Notes on Palaearctic sawflies, with particular reference to the German fauna

(Hymenoptera, Symphyta)

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Abstract

New data are presented on the taxonomy, distribution and biology of some Palaearctic sawfly species. A key is included for identification of the four leaf-mining sawfly species on *Salix* in Europe. The previously unknown male of *Scolioneura tirolensis* (ENSLIN, 1914) is briefly characterised.

The following taxonomic changes are made: *Empria immersa* (KLUG, 1818) = *E. tirolensis* ENSLIN, 1914 syn. nov.; *Heterarthrus wuestneii* (KONOW, 1904) ? = *H. tauricus* ERMOLENKO, 1984; *Pontania shibayanagii* (TOGASHI & USUBA, 1980) comb. nov. is transferred from *Euura*; *Pristiphora albilabris* (BOHEMAN, 1852) comb. nov. (transferred from *Nematus*) = *Nematus albilabris* THOMSON, 1863 syn. nov. A lectotype is designated for *Empria tirolensis*.

New records for Germany are *Amauronematus puniceus* (CHRIST, 1791) (Brandenburg), *Pristiphora albilabris* (Mecklenburg-Vorpommern) and *Scolioneura tirolensis* (Bavaria). *Nematus doebelii* (KONOW, 1901) is confirmed present in Alpine Bavaria, and notes are presented on its early stages developing on *Lonicera alpigena*. *Cephus runcator* KONOW, 1896 is removed from the list of German species. New records for Bavaria are, *Amauronematus miltonotus* (ZADDACH, 1883), *Ardis sulcata* (CAMERON, 1882), *Fenusella wuestneii* (KONOW, 1894), *Hoplocampa plagiata* (KLUG, 1816), *Nematus fagi* ZADDACH, 1876 and *N. putoni* (KONOW, 1903). *Gilpinia socia* (KLUG, 1812) and *Pachynematus pallescens* (HARTIG, 1837) are confirmed as occurring in Bavaria.

Newly recorded hostplant associations are: *Amauronematus puniceus* (*Salix purpurea*), *Cladius rufipes* SERVILLE, 1823 (*Ulmus laevis*), *Fenusella septentrionalis* (KOCH, 1990) (*Salix lapponum*), *Hinatara excisa* (KONOW, 1885) (*Acer monspessulanum*), and *Scolioneura tirolensis* (*Salix foetida*, *S. waldsteiniana*). Whilst *Hoplocampa crataegi* (KLUG, 1816) is mainly associated with *Crataegus monogyna* agg., *H. pectoralis* THOMSON, 1871 is attached to *C. laevigata*. *Fenusella wuestneii* is probably monophagous on *Salix viminalis*, and is recorded north only to Denmark. Records of leaf mines on *Salix lapponum* from subarctic and arctic Sweden and Finland, previously identified as belonging to *F. wuestneii*, are assigned to *F. septentrionalis*. Association of adult *Nematus putoni* with *Polygonum bistorta* suggests that this may be a hostplant.

Introduction

This contribution summarises the results of studies on sawflies, mainly relating to the European fauna, with respect to taxonomy, distribution and hostplant associations. Some of the work was carried out during the preparation of the forthcoming revision of the Symphyta part of the „Red Lists“ of endangered German animals. Other results presented below have already been used in the preparation of the *Rote Liste* for Bavaria (KRAUS & BLANK 2004). It seems desirable to document the data which influenced these decisions, particularly for some rarely recorded and potentially endangered species for which no data, or very little, were previously available. An attempt is made throughout to draw attention to interesting aspects of the natural history of these insects, it being my belief that most future progress in understanding their taxonomy will result from closer investigation of their biologies.

Material and methods

Specimens examined are deposited in the following collections:
AKB Private collection of Alexandra KEHL, Bayreuth, Germany
DEI Deutsches Entomologisches Institut, Müncheberg, Germany
JSD Private collection of Jochen SPÄTH, Dingolfing, Germany
MKN Private collection of Manfred KRAUS, Nürnberg, Germany
SMBC Private collection of Stephan BLANK, Eberswalde, Germany
TNO Private collection of Tommi NYMAN, Oulu, Finland
ZMHB Museum für Naturkunde der Humboldt-Universität, Berlin, Germany
ZSM Zoologische Staatssammlung, Munich, Germany

Results

Families and species are listed in alphabetical order, except for the European leaf-mining sawflies on *Salix*, dealt with in a separate concluding section. „Brandenburg" as used here refers always to the federal state, not the town of that name

Cephidae

Cephus runcator KONOW, 1896

Most European specimens previously identified as *C. runcator*, because of their dark wings, actually belong to *C. spinipes* (PANZER, [1800]), in which wing colour is highly variable (see TAEGER 1987, LACOURT 1995). As shown by LACOURT (1994), *C. runcator* is a valid species, but so far is known only from Croatia and Greece (latter based on material from K. & L. STANDFUSS), and should be deleted from the German list.

Diprionidae

Gilpinia socia (KLUG, 1812)

Germany: Bavaria, Lkr. Starnberg, Bernried, 1♀, leg. ?, 24.07.1939, ZSM; Bavaria, Lkr. Bad Tölz-Wolfratshausen, Königsdorf, 1♀, 03.07.1940, leg. W. SCHMIDT, ZSM; Bavaria, Lkr. Bad Tölz-Wolfratshausen, Königsdorf[er] Filz, 1♀, 03.07.1949, leg. ?, ZSM; „München", 4♂♂ (no further data), ZSM; Brandenburg, Lkr. Barnim, Eberswalde, larvae collected 18.06.1998 on *Pinus sylvestris*, 6♀♀ 17♂♂ emerged 07-08.1998, leg. S. M. BLANK, SMBC.

Recorded in Bavaria by JEMILLER (1894: „Trostberg einmal, Regensburg selten") and by FISCHER (1962: one record from Augsburg). This is one of the most rarely recorded diprionids in Germany. BLANK et al. (2001) indicate only a questionably recent occurrence in Brandenburg, and no records from Bavaria. In their short description of the ecology and biology of *G. socia* in Austria, PSCHORN-WALCHER & ALTENHOFER (2000) regard the species as widespread but not common, ascribing it a wide ecological tolerance. KNERER (1977) characterises *G. socia* as predominantly boreo-montane.

Monoctenus obscuratus (HARTIG, 1837)

Germany: Mecklenburg-Vorpommern, Lkr. Ostvorpommern, NSG Struck, 1♀, 1♂, 05.06.1999, leg. H.-J. JACOBS, DEI.

This record shows that this species has not entirely disappeared from lowland areas of Germany, contrary to the statement by LISTON (2006). Although *M. obscuratus* has often been suspected to be a synonym of *M. juniperi* (LINNAEUS, 1758), detailed studies by VIITASAARI & VARAMA (1987) and MOL & AARTSEN (1994) strongly indicate the existence of two distinct species.

Tenthredinidae

Amauronematus miltonotus (ZADDACH, 1883)

Germany: Bavaria, Lkr. Dingolfing Landau, near Marklkofen (398 m), 1♀, 10.5.2003, 1♀,

11.05.2003, leg. LISTON; near Eichendorf (350 m), 1♀, 01.06.2002, leg. LISTON, DEI & ZSM. All three specimens swept from *Salix viminalis* growing on the banks of the River Vils. **First records from Bavaria.**

The phenology of this species is unusual in the genus *Amauronematus*, being later than its congeners. Most leaves of *S. viminalis*, the only recorded host, are already fully developed at the time of adult activity. BENSON (1958) also records the flight period as May-June in Southern England. Habitus of the extremely pale female *A. miltonotus* much resembles that of *Nematus flavescens* STEPHENS (not known in Bavaria), and not that of other *Amauronematus* species, adults of which are much more extensively dark.

Amauronematus puniceus (CHRIST, 1791)

Germany: Brandenburg; Lkr. Märkisch-Oderland, Kleiner Schagenthinsee, NSG Gumnitz, bei Müncheberg, 1 larva from *Salix aurita*, 20.05.2006, leg. LISTON, DEI. In captivity the larva fed readily on *Salix cinerea*. Cocoon spun on 28.05.2006; Brandenburg, Lkr. Märkisch-Oderland, 5 km W. Prötzel, 9 larvae in loose group, on 4 leaves of leading shoot of young *Salix purpurea*, 28.05.2006, leg. LISTON. 7 larvae made cocoons on 29.05.2006. **First German records.**

This species was expected in Germany, but previous records based on adults are unconfirmed or have been shown to refer to other species, usually *A. krausi* TAEGER & BLANK, 1998 (= *A. puniceus* auct.) (TAEGER & BLANK 1998). KANGAS (1985) records as hostplants: *Salix aurita*, *S. caprea*, *S. fragilis*, *S. myrsinifolia* and *S. pentandra*. *S. purpurea* is a new hostplant record. Surprisingly, all original observations on hostplants of this species previous to KANGAS (1985), have referred only to *S. caprea*. The Brandenburg records support the oligophagy of *A. puniceus* on a wide range of *Salix* species, as already indicated by KANGAS. *A. puniceus* is a good example of a sawfly species which is much more easily identified in the larval stage than as an adult. The original description (CHRIST 1791) of *A. puniceus* was made by reference to the larval description in DEGEER (1771). Until the last feeding instar the predominant ground colour is black **(Fig. 1)**. The thoracic legs and a ventral patch between these, together with abdominal appendages, are white **(Fig. 2)**. At the moult before the last feeding instar, the dorsal ground colour changes to brown **(Fig. 3)**. Whilst a number of sawfly larvae feeding on *Betula* are predominantly black, including in Central Europe *Amauronematus berolinensis* (MUCHE, 1970) (TAEGER & BLANK 1998), of those on *Salix* only *A. puniceus* is black, the others being largely green.

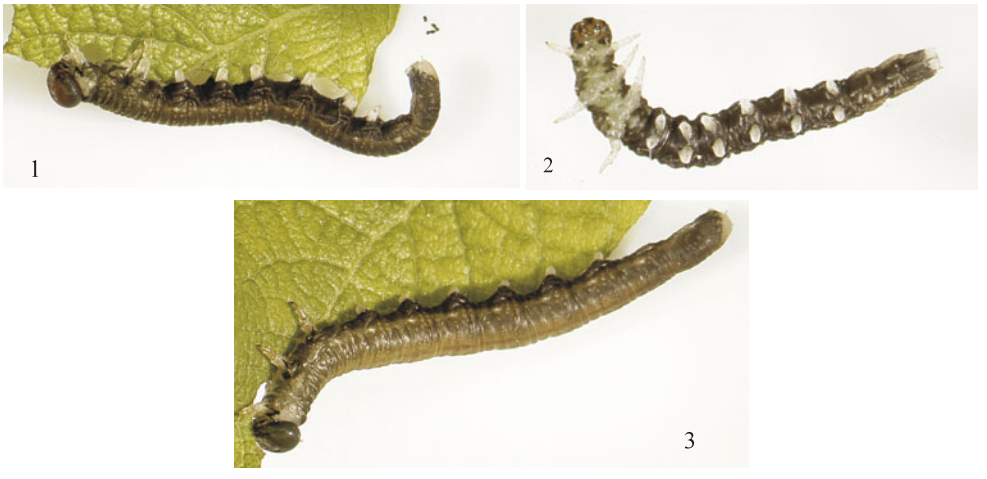


Fig. 1-3: *Amauronematus puniceus* larva, Germany, Brandenburg. **1**; lateral, before final feeding instar; **2**; same, ventral; **3**; lateral, final feeding instar.

Ardis sulcata (CAMERON, 1882)

Germany: Bavaria, Lkr. Oberallgäu, Oberstdorf, 1♀, 02.06.1947, leg. E. ENSLIN, MKN; Bavaria, Lkr. Berchtesgadener Land, Schneibstein (1700 m), in open stand of *Larix decidua* at tree-line, 1♀ ovipositing in *Rosa pendulina*, 02.06.2002, leg. LISTON, ZSM. **First records from Bavaria.**

Only one recent record of *Ardis sulcata* in Germany has been published: from Brandenburg in 1999 (BLANK et al. 2001). Apparently, *A. sulcata* differs biologically from *A. pallipes* (SERVILLE, 1823) mainly in phenology (see PSCHORN-WALCHER & ALTENHOFER 2000). These authors record larvae of *A. pallipes* from the terminal shoots of *Rosa pendulina*, whilst *A. sulcata* is said to favour wild roses of the *canina* group, and occurs also on ornamental roses. The more recent Bavarian record indicates that *A. sulcata* also feeds in *R. pendulina*. Noteworthy is the high altitude at which the Berchtesgaden specimen was taken. Most of the sawflies which Enslin collected in the environs of Oberstdorf are from altitudes of between 1500-2000 m. (M. KRAUS, pers. comm.), so perhaps his specimen of *A. sulcata* was also captured in the high subalpine zone.

Cladius (*Priophorus*) *rufipes* SERVILLE, 1823

Germany: Brandenburg, Lkr. Märkisch-Oderland, Müncheberg, larvae abundant on *Ulmus laevis*, 22.09.2005, 5♀♀, 4♂♂ emerged 04.-05.2006 (heated room), leg. LISTON, DEI.
Previously recorded hosts are *Ulmus glabra* and *U. minor* (PSCHORN-WALCHER & ALTENHOFER 2000).

Empria immersa (KLUG, 1818)

= *Tenthredo* (*Emphytus*) *immersa* KLUG, 1818: 284, ♂. Type locality: Germany.
= *Empria tirolensis* ENSLIN, 1914: 214, 216-217, ♀. Type locality: Grödener Tal, South Tyrol (now Italy); syn. nov.

Type material examined: *Empria tirolensis*. Lectotype (here designated). 1♀, Grödener Tal, Süd-Tirol, leg. E. ENSLIN, ZSM. The second syntype mentioned in the original description is not in the ENSLIN Collection (ZSM) and is probably lost.

Other material: Germany, Bavaria, Lkr. Bad Tölz-Wolfratshausen, Vorderriß (1000-1100 m), from *Salix* ? *myrsinifolia*, 3♀♀, 1♂♂, 06.06.2004, leg. LISTON, DEI.

ENSLIN (1914) compared *E. tirolensis* with *E. immersa* and distinguished these using the following characters:

E. tirolensis; sawsheath in dorsal view as wide as metatarsus, legs predominantly black, wings infuscate, body length 8.5 mm.

E. immersa; sawsheath in dorsal view narrower than metatarsus, rear legs, especially femur, extensively pale (reddish), wings always much paler, body length 6-7 mm.

For the following reasons, I agree with the synonymy of *E. tirolensis* and *E. immersa* as already tentatively proposed by CONDE (1940: 173). The width of the sawsheath is the same in both taxa, not wider in *E. tirolensis* as claimed by ENSLIN. Colouration of the legs of *E. immersa* is highly variable, as already noted by CONDE (1940: 174) and BENSON (1952: 87). BENSON supposed darker specimens to be commoner in northern areas, but they also occur in Central Europe. I have collected specimens of *E. immersa* in Brandenburg in which the middle and rear legs of both sexes are almost black. A specimen with similarly dark legs from near Giessen, identified by WEIFFENBACH (1985) as *E. tirolensis*, was re-examined by C. RITZAU (pers. comm.): it belongs to *E. immersa*. The wings of the lectotype of *E. tirolensis* are not so dark as suggested by ENSLIN's description, but may of course have faded (or have been darker in the missing syntype). However, this character is also somewhat variable in *E. immersa*, and is not suitable for distinguishing the taxa. The large body size of *E. tirolensis* seems to represent only one extreme of a further variable character. The depth of excision of the clypeus of *E. tirolensis* given by ENSLIN („fast so tief ausgerandet wie bei *excisa*“) is not correct: in both *E. tirolensis* and *E. immersa* the excision is approximately one third of the length of the clypeus. The specimens from Vorderriß resemble the lectotype of *E. tirolensis* very closely in all characters, including their large size (7.5-8.0 mm). The saw and penisvalve of these can not be distinguished from those of „typical“ lowland *E. immersa* (with rear legs extensively red).

Fenusa ulmi SUNDEVALL, 1847

Germany: Bavaria, Lkr. Bad Kissingen, Trimburg, above Trimberg, 1♀ ovipositing in leaf of *Ulmus glabra*, 26.04.2004, leg. LISTON, DEI.

BLANK et al. (2001) record *F. ulmi* in Bavaria only between 1900-1979. The note on sex-ratio in BLANK et al. (2001) is wrong: males of *F. ulmi* are very rare in C. and N. Europe, whereas *F. altenhoferi* (= *carpinifoliae*), synonymised by LISTON (1996), is bisexual (cf. LISTON 1993, PSCHORN-WALCHER & ALTENHOFER 2000).

Heterarthrus wuestneii (KONOW, 1905)

= *Phyllotoma Wüstneii* KONOW, 1905: 156, ♀, ♂. Type locality: Sonderburg, Insel Alsen (now Denmark).

= *Heterarthrus healyi* ALTENHOFER & ZOMBORI, 1987: synonymised by BLANK et al. 2001

? = *Heterarthrus tauricus* ERMOLENKO, 1984: 53-55, ♀, ♂. Type locality: Crimea, Ukraine.

It has not been possible to examine type material of *H. tauricus* (deposited in Zoological Museum Kiev, according to original description). The illustrations of the lancet, penisvalve and the mention of *Acer campestre* as hostplant by ERMOLENKO (1984) indicate strongly that this taxon is synonymous with *H. wuestneii* (see illustrations of *H. healyi* in ALTENHOFER & ZOMBORI 1987). No external morphological differences have been found between *H. wuestneii* reared from *A. campestre* and four males reared from *A. monspessulanum* (Germany: Franconia, Lkr. Bad Kissingen, Trimberg, leg. SPÄTH & LISTON, DEI). Neither does the penisvalve show any differences **(Fig. 4)**. Although the type material of *Heterarthrus smithi* ERMOLENKO, 1994 was collected in the adult stage from *Acer ibericum* (a synonym of *A. monspessulanum*), and *H. smithi* might therefore be suspected to be a synonym of *H. wuestneii*, the penisvalve of *H. smithi* illustrated by ERMOLENKO (1994) looks significantly different to that of *H. wuestneii*. At present it therefore seems best to consider *H. smithi* as a valid species. The identity of the *Heterarthrus* species recorded only on the basis of leaf-mines on *A. monspessulanum* in Corsica, Italy and France therefore needs to be checked.

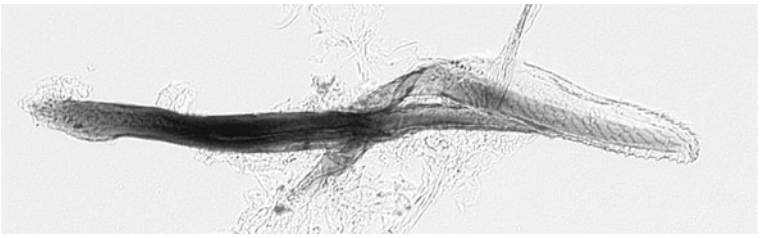


Fig. 4: *Heterarthrus wuestneii* male, penisvalve, Germany, Bavaria, reared from *Acer monspessulanum*.

Hinatara excisa (KONOW, 1885)

Germany: Bavaria, Lkr. Bad Kissingen, Engenthal, vacated leaf-mines on *Acer monspessulanum*, Engenthal, 26.05.2003, leg. J. SPÄTH & LISTON; 10 leaf-mines with larvae, same locality, 14.05. 2004, leg. LISTON. Mines occurred only on parts of trees in full shade of woodland interior and north-facing edges. On adjacent *A. pseudoplatanus* were found further mines of *H. excisa*, but none on *A. campestre*.

Although adults have not been reared from larvae on *Acer monspessulanum*, at present these are considered to belong to *H. excisa*. As described by ALTENHOFER & PSCHORN-WALCHER (1998), each of the three known West Palaearctic *Hinatara* species shows a distinctive and quite constant pattern of dark, sclerotised areas on the dorsum of the thorax **(Figs 5-7)**. Larvae from *A. monspessulanum* are indistinguishable from those of *H. excisa* on *A. pseudoplatanus*. The usual host associations of the other two European species are with *Acer platanoides* for *H. recta* (THOMSON, 1871), and with *A. campestre* for *H. nigripes* (KONOW, 1907).

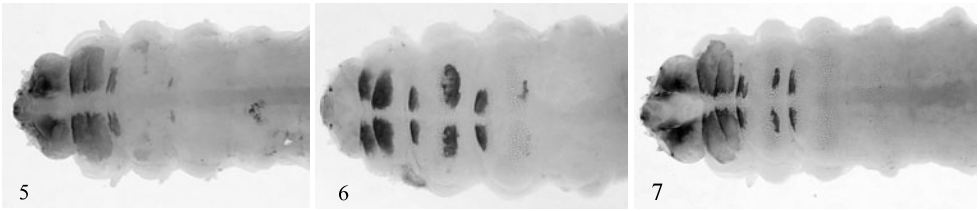


Fig. 5: *Hinatara excisa* larva, dorsal, Germany, Bavaria, from *Acer monspessulanum*. **Fig. 6:** *Hinatara recta* larva, dorsal, from *Acer platanoides*. **Fig. 7:** *Hinatara nigripes* larva, dorsal, from *Acer campestre*.

Hoplocampa crataegi (KLUG, 1816) and *H. pectoralis* (THOMSON, 1871)

The hostplants of both species are usually stated to be *Crataegus*. This seems to imply that several *Crataegus* spp. are fed on by each species. I have collected adults of *H. crataegi* exclusively from *C. monogyna*, and adults of *H. pectoralis* only from *C. laevigata*, which suggests that their hostplant associations may be more specialised than previously thought.

Hoplocampa plagiata (KLUG, 1816)

Germany: Bavaria, Lkr. Berchtesgadener Land, Hinteres Wimbachtal, Wimbachgries (1100-1300 m), in open stands of *Pinus mugo* var. *rotundata*, larvae in fruits of *Amelanchier ovalis*, 1 larva in ethanol, 23.06.2002, leg. LISTON; Bavaria, Lkr. Bad Tölz-Wolfratshausen, Vorderriß (1000 m), 4♀♀ swept from last flowers of *A. ovalis*, 06.06.2004, leg. LISTON, DEI. On 10.06.2004 no adults were to be found on these same plants. **First records from Bavaria**.

Affected fruit is easily detected, because of the hole made basally in its side, through which the larva ejects its excreta and cast skins. Although not every plant of *A. ovalis* harboured the sawfly, in those that were infested, one or two larvae were found in each cluster of fruit. Empty fruit of *A. ovalis*, with similar damage to that observed at the above localities, was also found on 21.07.2002 south of Mittenwald (Lkr. Garmisch-Partenkirchen). *H. plagiata* therefore appears to be widespread in subalpine Bavaria.

Much confusion has been caused by the misapplication of the name *Hoplocampa plagiata* to *H. crataegi*. It seems that the only previous record of the real *H. plagiata* in Germany was published by MOHR & KOCH (1991): 1♀ captured in a Malaise trap, with abundant *A. ovalis* around it (CÖLLN et al. 1991), in the "Koppelstein" Nature Reserve, Rhineland-Palatinate. *H. plagiata* has been regarded as characteristic of sub-mediterranean plant associations, particularly in the *Amelanchier*-rich understorey of xerotherm *Pinus nigra* forests in the region to the south of Vienna (PSCHORN-WALCHER & ALTENHOFER 2000). The type locality of *H. plagiata* lies in this area. MASUTTI & COVASSI (1978, 1980) have however already shown that *H. plagiata* is also found in subalpine habitats in the southern Alps. Interestingly, *H. plagiata* has so far apparently been unable to utilise as hosts the species of *Amelanchier* of North American origin now so often planted in European parks and gardens.

Nematus (Paranematus) doebelii (KONOW, 1901)

Germany, Bavaria: Lkr. Bad Tölz-Wolfratshausen, Vorderriß (900-1000 m), 3 larvae on *Lonicera alpigena*, 06.06.2004 and 10.6.2004, leg. LISTON. 1 eunymph and cocoon, DEI Biological Collection. Rearing failed. The illustrations of the living larvae **(Fig. 8 & 9)** are the best documentation of the present record.

When found, all larvae had apparently recently emerged from the eggs, which are laid fully inserted in the underside of the leaf-midrib, where their location is marked by a small pustule. 1st instar larvae commence feeding next to the oviposition site and eat a hole in the leaf-blade beside the midrib. The larva straddles the edge of this hole, which does not reach the leaf edge. The first two larvae were collected on the same leaf (eggs about 2 mm apart), and had commenced feeding directly opposite each other in two holes on each side of midrib. 1st instar larvae have a black head, thoracic legs and cerci. There is no medial black stripe on the dorsum of the body. The 2nd instar

larva **(Fig. 8)** moves to a different leaf and feeds on the leaf-edge. The thoracic legs are paler than the 1st instar, with only the outer surface blackened. The mature larva **(Fig. 9)** has a pale brown head and grass-green body. The thoracic legs are now without dark markings. A dark stripe runs through the middle of the frons, continued along the coronal suture of the head and along the thoracic midline, tapering towards the posterior and ending on the first abdominal segment. A similar stripe starts on abdominal segment 8 and ends just before the cerci. Cerci are also more or less dark apically and dorsally, but paler than in the younger larva. The extremely rapid growth of the larvae from 2.5 mm body length to 15 mm in just 6 days is remarkable (kept on shaded window-sill at approx. 17-25° C.). The first two larvae, having reached a length of approx. 18 mm, spun cocoons on 14.06.2004 only 8 days after their collection.

Figs 8-9: *Nematus doebelii* larva, on *Lonicera alpigena*, Bavaria, Vorderriß. **8:** young (2nd instar). **9**: mature.

No other *Nematus* (*Paranematus*) species has yet been associated with *L. alpigena* (VIKBERG 1972, ZINOVJEV 1978), and as pointed out by ZINOVJEV (1978), the hostplant associations of sawflies in this group seem highly specialised. Comparing the mature larvae from Vorderriß with the key to last instar larvae of other *Paranematus* species in ZINOVJEV (1978), that of *N. doebelii* can be distinguished from all others by the lack of a continuous black dorsal vitta on the abdomen. Site of oviposition has so-far only been mentioned in *Paranematus* for *N. coeruleus* (by ZINOVJEV 1978): in underside of leaf-blades below epidermis, usually next to a vein. Possibly there are therefore also specific differences here, because site of oviposition in *N. doebelii* was observed to be only in the midrib underside. Further, according to ZINOVJEV (1978), the larvae of *N. coeruleus* start feeding on the leaf-edges, whilst those of *N. doebelii* start feeding in holes in the leaf blade next to the midrib, unconnected with the leaf edge.

Lygaeonematus doebelii was first briefly described by KONOW (1901) as a new species based on larvae collected on *Lonicera alpigena* in North Switzerland (Kanton Aargau) by S. DOEBELI. The adult female specimens (syntypes) in the DEI reared from these larvae are those described by KONOW (1904). Until now the latter description has been recognised as the first description of this taxon, and the valid larval description overlooked.

LISTON (1995) included Germany in the distribution of *N. doebelii*, based on the record of a female specimen from Garmisch-Partenkirchen identified as this species by VIKBERG (1972). This record was not accepted by BLANK et al. (2001) because identity of the specimen is not certain. Adult morphology of *N. coeruleus* ZINOVJEV, 1978 (larva on *Lonicera caerulea*) is very similar to *N. doebelii*, but although this sawfly species can almost be expected in the Alps (ZINOVJEV 1978), no records are yet known.

Nematus fagi ZADDACH, 1876

Germany: Bavaria, 1♀, Bayreuth, 13.07.(?), collector unknown, DEI. **First record from Bavaria.**

Nematus putoni KONOW, 1903

Germany: Bavaria, Lkr. Dingolfing-Landau, NSG Vilstal near Marklkofen, meadows, 398 m, 2♂♂ 4.5.2003, 2♀♀ 1♂ 10.05.03, all swept from stands of *Polygonum bistorta*, leg. LISTON, ZSM. **First records from Bavaria.**

First recognised as occurring in Germany by TAEGER (2003), based on recent captures in the Eifel. Since then a single old specimen from Thuringia, without further data, has been found (LISTON et al. 2005). The species was redescribed by LACOURT (2006). Hostplant is unknown, but seems quite likely to be *Polygonum bistorta* according to the remarks made by LACOURT on the vegetation types in which *N. putoni* has been collected in France. The meadows at Marklkofen also harbour a few other sawflies which like *N. putoni* are apparently more typically montane and otherwise very rare in the Isar-Inn tertiary hill landscape: e.g. *Brachythops flavens* (KLUG, 1816), *Dolerus gilvipes* (KLUG, 1818), *Pseudodineura enslini* (HERING, 1923), *Tenthredo arcuata* FORSTER, 1771.

Pachynematus pallescens (HARTIG, 1837)

Germany: Bavaria, Lkr. Starnberg, Würmtal, Petersbrunn, 1♀, 23.06.1944, ZSM.

FISCHER (1962) lists 3 records from Swabia for the period 1947-1950. Not recorded in Bavaria by BLANK et al. (2001).

Pontania shibayanagii (TOGASHI & USUBA, 1980) comb. nov.

Euura shibayanagii TOGASHI & USUBA, 1980, 521-525, ♂, ♀, larva, type locality: Mt. Nokogiri, Honshu, Japan.

The descriptions and illustrations of the adult female and the gall of this species by TOGASHI & USUBA (1980) leave no doubt that it actually belongs to the *dolichura* species group of the genus *Pontania*. Presumably the original placement in *Euura* was because vein 2r-m is missing in the forewing, as rarely occurs in some individuals of *Pontania*. The type series consists of only two specimens. It would be interesting to know whether the unusual venation of the syntypes is typical of *P. shibayanagii*.

Pristiphora albilabris (BOHEMAN, 1852) comb. nov.

= *Nematus albilabris* BOHEMAN, 1852: 172, ♀. Holotype only. Type locality: Wärnaby, Smolandia, Sweden.

= *Nematus albilabris* THOMSON, 1863: 622, ♀. Holotype only. Type locality: Bohuslän, Sweden. syn. nov.

Germany: Mecklenburg-Vorpommern, T. [= Teschendorf in Mecklenburg], 1♀, 01.06.1905, leg. F. W. KONOW, DEI. **First record from Germany**.

Fig. 10: *Pristiphora albilabris* female, dorsal, Germany, Mecklenburg, Teschendorf.

Note on applicability of article 23.9.1-2 (ICZN 1999) on reversal of precedence: a total of only 23 references, by more than 10 authors, to *P. albilabris* (sometimes in combination with *Lygaeonematus*, *Lygaeotus* and *Nematus*) as a valid species has been traced for the last 50 years. The

reference to *P. albilabris* in MUCHE (1970) is not included, because this is based on a proven misidentification (below). *Nematus albilabris* BOHEMAN has never been recognised as a valid species by any subsequent author. It seems that the description by BOHEMAN (1852) has until now been entirely overlooked, even by THOMSON. To the best of my knowledge, the conditions which make mandatory a reversal of precedence in the subjective synonyms *Nematus albilabris* BOHEMAN, 1852 and *N. albilabris* THOMSON, 1863, are not met. BOHEMAN's description fits our present concept of *P. albilabris* well. THOMSON refers to a single specimen collected by BOHEMAN as the basis of his description, but the published type locality given for this („Bohuslän"), was also at that time a distinct province from Smolandia, so it seems that two different specimens were involved. According to LINDQVIST (1954: 152), the [THOMSON] holotype could not be found in the BOHEMAN collection and is presumed lost, whilst a specimen under the name *albilabris* in the THOMSON collection is not from Bohuslän, and belongs to the species now known as *P. groenblomi* LINDQVIST, 1952.

Specimens of *Pristiphora carinata* (HARTIG, 1837) are often misidentified as *P. albilabris*. Although they are superficially similar in colouration and habitus, the dark stigma (clearly darker than costa, **Fig. 10**) is a conspicuous and constant character in *P. albilabris*, which does not occur in any other European species of this group (LINDQVIST 1952). MUCHE (1970) records a single female *P. albilabris* from Saxony. The specimen on which this record is based is in the MUCHE Collection, Berlin (ZMHB). It belongs to *P. carinata*, det. LISTON 2006. The accuracy of the record in GHIGI (1905): „*Lygaeonematus albilabris* Thoms. ♂, ♀ Blankenburg, Turingia" based on material in the zoological museum at Naples, has not been checked. Although numerous publications state that the hostplant of *P. albilabris* is *Betula*, the only primary source for this information seems to be CONDE (1934), who observed oviposition on *Betula*.

Pseudodineura clematidis (HERING, 1924)

Germany: Bavaria, Lkr. Berchtesgadener Land, North-facing flank of Simetsberg above Königssee (approx. 900 m), on rocks under *Picea*, 1 leaf-mine with mature larva on *Clematis alpina*, 04.08.2002, leg. LISTON, DEI.

The only previous record of this species in Germany is documented by LORENZ & KRAUS (1957) [translated from German]: „The larvae were found by Dr. GROSCHKE on 15.08.1951 in Priesberg (Upper Bavaria)."

Tenthredo vespiformis SCHRANK, 1781

The date of capture of the specimens from Bavaria, Lkr. Dingolfing-Landau, NSG Goben recorded by LISTON & SPÄTH (2004) is 19.05.2001, not June of that year. In Lower Bavaria *T. vespiformis* adults have only been found in mid to late May.

The European leaf-mining sawflies on *Salix*

Larvae of the four species of leaf-mining sawfly on *Salix* (willow) in Europe, which except for *Heterarthrus microcephalus*, were not included in the excellent work by ALTENHOFER (1980), can be identified with the following key. Distinction of the larvae is simple. As stated by LORENZ & KRAUS (1957), the presence or absence of the black „spots" on the sides of the abdomen (actually groups of small black setae) is a valuable character for distinguishing *Fenusella* (= *Messa* auct.) from *Scolioneura*. Although this character was originally described for the better known *Scolioneura* species on birch (*Betula*) and *Fenusella* spp. on poplar (*Populus*), it proves to be equally valid for the less well known species of these genera on *Salix*. Mines found above the tree line in the Alps are likely to be of *Scolioneura tirolensis*, whilst at lowland sites (below approx. 700 m.) in Central Europe only *Heterarthrus microcephalus* and *Fenusella wuestneii* occur. Note that although younger mines of *Scolioneura* and *Fenusella* can easily be distinguished from those of *Heterarthrus*, once larvae of the former two genera have reached the leaf tip and started to mine back along the other side of the midrib, the mine comes to resemble more closely that of *H. microcephalus*.

Key to larvae of European leaf-mining sawflies on *Salix*

1. Larva: thoracic legs short and stubby, composed of only three indistinctly discernible articles, without a claw. Mine: starts at tip of leaf, soon occupying whole width of leaf (on both sides of midrib) and continued towards leaf base **(Fig. 11)**. Has been reared from nearly all European *Salix* species. . . . . *Heterarthrus microcephalus* (KLUG, 1818)

- Larva: thoracic leg longer and more slender, composed of 5 clearly distinguishable articles, including a well-developed claw. Mine: starts in basal part of leaf and is at first continued on only one side of the midrib, towards the leaf apex **(Fig. 12)**. Later, the mine is continued on the other side of the midrib, with direction of feeding towards base of leaf. 2

2. Larva with 3 lateral black spots around black marked stigma on abdominal segments 2-9 **(Figs 13-14)**. Pigmentation of ventral plate on prothorax pale brown. Venter with three medial black spots, on mesa-, metathorax and abdominal segment 1 **(Fig. 13)**. Head brown. Various *Salix* species. . . . . *Scolioneura tirolensis* (ENSLIN, 1914)

- Larva with no lateral black spots on abdomen, except for black stigma **(Figs 15-16)**. Pigmentation of ventral plate on thorax predominantly black and venter with 3-5 medial black spots, on mesa-, metathorax and abdominal segment(s) 1(-3) **(Figs 15-16)**. Head extensively black. *Salix viminalis* or *S. lapponum*. 3

3. Frons almost completely black, not paler at centre than adjacent parietals. Venter with 5 black spots, on meso-, metathorax and abdominal segments 1-3 **(Fig. 15)**. Hostplant: *Salix viminalis*. Records from other willow species need confirmation. . . . *Fenusella wuestneii* (KONOW, 1894)

- Frons brown, paler on lower half, but on upper half still paler at centre than adjoining parietals. Venter with three black spots, on meso-, metathorax and abdominal segment 1 **(Fig. 16)**. Hostplant: *Salix lapponum*. . . . . *Fenusella septentrionalis* (KOCH, 1990)

Notes on species

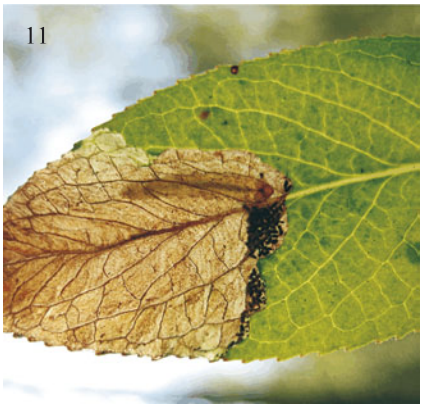
Scolioneura tirolensis (ENSLIN, 1914)

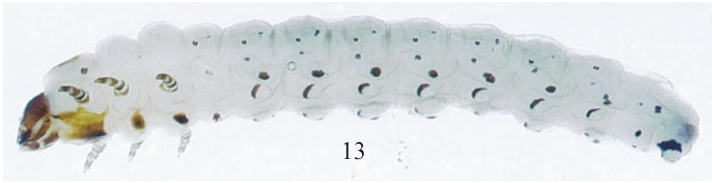
Germany: Bavaria, Lkr. Berchtesgadener Land, between Jenner and Schneibstein (1600-1800 m), 5 leaf-mines on *Salix waldsteiniana*, 26.07.2003, leg. LISTON & J. SPÄTH, DEI; Lkr. Garmisch-Partenkirchen, Krün, Soiernhaus (approx. 1600 m), leaf-mine on *Salix waldsteiniana*, 25.07.2004, leg. A. KEHL, AKB. **First records from Germany.**

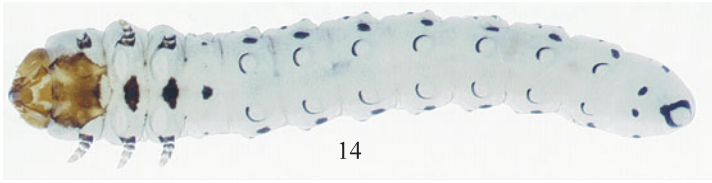
Switzerland: Kanton Solothurn, Solothurner Jura, Gänsbrunnen, from larvae on *Salix caprea*, coll. 07.08.1976, 2♂♂, 2♀♀, em. 24.-30.11.1976 and coll. 06.07.1976, 2♂♂, em. 26.-30.11.1976, DEI, also 7 larvae from which these were reared, TNO, all leg. E. ALTENHOFER.

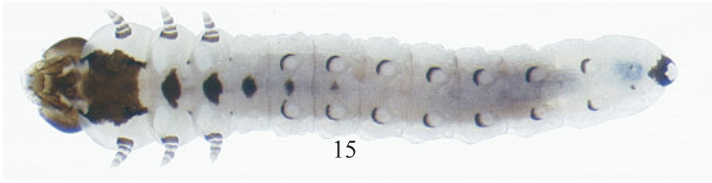
Austria: Vent, nr. Rotenbach, 06.08.2001, *Salix foetida*, 1 larva, leg. T. NYMAN, TNO; Vent, 04.08.2004, *S. helvetica*, 1 larva, leg. T. NYMAN, TNO.

Previously known from the Alps of Austria, Italy and Switzerland, and the Swiss Jura (TAEGER et al. 2006, PSCHORN-WALCHER & ALTENHOFER 2000). The species is apparently oligophagous on a large spectrum of willow species which are not closely related: *Salix hastata*, *S. helvetica* (SCHEDL 1976, reared), *S. aurita*, *S. myrsinifolia* (ALTENHOFER et al. 2001, identification of leaf-mines, not reared), *S. caprea* (ALTENHOFER 2003, reared, see also above). *S. waldsteiniana* and *S. foetida* (adults not reared) are recorded here for the first time. Altitudinal distribution is wide: collecting sites lie between approximately 800-2300 m above sea level. Although *S. tirolensis* is often found in willow rich stands of *Alnus viridis*, the mention of this sawfly as a phytophage of *A. viridis* by SCHEDL (1975) is probably mistaken. None of the sawfly leaf miners on willow occurs on other plant genera.









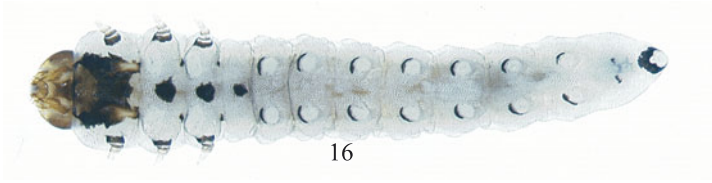


Fig. 11: *Heterarthrus microcephalus* leaf-mine on *Salix pentandra*.
Fig. 12: *Fenusella septentrionalis* leaf-mine on *Salix lapponum*, Finland, Kilpisjärvi.
Figs 13-14: *Scolioneura tirolensis* larva, from *Salix foetida*, Austria; **13**: lateral, **14**: ventral.
Fig. 15: *Fenusella wuestneii* larva, ventral, from *Salix viminalis*, Germany, Brandenburg.
Fig. 16: *Fenusella septentrionalis* larva, ventral, from *Salix lapponum*, Finland, Kilpisjärvi.

The male sex was previously unknown. Apart from primary sexual differences, it closely resembles the female. The two other European *Scolioneura* species, *S. betuleti* and *S. vicina*, attached to *Betula*, are not morphologically separable from each other (ALTENHOFER & TAEGER 1998). Some of the characters mentioned by ENSLIN (1914) as distinguishing *S. tirolensis* from these species are of doubtful practical use. The leg colour of *S. tirolensis* tends to be darker, but is highly variable. The first cubital cross vein in the specimens of *E. tirolensis* examined is present, although often pale and very faint (not absent as stated by ENSLIN). The best identification character for *S. tirolensis* is its shorter antenna: approx. 1.5x as long as the width of the head **(Fig. 17)**, and in *S. betuleti* / *S. vicina* 2x as long **(Fig. 18)**. Antennomere 3 is 3.5x as long as apical width viewed laterally in *S. tirolensis*, and 5-6x as long as apical width in *S. betuleti* / *S. vicina*. As already stated by ENSLIN the third antennomere is about 1.5x as long as the fourth in *S. tirolensis*, and only slightly longer than the fourth in the other species.


17


18

Fig. 17: *Scolioneura tirolensis* female, antenna. **Fig. 18:** *Scolioneura betuleti* female, antenna.

Fenusella wuestneii (KONOW, 1894)

Germany: Bavaria, Lkr. Dingolfing-Landau, near Marklkofen (398 m), leaf-mines on *Salix viminalis*; 4 half-developed mines, 11.05.2003; 2 vacated mines, 25.05.2003; 2♂♂ swept from the same bushes, 25.04.2004, all leg. LISTON, DEI. 3 larvae examined. **First record from Bavaria.**

The reports in the literature that *F. wuestneii* occurs on *Salix triandra* (BUHR 1941), and *Salix eleagnos* (LACOURT 1999) are possibly based only on identification of mines, and should be regarded as questionable unless they can be confirmed. North American *Salix* species mentioned as hosts by LACOURT (1999) are hosts of *F. alaskana* (KINCAID). Probably, all records so far published of *F. wuestneii* from Norway, Sweden and Finland refer to *F. septentrionalis* (below). *Salix viminalis*, as reported independently by several investigators, is the only proven hostplant. According to HERING (1924) and BUHR (1941) *F. wuestneii* is bivoltine, with the mines of the putative second generation occurring in late summer / autumn. Such temporally widely separated generations are extremely unusual in the Symphyta. It is however possible that these authors had no primary data on a second generation, but interpreted as such the record by Malaise (1920) of leaf mines of *F. wuestneii* (actually *F. septentrionalis*) found in late summer. Further investigation of this is required.

Fenusella septentrionalis (KOCH, 1990)

= *F. wuestneii*: misidentification by Fennoscandian authors

Finland: Kilpisjärvi, Saana, 2 larvae from *Salix lapponum*, 02.08.1997, 3 larvae, same data but 09.08.2001, leg. T. NYMAN, TNO.

This taxon was first reported as *F. wuestneii* after collection of mines from *Salix lapponum* by MALAISE (1920) in Sweden, and later by VIRAMO (1969, as *Messa wüstneii*) in Finland. Dr. V. VIKBERG (pers. comm.) confirms that Finnish specimens which he has examined, including one female which he reared from a larva collected in August 1966 in Kilpisjärvi on *S. lapponum*, all belong to *F. septentrionalis*.

Concluding remarks

The hostplant associations of some leaf-mining sawflies may not be so simple as they have sometimes recently been described. The timing of leaf flush in conjunction with the typically very short period of adult life may be a further important determinant of host suitability, apart from other more obvious factors, such as host identity. Possible examples of this referred to above are the occurrence of *Heterarthrus wuestneii* and *Hinatara excisa* each on two different hostplant species at the locality in Franconia, i.e. on *Acer monspessulanum* and respectively *A. campestre* and *A. pseudoplatanus*. These sawfly species had previously been considered to be strictly monophagous on the latter two *Acer* species. By way of contrast: hostplant relationships in the species of *Fenusella* associated with *Salix* seem to be considerably narrower than has sometimes been claimed.

Two of the rarely recorded tenthredinids (*Amauronematus miltonotus*, *Fenusella wuestneii*) which were found associated with *Salix viminalis* in the Vils Valley, Lower Bavaria, are examples of monophages which seem to occur only on this willow species. Their perceived rarity probably only reflects a relative lack of attention paid to this hostplant in Germany. Surprisingly, only two other sawfly species, *Nematus bergmanni* DAHLBOM and *Pristiphora* sp. cf. *bifida* (HELLÉN, 1947) were found on *S. viminalis* at the study site, although one additional monophage occurs in the neighbouring Isar Valley, viz. *Euura subgemma* LISTON, 2006. The Lower Bavarian symphytan community on *S. viminalis* thus seems very species-poor compared with the approximately 20 species recorded on the same host by URBAN (1993) in Moravia, Czech Republic.

As indicated under *Nematus* (*Paranematus*) *doebelii*, the investigation of the biologies of species of this subgenus, particularly in the Alps, could be hoped to advance our understanding of their poorly known taxonomy.

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Zusammenfassung

Neue Daten zu Taxonomie, Verbreitung und Biologie einiger paläarktischer Blattwespenarten werden vorgestellt. Ein Bestimmungsschlüssel für Larven der vier in Europa an *Salix* blattminierenden Tenthrediniden-Arten wird vorgestellt. Das bisher unbekannte Männchen von *Scolioneura tirolensis* (ENSLIN, 1914) wird kurz charakterisiert.

Folgende taxonomische Änderungen werden vorgeschlagen: *Empria immersa* (KLUG, 1818) = *E. tirolensis* ENSLIN, 1914 syn. nov.; *Heterarthrus wuestneii* (KONOW, 1904) ? = *H. tauricus* ERMOLENKO, 1984; *Pontania shibayanagii* (TOGASHI & USUBA, 1980) comb. nov. (bisher in *Euura*); *Pristiphora albilabris* (BOHEMAN, 1852) comb. nov. (bisher in *Nematus*) = *Nematus albilabris* THOMSON, 1863 syn. nov. Für *Empria tirolensis* wird ein Lectotypus festgelegt.

Folgende Arten wurden erstmals in Deutschland nachgewiesen: *Amauronematus puniceus* (CHRIST, 1791) (Brandenburg), *Pristiphora albilabris* (Mecklenburg-Vorpommern) sowie *Scolioneura tirolensis* (Bayern). Das Vorkommen von *Nematus doebelii* (KONOW, 1901) in den bayerischen Alpen wird bestätigt, und Beobachtungen der Frühstadien an *Lonicera alpigena* werden beschrieben.

Cephus runcator KONOW, 1896 wird von der Liste deutscher Arten gestrichen.
Erstmals für Bayern gemeldet werden: *Amauronematus miltonotus* (ZADDACH, 1883), *Ardis sulcata* (CAMERON, 1882), *Fenusella wuestneii* (KONOW, 1894), *Hoplocampa plagiata* (KLUG, 1816), *Nematus fagi* ZADDACH, 1876 und *N. putoni* (KONOW, 1903). Das Vorkommen von *Gilpinia socia* (KLUG, 1812) und *Pachynematus pallescens* (HARTIG, 1837) in Bayern wird bestätigt.
Neue Wirtspflanzen-Assoziationen sind: *Amauronematus puniceus* (*Salix purpurea*), *Cladius rufipes* SERVILLE, 1823 (*Ulmus laevis*), *Fenusella septentrionalis* (KOCH, 1990) (*Salix lapponum*), *Hinatara excisa* (KONOW, 1885) (*Acer monspessulanum*) und *Scolioneura tirolensis* (*Salix foetida*, *S. waldsteiniana*). Während *Hoplocampa crataegi* (KLUG, 1816) hauptsächlich an *Crataegus monogyna* agg. gefunden wird, kommt *H. pectoralis* THOMSON, 1871 an *C. laevigata* vor.
Fenusella wuestneii ist wahrscheinlich monophag an *Salix viminalis* und wurde nördlich nur bis Dänemark nachgewiesen. Blattminen an *Salix lapponum* aus dem subarktischen und arktischen Schweden und Finnland, die bisher *Fenusella wuestneii* zugeschrieben wurden, sind von *Fenusella septentrionalis*. Funde adulter *Nematus putoni* an *Polygonum bistorta*, deuten an, dass dies die Wirtspflanze sein kann.

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