

# The identity of *Myxexoristops arctica* (Zetterstedt), with notes on some other *Myxexoristops* (Diptera: Tachinidae)

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## Abstract

*Tachina arctica* Zetterstedt, 1838 is removed from synonymy with *Myxexoristops blondeli* (Robineau-Desvoidy, 1830) and established as a valid species of *Myxexoristops* Townsend, 1911. A full description is provided for this species. *Tachina porcula* Zetterstedt, 1859 is treated as nomen dubium, and *Tachina petiolinervis* Zetterstedt, 1859 is established as nomen oblitum; both are removed from synonymy with *Myxexoristops blondeli*. A key to the north European species of *Myxexoristops* is presented.

**Key words:** Tachinidae, *Myxexoristops*, new synonymy, key, Scandinavia.

## Zusammenfassung

*Tachina arctica* Zetterstedt, 1838 wird als gültige Art von *Myxexoristops* Townsend, 1911 aufgefasst, und nicht wie bisher als ein Synonym von *Myxexoristops blondeli* (Robineau-Desvoidy, 1830). Eine vollständige Beschreibung von *Tachina arctica* wird gegeben. *Tachina porcula* Zetterstedt, 1859 wird als nomen dubium verstanden und *Tachina petiolinervis* Zetterstedt, 1859 als nomen oblitum; beide sind nicht mehr Synonyme von *Myxexoristops blondeli*. Die Arbeit beinhaltet einen Bestimmungsschlüssel für die nordeuropäischen *Myxexoristops*-Arten.

## Contents

1	Introduction .....	435
2	Materials and Methods .....	436
3	<i>Myxexoristops arctica</i> (Zetterstedt, 1838) .....	436
4	Key to the north European species of <i>Myxexoristops</i> .....	441
5	Notes on some types of <i>Myxexoristops</i> species .....	443
6	References .....	444

## 1 Introduction

The genus *Myxexoristops* Villeneuve, 1911 constitutes a morphologically and biologically homogeneous group within the large and multiform tribe Goniini (HERTING 1984, O'HARA & WOOD 2004). This tribe is defined by microtype eggs which are deposited in numbers on the food-plants of the hosts and which are subsequently ingested by the victims (compare HERTING 1960). All *Myxexoristops* species are, so far as known, parasitoids of sawfly larvae (Hymenoptera: Symphyta).

At least all Scandinavian *Myxexoristops* share the following features: Eyes densely haired. Fronto-orbital plate with 2–3 reclinate inner orbital setae (posteriormost seta smaller), females in addition with 2–3 proclinate outer orbital setae. Ocellar setae moderately strong, proclinate. Parafacial narrowing below, at narrowest point narrower than width of first flagellomere. Facial ridge with setae and additional setulose hairs which are not reaching the upper half. Parafacial bare or at most with some minute hairs directly below the lowest frontal seta. Subcranial cavity 0.60–0.75 times as long as the length of frons. Prosternum haired. Proepisternum bare, except for 1–2 seta(e) and some hairs at lower margin. Postpronotum with 4–5 (rarely 6) setae, the 3 basal setae arranged in an obtuse

triangle, and 1–2 smaller setae anterior to the basal setae. Katepisternum with 3 (rarely 4) setae. Katepimeron bare or with 1–4 minute hairs restricted to anterior fourth. First postsutural supra-alar seta longer and stouter than notopleural setae. Scutellum with 4 pairs of setae, the lateral setae 0.6–1.0 times as long as the basal setae. Wing with second costal section normally bare ventrally, but with small black hairs in one species (*M. stolidi*). Mid tibia usually with only 1 anterodorsal seta, but in *M. bonsdorffi* with 2–3 setae. Syntergite 1+2 with mid-dorsal depression extending back to hind margin. Tergite 2 with a pair of median marginal setae.

*Myxexoristops* is externally very similar to *Phebellia* Robineau-Desvoidy, 1846, but is well separated from this genus by its different eggs and oviposition behaviour.

The genus *Myxexoristops* (sensu HERTING 1964) is widely distributed in the Palaearctic and Nearctic regions. Up to the present seven species of *Myxexoristops* have been recorded from the Palaearctic region (HERTING & DELY-DRASKOVITS 1993), six of them are known from Europe (TSCHORSNIG et al. 2004), and one (*M. grandicornis* Mesnil, 1955) only from Japan. Two species occur in the Nearctic region (O'HARA & WOOD 2004).

In this paper the current concept of *Myxexoristops arctica* (Zetterstedt, 1838) is revised and its synonymy

with *Myxexoristops blondeli* (Robineau-Desvoidy, 1830) is shown to be based on a misidentification. Furthermore, information on types and synonymy is given for some other species of *Myxexoristops*.

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### 2 Materials and Methods

This study was based on the examination of the following material representing six Palaearctic and two Nearctic species of *Myxexoristops*:

- M. arctica* (Zetterstedt, 1838): 7 specimens (+ holotype) from Norway and Sweden (see material listing in chapter 3);
- M. abietis* Herting, 1964: 26 specimens from Denmark [SA], Sweden [SA, CB, MZLU], Finland [MZH], and Russia [MZH];
- M. bicolor* (Villeneuve, 1908): 3 specimens from Poland and Sweden [CB];
- M. blondeli* (Robineau-Desvoidy, 1830): 1 ♂ from Denmark (Sjælland, Rude Skov, 23.VI.1984, S. ANDERSEN [SA]; dissected), and 13 specimens from Germany [SMNS, ZMHB], Switzerland [SMNS] and Britain [BMNH];
- M. bonsdorffi* (Zetterstedt, 1859): 25 specimens from Sweden [CB, RE, NHRS, MZLU], Finland [MZH] and Russia [MZH];
- M. fronto* (Coquillett, 1897): 4 specimens from Canada [CNC];
- M. neurotomae* (Sellers, 1943): 8 specimens from Canada [CNC];
- M. stolidi* (Stein, 1924): 140 specimens from Denmark [SA, NHM], Norway [KR], Sweden [CB, MZLU, NHRS], Finland [MZH], Russia [MZH] and Germany [ZMHB].

The dissection of the male terminalia (three dissections each of *M. arctica* and *M. blondeli*) was performed following the methods described by ANDERSEN (1996) and O'HARA (2002). For the preparation of the images genital parts and a wing were mounted on microscopic slides in polyvinylalcohol, sometimes with an admixture of chlorazol black E.

External morphological images (Figs. 1–2) were taken with a Nikon D2X digital camera mounted to a bellows and a macro-optical tube. Images of terminalia (Figs. 3–11) were taken with a digital camera mounted on a stereoscopic microscope. To create a completely focused image, a series of images of each object were taken at different focal planes. Using HeliconFocus, a program that combines the focused areas from the several partially focused images, creates one completely focused image.

Data on the labels of type material are listed using the following symbols: / = end of a line; // = end of a label (from top to bottom on the same pin).

The dissected male terminalia are preserved in glycerol in a small plastic tube pinned together with the specimen.

Terminology of external morphology and terminalia as well as measurements and ratios of head follow TSCHORSNIG (1985) and TSCHORSNIG & RICHTER (1998).

### Acronyms of depositories

BMNH	The Natural History Museum (formerly British Museum Natural History), London, UK (N. WYATT)
CB	Private collection of C. BERGSTRÖM, Uppsala, Sweden
CNC	Canadian National Collection, Biosystematics Research Centre, Ottawa, Canada (J. E. O'HARA)
KR	Private collection of K. ROGNES, Madla, Norway
MZH	Zoological Museum Helsinki, Finland (J. LAIHO)
MZLU	Museum of Zoology, Lund University, Sweden (R. DANIELSSON)
NHM	The Natural History Museum, University of Copenhagen, Denmark (T. PAPE)
NHRS	Swedish Museum of Natural History (= Naturhistoriska Riksmuseet), Department of Entomology, Stockholm, Sweden (B. VIKLUND)
RE	Private collection of R. ENGELMARK, Umeå, Sweden
SA	Private collection of S. ANDERSEN, Copenhagen, Denmark
SMNS	Staatliches Museum für Naturkunde, Stuttgart, Germany (H.-P. TSCHORSNIG)
ZMHB	Museum für Naturkunde, Humboldt-Universität, Berlin, Germany (J. ZIEGLER)

### 3 *Myxexoristops arctica* (Zetterstedt, 1838)

#### Material

**Holotype** (♂) from **Norway**, Finnmark, with the following labels: “*T. arctica* / ♂ BOSSEK (handwritten ZETTERSTEDT label) // [1981 / 521] // *Myxexoristops* / *blondeli* R. D. ♂ / B. HERTING det. // Holotype ♂ / *Tachina* / *arctica* Zett. 1838 / det. BERGSTRÖM 2003” [MZLU, Diptera Scandinaviae collection, drawer 22].

**Additional specimens:** **Norway:** 1 ♂, Telemark (TEI), EIS 16, Fyresdal, Aslestad-Slystøl, 650m, 7.VII.1980, K. ROGNES leg. [KR] (dissected). — **Sweden:** 1 ♂, Hälsingland, Bergsjö, Bodsjön, 31.VII.1993, RN 68727/15620, C. BERGSTRÖM leg. [CB] (dissected). — 1 ♂, Lp. in. / And (= Lapponia in. / ANDERSSON leg.) [NHRS] (dissected). — 1 ♀, Lule lappmark, Jokkmokk, Vajmat, Keutajape SO lake Kåikaure, 10.VII.2006, RN 73842/16649, C. BERGSTRÖM leg. [CB]. — 1 ♀, Uppland, Uppsala, Nåsten (Forsbacka), 18.VIII.1996, RN 66362/15973, C. BERGSTRÖM leg. [CB]. — 1 ♀, Västerbotten, Umeå, Gubböle, 17.VII.1997, ROGER ENGELMARK leg. [RE]. — 1 ♀, Jämtland, Åsen, Berge, 8.VIII.1840, J. W. ZETTERSTEDT leg. [MZLU] (see also *Tachina diligens*).

#### History of the use of the name *Tachina arctica*

In August 7, 1821, during his first journey to Scandinavian “Lappland”, J. W. ZETTERSTEDT climbed mount Skaaddavaara between Altengaard and Bossekop in Finnmark Fylke, Norway. On this particular day he collected a single tachinid specimen in the subalpine zone close to the mountain peak. Several years later he described this specimen under the name *Tachina arctica* (ZETTERSTEDT 1838: 645). In the original description he wrote: “Hab. in Finnmarkia occidentali rarissime; in monte subalpino Skaaddavaara,

non longe a capite septentr. distante, d. 7. Aug. semel inveni. (Lapponia.)". This description was slightly changed by ZETTERSTEDT (1844: 1187): "Hab. in Finmarkia occidentali Norvegiæ rarissime; in monte subalpino Skaaddavaara, non longe a Nord-Cap distante 7 Aug. 1821 inveni.". The holotype is mounted on a very strong pin that precludes a study of the postsutural area of the scutum. Both wings possess prominent tears; left fore and mid legs as well as tarsal segments on right fore and mid legs are missing.

There has been much confusion in the past concerning the correct use of the name *Tachina arctica* Zetterstedt. RINGDAHL (1934: 267), apparently the first reviser, stated that the type present in the Diptera Scandinaviae collection most likely represented an *Exorista* species ("*Exorista* sp. dub."). He also noted that the specimen would key out as *Exorista pexops* (Brauer & Bergenstamm, 1891) using the key of STEIN (1924) [*M. pexops*, the type-species of *Myxexoristops* Townsend, is today regarded as a junior synonym of *M. blondeli*]. However, RINGDAHL (l.c.) also stated that the description of STEIN is somewhat deviant and therefore considered that there was only a very small possibility that *arctica* was identical with *pexops*. He later (1945: 27) changed his opinion – without explanation – and regarded *T. arctica* as a synonym of *Eumea mitis* (Meigen, 1824). MESNIL (1955: 446) – without having seen the type – relied on RINGDAHL's first opinion and listed *arctica* as a synonym of *M. blondeli*, a concept which however also included *Myxexoristops stolidus* (Stein). HERTING (1964) established *M. blondeli* (Robineau-Desvoidy, 1830) and *M. stolidus* (Stein, 1924) as two valid species; he studied the type of *M. arctica*, but nevertheless maintained this species in synonymy with *M. blondeli*.

Identity: *Tachina arctica* herein revised is removed from synonymy with *Myxexoristops blondeli* (Robineau-Desvoidy, 1830) and established as the name of a valid species in the combination *Myxexoristops arctica* (Zetterstedt, 1838).

#### Description of the species

Male (statements within square brackets refer to holotype):

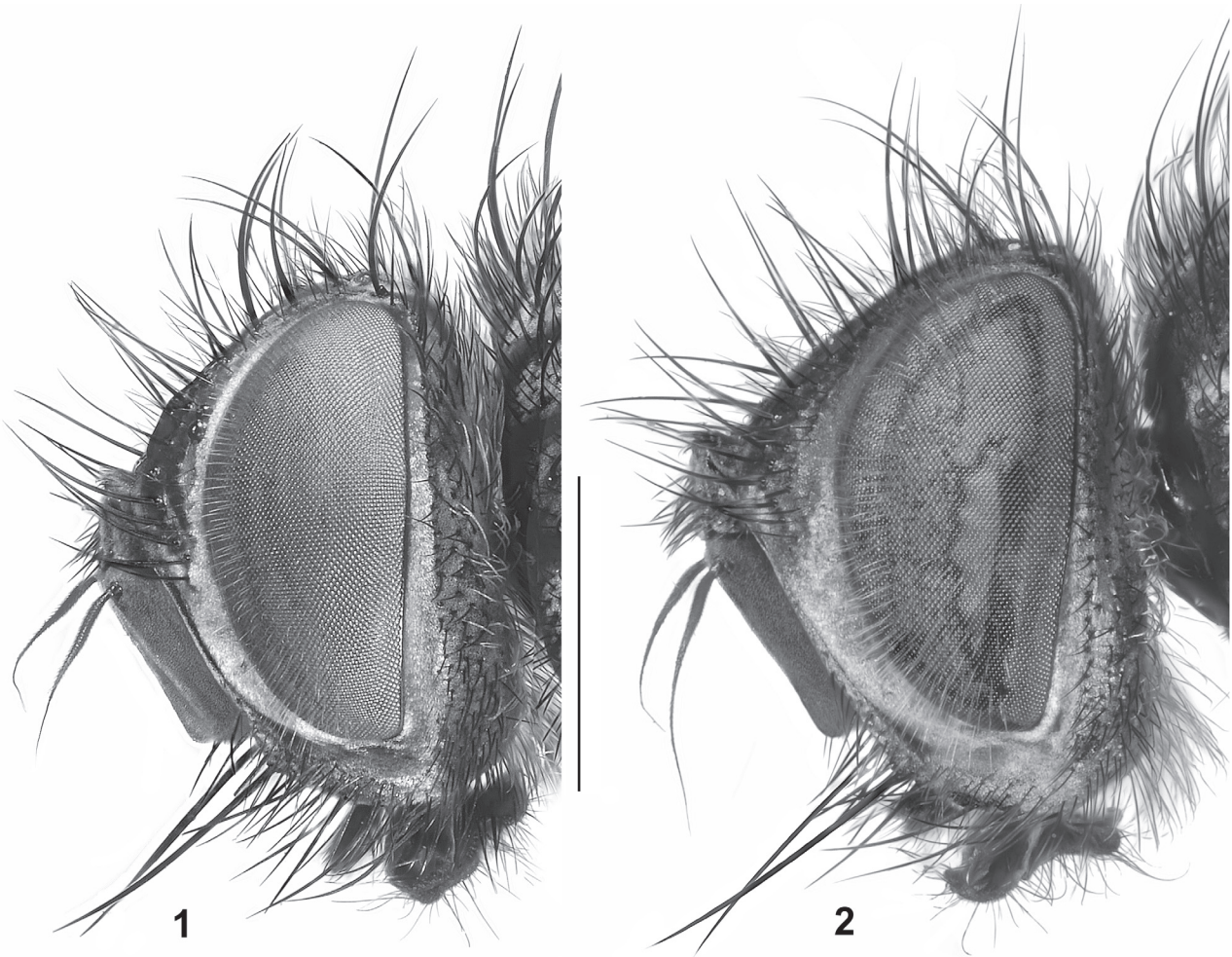
Colour and pruinosity: Head mainly black with a greyish white pruinosity; frontal vitta reddish brown to brown; face at mouth margin, anterior portion of parafacial, and genal groove reddish brown or brownish. Antenna black; arista black or brownish black. Palpus entirely black. Thorax black, dorsally covered with thin greyish white pruinosity; with 5 (less distinct) dark longitudinal stripes; middle stripe absent in front of suture. Black lateral thoracic stripe in front of suture somewhat indistinct, ending wedge-shaped at level of the posteriormost inner post-humeral seta; black lateral thoracic stripe behind the suture, insignificantly narrowing, extending backwards to the level of the posteriormost dorsocentral seta (most distinctly so in fe-

males). Tegula and basicosta black. Calypter yellowish white with fringe more yellow. Halter with base and stem brownish yellow, knob brownish. Legs black or – in older specimens – brownish black. Syntergite 1+2 without pruinosity. Tergites 3–4 dorsally with basal bands of greyish white pruinosity covering anterior  $2/3$ – $3/4$ , towards hind margins replaced by a more brownish pruinosity; interrupted in the middle by an unbroken black longitudinal stripe. Tergite 5 dorsally with a greyish white basal band covering anterior  $2/5$ – $1/2$  (slightly more laterally) of that segment.

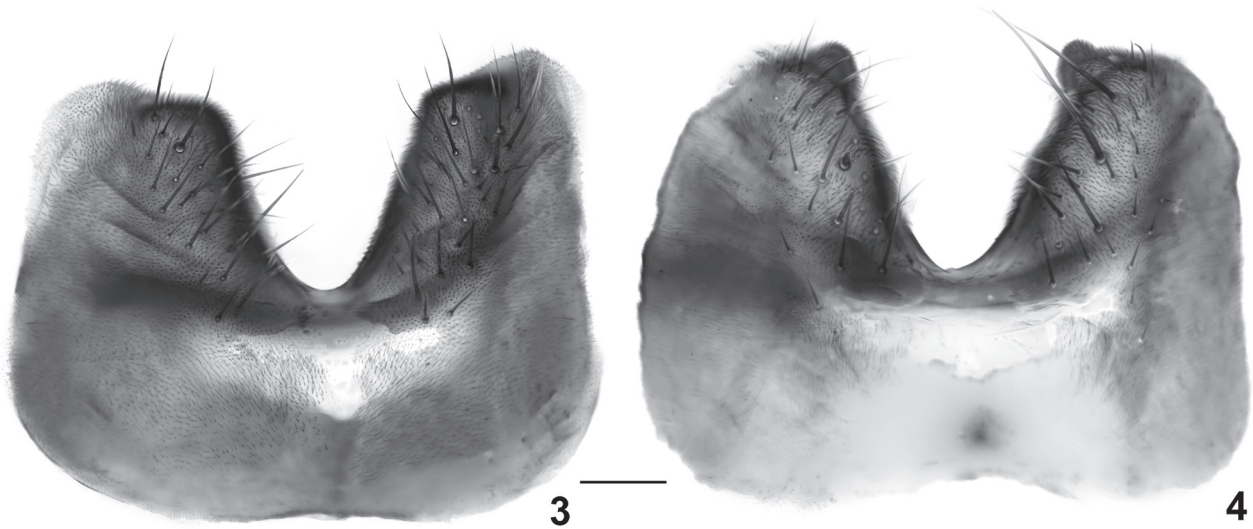
Head (Fig. 1): Eyes densely covered with long white hairs. Frons about as long as or slightly longer than face; in lateral view only slightly projecting, at level of antennal insertion about 0.4 times as wide as small diameter of eye; dorsally at its narrowest point 0.63–0.79 [0.70] times as wide as an eye in dorsal view. Interfrontal area at midpoint approximately as wide as the width of the parafrontal area at that level. Ocellar setae proclinate, usually as strong as or stronger than anteriormost inner reclinate orbital setae; postocellar setae strong. Inner vertical seta 0.6–0.7 [0.70] of eye-height; outer vertical seta 0.5–0.6 [0.63] times as long as inner vertical seta. Row of 10–12 frontal setae descending to about level of base of first flagellomere, or slightly beneath; 2–3 inner reclinate orbital setae. Parafacial with 0–4 [2–3] minute hairs descending below level of lowest frontal seta; strongly narrowing below, at its narrowest point approximately as wide as the maximal width of palpus. Occiput behind postocular row of setae with numerous black setulae, white hairs restricted to central and lower parts of occiput and postgena. First flagellomere relatively short, 2.4–3.1 [2.8] times as long as wide and 3.1–3.8 [3.1] times as long as pedicel. Arista evenly thickened in about basal fourth, and then gradually tapering towards tip. Sclerotized part of prementum about 2 times as long as wide. Palpus widened and slightly flattened apically, about as long as first flagellomere; tip densely covered by black hairs.

Thorax: Postpronotum with 4–5 setae; 3 basal setae arranged in an obtuse triangle and 1–2 [2] weaker setae in front of the middle and inner basal setae. Scutum with 3+3 pairs of acrostichal setae, 3+4 pairs of dorsocentral setae and 1+3 pairs of intra-alar setae. First postsutural supra-alar seta is stronger than notopleural setae. Katepisternum with 3 setae and numerous long, sometimes setulose hairs. Katepimeron bare. Anepimeral seta weak, distinctly weaker than the lowest katepisternal seta. Scutellum with 4 pairs of setae along margin; basal pair strong, almost as strong as subapical pair; lateral pair 0.6–0.7 times as long as subapical pair; apical pair slightly raised and crossed; dorsal surface of scutellum with a pair of discal setae, subequal to lateral setae.

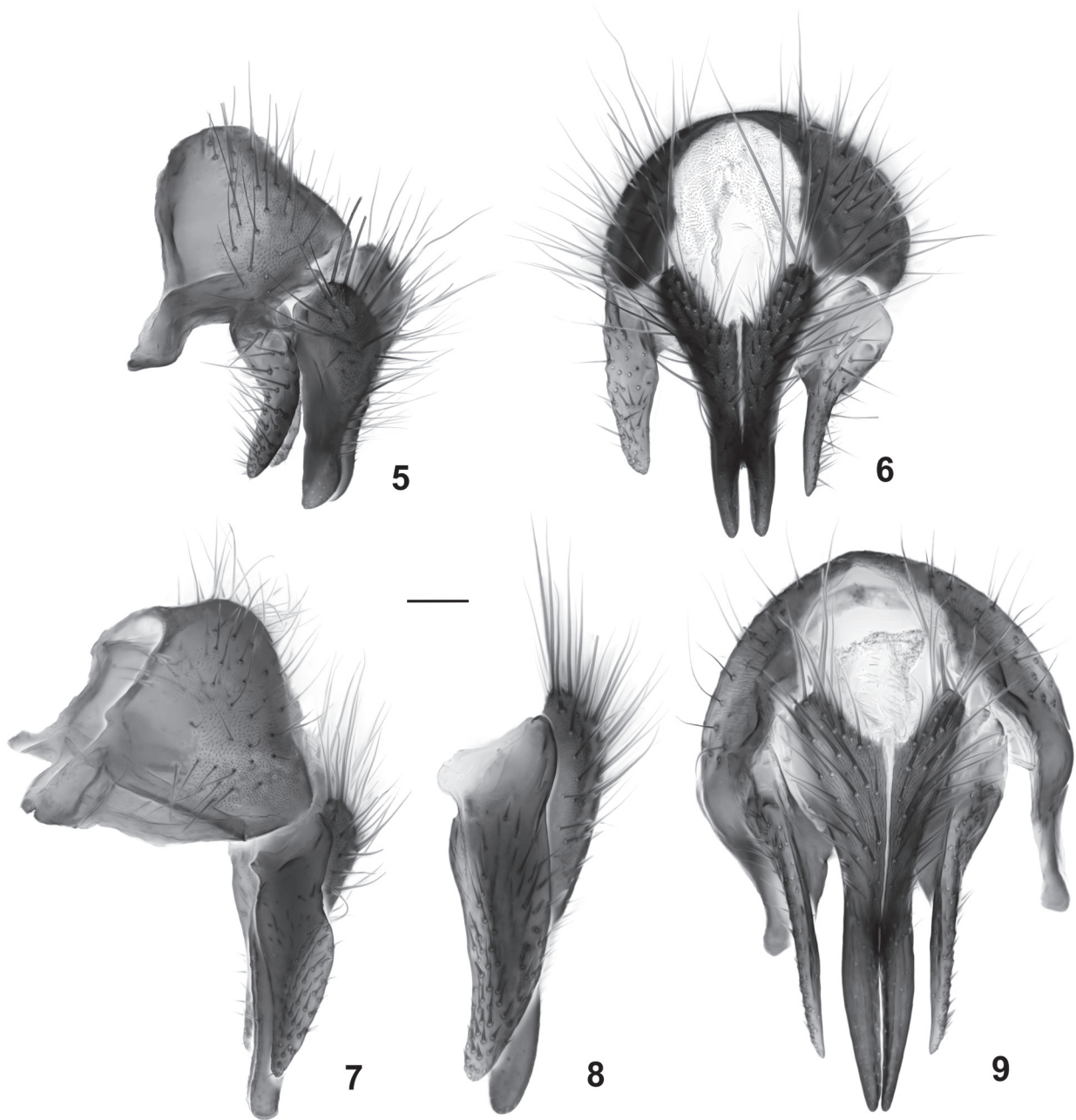
Wing: Costal spine weakly developed, only slightly stronger than the surrounding costal setulae; second costal section ventrally bare; fourth and fifth costal section to-



**Figs. 1–2.** *Myxexoristops* spp., ♂ head, lateral views. – 1. *M. arctica* (Zetterstedt) [Norway, Telemark]. 2. *M. blondeli* (Robineau-Desvoidy) [Germany, Baden-Württemberg, Kaiserstuhl]. – Scale: 1 mm.



**Figs. 3–4.** *Myxexoristops* spp., ♂ abdominal sternite 5. – 3. *M. arctica* (Zetterstedt) [Norway, Telemark]. 4. *M. blondeli* (Robineau-Desvoidy) [Denmark, Sjælland, Rude Skov]. – Scale: 0.1 mm.

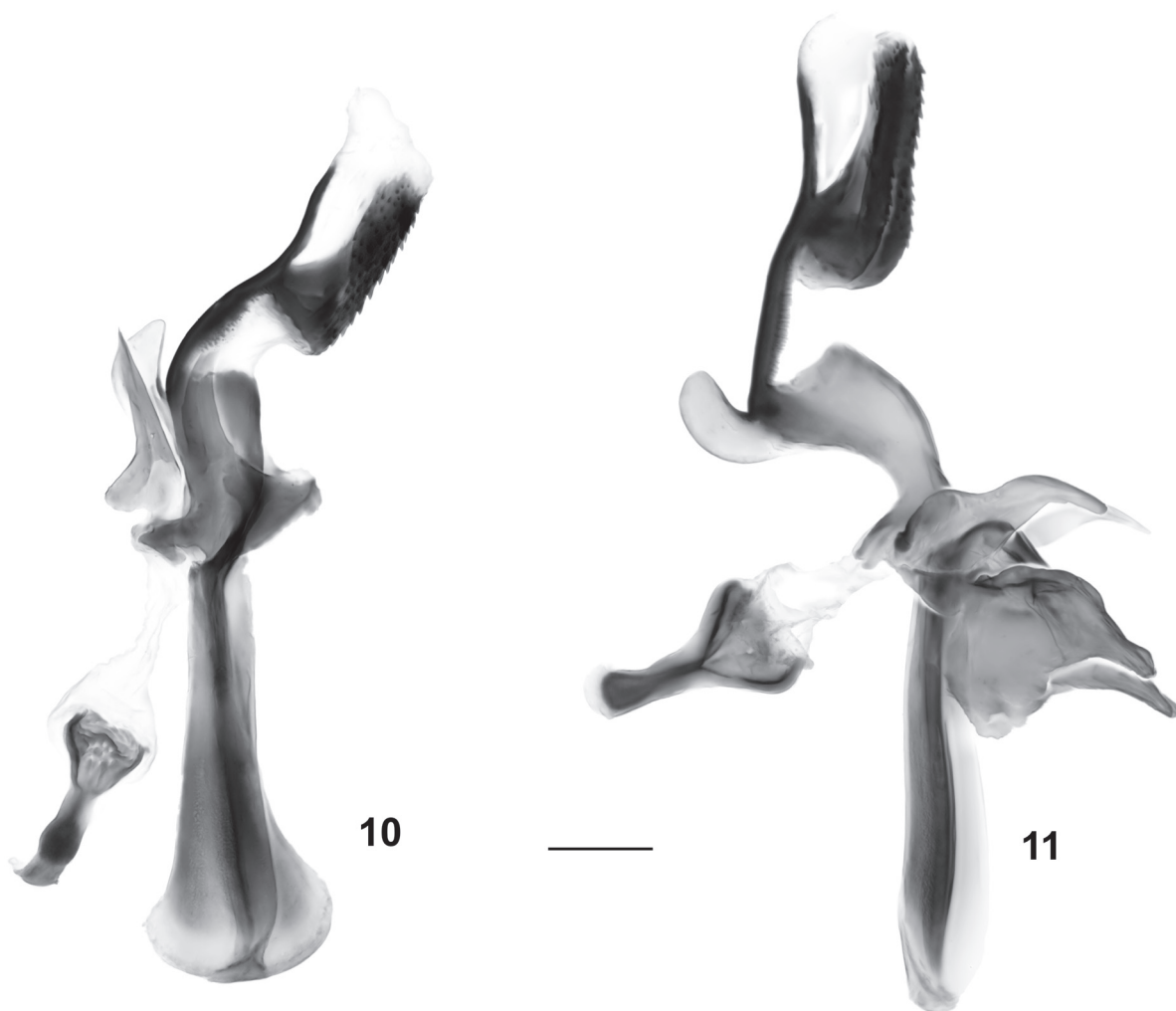


**Figs. 5–9.** *Myxexoristops* spp., ♂ hypopygium, lateral (5, 7–8) and caudal (6, 9) views. – 5–6. *M. arctica* (Zetterstedt) [Sweden, Hälsingland (5); Norway, Telemark (6)]. 7–9. *M. blondeli* (Robineau-Desvoidy) [Germany, Baden-Württemberg (7); Denmark, Sjælland (8); Britain, Wiltshire, Vernditch (9)]. – Scale: 0.1 mm.

gether 3.3–3.9 [3.8] times as long as sixth costal section. Vein  $R_{4+5}$  dorsally with 3–4 setulae at base. Bend of vein M obtuse and without an appendage; apical section of vein M distinctly concave. Section of vein M between crossvein dm-cu and bend 1.7–2.1 [1.7] times as long as distance between bend of vein M and margin of wing. Last section of vein  $CuA_1$  distinctly shorter than crossvein dm-cu.

Legs: Claws and pullvilli on fore legs about 1.2 times as long as tarsal segment 5, the latter 1.6–1.7 times as long

as tarsal segment 4. Fore tibia with 2 posterior setae and a row of 6–8 short anterodorsal setulae; preapical anterodorsal seta undifferentiated; preapical dorsal seta well developed. Mid tibia with 1 strong anterodorsal seta, 2 posterior setae and 1 strong ventral seta. Hind tibia with an irregular row of 12–16 anterodorsal setae, including a strong seta inserted at middle; moreover with a row of 4–5 short posterodorsal setae including a strong seta at height of strong anterodorsal seta; 2(3) strong anteroventral setae;



**Figs. 10–11.** *Myxexoristops* spp., ♂ aedeagus, pregonites, postgonites, aedeagal apodeme, and ejaculatory apodeme in lateral views. – **10.** *M. arctica* (Zetterstedt) [(Norway, Telemark]. **11.** *M. blondeli* (Robineau-Desvoidy) [Britain, Wiltshire, Vernditch]. – Scale: 0.1 mm.

2 preapical dorsal setae; preapical posteroventral seta of hind tibia undifferentiated.

Abdomen: Ground-vestiture on tergite 3 half recumbent, distinctly more erect on tergite 4. Tergite 2 with a pair of median and a pair of lateral marginal setae. Tergite 3 with a pair of median and 1–2 pairs of lateral marginal setae; with a pair of median discal setae but without differentiated lateral discal setae. Tergite 4 with a complete row of 8–10 [8] marginal setae; medially with 2(–4) strong discal setae and often some additional setulose hairs, without differentiated lateral discal setae. Tergite 5 with two complete rows of discal setae in addition to the row of marginal setae.

Male terminalia (Figs. 3, 5–6, 10): Sternite 5 approximately 0.8 times as long as wide; with deep U-formed cleft occupying about anterior half; posterior lobe on surface with setae and setulae and along medio-apical margin densely haired. Sternite 6 well developed, strongly asym-

metrical. Tergite 6 divided into two hemitergites, without setulae and with spiracle 6 situated in membrane. Segment 7+8 narrow, with some setulae, and with spiracle 7 in that segment. Cerci short, in dorsal view approximately 3.5 times as long as broad at midpoint, apical half almost parallel sided; cerci apically separated from each other by a well defined cleft about as long as  $\frac{2}{5}$  of basal suture, dorsal margin in lateral view slightly curved and tip evenly curved. Surstylus distinctly shorter than cercus; in lateral view curved anteriorly and distinctly diverging from cercus; gradually narrowing towards apex and densely covered by long setulose hairs. Aedeagus: basiphallus with basal projection; membranous epiphallus inserted dorso-apically; distiphallus with ventral plate of distiphallus not much expanded laterally and with lateroventral surface densely covered with spinules.

Body length: 5.2–7.2[7.2] mm (n = 4).

Female (differences from male):

Head: Frons at its narrowest point 0.76–0.86 times as wide as an eye in dorsal view. Parafrontal area with row of 6–10 frontal setae descending to about level of base of first flagellomere or sometimes slightly further; 2 outer proclinate orbital setae and 2 inner reclinate orbital setae (the posteriormost seta often slightly laterocline). First flagellomere 2.8–3.2 times as long as pedicel. Fore leg with claws and pullvilli 0.6–0.7 times as long as tarsal segment 5, the latter 1.3–1.4 times as long as tarsal segment 4. Dorsal ground vestiture on tergite 3 mainly recumbent, but erect or suberect between the median marginal and discal setae, and also on lateral edge; tergite 4 predominantly with erect or semi-erect setulae but sometimes with a small area of recumbent setulae close to the anterior margin. Tergite 3 with 2–3 median discal setae; tergite 4 with 2–6 irregular discal setae.

Body length: 7.0–7.4 mm ( $n = 3$ ).

#### Distribution

*M. arctica* is only recorded from Scandinavia. All examined specimens from Norway and Sweden previously assigned to *M. blondeli* are actually specimens of *M. arctica*. The true *M. blondeli* is therefore only represented in the Nordic countries by a single male specimen from Denmark (see chapter 2).

#### Biology

Habitats are deciduous woodland often close to boggy areas. The female from Keutajape was collected from foliage of an osier (*Salix* sp.) in an open fen area.

Host of *M. arctica* are unknown. It is unlikely that some of the recorded hosts of *M. blondeli* might refer to *M. arctica*, because the breedings were not from Scandinavia: the Pamphiliidae *Neurotoma saltuum* (Linnaeus, 1758) from Germany and United Kingdom (HERTING 1964), and the Tenthredinidae *Mesoneura opaca* (Fabricius, 1775) from Germany (HERTING 1961) and *Pristiphora moesta* (Zaddach, 1876) probably from Central Europe (the record in TSCHORSNIG & HERTING 1994 is based on a breeding of ZINNERT which was not published elsewhere). But it is of course probable that so nearly related species as *M. blondeli* and *M. arctica* might have similar hosts.

#### Differences from other species of *Myxexoristops*

*M. arctica* and *M. blondeli* can usually be distinguished from other European species of *Myxexoristops* by their entirely black scutellum (not quite stable in *M. arctica*). Specimens of *M. stolidus* sometimes also have an entirely dark scutellum, but are then recognized by the minute black setulae ventrally on the second costal section. *M. arctica* can be separated from *M. blondeli* as shown in the key below.

My examination and also the descriptions of the two Nearctic species *Myxexoristops fronto* (Coquillett) [see COQUILLET 1897: 96 and SELLERS 1943: 96] and *M. neurotomae* (Sellers) [see SELLERS 1943: 85] show that neither of them is conspecific with *M. arctica*. The combination of characters of *M. fronto* and *M. neurotomae* – as shown below – does neither apply to *M. arctica* (see description presented above) nor to any other European *Myxexoristops*.

The study of 2 ♂♂ and 2 ♀♀ of *M. fronto* gives the following results: scutellum mostly black but distinctly reddish brown at tip, sometimes in almost apical third; palpus entirely yellow; frons in male at narrowest point 0.7–0.8 times, in female 0.8–0.9 times as wide as an eye; first flagellomere in male 4.6–5.3 times, in female 3.8–4.0 times as long as pedicel; tibia and ventral part of femur reddish yellow in male, legs yellowish in female; hairs of anterior spiracle yellowish, lid of posterior spiracle yellowish or whitish; second costal section ventrally without black setulae; abdomen in male with distinct reddish yellow spot dorso-laterally on tergite 3 and sometimes also more or less visible on tergite 4, in female ventrally (including tergite 5) and also dorso-laterally extensively yellow. ♀♀: ground vestiture of tergite 3 erect medio-dorsally distinctly recumbent dorso-laterally; on tergite 4 entirely erect dorsally.

My examination of 3 ♂♂ and 3 ♀♀ of *M. neurotomae* shows the following features: scutellum extensively black but mostly narrowly reddish brown at extreme tip; palpus brownish yellow; frons in male at narrowest point 0.7–0.8 times, in female 0.9–1.0 times as wide as an eye; first flagellomere in male 4.7–5.3 times, in female 3.3–3.8 times as long as pedicel; legs uniformly brownish or brownish black; hairs of anterior spiracle and lid of posterior spiracle dark; second costal section ventrally without minute black setulae; abdomen in male mostly black but sometimes with indistinct reddish yellow spot laterally on tergite 3 and sometimes also on tergite 4, in female ventrally (except for tergite 5) predominately reddish yellow and dorso-laterally with reddish yellow spots on tergites 3–4. ♀♀: ground vestiture of tergites 3 and 4 recumbent or at most half erect.

#### 4 Key to the north European species of *Myxexoristops*

*M. arctica* keys out from the other north European species of *Myxexoristops* using the following key modified from TSCHORSNIG & HERTING 1994: 58–59. Confirmatory features are added within square brackets.

- 1 Parafrontal without outer orbital setae (♂♂). . . . . 2
- Parafrontal with 2 or 3 proclinate outer orbital setae (♀♀). . . . . 7
- 2 First flagellomere 5.0–6.5 times as long as pedicel, 3.0–5.5 times as wide as parafacial at its narrowest point. Face distinctly longer than frons. [Tergites 4 and 5 each covered with pruinosity in their anterior  $\frac{1}{2}$ – $\frac{2}{3}$ . Black lateral longitu-

- dinal thoracic stripe before the suture diffuse, exceeding the level of insertion of the posteriormost inner post-humeral seta. Palpus yellow to brown. Wing with second costal section bare ventrally or at most with a single black setula.] . . . . . *M. bicolor*
- First flagellomere 3.0–4.5 times as long as pedicel, 1.5–2.8 times as wide as parafacial at its narrowest point. Face about as long as frons. . . . . 3
  - 3 Tibiae yellow or brownish yellow, except darkened ventrally in its basal  $\frac{1}{3}$ . Mid tibia with 2 anterodorsal setae. First flagellomere 3.5–4.5 times as long as pedicel. . . . . *M. bonsdorffi*
  - Tibiae black or evenly dark brown. Mid tibia with 1 anterodorsal seta (rarely 2). First flagellomere 3–4 times as long as pedicel. . . . . 4
  - 4 Second costal section and often also third ventrally with some minute black setulae, which are as strong as the corresponding setulae of the first costal section (rarely second costal section with only a single seta). Tergite 3 with a band of pruinosity in anterior  $\frac{4}{5}$ . Scutellum reddish or yellow on the extreme tip. Tergite 3 without reddish brown lateral spot. [Facial ridge above the vibrissa with setulae and setulose hairs on lower  $\frac{1}{3}$ – $\frac{2}{5}$ .] . . . . . *M. stolidus*
  - Second costal section ventrally without minute black setulae, or if rarely present then only visible at higher magnification and distinctly smaller than corresponding setulae of first costal section. Tergite 3 with a band of pruinosity in anterior  $\frac{2}{3}$  (rarely  $\frac{4}{5}$ ). Scutellum differently coloured. Tergite 3 with or without reddish lateral spot. . . . . 5
  - 5 Facial ridge with some setae and setulose hairs on lower  $\frac{1}{5}$ – $\frac{1}{3}$ , length of this row less than half the length of palpus. Palpus not widened towards tip. Scutellum broadly yellow, with yellow colouration along posterior edge extended to the basal seta. Tergite 3 usually with distinct reddish spot laterally. [Lateral longitudinal thoracic stripes before the suture well defined and ending wedge-shaped close to the insertion of the strong post-humeral setae.] . . . . . *M. abietis*
  - Facial ridge with setae and slender hairs on lower  $\frac{1}{3}$ – $\frac{1}{2}$ , length of this row at least half the length of palpus. Palpus distinctly widened (clavate) in about apical half. Scutellum normally entirely black, but sometimes in *arctica* with a minute reddish brown spot at the extreme tip. Tergite 3 laterally usually without a reddish brown spot (an indistinct spot sometimes present in *arctica*). . . . . 6
  - 6 Black lateral longitudinal thoracic stripes before the suture exceeding insertion of the posteriormost inner post-humeral setae. Frons somewhat projecting (Fig. 2); parafacial at level of antennal insertion 0.5–0.6 times as wide as small diameter of eye. Parafrontal area with an additional row of setae parallel to the frontal setae; the anterior setae in this row stronger than those at vertex and almost  $\frac{2}{3}$  as long as the strongest frontal seta. Scutellum entirely black. Tergite 4 usually with 4–6 median discal setae. Terminalia as in Figs. 4, 7–9, 11. Cerci in dorsal view long and slender, approximately 6 times as long as broad at midpoint; slightly enlarged shortly before apex, narrowly separated in their apical  $\frac{2}{5}$ – $\frac{1}{2}$ . . . . . *M. blondeli*
  - Black lateral longitudinal thoracic stripes before the suture slightly diffuse, ending wedge-shaped at level of the posteriormost inner post-humeral setae. Frons not projecting (Fig. 1); parafacial at level of antennal insertion about 0.4 times as wide as small diameter of eye. Parafrontal area without a row of differentiated parafrontal setae but with setulose hairs subequal to those at vertex. Tergite 4 with 2(–4) median discal setae. Scutellum entirely black or sometimes with a small reddish brown spot at apex. Terminalia as in Figs. 3, 5–6, 10. Cerci in dorsal view short, approximately 3.5 times as long as broad at midpoint; apical half in dorsal view almost parallel sided, separated from each other by a well defined apical cleft that is about  $\frac{2}{5}$  as long as the basal suture. . . . . *M. arctica*
  - 7 Abdomen usually with expanded yellow colouration dorso-laterally and ventrally, but tergite 3 at least with a distinct lateral spot. Tibiae usually light brown-yellow. Ground vestiture on tergites 3 and 4 recumbent, but erect between median marginal and discal setae. . . . . 8
  - Abdomen entirely black or tergite 3 at most with a small reddish brown lateral spot. Tibiae black or evenly brown, but if sometimes light brown (in *abietis*) then the ground vestiture on tergites 3 and 4 recumbent also between median marginal and discal setae. [Mid tibia usually with 1 anterodorsal seta.] . . . . . 9
  - 8 Coxae and trochanters yellow under the greyish white pruinosity; scape and pedicel yellow in part. Abdomen entirely yellow ventrally, with distinct lateral yellow colouring in dorsal view. Tergites 3–5 with pruinosity covering anterior  $\frac{1}{2}$ – $\frac{2}{3}$  of each segment. Palpus yellow. Second costal section ventrally sometimes with a single minute black setula. Claws of fore leg a little shorter than  $\frac{1}{2}$  the length of tarsal segment 5. Mid tibia with 1 anterodorsal seta. . . . . *M. bicolor*
  - Coxae, trochanters, scape and pedicel black. Ventral side of abdomen yellow to a varying extent, but at least tergite 5 and usually also a ventral medial stripe black; yellow abdominal colouring not clearly visible in dorsal view. Tergites 3–5 with pruinosity covering anterior  $\frac{5}{6}$ – $\frac{7}{8}$  of each segment. Palpus brownish yellow to black. Second costal section bare ventrally. Claws of fore leg longer than  $\frac{1}{2}$  the length of tarsal segment 5. Mid tibia with 2–3 anterodorsal setae. . . . . *M. bonsdorffi*
  - 9 Second costal section and often also third ventrally with some minute black setulae, which are as strong as the corresponding setulae of the first costal section (rarely only a single seta present on second costal section). Tergites 3–5 densely covered by a greyish, yellow or golden yellow pruinosity in the anterior  $\frac{1}{5}$  of each segment. Scutellum reddish or yellow only at extreme tip. Tergite 3 laterally without a pair of reddish brown spots. Facial ridge above the vibrissa with some setulae and setulose hairs in lower  $\frac{1}{3}$ – $\frac{2}{5}$ . . . . . *M. stolidus*
  - Second costal section ventrally without setulae, or if rarely present then only visible at higher magnification and also distinctly smaller than corresponding setulae of the first costal section. Tergites 3–4 with pruinosity covering the anterior  $\frac{2}{3}$ – $\frac{4}{5}$  of each segment, on tergite 5 at most covering anterior  $\frac{3}{4}$ . Scutellum black or reddish brown at extreme tip. Tergite 3 laterally with or without a pair of reddish brown spots. Facial ridge above the vibrissa with some setulae and setulose hairs in lower  $\frac{1}{5}$ – $\frac{1}{2}$ . . . . . 10
  - 10 Abdominal ground vestiture on tergites 3 and 4 recumbent also between median marginal and discal setae. Scutellum more or less broadly reddish yellow at tip. First flagellomere 3.4–4.0 times as long as pedicel. Tergite 5 with pruinosity in anterior  $\frac{2}{3}$ – $\frac{3}{4}$ . [Lateral longitudinal thoracic stripes before suture well defined and ending wedge-shaped close to insertion of the strong posthumeral seta.] . . . . . *M. abietis*
  - Abdominal ground vestiture on tergites 3 and 4 recumbent, but erect between median marginal and discal setae. Scutellum usually entirely black, rarely with a small brownish spot at tip. First flagellomere 2.8–3.6 times as long as pedicel. Tergite 5 with pruinosity in anterior  $\frac{2}{5}$ – $\frac{2}{3}$ . . . . . 11
  - 11 Black lateral longitudinal thoracic stripes before suture exceeding insertion of posteriormost inner posthumeral seta; black lateral thoracic stripe behind suture strongly narrowing and ending close to the posteriormost intra-alar seta. Frons projecting; parafacial at level of antennal insertion

0.5–0.6 times as wide as small diameter of eye diameter. Scutellum entirely black. . . . . *M. blondeli*  
 – Lateral longitudinal thoracic stripes before suture diffuse, ending wedge-shaped at level of posteriormost inner post-humeral seta; black lateral thoracic stripe behind the suture insignificantly narrowing, extending backwards to the level of the posteriormost dorsocentral seta. Frons slightly projecting; parafacial at level of antennal insertion about 0.4 times as wide as small diameter of eye. Scutellum entirely black or with a small reddish brown spot at tip. . . . .  
 . . . . . *M. arctica*

## 5 Notes on some types of *Myxexoristops* species

*Tachina diligens* Zetterstedt, 1844  
 [ZETTERSTEDT 1844: 1122]

The lectotype and a paralectotype are available in the Dip-tera Scandinaviae collection, drawer 21 [MZLU].

The lectotype bears the following labels: green tag // *T. diligens* / ♀ Naes Norv. (handwritten ZETTERSTEDT label) // *Phebellia* ♀ / *strigifrons* Zett. / B. HERTING det. / Lectotype *diligens* // 1981 / 512.

The paralectotype (= misassociated specimen of *Myxexoristops*) is labelled as follows: green tag // BERGE ad ALSEN / Jemtl. / 8/8 40 (printed) // 1981 / 513 // *Myxexoristops* / *blondeli* R. D. ♀ / B. HERTING det. // Paralectotype ♀ / *Tachina diligens* / Zetterstedt, 1844 / des. BERGSTRÖM 2006 // *Myxexoristops* ♀ / *arctica* (Zetterstedt) / C. BERGSTRÖM det. 2006.

The nominal species *T. diligens* was based on two females. In the original description (ZETTERSTEDT 1844: 1122–1123) wrote: “Hab. in Scandinavia boreali; 8 Jul., 8 Aug., duo specimina mihi obvia; scilicet unum in Jemtlandia ad diversorium Berge in Alsen, & alterum in Norvegia ad Næs Værdaliæ lectum.” RINGDAHL (1934: 268) regarded *T. diligens* as a synonym of *Exorista cincta* Rondani, 1859. This opinion was repeated by RINGDAHL (1945: 27), but later (RINGDAHL 1952: 132) he changed the name to *Exorista honesta* (Robineau-Desvoidy), which is a junior synonym of *Tlephusa cincta* (Rondani). MESNIL (1954: 328) followed RINGDAHL and treated *Tlephusa diligens* (Zetterstedt) as valid with *E. cincta* and *T. honesta* as synonyms.

Identity: I have examined the lectotype of *Tachina diligens* and agree that it is a junior synonym of *Phebellia strigifrons* (Zetterstedt, 1838) as it was already found out by HERTING (1982: 4) and fixed by his lectotype designation. The misassociated paralectotype specimen, however, represents *Myxexoristops arctica* and not *M. blondeli* as it was presumed by HERTING (l. c.). The abdomen of this specimen possesses a pair of small reddish brown lateral spots on tergite 3 which is not a suitable character for *M. blondeli*.

*Tachina porcula* Zetterstedt, 1859  
 [ZETTERSTEDT 1859: 6103]

*T. porcula* was described from a single ♀. In his original description ZETTERSTEDT wrote: “Hab. in Scania rarissime: ad Lindholmen d. 29 Jul. 1858 ♀ unica, Roth.” The holotype of *porcula* cannot be located and is apparently lost.

LUNDBECK (1927: 339–341) used the name “*Zenillia porcula* (Zett.?) Pand.” and noted as a remark: “I have kept the name *porcula*, but whether the species is *porcula* Zett. cannot be decided, for according to a communication from Dr. BENGSSON *porcula* is not found in ZETTERSTEDT’s collection. – After a communication from Dr. VILLENEUVE is *stolida* Stein l. c. a variety of the present species.”. RINGDAHL (1945: 34) examined the holotype of *T. porcula* that at that time apparently existed in the ROTH collection drawer 13 (2) in Lund. He adopted the name *porcula* as a valid species in the combination suggested by LUNDBECK, i. e. *Zenillia porcula* with *petiolinervis* as a junior synonym and with *stolida* as a probable junior synonym. This opinion was repeated by RINGDAHL (1952: 132) but was not followed by other authors. MESNIL (1955: 446) treated *porcula* in synonymy with his concept of *M. blondeli* which however also included *M. stolida*.

HERTING (1984: 65) synonymized *porcula* with *blondeli*. He possibly based the synonymy solely on the character of the greyish pruinosity, “griseo-cinerea, opaca”, mentioned in the original description. This variable character alone is definitely not sufficient for a safe recognition of *blondeli*. The original description also says: “palpis summo apice luteis”, which means that the palpi have yellow tip. Females of *M. stolida* examined by me all have yellow palpi at least at the extreme tip, whereas females of *M. blondeli* all have entirely black palpi, i. e. yellow palpi indicate *M. stolida*.

Identity: The current listing of *Tachina porcula* as a synonym of *Myxexoristops blondeli* (HERTING 1984: 65) is probably wrong and I agree with RINGDAHL (1945) that *porcula* is most probably conspecific with *stolida*. *M. porcula* would then have priority. But as the type is lost and the identity of the species cannot be proved with absolute certainty, the name *M. porcula* should better be treated as nomen dubium than to replace the long-accepted name *M. stolida* (see also below under *T. petiolinervis*).

*Tachina petiolinervis* Zetterstedt, 1859  
 [ZETTERSTEDT 1859: 6126]

The holotype is still available in the ROTH collection, drawer 13 [MZLU]. It is labelled as follows: “Lhn / 9/7 // *T. petiolinervis* Zett. / n. sp. ♂ (handwritten ZETTERSTEDT label) // Holotype / *T. petiolinervis* Zett. / B. HERTING det. // *Myxexoristops* / *stolida* Stein ♂ / B. HERTING det.”.

*T. petiolinervis* was described from a single ♂. In the original description ZETTERSTEDT (1859) wrote: “Hab. in Scania rarissime: ad Lindholmen d. 9 Jul. 1856 marem unicum invenit Roth.”. RINGDAHL (1945: 29, 34) regarded *M. petiolinervis* as a junior synonym of *T. porcula*, but this opinion was not followed by HERTING (1984: 65) who treated *M. petiolinervis* as a junior synonym of *M. blondeli*. The name *petiolinervis* alludes to the fact that that wing cell  $r_{4+5}$  of the holotype possesses a petiole (which is about as long as crossvein r-m). This character is aberrant and not useful in the classification of *Myxexoristops*.

Identity: I have examined the holotype and it is conspecific with *Myxexoristops stolidus* (Stein, 1924). *M. petiolinervis* (Zetterstedt, 1838) is the older name and would normally have priority, but to avoid unnecessary changes of long-accepted names, Art. 23.9. was introduced in the 1999 edition of the ICZN. To maintain the stability of the name *M. stolidus* it is stated herewith that according Art. 23.9.1.1. *M. petiolinervis* was not used as a valid name after 1899, and that according to Art. 23.9.1.2. *M. stolidus* has been used as a valid name in more than 25 works of more than 10 authors in the preceding 50 years, encompassing a span of more than ten years. The name *M. stolidus* has been used in various papers on the biology of Tenthredinidae (e.g. EICHORN & PSCHORN-WALCHER 1978), host catalogues (e.g. SHIMA 1999), keys (e.g. TSCHORSNIG & HERTING 1994), many regional faunas (e.g. VANHARA et al. 2004), etc. *M. petiolinervis* (Zetterstedt, 1838) hence becomes the status of a nomen oblitum.

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