, Germany, Austria, Poland, Estonia, Latvia, Lithuania and Russia (CET, ES, FE). For the first time reported from Sweden. This is also the first record of the genus *Phaenobezzia* in Scandinavia.

Note. This is the only species of *Phaenobezzia* known in Europe. On the basis of male Tokunaga (1939) described from Japan closely related *P. minutistyla* which is distinguished from *P. rubiginosa* by much wider and shorter gonocoxites. The Nearctic Region inhabits very similar *P. opaca* (Loew), which differs from *P. rubiginosa* in having dark brown hind tibia and higher value of antennal ratio (Wirth and Grogan 1982).

Bezzia albicornis (Meigen)

Ceratopogon albicornis Meigen, 1818: 74.
Ceratophus albicornis (Meigen); Kieffer, 1906: 60.
Bezzia albicornis (Meigen); Goetghebuer, 1922: 58.
Ceratopogon pallidatarsatus Strobl, 1900: 171.
Bezzia pallidatarsata (Strobl); Kieffer, 1924: 264.
Bezzia brevinervis Kieffer, 1919: 122.
Bezzia strobli Kieffer, 1919: 122.
Homobezzia atrata Macfie, 1944: 126.
Bezzia atrata (Macfie); Clastrier, 1962a: 112.

Diagnosis. Legs black; tarsi whitish. Fore leg with 2-4 spines. Parameres robust distally, expanded in the middle, with lateral surfaces coarsely corrugated in the widened area; end of parameres hyaline, formed by four small lobes, inner two of them longer and divided by a deep notch.

Types: Male holotype of *C. albicornis* Meigen in MNHN, Paris. One male and three female syntypes of *H. atrata* Macfie in MNH, London.

Scandinavian specimens. SWEDEN: Sk: Klagshamnssudde, 1.06.1983, H. Andersson leg., 1 ♂ (ZML).

Distribution. This is one of the most widely distributed species of *Palpomyiini*, known from Central and western Africa, in Palaearctic from Algeria, Egypt, Spain, Great Britain, Belgium, Germany, Serbia, Croatia, Austria, Hungary, Poland, Lithuania, Ukraine, Russia (SET, SMA, WS, ES, FE), Armenia, Azerbaijan, Turkmenistan, Kazakhstan, Afghanistan, Mongolia and north China. Now recorded for the first time from Sweden.

Note. *B. albicornis* belongs to a small group of species, males of which are very distinctive in the

morphology of their genitalia and females have strongly sclerotized ninth sternum with very narrow, nearly straight and pointed arms. At present only males can be determined to species in this group.

Bezzia nobilis (Winnertz)

Ceratopogon nobilis Winnertz, 1852: 79.
Bezzia nobilis (Winnertz); Kieffer, 1901: 153.
Ceratopogon setulosus Loew, 1861: 312.
Bezzia setulosa (Loew); Johannsen, 1905: 102.
Ceratopogon barberi Coquillett, 1901: 601.
Bezzia barberi (Coquillett); Malloch, 1914: 282.
Bezzia leucosticta Kieffer, 1919: 124.
Bezzia chrysocoma Kieffer, 1922: 355.
Bezzia acanthodes Macfie, 1940: 192.
Bezzia atlantica Wirth & Williams, 1957: 13.
Bezzia nobiliformis Clastrier, 1962a: 74.

Diagnosis. Female: thorax brown, scutellum yellowish, abdomen whitish; legs yellow, fore femur with a narrow praeapical brown ring, distal 1/3 of mid femur dark brown, basal and distal 1/4 of hind femur dark brown or black; fore tibia with a narrow, subbasal ring, mid and hind tibiae broadly black on both ends; fore femur with 2-4 spines, often mid and hind femora armed with 1-2 spines; proximal flagellomeres yellow basally; postscutellum bare. Male: abdomen brown; legs similar in colour to female; proximal flagellomeres almost totally yellow, plume reddish.

Types. Two male syntypes of *B. nobiliformis* Clastrier in MNHN, Paris.

Scandinavian specimens. SWEDEN: Sk: Norr Krankesjön, 3.07.1975, H. Andersson leg., 2 ♂; Norr Krankesjön, Sjöstrand, sand, 3.07.1975, H. Andersson leg. 1 ♂, 2 ♀ (ZML).

Distribution. *B. nobilis* is the most widespread species occurring in Holarctic and Neotropical Regions; in Palaearctic known from Great Britain, France, Belgium, the Netherlands, Germany, Austria, Hungary, Poland, Estonia, Lithuania, Ukraine (Crimea), Russia (NET, CET, SET, WS, ES, FE), Kazakhstan, Mongolia, China and Japan. For the first time reported from Sweden.

Note. *B. nobilis* is closely related to *B. taeniata* (Haliday in Walker).

Bezzia taeniata (Haliday in Walker)

Ceratopogon taeniatus Haliday in Walker, 1856: 238.

Bezzia taeniata (Haliday in Walker); Kieffer, 1919: 114.

Diagnosis. Female: thorax matt, brownish black; scutellum yellowish brown; abdomen yellowish, dorsally with a narrow brown median stripe interrupted on joints of segments and with dark band along each side. Legs yellow; basal 1/4 of femora brown, distal 1/4 of femora brownish black; fore tibia with a wanting brown subbasal ring and brown tip, mid and hind tibiae broadly brown or black on both ends; fore femur with 2-5 spines, other femora unarmed; bases of proximal flagellomeres light brown; postscutellum covered with setae. Male: legs darker than in female, hind femur totally brownish black; flagellum black, plume brownish black.

Scandinavian specimens. SWEDEN: Nb: N. Luleå, S. Sunderbyn, 4.07.1972, 1 ♂, 2♀; 5.07.1972, 3 ♂, 2 ♀; 7.07.1972, 4 ♀. Nb, Råneå, Rörbäck, 7.07.1972, 2 ♂, 3 ♀. All specimens H. Andersson leg. (ZML).

Distribution. *B. taeniata* is known from Ireland only. Now recorded for the first time in Sweden.

Note. *B. taeniata* was described by Haliday in Walker's (1856) "Insecta Britannica". The species has not been found by any later author though its name appeared in several papers of a compilatory character (Kieffer, 1919 - in key; Edwards, 1926; Goetghebuer, 1934b; Remm, 1988).

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Sammanfattning

Nio arter svidknott av tribus Palpomyiini (Diptera: Ceratopogonidae) rapporteras nya för den svenska faunan: *Palpomyia brachialis* (Hal.), *P. luteifemorata* Edw., *P. nigripes* (Meig.), *P. semifumosa* Gtgh., *P. spinipes* (Panzer), *Phaenobezzia rubiginosa* (Winn.), *Bezzia albicornis* (Meig.), *B. nobilis* (Winn.), *B. taeniata* (Hal. in Walker). *P. pubescens* Kieff. är ny för Norge. Släktet *Phaenobezzia* uppges för första gången här från Skandinavien. Diagnostiska karaktärer ges för de rapporterade arterna jämte allmänna utbredningsdata.