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The European species of the genus *Phyllocolpa*, part I: the *leucosticta*-group

(Insecta, Hymenoptera, Tenthredinidae, Nematinae)

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Abstract

The European species of the *leucosticta*-group of the genus *Phyllocolpa* (Tenthredinidae: Nematinae) are revised. The *leucosticta*-group is composed of 13 species, 5 of which are new: *Phyllocolpa carinifrons* (BENSON 1940) stat. n., *Ph. erythropyga* (FÖRSTER 1854) stat. n., *Ph. ischnocera* (THOMSON 1862) stat. n. [= *Nematus leucostigmus* CAMERON 1875, syn. n.], *Ph. kopelkei* (LACOURT 1996), *Ph. leucosticta* (HARTIG 1837) [= *Nematus crassulus* THOMSON 1862, *Nematus nigrifrons* KONOW 1897, syn. n.], *Ph. oblita* (SERVILLE 1823) [= *Nematus oblitus* LEPELETIER 1823, = *Nematus pineti* HARTIG 1837, = *Nematus puella* THOMSON 1871], *Ph. plicadaphnoides* sp. n., *Ph. plicaglauca* sp. n., *Ph. plicalapponum* sp. n., *Ph. plicaphylicifolia* sp. n., *Ph. polita* (ZADDACH 1883) [= *Nematus sieboldii* ZADDACH 1884, syn. n., = *Pontania leucapsis* v. *connata* ENSLIN 1915, syn. n.], *Ph. prussica* (ZADDACH 1883) stat. n., and *Ph. pschornwalcheri* sp. n. The females of this species-group induce open galls on the leaves of their willow host plants (*Salix* spp.). The leaf folds are never twisted along the longitudinal axis as in species of the *leucapsis*-group. Oviposition occurs on young, nearly unfolded leaves below the apical bundle of a shoot. The *Phyllocolpa* species often induce their galls on several successive leaves of young shoots. Collections for this study have been made since 1986 at 140 natural sites in 10 European countries. About 24 870 galls of the *leucosticta*-group were reared in the laboratory under ambient conditions. The material was collected from 20 willow species and 6 plant hybrids. Host specificity was tested by many ovipositing experiments. An identification key, descriptions, and illustrations are presented for the adults and galls, supplemented by distribution data. The females of the *leucosticta*-group can be separated from related genera by the acuminate sheath which in lateral view usually emarginates ventrally. Types of 50 taxa were examined to clarify the status of *Phyllocolpa* species. Lectotypes are designated for *Euura acuminata* ENSLIN 1915, *Nematus alienatus* FÖRSTER 1854, *Nematus anglicus* CAMERON 1877, *Nematus anomalopterus* FÖRSTER 1854, *Nematus crassulus* THOMSON 1862, *Nematus erythropygus* FÖRSTER 1854, *Nematus ischnocerus* THOMSON 1862, *Nematus leucostictus* HARTIG 1837, *Nematus leucostigmus* CAMERON 1875, *Nematus ischnocerus nigrifrons* KONOW 1897, *Nematus nigrolineatus* CAMERON 1879, *Nematus piliserra* THOMSON 1862, *Nematus pineti* HARTIG 1837, *Nematus puella* THOMSON 1871, *Nematus purpureae* CAMERON 1884, *Nematus scotaspis* FÖRSTER 1854, *Nematus westermani* THOMSON 1862, *Nematus xanthogaster* FÖRSTER 1854, *Pontania albopicta* MALAISE 1931, *Pontania apicifrons* MALAISE 1931, *Pontania leucapsis connata* ENSLIN 1915, *Pontania excavata* MARLATT 1896, *Pontania fibulata* KONOW 1901, *Pontania nigrifrons* KONOW 1897, *Pontania apicifrons punctifrons* MALAISE 1931, and *Pontania sibirica* MALAISE 1931. Neotypes are designated for *Nematus leucapsis* TISCHBEIN 1846, *Nematus politus* ZADDACH 1883, and *Nematus prussicus* ZADDACH 1883.

K e y w o r d s : gall formers, taxonomy, description, identification key

Die europäischen Arten der Gattung *Phyllocolpa*, Teil I: die *leucosticta*-Gruppe (Insecta, Hymenoptera, Tenthredinidae, Nematinae)

Z u s a m m e n f a s s u n g : Die Arten der *leucosticta*-Gruppe der Gattung *Phyllocolpa* (Tenthredinidae: Nematinae) in Europa werden revidiert. Diese Verwandtschaftsgruppe setzt sich aus

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13 Arten zusammen, von denen fünf neu beschrieben werden: *Phyllocolpa carinifrons* (Benson 1940) stat. n., *Ph. erythropyga* (Förster 1854) stat. n., *Ph. ischnocera* (Thomson 1862) stat. n. [= *Nematus leucostigmus* Cameron 1875, syn. n.], *Ph. kopelkei* (Lacourt 1996), *Ph. leucosticta* (Hartig 1837) [= *Nematus crassulus* Thomson 1862, *Nematus nigrifrons* Konow 1897, syn. n.], *Ph. oblita* (Serville 1823) [= *Nematus oblitus* Lepeletier 1823, = *Nematus pineti* Hartig 1837, = *Nematus puella* Thomson 1871], *Ph. plicadaphnoides* sp. n., *Ph. plicaglauca* sp. n., *Ph. plicalapponum* sp. n., *Ph. plicaphylicifolia* sp. n., *Ph. polita* (Zaddach 1883) [= *Nematus sieboldii* Zaddach 1884, syn. n., = *Pontania leucapsis* v. *connata* Enslin 1915, syn. n.], *Ph. prussica* (Zaddach 1883), stat. n., *Ph. pschornwalcheri* sp. n. Die Weibchen dieser Verwandtschaftsgruppe erzeugen auf ihren Wirtspflanzen (*Salix* spp.) offene Blattgallen in Gestalt von nach unten umgelegten Falten. Die Gallen sind nicht der Länge nach verdrillt wie bei Arten der *leucapsis*-Gruppe und werden im Bereich der Sproßspitze oftmals an aufeinanderfolgenden Blättern erzeugt. Seit 1986 wurden ca. 24 870 Gallen an 140 verschiedenen Lokalitäten in 10 europäischen Ländern gesammelt und gezüchtet. Das Material stammt von 20 verschiedenen Weidenarten und 6 *Salix*-Hybriden. Die Wirtspflanzenspezifität wurde durch Eiablageexperimente überprüft. Die taxonomischen Merkmale werden beschrieben und abgebildet, ergänzend wird ein Bestimmungsschlüssel der Arten präsentiert. Die Weibchen der meisten Arten der *leucosticta*-Gruppe können von ihren Verwandten durch eine zugespitzte, ventral gewöhnlich deutlich konkav ausgerandete Sägescheide unterschieden werden. Typen von 50 Arten wurden zur Klärung der Arten der Gattung *Phyllocolpa* untersucht. Lectotypen werden festgelegt für *Euura acuminata* Enslin 1915, *Nematus alienatus* Förster 1854, *Nematus anglicus* Cameron 1877, *Nematus anomalopterus* Förster 1854, *Nematus crassulus* Thomson 1862, *Nematus erythropygus* Förster 1854, *Nematus ischnocerus* Thomson 1862, *Nematus leucostictus* Hartig 1837, *Nematus leucostigmus* Cameron 1875, *Nematus ischnocerus nigrifrons* Konow 1897, *Nematus nigrolineatus* Cameron 1879, *Nematus piliserra* Thomson 1862, *Nematus pineti* Hartig 1837, *Nematus puella* Thomson 1871, *Nematus purpureae* Cameron 1884, *Nematus scotaspis* Förster 1854, *Nematus westermani* Thomson 1862, *Nematus xanthogaster* Förster 1854, *Pontania albopicta* Malaise 1931, *Pontania apicifrons* Malaise 1931, *Pontania leucapsis connata* Enslin 1915, *Pontania excavata* Marlatt 1896, *Pontania fibulata* Konow 1901, *Pontania nigrifrons* Konow 1897, *Pontania apicifrons punctifrons* Malaise 1931 und *Pontania sibirica* Malaise 1931. Neotypen werden festgelegt für *Nematus leucapsis* Tischbein 1846, *Nematus politus* Zaddach 1883 und *Nematus prussicus* Zaddach 1883.

Introduction

The nematine genus *Phyllocolpa* Benson 1960 and the related genera *Pontania* Costa 1859 and *Euura* Newman 1837 consist of a biologically homogenous guild of gall formers which induce their galls particularly on willows, in the nearctic region also on poplars. The larvae of *Phyllocolpa* feed and develop in open leaf rolls or folds whereas the larvae of *Pontania* feed within closed leaf-galls and the larvae of *Euura* develop within closed stem-, petiole- or bud-galls. To date the real number of *Phyllocolpa* species occurring in Europe is unknown, due to many questions about the status of species and their host plant specificity. Moreover, the systematics of the genera is also controversly interpreted in the literature. Several authors considered *Euura, Phyllocolpa,* and *Pontania* as distinct genera whereas others subdivided the genus *Pontania* into the subgenera *Pontania*, *Eupontania,* and *Phyllocolpa* (summary in Table 2 in Kopelke 1999 and 2003a, respectively). Some authors (Zinovjev 1985, 1993, 1995, Liston 1995, Zinovjev & Vikberg 1998, 1999, Zinovjev & Smith 2000) have dismembered the biologically homogenous group of leaf folders (making open galls) by assigning them in part to *Pontania,* generally known as inducers of closed galls. Moreover, some authors separate the leaf folders into three species-groups: the *piliserra*-, *leucapsis*-, and *leucosticta*-group (Zinovjev & Vikberg 1999), referring to Benson (1960a). The present study follows the traditional view (Benson 1960b, E. L. Smith 1968, 1970, D. R. Smith 1979, Taeger et al. 1998, Kopelke 1999, 2003a), considering *Pontania* and *Phyllocolpa* as distinct genera which make closed leaf galls (*Pontania*) and/or open leaf rolls or folds (*Phyllocolpa*). Considering morphological and biological data, the present author separates the genus *Phyllocolpa* into five species-groups: 1) *leucosticta*-, 2) *leucapsis*-, 3) *crassispina*-, 4) *scotaspis*-, and 5) *piliserra*-group. The *leucosticta*-group is dealt with in the present paper.

Recently, Liston (1995) recorded 15 *Pontania* leaf roller species from Europe, attributing them to the subgenera *Pontania* (6 spp.) and *Phyllocolpa* (9 spp.), whereas Lacourt (1999) mentioned a total number of 18 western Palaearctic species, attributing them to the subgenus *Phyllocolpa*. In their checklist Taeger et al. (2006) recorded 17 leaf rollers from Europe, however, attributing them to the genera *Phyllocolpa* (14 spp.) and *Pontania* (3 spp.). Only 8 (Taeger et al. 1998) and/or 13 leaf rollers (Taeger et al. 2006) were recorded from Germany. The present author found a total number of 26 species of *Phyllocolpa* occurring in Europe (tab. 2 in Kopelke, submitted). The same number of species is listed in the related genus *Euura,* however, a significantly higher number in *Pontania* (44 spp.) (Kopelke 1999, 2003a). Approximately the same number of 25 species for the genus *Phyllocolpa* was recorded from North America (Smith & Fritz 1996).

Scarce and unreliable information about the host plant specificity and insufficient morphological characters are the main problems which in the past did not allow to identify *Phyllocolpa* species without doubt. Thus, like the studies on *Pontania* and *Euura,* the present investigation is based exclusively on types and reared material from various populations in order to determine the variability of morphological characters, supplemented by lots of oviposition experiments for checking the host plant specificity. The results of both, biological and morphological studies, allow a more precise fixing of the species status of the leaf folders. Vikberg (1970), Zinovjev (1995, 1998), and Vikberg & Zinovjev (2006) supposed a broader host plant spectrum for several species especially of the genera *Phyllocolpa* and *Pontania*. However, the results of more than 500 oviposition experiments (no-choice and multiple-choice experiments; Kopelke 1999, 2003a) and some more detailed DNA sequence data (Nyman et al., submitted) clearly support the view of the present author.

Material and methods

S a m p l i n g a n d r e a r i n g : Since 1986 the author has reared 24 870 galls of the *leucosticta*-group from 20 willow species and six *Salix* hybrids. The material was collected at 140 natural sites in 10 European countries. The rearing of entire galls was conducted in the laboratory under ambient conditions. Before starting with rearing every gall was checked whether the inhabiting larva was alive or parasitized or whether a gall was induced without oviposition. Until pupation of the larvae the galls were stored in plastic bags and were controlled every other day. Mouldy willow leaves were exchanged against fresh ones of the same host plant species which could act as food reserve. The larvae often pupate between the leaves. Hibernation of the cocoons occured in flowerpots with clay granulate under natural conditions in the roof garden of the institution or in a climatized chamber; the latter has shown the largest reduction of the mortality rate of gall-formers among the tested methods. Immediately after emerging in spring the females of the gall makers were used for oviposition experiments. Host preferences of ovipositing females were studied by no-choice and multiple-choice experiments in the laboratory (Kopelke 1999, 2003a). Before starting with the no-choice as well as multiple-choice tests the plants used in the experiments were tested according to their suitability by offering them to females of their "original" gall-forming species from which they were known to have been reared. If a host plant individual was accepted by the "original" gall-former it was offered in different experiments to various gall-forming species (Kopelke 1999, 2003a). The host preference was documented by observing the egg laying behavior of females.

T y p e s s t u d i e d : In the context of the revisional study on the genus Phyllocolpa types of 50 species-group taxa were examined to clarify the status of species belonging to different species-groups (Kopelke in press, submitted). Altogether 26 lectotypes and 3 neotypes are here designated, and 5 species are described here as new, and 2 further species will follow in the next publication (Kopelke, in press). For most species the records of host plants are based on reared specimens.

The following acronyms are used for the type material:

HT	holotype(s),
LT	lectotype(s),
NT	neotype(s),
PLT	paralectotype(s),
PT	paratype(s)
ST	syntype(s).

The following acronyms are used for museums and collections which provided type material:

BMNH:	The Natural History Museum, London, U.K.;
CLA:	Collection Lacourt, Igé, France;
DEI:	Deutsches Entomologisches Institut, Müncheberg, Germany;
MRSN:	Museo Regionale di Scienze Naturali, Museum of Systematic Zoology of the University, Torino, Italy;
MZL:	Musée Zoologique, Lausanne, Switzerland;
NMV:	Naturhistorisches Museum, Wien (Vienna), Austria;
NRS:	Naturhistoriska Riksmuseet, Stockholm, Sweden;
SMF:	Senckenberg-Museum und Forschungsinstitut, Frankfurt am Main, Germany;
USNM:	National Museum of Natural History, Smithsonian Institution, Washington D.C., USA;

ZMH: Zoological Museum, University of Helsinki, Finland;
ZMHU: Zoologisches Museum der Humboldt-Universität Berlin;
ZML: Zoological Museum, Lund, Sweden;
ZSM: Zoologische Staatssammlung, München (Munich), Germany.

The following type designations were made in the course of the revisional work in accordance with Art. 74 of the Code (ICZN 1999) to define the identity of the taxa and thereby stabilize nomenclature:

Lectotypes here designated (in alphabetic order of genus and species names):

- *Euura acuminata* Enslin 1915 (LT ♀, here designated, ZSM): Enslin described a ♀ of *acuminata* from Merseburg and labelled a "type" from Krieger's collection, which was collected in Meißen; the corresponding ♂ was unknown to him. Lectotype: pinned ♀ in good condition, labelled as follows: 1) Type; 2) Sammlung Dr. Enslin; 3) Meißen, D. 25. vi. [18]98, Krieger l.; 4) *Euura acuminata* ♀ Enslin, Enslin det.; 5) *Nematus proximus* Lep. O. Conde det. Geäder abnorm 6) Lectotypus *Euura acuminata* Enslin 1915, Kopelke 2004 design., 7) GBIF-GISHym 3709
- *Nematus alienatus* Förster 1854 (LT ♀, here designated, ZSM): Förster described a ♀ of *alienatus* from Aachen. Lectotype: pinned ♀, left antenna and all tarsomeres missing, labelled as follows: 1) Type; 2) *Nematus alienatus* ♀ Först., A. Förster det.; 3) Sammlung A. Förster; 4) *Pontania viminalis* Htg. ♀ det. Fr. W. Konow; 5) *Pontania leucapsis* Tischb. ♀ det. E. Clement; 6) Lectotypus *Nematus alienatus* Förster 1854, Kopelke 2004 design., 7) GBIF-GISHym 3702
- *Nematus anglicus* Cameron 1877 (LT ♀, here designated, BMNH): Cameron described a ♀ of *anglicus* from Stephens' collection, the type locality is unknown. Lectotype: ♀, broken into two halfs, affixed on a label, labelled as follows: 1) Type; 2) B.M. Type Hym. 1.611; 3) Type of *Nematus anglicus* Cameron; 4) W.F. Kirby List Tab. 1 Fig. 13; 5) Stephens Coll. 53-46; 6) *alienatus* Först., *anglicus* Cam.; 7) *Pontania leucapsis* Tischb. det R. B. Benson 1938; 8) Lectotypus *Nematus anglicus* Cameron 1877, Kopelke 2004 design.
- *Nematus anomalopterus* Förster 1854 (LT ♀, here designated, ZSM): Förster described a ♀ of *anomalopterus* from Aachen. Lectotype: pinned ♀, antenna, the fore legs and tarsomeres of middle legs missing, labelled as follows: 1) Type, 2) *Nematus anomalopterus* Först., A. Förster det. W, 3) Sammlung A. Förster, 4) *Pontania pedunculi* Htg. — Konow det.; 5) Lectotypus *Nematus anomalopterus* Förster 1854, Kopelke 2004 design., 6) GBIF-GISHym 3705, 7) preparation of the saw, Kop.
- *Nematus crassulus* Thomson 1862 (LT ♀, here designated, 8 PLT, ZML): Thomson described ♀ and ♂ of *crassulus* from Norbotten, Smaland, Öland, and Skane. Lectotype: pinned ♀ together with a paralectotype ♂ in good condition, labelled as follows: 1) *crassulus* [label red framed, handwritten], 2) *crassulus* ♂–♀ types [handwritten], 3) Lectotype ♀ *Nematus crassulus* Thomson 1862, Kopelke 2007 design., 4) Paralectotype ♂ *Nematus crassulus* Thomson 1862, Kopelke 2007 design. Paralectotypes, pinned ♀♀ and ♂♂ in good condition [5 ♀♀, 2 ♂♂]: one pin with 3 ♀♀, labelled as follows: 1) white illegible handwritten label, 2) Paralectotype 3 ♀♀, *Nematus crassulus* Thomson 1862, Kopelke 2007 design.; one pin with 2 ♀♀, labelled as follows: 1) O [handwritten on white label], 2) Paralectotype 2 ♀♀, *Nematus crassulus* Thomson 1862, Kopelke 2007 design.; one pin with 1 ♂, labelled as follows: 1) white illegible, handwritten label, 2) Scania [printed], 3) Paralectotype ♂, *Nematus crassulus* Thomson 1862, Kopelke 2007 design.; one pin with 1 ♂, labelled as follows: 1) [?] Nor [white handwritten label], 2) Paralectotype ♂, *Nematus crassulus* Thomson 1862, Kopelke 2007 design.
- *Nematus erythropygus* Förster 1854 (LT ♀, here designated, ZSM): Förster described a ♀ of *erythropygus* from Aachen. Lectotype: pinned ♀, left antenna missing, labelled as follows: 1) Type; 2) *Nematus erythropygus* ♀ Först., A. Förster det.; 3) Sammlung A. Förster; 4) *Pontania leucosticta* Htg. ♀, det F. W. Konow; 5) Lectotypus *Nematus erythropygus* Förster 1854, Kopelke 2004 design.
- *Nematus ischnocerus* Thomson 1862 (LT ♀, here designated, 1 PLT, ZML): Thomson described ♀ and ♂ of *ischnocerus* from "Norl." [that probably means Norrland in Sweden]. Lectotype: pinned ♀, right antenna and right hind leg missing, labelled as follows: 1) Norl.; 2) ischnocerus [label red framed, handwritten], 3) Lectotype *Nematus ischnocerus* Thomson 1862, Kopelke iii. [19]88 design.; 4) Loan no. 1988-167, 5) Loan no. 1994: 314. Paralectotype: pinned ♀ in good condition, labelled as follows: 1) Norl.; 2) Paralectotype *Nematus ischnocerus* Thomson 1862, Kopelke iii. [19]88 design.; 4) Loan no. 1988-171, 5) Loan no. 1994: 315.
- *Nematus leucostictus* Hartig 1837 (LT, here designated, ZMHU): Hartig described ♀ and ♂ of *leucostictus* from *Salix caprea* without mentioning a type locality but referring to Klug's collection (species name *Nematus leucostictus* supplemented by "Mus. Kl.") which is presently at least in part

deposited in the ZMHU in Berlin and Museum Naturalis (formerly Rijksmuseum van Natuurlijke Historie) in Leiden (Horn et al. 1990). No other depository of Klug's Hymenoptera material is known. The Hartig collection in ZSM includes 11 specimens which were labelled by him as "cotypes" of *Nematus leucostictus*. "Cotypes" do not necessarily have syntype status; for example, at least two specimens were collected in [18]39 [*Nematus* sp. n. 20. iv. [18]39, handwritten, green label], i.e. 2 years after the publication of the description of the new taxon. Furthermore, no specimens labelled as Hartig's [syn-]types or else clearly identifiable as such are known at present from the collections of the Museum Naturalis in Leiden and ZMHU; however, in ZMHU there is a clear hint in the collection catalogue to a specimen which refers to Klug's collection. This specimen corresponds clearly with Hartig's description of *leucostictus*. The notes in the catalogue are handwritten as follows: [catalogue no.] "14308", "—" [for *Nematus*], "*leucostictus*", "1.", "—" [for "German."] "—" [for "Kl."]. This specimen is here selected as lectotype. Lectotype: pinned ♀ in good condition, labelled as follows: 1) 14308, 2) Zool. Mus. Berlin, 3) Lectotypus *Nematus leucostictus* Hartig 1837, Kopelke 2007 design. — Further specimens were not identified beyond any doubt as syntypes of *leucostictus* Hartig; therefore, at present there are no PLT of this taxon.

- *Nematus leucostigmus* Cameron 1876 (LT, here designated, BMNH): Cameron described a ♀ of *leucostigmus* from Rannoch (Scotland), a ♂ was unknown to him. Lectotype: pinned ♀ in good condition, labelled as follows: 1) Type HT; 2) B.M. Type Hym. 1610, *Nematus leucostigmus* Cam. type; 4) Cameron 96-76, 5) *leucapsis* [probably handwritten by Benson]; 6) Lectotypus Kopelke 2004 design.
- *Nematus ischnocerus* var. *nigrifrons* Konow 1897 (LT, here designated, DEI): Konow described ♀ and ♂ of the supposed variety *nigrifrons* of *ischnocerus*, not specifying a type locality. Lectotype: pinned ♂, left antenna missing, labelled as follows: 1) Coll. Konow, 2) *Pontania* v. *nigrifrons* Knw. Trihof v. [18]96., 3) *Nematus leucapsis* Tischb. Conde det., 4) Coll. DEI Eberswalde, 5) Preparation of penisvalve, Kopelke, 6) Lectotypus *Pontania nigrifrons* Konow 1897, Kopelke 2004 design.
- *Nematus nigrolineatus* Cameron 1879 (LT, here designated, BMNH): Cameron described ♀ and ♂ of *nigrolineatus*, reared from *Salix viminalis* and collected in Worcester, England [not mentioned in his discription]. Lectotype: pinned ♀, right antenna, left hind leg, and tarsomeres of left middle leg missing, right forwing tattered, fragments affixed on the label together with the right hindwing, labelled as follows: 1) Type [printed on round label, red framed], 2) [?]B.. 14. v. [18]78, the larva vii. in rolled leaf of *Salix viminalis* Wor'ster [handwritten]; 3. Cameron 96-76, Worcester [printed], *nigrolineatus* [handwritten on the underside], 4) B.M. Type Hym. *Nematus nigrolineatus* (Cameron 1879) [name handwritten], 5) B.M. Type Hym. 1.613 [printed], 6) Type of *P. nigrolineatus* Cameron ♀ [handwritten], 7) Lectotypus *Nematus nigrolineatus* Cameron 1879, Kopelke 2004 design.
- *Nematus piliserra* Thomson 1862 (LT, here designated, 2 PLT, ZML): Thomson described a ♀ of *piliserra* from Arrie in Skane, Sweden. Lectotype: pinned ♀ in good condition, labelled as follows: 1) Ar. [that most likely means Arrie in Skane], 2) *Pont. piliserra* typ. [handwritten with pencil], 3) Loan no. 1994-317, 4) Lectotypus *Nematus piliserra* Thomson 1862, Kopelke 2005 design. Paralectotypes: two pinned ♀♀ in good condition, labelled as follows: 1) Pal., 2) *piliserra* [handwritten, red framed label, present on only one ♀], 3) Loan no. 1994-316 and/or 1994-313, 4) Paralectotypus *Nematus piliserra* Thomson 1862, Kopelke 2005 design.
- *Nematus pineti* Hartig 1837 (LT, here designated, ZSM): Hartig described a ♀ of *pineti* without mentioning the type locality, but misattributing it to *Picea abies* L. Lectotype: pinned ♀, distal segments of the antennae and tarsomeres of left hind leg missing, labelled as follows: 1) Type [red, printed], 2) *Nematus pineti* Htg. [handwritten], Th. Hartig det. [printed], 3) 67 [small green label, handwritten], 4) *pineti* n. [handwritten], 5) *Pontania puella* Ths ♀, E. Clement det., 6) *Nematus pineti* ♀ Htg., Conde det [handwritten], 7) Lectotypus *Nematus pineti* Hartig 1837, Kopelke 2004 design., 8) GBIF-GISHym 3707.
- *Nematus puella* Thomson 1871 (LT, here designated, 8 PLT, ZML): Thomson described a ♀ of *puella* from Skane, Sweden. Lectotype: pinned ♀, distal segments of the antennae missing, labelled as follows: 1) Lund [Skane, Sweden], 2) *puella* type [handwritten with pencil], 3) Loan no. 1994-309, 4) Lectotypus *Nematus puella* Thomson 1871, Kopelke 2005 design. Paralectotypes: pinned ♀♀ and ♂♂ [5 ♀♀, 3 ♂♂] in good condition, labelled as follows: [3 ♂♂, pinned on one pin] 1) Lund, 2) ♂, 3) *puella* ♂ type + Kotype, 4) Loan no. 1994-311, 5) Paralectotypus *Nematus puella* Thomson 1871, Kopelke 2005 design.; [5 ♀♀ individually pinned] 1) Lund, 2) *puella* [handwritten, red framed label, present on only one ♀], 3) Loan no. 1994-306 / 1994-307 / 1994-308 / 1994-310 / 1994-312, 4) Paralectotypus *Nematus puella* Thomson 1871, Kopelke 2005 design.

- *Nematus purpureae* Cameron 1884 (LT, here designated, BMNH): Cameron described a ♀ of *purpureae* reared from *Salix purpurea* by J. E. Fletcher, Worcester, England. Lectotype: ♀ affixed on label, left antenna missing, labelled as follows: [?]B.. 14. vi. [18]84, l[arva] vii. in rolled l[eaf] of *Salix purpurea* Wor'ster [handwritten on the underside of the label with the affixed ♀], 1) Type HT [printed on round label, red framed], 2) B.M. Type Hym. 1.612; 3) Cameron 96-76 Worcester, 4) B.M. Type Hym. *Nematus purpureae* (Cameron 1884), 5) *Pontania purpureae* Cameron Holotype ♀ det. Benson 1936, 6) Lectotypus *Nematus purpureae* Cameron 1884, Kopelke 2004 design.
- *Nematus scotaspis* Förster 1854 (LT, here designated, ZSM): Förster described a ♀ of *scotaspis* from Aachen. Lectotype: pinned ♀, antennae missing, labelled as follows: 1) Type, 2) *Nematus scotaspis* ♀ Först. [handwritten], Förster det.; 3) Sammlung A. Förster, 4) *Pontania scotaspis* Först. ♀, det. F. W. Konow [handwritten], 5) Lectotypus *Nematus scotaspis* Förster 1854, Kopelke 2004 design., 6) GBIF GISHym 3703.
- *Nematus westermani* Thomson 1862 (LT, here designated, 9 PLT, ZML): Thomson described ♀ and ♂ of *westermani* from Skane, Sweden. Lectotype: pinned ♀ together with a paralectotype ♂ in good condition, labelled as follows: 1) dissected saw, affixed on the label [Kop.], 2) *westermani* type [handwritten with pencil], 3) Lectotypus *Nematus westermani* Thomson 1862 ♀, Kopelke 2007 design., 4) Paralectotypus *Nematus westermani* Thomson 1862 ♂, Kopelke 2007 design. Paralectotypes: pinned ♀♀ and ♂♂ [5 ♀♀, 3 ♂♂] in good condition, labelled as follows: 1) Lund [printed, 1 ♀ and 1 ♂ instead of the printed an illegible handwritten label], 2) Paralectotypus *Nematus westermani* Thomson 1862, Kopelke 2007 design.
- *Nematus xanthogaster* Förster 1854 (LT, here designated, 2 PLT, ZSM): Förster described a ♂ of *xanthogaster* from Aachen, the ♀ was unknown to him. Lectotype: pinned ♂ in good condition, labelled as follows: 1) Cotype, 2) *Nematus xanthogaster* ♂, Förster det. [handwritten], 3) *Pontania bipartita* Lep. ♂, det. Konow [handwritten], 4) Sammlung A. Förster, 5) GBIF GISHym 3461, 6) Lectotypus *Nematus xanthogaster* Förster 1854, Kopelke 2007 design. Paralectotypes: two pinned in good condition, labelled as follows: 1) Cotype, 2) *Nematus xanthogaster* ♂, Förster det. [handwritten], 3) sp. n. α [only in one ♂], 4) *Pontania bipartita* Lep. ♂, det. Konow [handwritten], 5) Sammlung A. Förster, 6) GBIF GISHym 3461/3460, 6) Paralectotypus *Nematus xanthogaster* Förster 1854, Kopelke 2007 design.
- *Pontania albopicta* Malaise 1931 (LT, here designated, NRS): Malaise described a ♀ of *albopicta* from Elisowo, Kamtschatka. Lectotype: pinned ♀ in good condition, labelled as follows: 1) Distal part of saw affixed on label, 2) Kamtschatka, Malaise, 3) Typus, 4) *Pontania leucosticta* Htg. n. var. *albopicta* Malaise, typus, 5) *Nematus leucapsis* Tischb., Conde det. 1937, 7) Loan no. 177/54, 8) Loan no. 490/87, 9) Naturhist. Riksmus. Loan no. 295/94, 10) Lectotypus *Pontania albopicta* Malaise 1931, Kopelke 2004 design.
- *Pontania apicifrons* Malaise 1931 (LT, here designated, NRS): Malaise described ♀ and ♂ of *apicifrons* from Klutchi and Petropawlowsk, Kamtschatka. Lectotype: pinned ♀ in good condition, labelled as follows: 1) Kamtschatka, Malaise, 2) 1470, 3) Typus, 4) *Pontania kamtchatika* Typus sp. n. Mal., 5) *apicifrons* Mal. [redefined, handwritten with pencil, probably by Conde], 6) *Nematus leucapsis* Tischb., Conde det. 1937 [modified with pencil in *leucaspis*], 7) *apicifrons*, 8) Lectotypus *Pontania apicifrons* Malaise 1931, Kopelke 2004 design.
- *Pontania apicifrons* var. *punctifrons* Malaise 1931 (LT, here designated, NRS): Malaise described a ♀ of the supposed variety *punctifrons* of *apicifrons* from Klutchi and Petropawlowsk, Kamtschatka. Lectotype: pinned ♀ in good condition, labelled as follows: 1) Kamtschatka, Malaise, 2) 1409, 3) Typus, 4) *P. kamtschatica* sp. n. [cancelled] *punctifrons* n. var., 5) *Nematus leucapsis* Tischb., O. Conde det. 1937, 6) Naturhist. Riksmus. Loan No. 297/94, 7) Lectotypus *Pontania punctifrons* Malaise 1931 Kopelke 2004 design.
- *Pontania excavata* Marlatt 1896 (LT, here designated, 2 PLT, USNM): Marlatt described ♀ and ♂ [4 ♀♀, 1 ♂] of *excavata* from "California, Colorado (C. P. Gillette); Veta Pass, Colorado (USA)." Lectotype: pinned ♀, distal segments of antennae missing, labelled as follows: 1) Col., 2) Ac Cat 60, 3) 85 [handwritten with pencil], 4) Type No 910 USNM [printed red label], 5) Type ♀ [handwritten], 6) *Pontania excavata* Marlatt sp. n. [handwritten], 7) Lectotypus *Pontania excavata* Marlatt 1896, Kopelke 2006 design. Paralectotypes: ♀ affixed on label and pinned ♂ in good condition, labelled as follows: ♀: 1) Veta Pass 21. vi. Col, 2) Collection C. V. Riley, 3) Type No 910 USNM [printed red label], 4) Paralectotypus *Pontania excavata* Marlatt 1896, Kopelke 2006 design.; ♂: 1) Col., 2) Ac Cat 175, 3) 83 [handwritten with pencil], 4) Type ♂ [handwritten], 5) Type No 910 USNM [printed red label], 6) *Pontania excavata* sp. n. ♂ [handwritten], 7) Paralectotypus *Pontania excavata* Marlatt 1896, Kopelke 2006 design.
- *Pontania fibulata* Konow 1901 (LT, here designated, 1 PLT, DEI): Konow described ♀ and ♂ of *fibulata* from Nantes (France) and Moravia. Lec-

totype: pinned ♀, hind legs and distal segments of antennae missing, labelled as follows: 1) Typus [red label], 2) *Pont fibulata* Knw. [handwritten], 3) Dtsch. Entomol. Institut Berlin, 4) Coll. Konow, 5) Morav [handwritten], 6) Coll DEI Eberswalde, 7) Dtsch. Ent. Inst. Eberswalde, 8) Lectotypus *Pontania fibulata* Konow 1901, Kopelke 2005 design.; Paralectotypus: pinned ♂, parts of legs and antennae missing, body broken and affixed on pin, labelled as follows: 1) Moravia [handwritten], 2) Coll. Konow, 3) *Pontania fibulata* Moravia [handwritten, black framed label], 4) Conde revid. [handwritten], 5) Typus [red label], 6) Dtsch. Ent. Inst. Eberswalde, 7) Coll DEI Eberswalde, 8) Paralectotypus *Pontania fibulata* Konow 1901, Kopelke 2005 design.

- *Pontania leucapsis* var. *connata* Enslin 1915 (LT, here designated, ZSM): Enslin described a ♀ of the supposed variety *connata* of *leucapsis* from Central and Northern Europe, the type locality was not specified. Lectotype: pinned ♀, right antenna, hindwings, middle legs missing, labelled as follows: 1) Type [red label], 2) Gotha, 3) Sammlung Dr. Enslin, 4) *Pontania leucapsis* v. *connata* Ensl., Dr. Enslin det., 5) Lectotypus *Pontania connata* Enslin 1915, Kopelke 2004 design.
- *Pontania sibirica* Malaise 1931 (LT, here designated, NRS): Malaise described ♀ and ♂ of *sibirica* from Klutchi, Kamtschatka. Lectotype: pinned ♀ in good condition, labelled as follows: 1) Kamtschatka, Malaise, 2) 442, 3) Typus, 4) *Pontania sibirica* Typus Malaise, 5) *Nematus leucapsis* Tischb. O. Conde det. 1937, 6) *sibirica*, 7) 491/87 [Loan no], 8) Lectotypus *Pontania sibirica* Malaise 1931, Kopelke 2004 design.

Neotypes here designated:

Tischbein's collection was deposited in the Zoological Museum in Hamburg where it was completely destroyed in 1943 during World War II (Horn et al. 1990). A neotype of *Nematus leucapsis* Tischbein is designated in the interest of promoting nomenclatural stability according to the code, Art. 75.3. The specimen is taken from reared material of the author.

- *Nematus leucapsis* Tischbein 1846: 77 (NT ♀, here designated, SMF): Tischbein described *leucapsis* from Eutin, situated in eastern Schleswig-Holstein (Germany), mentioning especially colouration characters which correspond clearly with material reared from *S. cinerea*. — The neotype is designated in order to fix the use of the nominal taxon, selected from material exclusively reared from leaf rolls on *S. cinerea* (note: distinct host plant specificity in most *Phyllocolpa* species) with both edges of the leaf rolled and twisted along the longitudinal axis, collected in Mecklenburg-Western Pomerania (adjacent to Schleswig-Holstein), Rügen, Zittvitz (Kopelke galls leg. 15. vii. 2005), rearing-no. SZ 51/2005, emerging date 6. v. 2006. — Morphological characters of the neotype as follows: Head with inner orbits nearly entirely pubescent. Face black apart from basis of mandibels, labrum, and front margin of clypeus yellowish, supraclypeal area brownish to dark brown, upper head black, with hind orbits slightly gleaming brownish. Sheath in lateral view acuminate, clearly convex on upper margin, nearly straight on lower, in dorsal view nearly triangular with lateral margin clearly angled. Sheath hairs widely distributed on the lateral areas, in dorsal view slightly curled.— Neotype: pinned ♀ in good condition, labelled as follows: 1) Zucht Kopelke, Nr. SZ 51/2005, emerging date 6. v. 2006 [green label], 2) D/Meck.-Vorpommern, Rügen, Zittvitz, Kopelke 15. vii. 2005, 3) *Phyllocolpa leucapsis*/*S. cinerea*/stark verdrillte Blattrolle, Kopelke det., 4) Neotypus *N. leucapsis* Tischb. 1846, SMFH 2561 [handwritten].

Zaddach's collection was deposited in the Zoological Museum in Königsberg and, as several authors assumed, was also completely destroyed during World War II (Blank & Taeger 1998). During my studies I have never seen original material from the Zaddach collection which may be interpreted as types of the taxa in question. Neotypes of *Nematus politus* Zaddach and *Nematus prussicus* Zaddach are designated in the interest of promoting nomenclatural stability according to the code, Art. 75.3. The neotypes are taken from reared material of the author. The morphological characters of the neotypes reared from *S. purpurea* (*Nematus politus*) or *S. cinerea* (*Nematus prussicus*) correspond clearly with Zaddach's description.

- *Nematus politus* Zaddach 1883 (NT ♀, here designated, SMF): *N. politus* was originally published in Briscke's illustration (*in* Brischke & Zaddach 1883: table I, 14), a description in words followed in Brischke & Zaddach (1884: 164, 167–168), type localities are Festungswerke nr. Gdansk, Königsberg [Kaliningrad], Bautzen, and Scotland. Briscke's illustration (Brischke & Zaddach 1883: table I, 14) clearly show the galltype on *S. helix* (= *purpurea* × *viminalis*, Hegi 1957), further Zaddach's description and Brischke's illustration of the morphological characters correspond clearly with material reared from *S. purpurea*. Thus, a neotype was selected from material reared from leaf folds exclusively on *S. purpurea* (note: distinct host plant specificity in most *Phyllocolpa* species). — Morphological characters of the neotype as follows: Head with inner orbits sparcely pubes-

cent at the margins of the eyes. Sheath in lateral view acuminate, nearly straight on upper and lower margin, in dorsal view nearly homogeneously curved. Bristles hardly longer than greatest width of sheath, widely distributed onto the lateral areas, in dorsal view slightly curled. — Neotype: pinned ♀ in good condition, labelled as follows: 1) Zucht Kopelke, Nr. 8-C/1995, Schlüpfdatum [emerging date]: 1. v. 1996 [green label], 2) D/Hessen, Ortenberg, Nidder, Kopelke 4. vii. 1995, 3) ex Gallen an *S. purpurea*, 4) *Phyllocolpa* sp./*S. pupurea*/einfache Rolle, Kopelke det., 5) Neotypus *Nematus politus* Zaddach 1883, SMFH 2556.

- *Nematus prussicus* Zaddach 1883 (NT ♀, here designated, SMF): *N. prussicus* was originally published in Briscke's illustration (*in* Brischke & Zaddach 1883: table I, 4), a description in words followed in Brischke & Zaddach (1884: 164, 166), type localities are Schnakenburg and Neufähr [German names in pre-war time] in Courland Spit. The description of *prussicus* is based on material from *S. viminalis* and/or *S. cinerea*. Brischke & Zaddach (1883: 166) already mentioned certain differences between the larvae reared from the different host plants. In the interest of promoting nomenclatural stability *prussica* was attributed only to the leaf-fold on *Salix cinerea,* as it was shown in Brischke & Zaddach (1883): table I (7), Fig. 4 [right leaf gall]. Thus, a neotype was selected from material reared from leaf folds exclusively on *S. cinerea* (note: distinct host plant specificity in most *Phyllocolpa* species). — Morphological characters of the neotype as follows: Head with inner orbits sparcely pubescent at the margins of the eyes. Sheath in lateral view acuminate and sharply pointed, slightly convex on upper margin and slightly emarginated on lower, in dorsal view triangular and widish, lateral margin clearly angled. Bistles conspicuously longer than greatest width of sheath, widely distributed onto the lateral areas, in dorsal view clearly curled. — Neotype: pinned ♀ in good condition, labelled as follows: 1) Zucht Kopelke, Nr. SZ 62/2005, emergence date 8. v. 2006 [green label], 2) D/Meck.-Vorpommern, Rügen, Zittvitz, Kopelke 15. vii. 2005, 3) *Phyllocolpa prussica* / *S. cinerea* / einfache Blattfalte, Kopelke det., 4) Neotypus *Nematus prussicus* Zaddach 1883, SMFH 2557.

Holotypes, lectotypes, and other type material studied in the course of the present revision:

Amauronematus meidli Zirngiebl 1937 (HT, NMV),
Nematus bipartitus Serville 1823 (1 PLT, MRSN),
Nematus (Pontania) coriaceus Benson 1953 (HT, BMNH),
Nematus crassispinus Thomson 1871 (LT, 2 PLT, ZML),
Nematus oblitus Serville 1823 (LT, MRSN);
Nematus (Pontania) tuberculatus Benson 1953 (HT, BMNH),
Phyllocolpa plicadaphnoides sp. n. (HT, 52 PT, SMF),
Phyllocolpa plicaglauca sp. n. (HT, 20 PT, SMF),
Phyllocolpa plicalapponum sp. n. (HT, 15 PT, SMF),
Phyllocolpa plicaphylicifolia sp. n. (HT, 3 PT, SMF),
Phyllocolpa pschornwalcheri sp. n. (HT, 4 PT, SMF),
Phyllocolpa rolleri Liston 2005 (6 PT, SMF),
Pontania acutiserra Lindquist 1948 (HT, 11 PT, ZMH),
Pontania auberti Zirngiebl 1957 (HT, MZL),
Pontania carinifrons Benson 1940 (HT, BMNH),
Pontania cyrnea Liston 2005 (HT, 1 PT, ZSM),
Pontania joergenseni Enslin 1916 (LT, 2 PLT, DEI),
Pontania (Phyllocolpa) kopelkei Lacourt 1996 (HT, 2 PT, CLA),
Pontania nudipectus Vikberg 1965 (HT, 3 PT, ZMH).

Key to the ♀♀ of European species of the *leucosticta*-group of the genus *Phyllocolpa* (including some notes to ♂♂, hostplants, galls, and distribution)

1 Head with predominate colouring yellowish to brownish, face with supraclypeal area and inner orbits yellowish to brownish, upper head yellowish-brown apart from black spots around the ocelli. Mesonotum brownish with large black spots. Mesopleuron smooth and shiny with upper half pale brownish, lower half black. Pronotum and tegulae pale brownish. Sheath (Fig. 6f) in lateral view acuminate and nearly sharply pointed, strongly convex on upper margin and strongly emarginated on lower, in dorsal view nearly triangular, sheath hairs in dorsal view clearly curled. Saw (Fig. 8f) usually consisting of 19 segments, ctenidea found on the saw normally starting with annulus 2 and normally completely covering the length of this annulus (see Fig.). ♂: Penisvalve (Fig. 10e) in lateral view straight, spiny appendix narrow, basal lobe with lower edge homogeneously curved. Gall: on *S. alba*, *S. fragilis,* and *rubens* (Fig. 12d), usually only one edge of the leaf folded, creating a flat cavity for the larva. Distribution: central and southern Europe ..... ***oblita***

1* Head with predominate colouring other than yellowish to brownish **2**

2 Face with predominate colouring black **3**

2* Face two-coloured, with upper part black and lower part yellowish to brownish **8**

3 Inner orbits sparsely pubescent at the margin of the eyes as in Fig. 2a **4**

3* Inner orbits nearly entirely pubescent as in Fig. 2b **7**

4 Sheath (Figs. 6a, d) in dorsal view nearly homogeneously curved, greatest width (gw in Fig. 6a) me-

dian, bristles not and/or hardly longer than greatest width of sheath **5**

4* Sheath (Figs. 6h, 7b) in dorsal view nearly triangular with lateral margin slightly angled, greatest width (gw in Fig. 6h) proximal, bristles conspiciously longer than greatest width of sheath ... **6**

5 Sheath (Fig. 6a) in lateral view nearly sharply pointed, Cerci long, extending more than half of the sheath length. Saw (Fig. 8a) in lateral view with aulax slightly arcuated, usually consisting of 19 segments, ctenidea fragmentary present from annulus 3. ♂: Penisvalve (Fig. 10a) with spiny appendix nearly straight, basal lobe with lower edge nearly ripple shaped. Gall (Fig. 12a): leaf fold on *Salix pentandra,* usually only one edge of the leaf folded, creating a flat cavity for the larva. Distribution: central and southern Europe ..... ***carinifrons***

5* Sheath (Fig. 6d) in lateral view not sharply pointed. Cerci short, extending at most half the length of the sheath. Saw (Fig. 8d) in lateral view with aulax nearly straight, consisting of 17–18 segments, ctenidea short, nearly completely present from annulus 2. ♂: unknown. Gall: leaf fold probably on *S. retusa* and/or *S. reticulata.* Distribution: central Europe, western Alps ..... ***kopelkei***

6 Tegulae brownish to dark brown, pronotum black, sometimes with lateral angles marginally brownish. Legs with hindtarsus about as long as hindtibia. Sheath as in Fig. 6h. Saw (Fig. 9a) in lateral view with aulax slightly arcuated, usually consisting of 17 segments, ctenidea fragmentary present from annulus 2. ♂: Basal lobe of penisvalve (Fig. 10g) with lower edge nearly ripple shaped. Gall (Fig. 12f): Leaf fold on *S. glauca* and *S. glaucosericea,* usually only one edge of the leaf folded, creating a flat cavity for the larva. Distribution: central and northern Europe..... ***plicaglauca* sp. n.**

6* Tegulae pale yellowish, pronotum entirely black. Legs with hindtarsus shorter than hindtibia. Sheath as in Fig. 7b. Saw (Fig. 9c) in lateral view with aulax nearly straight, usually consisting of 18 segments, ctenidea completely present from annulus 2. ♂: Basal lobe of penisvalve (Fig. 11b) with lower edge slightly angled. Gall: Leaf fold on *S. phylicifolia,* usually only one edge of the leaf folded, creating a flat cavity for the larva. Distribution: northern Europe ..... ***plicaphylicifolia* sp. n.**

7 Pronotum black with lateral angles marginally yellowish as in Fig. 5b. Sheath (Fig. 6b) in dorsal view broadened and homogeneously curved. Cerci short, extending at most half the length of the sheath. Saw (Fig. 8b) usually consisting of 19 segments, ctenidea fragmentary present from annulus 2. ♂: Basal lobe of penisvalve (Fig. 10b) with lower edge normally showing a pronounced spur. Gall: Leaf fold on *S. aurita,* usually only one edge of the leaf folded down, creating a spacious cavity for the larva. Distribution: central and northern Europe ..... ***erythropyga***

7* Pronotum black, with lateral angles largely yellowish as in Fig. 5a. Sheath (Fig. 6e) in dorsal view relative small and nearly triangular, lateral margin not angled. Cerci long, extending more than half of the sheath length. Saw (Fig. 8e) usually consisting of 19 segments, ctenidea fragmentary present from annulus 3. ♂: Basal lobe of penisvalve (Fig. 10d) with lower edge slightly angled. Gall (Fig. 12c) on *S. caprea,* usually only one edge of the leaf folded down, creating a spacious cavity for the larva. Distribution: central and northern Europe ..... ***leucosticta***

8 Pronotum black, with lateral angles marginally yellowish as in Fig. 5b **9**

8* Pronotum black, with lateral angles largely yellowish as in Fig. 5a, tegulae pale yellowish. Sheath (Fig. 7a) in lateral view sharply pointed, nearly straight on upper and lower margin, in dorsal view nearly triangular, lateral margin clearly angled. Saw (Fig. 9b) consisting of 18 segments, ctenidea completely present from annulus 2. ♂: Basal lobe of penisvalve (Fig. 11a) with lower edge homogeneously curved. Gall on *S. lapponum,* usually only one edge of the leaf folded down, creating a flat cavity for the larva. Distribution: northern Europe ..... ***plicalapponum* sp. n.**

9 Sheath (Fig. 7c) in dorsal view nearly homogeneously curved, in lateral view nearly straight on upper and lower margin, bistles hardly longer than greatest width of sheath, in dorsal view slightly curled. Saw (Fig. 9d) in lateral view with aulax slightly arcuated, usually consisting of 18 segments, ctenidea completely present from annulus 2. ♂: Penisvalve (Fig. 11c) with spiny appendix nearly straight, basal lobe with lower edge conspicuously angled. Gall (Fig. 12g) on *S. purpurea,* usually only one edge of the leaf folded down, creating a flat cavity for the larva. Distribution: Central and Southern Europe..... ***polita***

9* Sheath (Figs. 6c, g; 7d, e) in dorsal view nearly triangular, in lateral view convex on upper margin and emarginated on lower. Bistles conspicuously longer than greatest width of sheath, in dorsal view clearly curled..... **10**

10 Sheath (Figs. 6c, g) in dorsal view nearly triangular and small, lateral margin not angled. Hindtarsus as long as hindtibia, hindtibia spurs somewhat shorter than the half length of the basitarsus **11**

10* Sheath (Figs. 7d, e) in dorsal view triangular and widish, lateral margin angled. Hindtarsus somewhat shorter than hindtibia, hindtibia spurs nearly as long as the half length of the basitarsus..... **12**

11 Sheath (Fig. 6c) in lateral view acuminate, distally nearly right-angled, strongly convex on upper margin and conspicuously emarginate on lower. Saw (Fig. 8c) usually consisting of 19 segments, ctenidea short, fragmentary present from annulus 2. ♂: Basal lobe of penisvalve (Fig. 10c) with lower edge clearly ripple-shaped. Gall on *S. myrsinifolia* and *S. mielichhoferi*, usually only one edge of the leaf folded down, creating a spacious cavity for the larva. Distribution: central and northern Europe ..... ***ischnocera***

11* Sheath (Fig. 6g) in lateral view acuminate, distally acute-angled, slightly convex on upper margin and conspicuously emarginate on lower. Saw (Fig. 8g) usually consisting of 16 segments, ctenidea short, completely present from annulus 2. ♂: Basal lobe of penisvalve (Fig. 10f) with lower edge slightly angled. Gall on *Salix daphnoides*, usually only one edge of the leaf folded down, creating a flat cavity for the larva. Distribution: Central Europe ..... ***plicadaphnoides* sp. n.**

12 Sheath (Fig. 7e) in lateral view short and sharply pointed, slightly convex on upper margin and conspicuously emarginated on lower. Cerci long, extending more than half of the sheath length. Saw (Fig. 9f) in lateral view with aulax clearly arcuated, usually consisting of 19 segments, ctenidea short, completely present from annulus 2. ♂: Penisvalve (Fig. 11e) with spiny appendix slightly arcuated, basal lobe with lower edge homogeneously curved. Gall on *S. appendiculata*, usually only one edge of the leaf folded down, creating a spacious cavity for the larva. Distribution: Alps, central Europe .....***pschornwalcheri* sp. n.**

12* Sheath (Fig. 7d) in lateral view longish and sharply pointed, slightly convex on upper margin and slightly emarginated on lower. Cerci short, extending at most half the length of the sheath. Saw (Fig. 9e) in lateral view with aulax slightly arcuated, usually consisting of 19 segments. Ctenidea short, completely present from annulus 2. ♂: Penisvalve (Fig. 11d) with spiny appendix straight, basal lobe with lower edge conspicuously acute-angled. Gall on *S. cinerea*, usually only one edge of the leaf folded down, creating a spacious cavity for the larva. Distribution: Central Europe..... ***prussica***

Taxonomy

Phyllocolpa carinifrons (Benson 1940)

Pontania carinifrons Benson (1940: 210), stat. n. Type locality: Scotland, Roxburghshire, Newcastleton, on "*S. pentandra*".

Pontania excavata (Marlatt 1896) — Vikberg (1970: 11), on "*S. pentandra*", partim; misidentification.

Pontania excavata (Marlatt 1896) — Zinovjev (1998: 216), on "*S. pentandra*"; misidentification.

Type material: *Pontania carinifrons* Benson, HT ♀ (BMNH). *Pontania excavata* Marlatt, LT ♀, here designated, PLT 1 ♀, 1 ♂ (USNM).

Additional material: ♀♀, ♂♂ reared from a total of 1401 galls, Kopelke leg.: Austria: Tirol: Ötztal, Vent, Gample (1. ix. 1991: 192 galls; 27. viii. 1992: 227; 29. vii. 1995: 277; 28. viii. 1996: 355; 28. viii. 1998: 289) – Switzerland: Valais: Arolla (4. ix. 1992: 7) **—** Norway: N.-Trondelag: Heimhulhatten (19. viii. 1997: 17); Hammer (19. viii. 2004: 18); Nordland: Fauske (12. viii. 2004: 19).

Description

♀: Head: Frontal area with deep and broad depression as in Fig. 1, inner orbits sparsely pubescent at the margins of the eyes as in Fig. 2a, upper head shiny and only slightly sculptured, weakly pubescent. Antenna thin, hardly longer than head and thorax together. Front margin of the clypeus slightly incised. Colouring: Face black apart from basis of mandibels, labrum, and front of clypeus yellowish to brownish, upper head black, sometimes with hind orbits slightly gleaming dark brownish, to a considerably lesser extent than in Fig. 3. Antenna dark brown to black. Types somewhat lighter.

Thorax: Black, mesonotum slightly sculptured between shallow punctures, mesopleura nearly unsculptured and conspicuously shiny, with sparse pubescense primarily on the upper half as in Fig. 4a. Pronotum black, with lateral angles marginally yellowish to brownish as in Fig. 5b, sometimes dark brown, tegulae yellowish brown. Forewing with stigma transparent and light yellowish brown, basal half paler, wing venation dark brown. Legs with coxa black, tibia and tarsomeres yellowish to dark brown. Hindtarsus as long as hindtibia, inner hindtibia spur slim, straight and conspicuously shorter than the half length of the basitarsus.

Abdomen: Completely dark brown to black, sawsheath dark brown. Cerci pale to dark brown and long, extending more than half of the sheath length.

Sheath (Fig. 6a): With slight microsculpture and shiny, in lateral view acuminate, nearly sharply pointed, slightly convex on upper margin and slightly emarginated on lower. In dorsal view broadened and nearly homogeneously curved. Bristles hardly longer than greatest width of sheath and widely distributed onto the lateral areas, in dorsal view clearly curled.

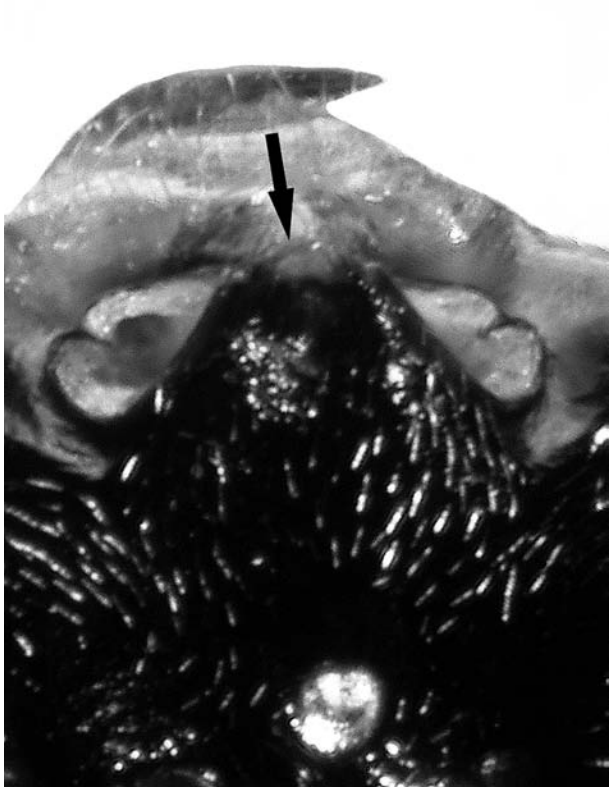


Fig. 1: Head with frontal area with deep and broad depression (arrow).

S a w (Fig. 8a): In lateral view with aulax slightly arcuated, the basal half of the saw not broadened, usually consisting of 19 segments. Ctenidea short, fragmentary present from annulus 3. Serrulae flat, cypsellae and postcalcares well developed.

♂: Microstructure and colouring like in ♀, antenna dark brown to black, conspicuously longer than thorax and abdomen together. Forewing with stigma completely dark brownish and transparent. Hypogydium pale to dark brown, penisvalve (Fig. 10a) in lateral view only slightly arcuated, the basal part nearly straight and hardly broadened. Spiny appendix nearly straight, basal lobe with lower edge nearly ripple shaped.

G a l l (Fig. 12a): Leaf fold, usually only one edge of the leaf folded, creating a flat cavity for the larva.

H o s t p l a n t : *Salix pentandra* Linnaeus 1753, a tree up to 15–18 m tall in favorable conditions, belonging to the subgenus *Salix*, section *Pentandrae* (Svortsov 1999). It is distributed mostly in the mountains, ascending to 2000 m in the Alps; locally introduced and naturalized in North America.

D i s t r i b u t i o n : central and northern Europe. *Ph. carinifrons* occurs locally, often in low densities.

C o m m e n t : The leaf folder on *S. pentandra* was described by Benson (1940) as *carinifrons* which some authors wrongly considered as a junior synonym of *excavata* (Benson 1960a, Smith 1979, Liston 1981, Viitasaari & Vikberg 1985, Spooner 1991, Lacourt 1999). Marlatt (1896) described *excavata* from material collected in North America; he did not mention a host plant. Several authors regarded *excavata* as the gall former on *S. pentandra* (Benson 1960a, Benes 1968, Benander 1969, Vikberg 1970, Hellén 1977, Smith 1979, Lacourt 1985, 1999, Price et al. 1990, Zhelokhovtsev 1994, Liston 1995, Zinovjev 1998, Kopelke 1999, 2003a, Nyman et al. 2000). However, this willow is native to Eurasia and was merely introduced to North America. It is not known whether *S. pentandra* is present at the locus typicus at all and whether it is the real host plant of *Ph. excavata*. Besides, the study of the types clearly shows that *carinifrons* and *excavata* are not conspecific due to discrepancies in certain morphological characters. Moreover, *Ph. carinifrons* (= *excavata* auct.) was misattributed to *Salix phylicifolia* (Vikberg 1970, Hellén 1977, Liston 1995, Lacourt 1999), just as the leaf folder *apicifrons* (Malaise 1931) was also misinterpreted as a synonym of *excavata* (auct.) (Benson 1960a, Smith 1979, Liston 1981, Viitasaari & Vikberg 1985, Spooner 1991). Some authors (Cameron 1885, Dittrich 1924, Lorenz & Kraus 1957, Kontuniemi 1960, Muche 1970, Hellén 1977, Taeger et al. 1998) misleadingly listed *Ph. leucosticta* and/or *Ph. leucapsis* as leaf folders on *S. pentandra*. The examination of the types and reared material has confirmed *carinifrons* as a valid species which makes galls only on *S. pentandra.*

Phyllocolpa erythropyga (Förster 1854)

Nematus erythropygus Förster (1854: 309), ♀; stat. n. Type locality: Germany, Aachen.

Pontania leucosticta (Hartig 1837) — Benson (1958: 200), on "*S. aurita*", partim; misidentification.

Pontania leucosticta (Hartig 1837) — Zinovjev (1998: 216), on "*S. aurita*", partim; misidentification.

T y p e m a t e r i a l : *Nematus erythropygus* Förster; LT ♀ (ZSM), here designated.

A d d i t i o n a l m a t e r i a l : ♀♀, ♂♂ reared from a total of 1478 galls, Kopelke leg.: Austria: Lower Austria, Schremser Moor (25. viii. 1998: 66 galls) — Germany: Baden-Württemberg, Black Forest, Altglashütten (16. vii. 2004: 69); Baden-Württemberg, Radolfzell, Mettnau (18. vi. 2005: 86, 2. vii. 2006: 55); Hesse, Wetterau, Limeshain, Rommelhausen (2. vii. 1995: 104, 2. viii. 1996: 82, 13. vii. 1997: 201, 19. vii. 1998: 232, 2. viii. 1998: 131), Hesse: Wüstensachsen, NWR Stirnberg (26. vi. 2003: 4); Mecklenburg-Western Pomerania: Rügen, Bergen: Kaiseritz (20. vii. 2005: 85, 24. vii. 2005: 44); Rügen, Bergen: Nonnenweiher (22. vii. 2005: 37); Rügen: Neuensien (18. vii. 2005: 45) — Danmark, Jylland, Skaerbaek (23. vi. 2005: 64) — Lithuania: Sudargas (9. viii. 2006: 26) — Norway: Hordaland: Skutevik (21. viii. 2001: 44); Sør-Trondelag: Leira, nr. Trondheim (20. viii. 2004: 103).

Description

♀: H e a d : Frontal area with deep and broad depression as in Fig. 1, inner orbits nearly entirely pubescent as

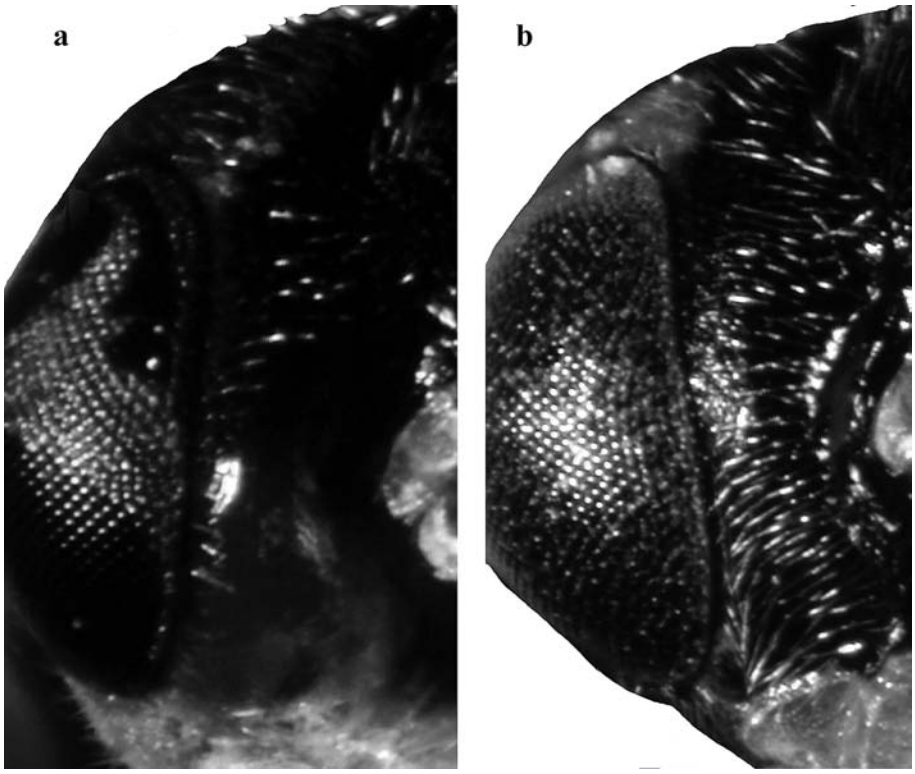


Fig. 2: Head with inner orbits a) sparsely pubescent at the margins of the eyes, b) nearly entirely pubescent.

in Fig. 2b, upper head shiny between shallow punctures and slight microsculpture, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus rather deeply incised. Colouring: Face black apart from basis of mandibles, labrum and clypeus which are pale yellowish to whitish, supraclypeal area yellowish to brownish, upper head black with hind orbits slightly gleaming brownish, to a lesser extent than in Fig. 3. Antenna black.

T h o r a x : Black, mesonotum with coriaceous surface sculpture, mesopleura shiny, almost entirely and densely pubescent as in Fig. 4b. Pronotum black, with lateral angles marginally yellowish as in Fig. 5b, sometimes more largely yellowish, tegulae pale yellowish to whitish. Forewing with stigma transparent and pale brownish, basal half paler, wing venation brown. Coxa bicolorous, basal dark brown to black, distal pale yellowish to whitish, femora, tibia, and tarsus yellowish brown. Legs with hindtibia longer than hindtarsus, hindtibia spurs slim and somewhat shorter than the half length of the basitarsus, inner spur nearly straight, outer spur slightly arcuated.

A b d o m e n : Completely dark brown to black, sawsheath black. Cerci pale brown, extending at most half the length of the sheath.

S h e a t h (Fig. 6b): Nearly unsculptured and shiny, in lateral view acuminate and nearly sharply pointed, strongly convex on upper margin and conspicuously emarginated on lower, in dorsal view broadened and homogeneously curved. Bristles longer than greatest width of sheath, widely distributed onto the lateral areas, in dorsal view clearly curled.

S a w (Fig. 8b): In lateral view with aulax only slightly arcuated, the basal half not broadened, usually consisting of 19 segments. Ctenidea short, fragmentary present from annulus 2. Serrulae flat, cypsellae and postcalcares well developed.

♂: Microstructure and colouring like in ♀, antenna dark brown, longer than thorax and abdomen together. Forewing with stigma completely dark brownish and transparent. Hypogydium pale brown, penisvalve (Fig. 10b) in lateral view only slightly arcuated, the basal part usually not broadened. Spiny appendix narrow, nearly straight, basal lobe with lower edge normally showing a pronounced spur.

G a l l : Leaf fold, usually only one edge of the leaf folded down, creating a spacious cavity for the larva, looking similar to the galls of *Ph. leucosticta* (Fig. 12c) but exclusively produced on *S. aurita*.

H o s t p l a n t : *S. aurita* Linnaeus 1753, belonging to the subgenus *Vetrix,* section *Vetrix,* growing as a medium-sized shrub, 1–3 m tall, occurring on mesotrophic edges of wetlands, damp lowlands, and light forests (Skvortsov 1999).

D i s t r i b u t i o n : central and northern Europe.

C o m m e n t : *Ph. erythropyga* produces the leaf galls merely folded only on *S. aurita.* The more striking leaf folds on *S. aurita* which are twisted along the longitudinal axis are made by *Ph. alienata* of the *leucapsis*-group (Kopelke in press). In the literature *Ph. erythropyga* was wrongly considered as a junior synonym of *leucosticta*

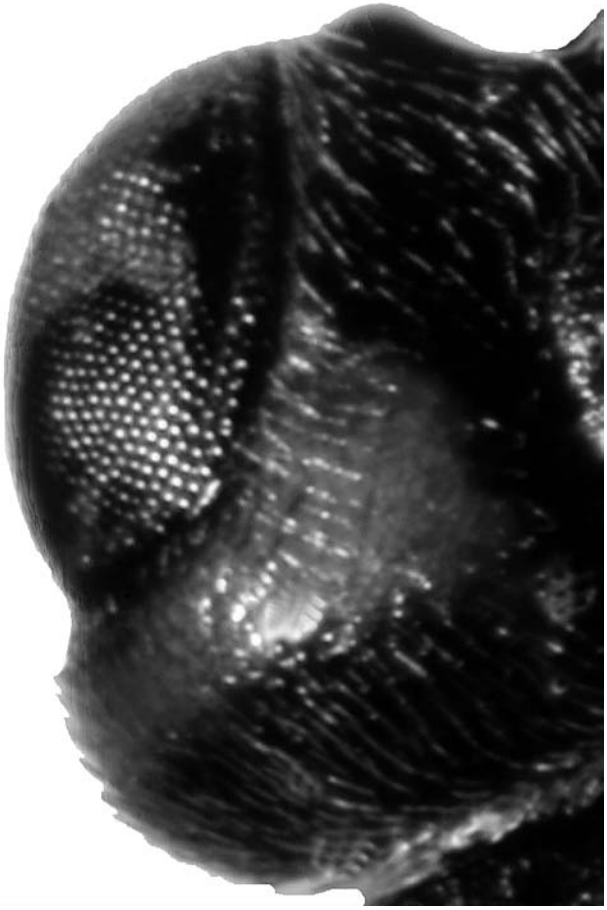


Fig. 3: Upper head with hind orbits gleaming brownish.

(Cameron 1885, Konow 1890, 1901, Jörgensen 1906a, Enslin 1915, Dittrich 1924), the leaf folder on *S. caprea* Linnaeus 1753. Moreover, several *Phyllocolpa* species are wrongly listed as leaf folders on *S. aurita,* inter alia especially *leucapsis,* the inducer of twisted galls exclusively on *S. cinerea,* and *leucosticta,* the leaf folder on *S. caprea* (Benson 1940, 1958, Lorenz & Kraus 1957, Kontuniemi 1960, Benes 1968, Benander 1969, Muche 1970, Hellén 1977, Zhelokhovtsev 1994, Liston 1995, Zinovjev 1998, Taeger et al. 1998, Lacourt 1999). The presence of different galltypes on this host plant, belonging to species of different species-groups, was normally ignored and/or wrongly interpreted. The examination of the lectotype and reared material has confirmed *erythropyga* as a valid leaf folder on *S. aurita.* Its morphological characters do not correspond with any other species of the *leucosticta*-group.

Phyllocolpa ischnocera (Thomson 1862)

Nematus ischnocerus Thomson (1862: 638); ♀♂; stat. n. Type locality: Norl. = ?Norway, Norland.

= *Nematus leucostigmus* Cameron (1876: 308); ♀♂; syn. n. Type locality: Rannoch, Scotland.

Pontania leucapsis (Tischbein 1846) — Zinovjev (1998: 216), on "*S. myrsinifolia* (= *nigricans*)", partim; misidentification.

Phyllocolpa sp. 1 — Kopelke & Amendt (2002: 173–193), on *S. myrsinifolia*.

Phyllocolpa sp. 8/*myrsinifolia* — Kopelke (2003b: 277–312), on *S. myrsinifolia*.

Phyllocolpa sp. 10 — Kopelke (1999: 151), on *S. myrsinifolia*.

Phyllocolpa sp. 10 — Kopelke (2003a: 171), on *S. myrsinifolia*.

Type material: *Nematus ischnocerus* Thomson, LT ♀, PLT ♀ (ZML). *Nematus leucostigmus* Cameron, LT ♀ (BMNH), the LT here designated.

Additional material: ♀♀, ♂♂ reared from a total of 2137 galls, Kopelke leg.

Galls (n = 1544) collected from *Salix mielichhoferi:* Austria: Salzburg: Obertauern I (27. viii. 1991: 122 galls, 8. viii. 1994: 180, 9. viii. 1994: 302, 14. ix. 1995: 314, 26. viii. 1996: 126, 27. viii. 1996: 92, 1. viii. 1998: 258, 8. viii. 2002: 48, 1. viii. 2003: 63), Untertauern II (27. viii. 1996: 39).

Galls (n = 593) collected from *Salix myrsinifolia*: Austria: Salzburg: Defereggental, Erlsbach (7. viii. 2002: 10 galls), Ramsau, Silberklamm (29. vii. 2003: 35); Tirol, Ötztal: Vent, Gample (28. viii. 1996: 39) — Switzerland: Graubünden: Juppa (1. ix. 1999: 55); Zillis (14. vii. 1999: 27, 20. vii. 1999: 18) – Italy: Lombardia: Paso di Gavia, Pezzo (26. vii. 1995: 4) — Lithuania: Palanga (13. viii. 2006: 26) — Norway: Finnmark: Alta (2. viii. 2001: 69); Lakselv, Stabursnes (2. viii. 2001: 44); N.-Varanger, Reppen (5. viii. 2001: 4); N.-Varanger, Tanabru (3. viii. 2001: 13); N.-Varanger, Neiden (6. viii. 1993: 2); S.-Varanger, Nyrud (6. viii. 2001: 27); S.-Varanger, Vaggatem, Elentj. (5. viii. 2001: 16); N.-Trondelag: Grane (17. viii. 1997: 9); Hammer (19. viii. 2004: 10); Steinamoen (19. viii. 2004: 13); S.-Trondelag: Berkak (21. viii. 2004: 38); Dovrefjell: Driva (22. viii. 2004: 86) — Sweden: Lappland: Yttervik/Ajaure (8. viii. 2004: 38); Norrbotten: Torne Träsk, Abisko (11. viii. 1993: 9) — Finland: Lappin: Kilpisjärvi (10. viii. 2001: 1)

Description

♀: Head: Frontal area with deep and broad depression as in Fig. 1, inner orbits sparsely pubescent at the margins of the eyes as in Fig. 2a, upper head shiny and slightly sculptured between shallow punctures especially marginally, weakly pubescent. Antenna thin, somewhat longer than head and thorax together. Front margin of the clypeus deeply incised. Colouring: Face bicolorous, with upper part black and lower part yellowish to brownish. In detail: Basis of mandibels, labrum, clypeus, supraclypeal area, and lower part of the inner orbits often yellowish to brownish, upper head black with hind orbits slightly gleaming brownish as in Fig. 3. Antenna dark brown to black.

Thorax: Black, mesonotum slightly sculptured, mesopleura unsculptured and shiny, with sparse pubescense primarily on the upper half as in Fig. 4a. Pronotum black with lateral angles marginally yellowish as in Fig. 5b, tegulae normally pale yellowish. Forewing with stigma transparent and pale yellowish, basal half paler, wing venation dark brown. Legs with coxa black, tibia and tarsomeres yellowish to dark brown. Hindtarsus as

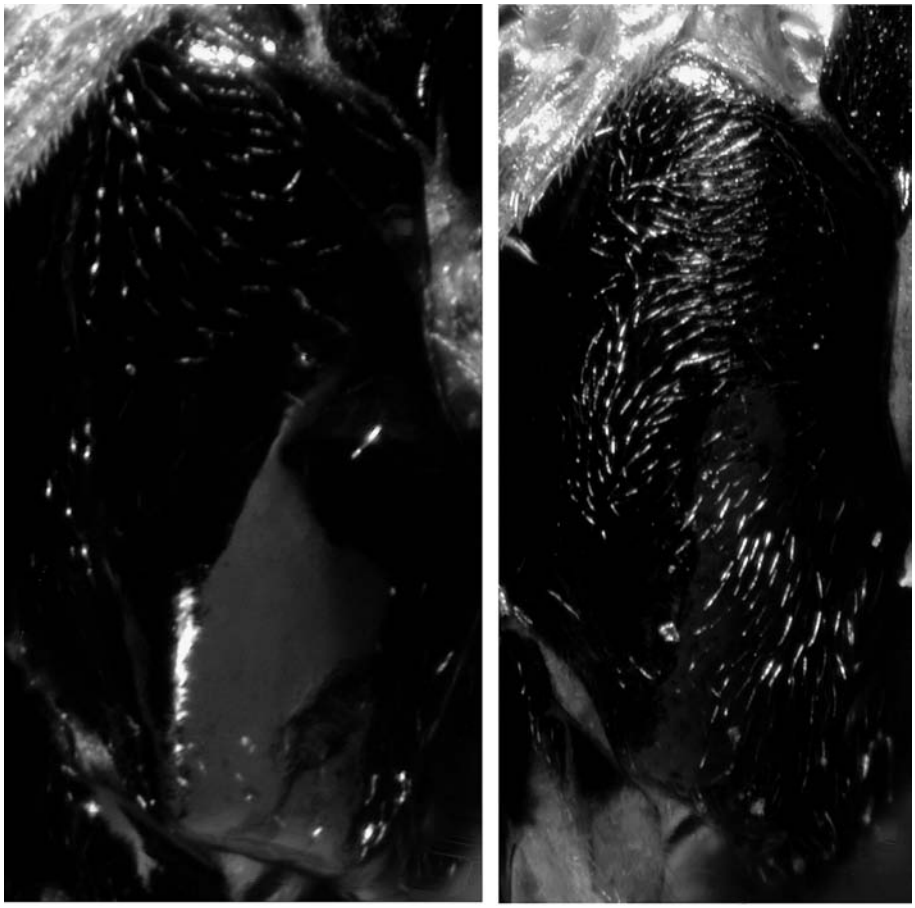


Fig. 4: Mesopleuron a) sparsely, b) entirely and densely pubescent.

long as hindtibia, hindtibia spurs slim and nearly straight, somewhat shorter than the half length of the basitarsus.

A b d o m e n : Completely dark brown to black, sawsheath nearly black. Cerci pale brown, extending at most half the length of the sheath.

S h e a t h (Fig. 6c): With slight microsculpture and shiny, in lateral view acuminate, distally nearly right-angled, strongly convex on upper margin and conspicuously emarginated on lower, in dorsal view nearly triangular and small, lateral margin not angled. Sheath bristles conspicuously longer than greatest width of sheath, widely distributed onto the lateral areas, in dorsal view clearly curled.

S a w (Fig. 8c): In lateral view with aulax only slightly arcuated, the basal half broadened, usually consisting of 19 segments. Ctenidea short, fragmentary present from annulus 2. Serrulae flat, cypsellae and postcalcares well developed.

♂: Microstructure and colouring like in ♀, antenna dark brown to black, clearly longer than thorax and abdomen together. Forewing with stigma completely brownish and transparent. Hypogydium pale to dark brown, penisvalve (Fig. 10c) in lateral view nearly straight, the basal part usually somewhat broadened. Spiny appendix nearly straight, basal lobe with lower edge clearly ripple shaped.

Gall (Fig. 12b): Leaf fold, usually only one edge of the leaf folded down, creating a spacious cavity for the larva.

H o s t p l a n t : *S. myrsinifolia* Salisbury 1796 and *S. mielichhoferi* Sauter 1849, both belonging to the subgenus *Vetrix* and the small-sized section *Nigricantes* with only three or four species (Skvortsov 1999). They are medium-sized shrubs, occurring at damp peaty meadows and banks of streams.

D i s t r i b u t i o n : central and northern Europe.

C o m m e n t : *Ph. ischnocera* was misidentified by several authors. Some authors misattributed this species to the *dolichura*-group of the genus *Pontania* (Brischke & Zaddach 1876, 1884, Brischke 1882, Cameron 1885, Löw 1888, Trail 1889, Konow 1890, Hieronymus 1891, Enslin 1915, 1916, Zirngiebl 1955, Benes 1968, Spooner 1991). However, Thomson (1871: 160) already mentioned in his description morphological similarities between *ischnocera* and *puella* (auct.) which is generally known as a leaf folder. The examination of the types confirmed *ischnocera* as a valid species of the genus *Phyllocolpa*. Scobiola-Palade (1981) identified *ischnocera* as a leaf folder but misinterpreted it as a synonym of *leucapsis* (Tischbein 1846). *Ph. ischnocera* is one of a few leaf folders which are able to induce their galls on two host plant species, i.e. *Salix myrsinifolia* and *S. mielichhoferi.*

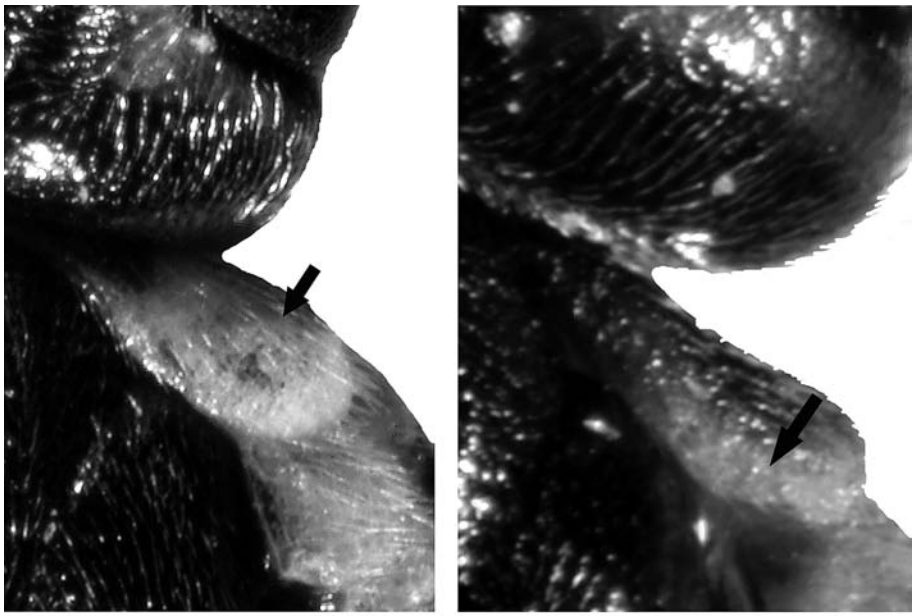


Fig. 5: Pronotum with lateral angles a) largely, b) marginally yellowish.

N. leucostigmus Cameron 1875 was regarded as a valid species (Konow 1890), but also misinterpreted as a synonym of *N. leucapsis* Tischbein 1846 (Enslin 1915, Benson 1958, Muche 1970, Spooner 1991, Lacourt 1999) and/or of *N. viminalis* Hartig 1840 *nec* Linnaeus 1758 (Konow 1901, Jörgensen 1906). The examination of the types showed that the morphological characters of *leucostigmus* definitevely correspond with those of *ischnocera;* therefore, *leucostigmus* is a junior synonym of *ischnocera.* Cameron (1885) misattributed *leucostigmus* to *Salix helix* (= *purpurea* × *viminalis*, Hegi 1957).

Ph. ischnocera is the only leaf-folder on *S. myrsinifolia* (see tab. 2, Kopelke, in press). Twisted leaf galls as known from species of the *leucapsis*-group are not yet recorded from this willow species. Notes about the presence of *leucapsis* on *S. myrsinifolia* (Zinovjev 1998) are based on a misidentification.

Phyllocolpa kopelkei (Lacourt 1996)

Pontania (Phyllocolpa) kopelkei Lacourt (1996: 271); ♀♀. Type locality: France, Saint-Véran (Hautes-Alpes), La Chapelle-de-Clousis, on *S. reticulata, S. retusa*.
Pontania (Phyllocolpa) kopelkei Lacourt 1996 — Lacourt (1999: 213), on *S. ?retusa*.
Phyllocolpa kopelkei Lacourt 1996 — Kopelke (1999: 74), on S. *reticulata, S. retusa*.
Phyllocolpa kopelkei Lacourt 1996 — Kopelke (2003a: 171), on S. *reticulata, S. retusa*.
Phyllocolpa kopelkei Lacourt 1996 — Kopelke (2003b).

M a t e r i a l : *Pontania (Phyllocolpa) kopelkei* Lacourt, holotype ♀, paratypes 2 ♀♀ (CLA).

Description

♀: H e a d : Frontal area with deep and broad depression as in Fig. 1, inner orbits sparsely pubescent at the margines of the eyes as in Fig. 2a, upper head shiny, with slight coriaceous surface sculpture, weakly pubescent. Antenna thin, somewhat longer than head and thorax together. Front margin of the clypeus deeply incised. Colouring: Face black apart from basis of mandibels, labrum, and front margin of clypeus brownish, upper head black with hind orbits slightly gleaming brownish as in Fig. 3. Antenna black.

T h o r a x : Black, mesonotum slightly sculptured, mesopleuron smoothly and shiny, with sparse pubescense on the upper half as in Fig. 4a. Pronotum black with lateral angles marginally yellowish as in Fig. 5b, tegulae brownish. Forewing with stigma transparent and dark brownish, the basal half paler, wing venation dark brown. Legs with coxa and femora black to dark brownish, tibia and tarsomeres dark brownish. Hindtarsus shorter than hindtibia, hindtibia spurs slim and nearly straight, somewhat shorter than the half length of the basitarsus.

A b d o m e n : Completely black, sawsheath nearly black. Cerci dark brown to black, extending at most half the length of the sheath.

S h e a t h (Fig. 6d): Without microsculpture and shiny, in lateral view acuminate but not sharply pointed, slightly convex on upper margin and clearly emarginated on lower, in dorsal view broadened and nearly homogeneously curved. Bristles not longer than greatest width of sheath, not widely distributed onto the lateral areas, in dorsal view only slightly curled.

S a w (Fig. 8d): In lateral view with aulax nearly straight, the basal half broadened, the distal half conspicuously narrowed, consisting of 17–18 segments. Ctenidea short, nearly completely present from annulus 2. Serrulae flat, cypsellae and postcalcares well developed.

♂: unknown.

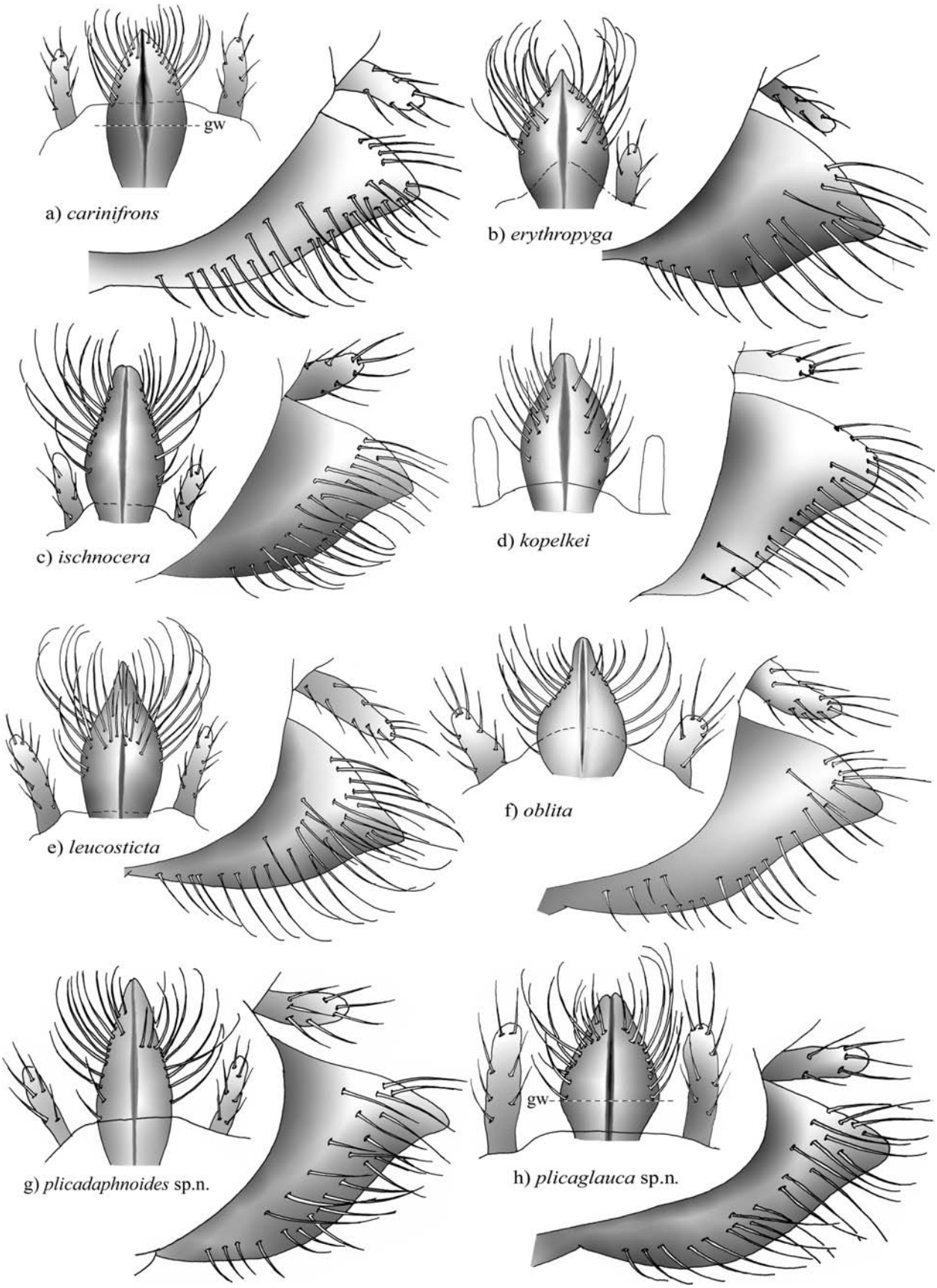


Fig. 6a–h: Sawsheath of the European species of the *Phyllocolpa leucosticta*-group in dorsal and lateral view. Fig. 6a. *carinifrons* (Benson 1940). Fig. 6b. *erythropyga* (Förster 1854). Fig. 6c. *ischnocera* (Thomson 1862). Fig. 6d. *kopelkei* (Lacourt 1996). Fig. 6e. *leucosticta* (Hartig 1837). Fig. 6f. *oblita* (Serville 1823), Fig. 6g. *plicadaphnoides* sp. n.. Fig. 6h. *plicaglauca* sp. n.

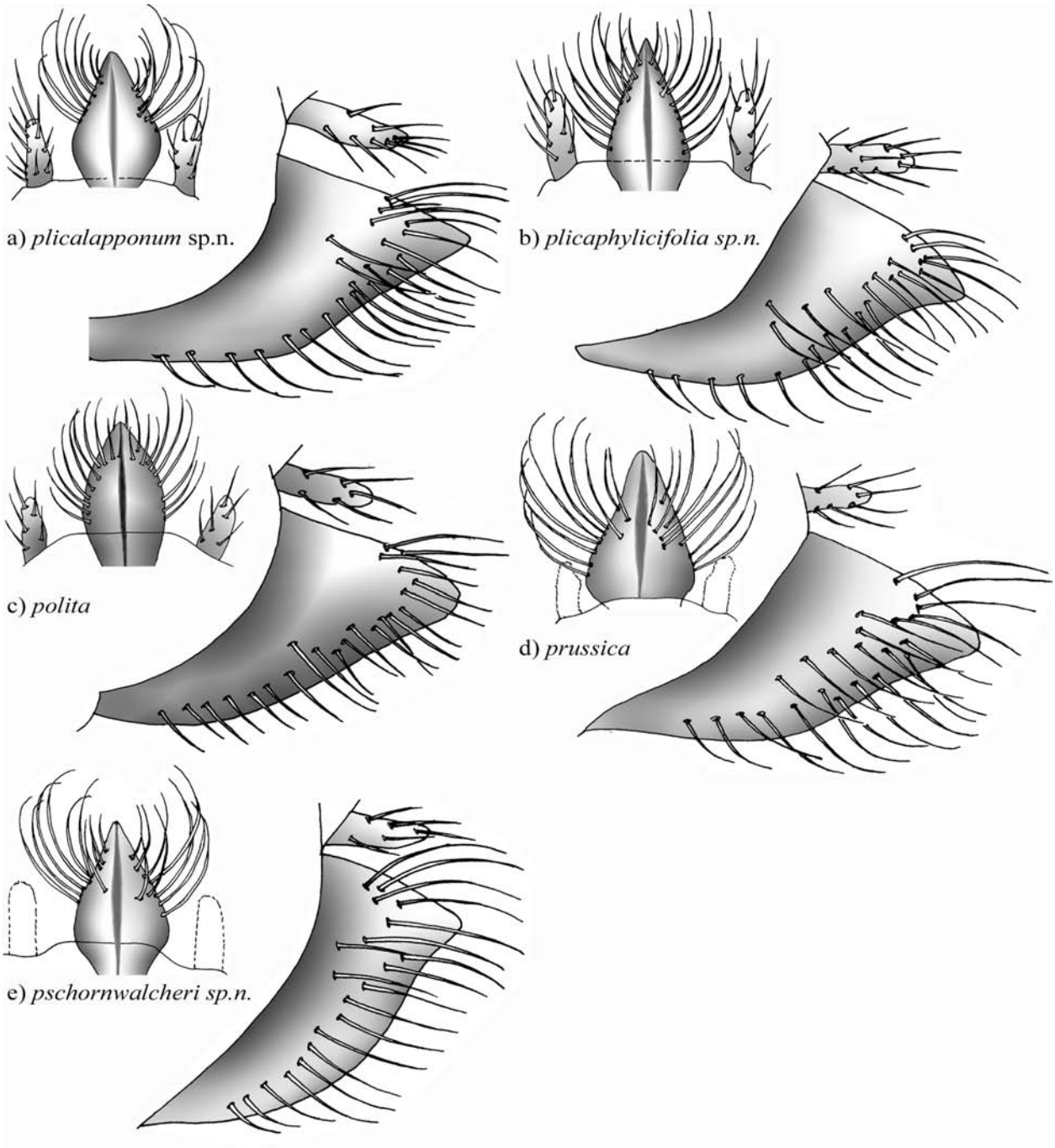


Fig. 7a–e: Sawsheath of the European species of the *Phyllocolpa leucosticta*-group in dorsal and lateral view. Fig. 7a. *plicalapponum* n.sp. Fig. 7b. *plicaphylicifolia* sp. n. Fig. 7c. *polita* (Zaddach 1883). Fig. 7d. *prussica* (Zaddach 1883). Fig. 7e. *pschornwalcheri* sp. n.

G a l l : Probably leaf fold, not twisted along the longitudinal axis. Galls were not found to date.

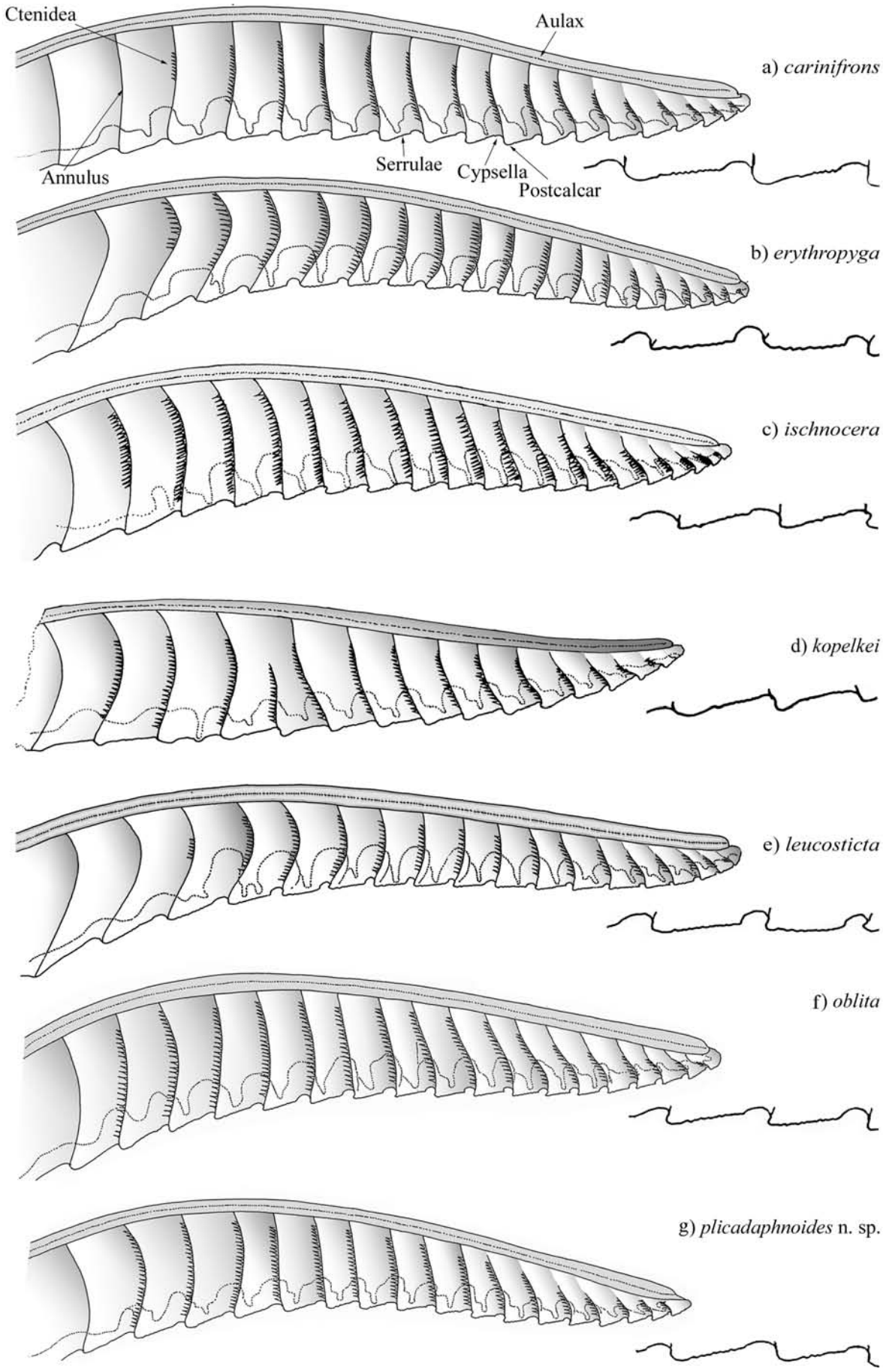
H o s t p l a n t : Probably *S. retusa* Linnaeus 1763 and *S. reticulata* Linnaeus 1753, belonging to the subgenus *Chamaetia,* sections *Retusae* and *Chamaetia,* respectively.

D i s t r i b u t i o n : central Europe, western Alps.

C o m m e n t : Lacourt (1996) described *Ph. kopelkei* from material he collected in the French Alps. He did not find galls but attributed the species to the willow hosts *Salix reticulata* and *S. retusa* from which *Phyllocolpa* was not known so far. However, the attribution of *Ph. kopelkei* to willow species belonging to different sections of the genus *Salix* is rather doubtful and needs confirmation, due to the generally quite distinct host plant specificity of the gall formers.

Phyllocolpa leucosticta (Hartig 1837)

Nematus leucostictus Hartig (1837: 202), ♀. Type locality not specified, on *S. caprea*.


Ctenidea
Aulax
Annulus
Serrulae
Cypsella
Postcalcar
a) *carinifrons*
b) *erythropyga*
c) *ischnocera*
d) *kopelkei*
e) *leucosticta*
f) *oblita*
g) *plicadaphnoides* n. sp.

= *Nematus crassulus* Thomson (1862: 630), ♀♂. Type locality: Norbotten, Smaland, Öland, Skane.
= *Nematus nigrifrons* Konow (1897: 174–177), ♀♂, syn. n. Type locality: "Trihof" (unknown locality which could not be clarified by me) handwritten by Konow on the label of the type specimen, not mentioned in his description.

Type material: *Nematus leucostictus* Hartig, LT ♀ (ZMHU). *Nematus nigrifrons* Konow, LT ♂ (DEI). *Nematus crassulus* Thomson, LT ♀, PLT 5 ♀♀, 3 ♂♂ (ZML). All lectotypes here designated.

Additional material ♀♀, ♂♂ reared from a total of 1004 galls, Kopelke leg.: Austria: Schladming, Untertal (30. vii. 2003: 82 galls); Schladming, Untertal, Riesachfälle (30. vii. 2003: 176) — Switzerland, Graubünden: Lago di Lei (2. ix. 1999: 1); Zillis (14. viii. 2000: 28); Thurgau: Weinfelden/Thur (14. vi. 2005: 8) — Germany, Mecklenburg-Western Pomerania: Rügen, Glowitz (19. vii. 2005: 17); Rügen, Neuensien (18. vii. 2005: 36), Rügen, Zittvitz (15. vii. 2005: 93); Hesse: Vogelsberg, Hoherodskopf, (1. vii. 1986: 26; 4. vii. 1995: 43); Wetterau, Altenstadt-Höchst (10. vii. 1994: 8); Rhön, Wüstensachsen, NWR Stirnberg (26. vi. 2003: 28); Baden-Württemberg: Dettingen (12. vi. 2004: 27); Markelfingen (3. vii. 2006: 69) — Danmark, Jylland: Gammelby (29. vii. 2005: 32) — Lithuania: Siluva (6. viii. 2006: 31); Sudargas (9. viii. 2006: 2) — Norway, Finnmark: S.-Varanger, Nyrud (6. viii. 2001: 164); N.-Trondelag: Namsskogan, Mellingsmoen (16. viii. 1993: 4; 3. viii. 1997, 4); Nordland: Lofot, Austvagoya, Rörvika (13. viii. 2001: 52); Lofot, Sandsletta (12. viii. 1993: 9, 11. viii. 2001: 11); Lofot, Laukvik (14. viii. 1997: 3); Lofot, Svolvaer (13. viii. 1993: 4; 14. viii. 1997: 21; 13. viii. 2001: 7) — Sweden, Lappland: Storuman (8. viii. 2004: 18).

Description

♀: Head: Frontal area with deep and broad depression as in Fig. 1, inner orbits nearly entirely pubescent as in Fig. 2b, upper head shiny and slightly sculptured between shallow punctures, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus deeply incised. Colouring: Face black apart from basis of mandibels, labrum, frontal part of clypeus whitish to yellowish, supraclypeal area and sometimes lower part of the inner orbits dark brownish, upper head black with hind orbits slightly gleaming brownish as in Fig. 3. Antenna dark brown to black.

Thorax: Black, mesonotum slightly sculptured between shallow punctures, mesopleura smoothly and shiny, almost entirely and densely pubescent as in Fig. 4b. Pronotum black, with lateral angles largely yellowish as in Fig. 5a, tegulae pale yellowish. Forewing with stigma transparent and pale brownish, the basal half hardly paler, wing venation dark brown. Coxa pale brown to black, sometimes bicolorous, tibia and tarsus yellowish brown. Hindtarsus somewhat shorter than hindtibia, hindtibia spurs relative thick and as long as the half length of the basitarsus, inner spur nearly straight, outer spur slightly arcuated.

Abdomen: Completely dark brown to black, sawsheath dark brown. Cerci pale brown and long, extending more than half of the sheath length.

Sheath (Fig. 6e): Without microsculpture and shiny, in lateral view acuminate and sharply pointed, strongly convex on upper margin and slightly emarginated on lower, in dorsal view relative small and nearly triangular, lateral margin not angled. Bristles conspicuously longer than greatest width of sheath, widely distributed onto the lateral areas, in dorsal view hairs clearly curled.

Saw (Fig. 8e): In lateral view with aulax only slightly arcuated, the basal half not broadened, usually consisting of 19 segments. Ctenidea short, fragmentary present from annulus 3. Serrulae flat, cypsellae and postcalcares well developed.

♂: Microstructure and colouring like in ♀, antenna dark brown, longer than thorax and abdomen together. Forewing with stigma completely dark brownish and transparent. Hypogydium pale to dark brown, penisvalve (Fig. 10d) in lateral view only slightly arcuated, the basal part usually not broadened. Spiny appendix acuminate and narrow, nearly straight, basal lobe with lower edge slightly angled.

Gall (Fig. 12c): Leaf fold, usually only one edge of the leaf folded down, creating a spacious cavity for the larva.

Host plant: *S. caprea* Linnaeus 1753, belonging to the subgenus *Vetrix*, section *Vetrix,* growing up to 12–14 m, sometimes with a shrubby habit and occurring on well-drained soils as well as a vast variety of secondary postforest habitas, however, avoiding wet soils (Skvortsov 1999).

Distribution: central and northern Europe.

Comment: In the description of *leucosticta* Hartig (1837: 202) specified *S. caprea* as the potential willow host, mentioning "schwärmt Ende Mai auf *S. caprea"*. In the literature some more host plant species were misattributed to this gall former, i.e. *S. aurita, S. cinerea, S. atrocinerea, S. pentandra*, and *S. viminalis*. However, the study of the types clearly show that *leucosticta* corresponds in morphological characters exclusively with reared material from *S. caprea*.

Nematus crassulus Thomson was generally regarded as a junior synonym of *leucosticta* (Brischke & Zaddach

Fig. 8a–g: Saws of the European species of the *Phyllocolpa leucosticta*-group. Fig. 8a. *carinifrons* (Benson 1940). Fig. 8b. *erythropyga* (Förster 1854). Fig. 8c. *ischnocera* (Thomson 1862). Fig. 8d. *kopelkei* (Lacourt 1996). Fig. 8e. *leucosticta* (Hartig 1837). Fig. 8f. *oblita* (Serville 1823). Fig. 8g. *plicadaphnoides* sp. n..

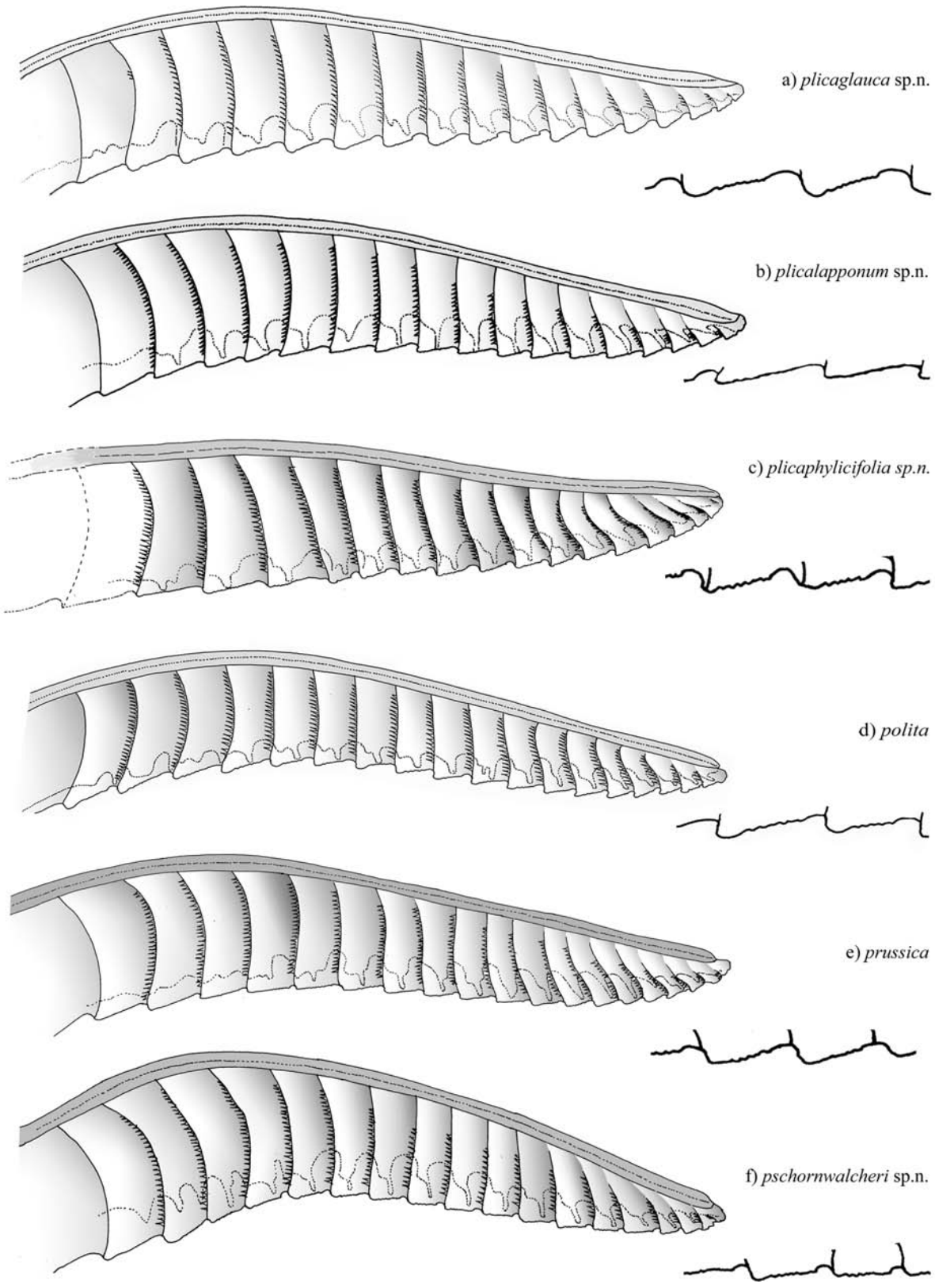


Fig. 9a–f: Saws of the European species of the *Phyllocolpa leucosticta*-group. Fig. 9a. *plicaglauca* sp. n. Fig. 9b. *plicalapponum* sp. n. Fig. 9c. *plicaphylicifolia* sp. n. Fig. 9d. *polita* (Zaddach 1883). Fig. 9e. *prussica* (Zaddach 1883). Fig. 9f. *pschornwalcheri* sp. n.

1884, Cameron 1885, Konow 1890, 1901, Jörgensen 1906a, Enslin 1915, 1916, Dittrich 1924, Lindquist 1954, Scobiola-Palade 1981, Spooner 1991, Lacourt 1999), which is also confirmed here.

N. nigrifrons described by KONOW was generally ignored in the literature, however, the examination of the lectotype has shown that *N. nigrifrons* is a junior synonym of *Ph. leucosticta*.

Phyllocolpa oblita (SERVILLE 1823)

Nematus oblitus SERVILLE (1823: 72 no. 29); ♀. Type locality: France, Paris.

= *Nematus pineti* HARTIG (1837: 208); ♀. Type locality: "Im Mai bei uns" = Berlin? (not specified in the description and on the label of the type specimen).

= *Nematus puella* THOMSON 1871: 160; ♀. Type locality: Skane, Sweden.

Pontania leucapsis (TISCHBEIN 1846): ZINOVJEV (1998): 216, on "*S. alba*, *fragilis* and hybrids with *alba*", partim; misidentification.

Type material: *Nematus oblitus* SERVILLE, LT ♀ (MRSN), designated by BLANK & TAEGER (1998). *Nematus pineti* HARTIG, LT ♀ (ZSM), here designated. *Nematus puella* THOMSON, LT ♀, PLT 5 ♀♀, 3 ♂♂ (ZML), here designated.

Additional material ♀♀, ♂♂ reared from a total of 796 galls, KOPELKE leg.

Galls (n = 593) collected from *Salix alba:* Germany: Baden-Württemberg: Hartheim (8. VII. 1999: 8 galls; 17. VII. 2000: 37); Honau (5. VII. 1999: 67, 6. VII. 1999: 43; 8. VII. 1999: 8, 19. VII. 2000: 90); Rheinau (6. VII. 1999: 22; 20. VII. 2000: 39); Markelfingen (3. VII. 2006: 25); Markelfingen-Schlafbach (4. VII. 2006: 7); Radolfzell, Mettnau (2. VII. 2006: 14); Hesse: Kühkopf, Mordhecke II (17. VII. 1996: 43; 9. VII. 1997: 155); Nordrhein-Westfalen: Urdenbacher Kempe (28. VI. 1999: 35).

Galls (n = 155) collected from *Salix fragilis:* Germany: Hesse: Mörfelden (27. VI. 1995: 13); Wetterau, Ortenberg I (4. VII. 1995: 46); Germany, Mecklenburg-Western Pomerania: Usedom, Lütow (15. VIII. 2003: 3); Usedom, Zempin, Lüttendorf (14. VIII. 2003: 12); Rügen, Glowitz (19. VII. 2005: 43); Nordrhein-Westfalen, Urdenbacher Kempe (28. VI. 1999: 25) — Lithuania: Nemirseta nr. Palanga (14. VIII. 2006: 2); nr. Rociskiau (9. VIII. 2006: 2), Raudone (10. VIII. 2006: 9).

Galls (n = 48) collected from *Salix* × *rubens* (= *fragilis* × *alba*): Austria, Lower Austria: Traismauer at the Danube (27. VIII. 1998: 12) — Germany, Hesse: Mörfelden (17. VII. 1996: 6); Nordrhein-Westfalen: Grietherbusch, Dornick (29. VI. 1999: 19); Urdenbacher Kempe (28. VI. 1999: 11).

Description

♀: Head: Frontal area with flat and broad depression, inner orbits sparsely pubescent at the margins of the eyes as in Fig. 2a, upper head shiny, with slight coriaceous surface sculpture, weakly pubescent. Antenna thin, longer than head and thorax together. Anterior margin of the clypeus conspicuously concave incised. Colouring: Face with supraclypeal area and inner orbits totally yellowish to brownish, upper head yellowish-brown apart from black spots around the ocelli. Antenna ventral pale brown, dorsal darker.

Thorax: Mesonotum with slight coriaceous surface sculpture, bicolorous, brownish with large black spots. Mesopleuron smoothly and shiny with sparse pubescense on the upper half, bicolorous, lower half black, upper half pale brownish. Pronotum and tegulae pale brownish. Forewing with stigma transparent and dark brownish, the basal half hardly paler, wing venation brownish. Coxa pale brown to black, sometimes bicolorous, tibia and tarsus yellowish brown. Hindtarsus somewhat shorter than hindtibia, hindtibia spurs slim, unequally long and nearly straight, somewhat shorter than the half length of the basitarsus.

Abdomen: Dorsally completely dark brown to black, last tergits paler. Ventrally brownish, sawsheath at the basis brownish, distal dark brown to black. Cerci brown, extending at most half the length of the sheath.

Sheath (Fig. 6f): Without microsculpture and shiny, in lateral view acuminate and nearly sharply pointed, strongly convex on upper margin and strongly emarginated on lower, in dorsal view nearly triangular, lateral margin not angled. Sheath hairs not widely distributed onto the lateral areas, in dorsal view clearly curled.

Saw (Fig. 8f): In lateral view only slightly arcuated, the basal half broadened, usually consisting of 19 segments. Ctenidea short, normally completely present from annulus 2. Serrulae flat, cypsellae and postcalcares well developed.

♂: Microstructure like in ♀, colouring darker, head dorsal largely black, mesopleuron totally black. Antenna dark brown, longer than thorax and abdomen together. Forewing with stigma completely dark brownish and transparent. Hypogydium and the ventral part of abdomen pale brown, penisvalve (Fig. 10e) in lateral view straight, the basal part usually slightly broadened. Spiny appendix acuminate and narrow, nearly straight, basal lobe with lower edge homogeneously curved.

Gall (Fig. 12d): leaf fold, usually only one edge of the leaf folded down, creating a flat cavity for the larva.

Host plant: *S. alba* LINNAEUS 1753, *S. fragilis* LINNAEUS 1753, and *S.* × *rubens* SCHRANK 1789 (= *fragilis* × *alba*), belonging to the subgenus *Salix*, section *Salix*, and growing as large trees up to 30 m tall. These willow species occurr on river banks and in valleys on sandy and especially sandy-muddy drifts. They naturally ascend to 1000 m in the Alps (SKVORTSOV 1999).

Distribution: central and southern Europe.

Comment: In the literature *Ph. oblita* was not assigned to the group of gall makers for a long time. BLANK & TAEGER (1998) identified *oblita* as a valid species of the genus *Phyllocolpa* and found that *puella* is a junior synonym of *Ph. oblita*. This is confirmed here. In the literature *oblita* (= *puella* auct.) was generally known as a gall fomer on *S. alba, fragilis,* and *triandra* (JÖRGENSEN 1906, ENSLIN 1915, 1916, BENSON 1958, MUCHE 1970), however, in the present study *oblita* was reared only from *alba, fragilis*, and the hybrid *rubens*. Whether *S. triandra* is another hostplant of this gall former needs confirmation.

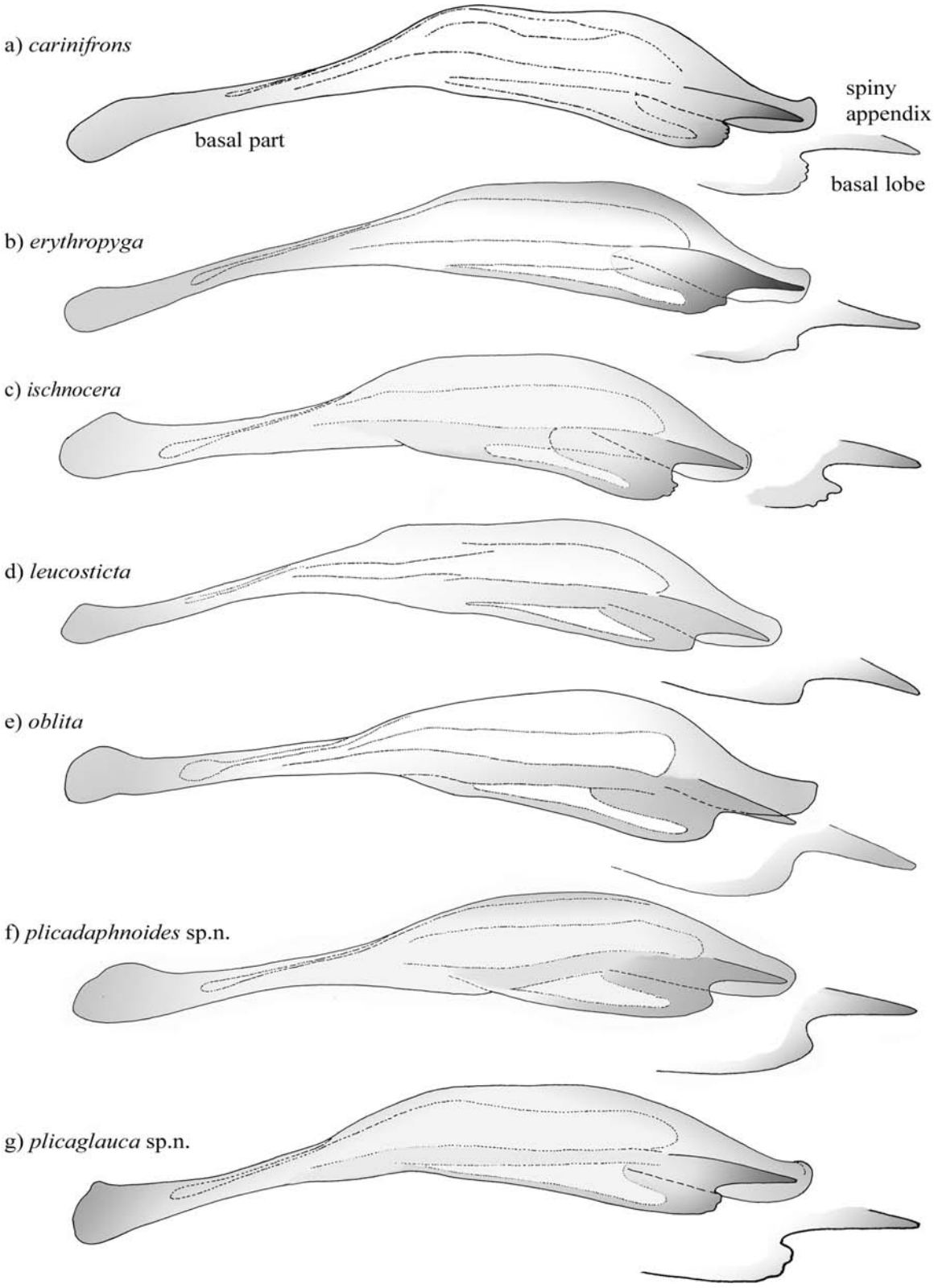


Fig. 10a–g: Penisvalves of the European species of the *Phyllocolpa leucosticta*-group. Fig. 10a. *carinifrons* (Benson 1940). Fig. 10b. *erythropyga* (Förster 1854). Fig. 10c. *ischnocera* (Thomson 1862). Fig. 10d. *leucosticta* (Hartig 1837). Fig. 10e. *oblita* (Serville 1823). Fig. 10f. *plicadaphnoides* sp. n. Fig. 10g. *plicaglauca* sp. n.

N. pineti Hartig was first misinterpreted by the present author (Kopelke 1999: 83), who did not attribute this species to one of the gall forming genera *Pontania, Euura,* and *Phyllocolpa*. However, additional studies on

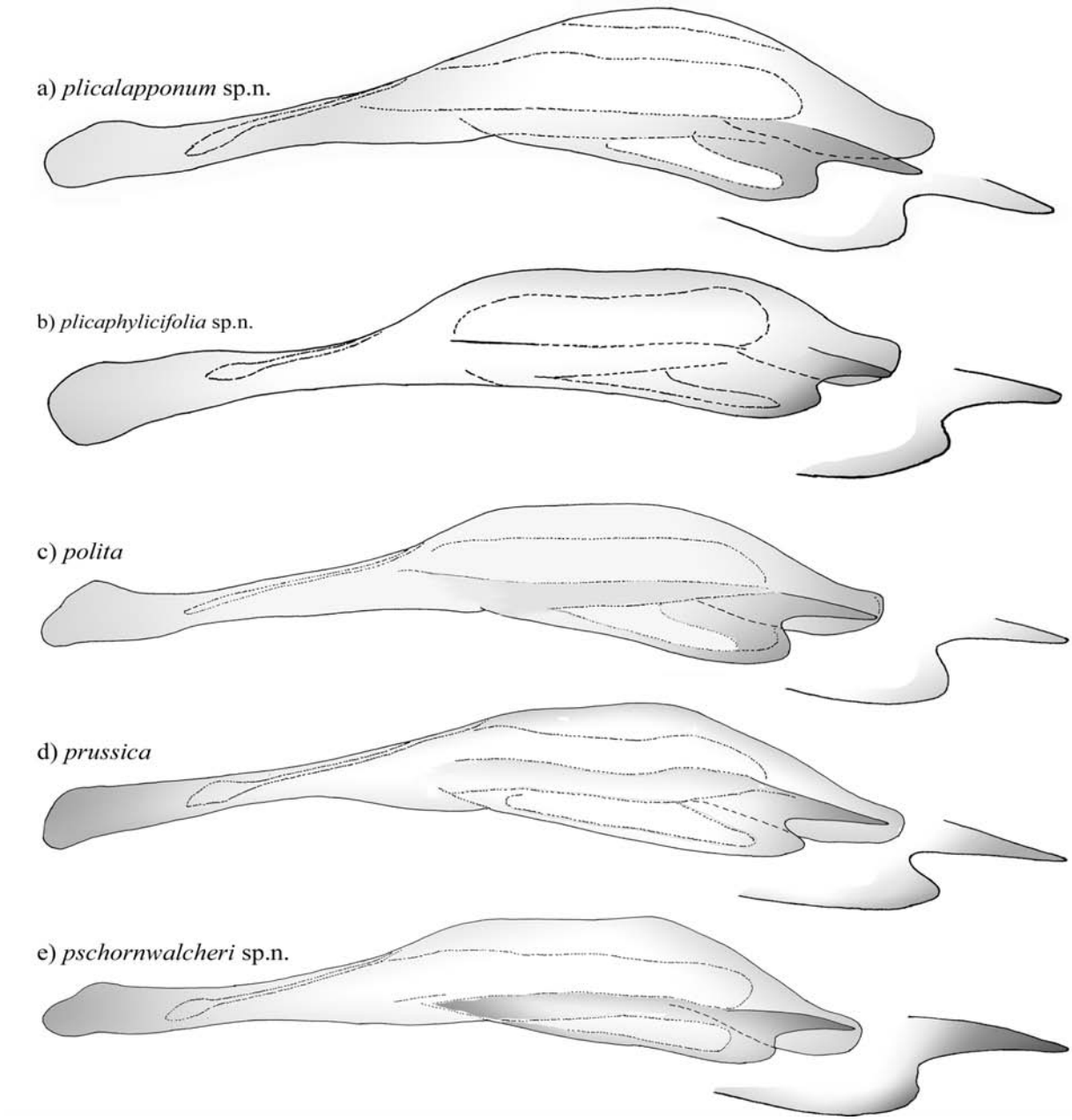


Fig. 11a–g: Penisvalves of the European species of the *Phyllocolpa leucosticta*-group. Fig. 11a. *plicalapponum* n.sp. Fig. 11b. *plicaphylicifolia* sp. n. Fig. 11c. *polita* (Zaddach 1883). Fig. 11d. *prussica* (Zaddach 1883). Fig. 11e. *pschornwalcheri* sp. n.

reared material and types showed that *pineti* is in fact a junior synonym of *Ph. oblita*. Brischke (1882) misattributed *pineti* to the willow host *S. aurita*.

Ph. oblita is the only leaf-folder known on *S. alba*, *S. fragilis*, and *S.* × *rubens* (see tab. 2, Kopelke, in press). Notes about the presence of *Ph. leucapsis* on these willow species (Zinovjev 1998) are based on a misidentification.

Phyllocolpa plicadaphnoides sp. n.

Pontania leucapsis (Tischbein 1846) — Zinovjev (1998: 216), on *S. daphnoides*, partim; misidentification.

Phyllocolpa sp. 2 — Kopelke (1999: 151).
Phyllocolpa sp. 2 — Kopelke (2003a: 171), on *S. daphnoides*.
Phyllocolpa sp. 2/*daphnoides* — Kopelke (2003b), on *S. daphnoides*.

Holotype ♀: (SMFH 2546), Austria, Salzburg, Obertauern, Kopelke galls leg. 14. ix. 1995, galls on *S. daphnoides*, rearing no. SZ-Z 1995, emerged 24. iv. 1996, in coll. Senckenberg, Frankfurt am Main, Germany.

Paratypes (in total 26 ♀♀, 26 ♂♂): Austria: 15 ♀♀ (SMFH 2547a–o), 10 ♂♂ (SMFH 2548a–j) together with holotype; 5 ♀♀ (SMFH 2547q–u), 2 ♂♂ (SMFH 2548k–l) Obertauern I (Kopelke galls leg. 26. viii. 1996); 5 ♀♀ (SMFH

a) *carinifrons / S. pentandra*

b) *ischnocera / S. myrsinifolia*

c) *leucosticta / S. caprea*

d) *oblita / S. alba*

e) *plicadaphnoides sp.n. / S. daphnoides*

f) *plicaglauca* sp.n. / *S. glauca*

g) *polita / S. purpurea*

h) *prussica / S. cinerea*

2547v–z), 13 ♂♂ (SMFH 2548m–y) Obertauern I (Kopelke galls leg. 22. viii. 1998) — Switzerland: 1 ♀ (SMFH 2547p), 1 ♂ (SMFH 2548z), Valais: Obergoms, Obergesteln (Kopelke galls leg. 12. ix. 1995). — The HT and PT were reared from *Salix daphnoides*.

Additional material: ♀♀, ♂♂ reared from a total of 2570 galls on *Salix daphnoides*, Kopelke leg.: Austria: Kärnten: Maltatal I (7. viii. 1994: 61 galls); Salzburg: Defereggental, Erlsbach (7. viii. 2002: 589); Obertauern I (26. viii. 1996: 429, 22. viii. 1998: 502, 8. viii. 2002: 396, 1. viii. 2003: 111); Tauernpaß, Tweng (12. viii. 1994: 81); Zederhaustal, Oberweißburg (11. viii. 1994: 37); Ramsau, Silberklamm (29. vii. 2003: 23) — Switzerland: Valais, Obergoms: Obergesteln (12. ix. 1995 92), Reckingen (13. ix. 1995: 249).

Description

♀: Head: Frontal area with deep and broad depression as in Fig. 1, inner orbits sparsely pubescent at the margins of the eyes as in Fig. 2a, upper head shiny and slightly sculptured, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus deeply incised. Colouring: Face bicolorous, with upper part black and lower part yellowish to brownish. In detail: basis of mandibels, labrum, clypeus, supraclypeal area, and inner orbits yellowish to brownish, upper head black with hind orbits slightly gleaming brownish as in Fig. 3. Antenna black.

Thorax: Black, mesonotum with slight microsculpture, mesopleuron smoothly and conspicuously shiny, with sparse pubescense on the upper half as in Fig. 4a. Pronotum black with lateral angles marginally yellowish as in Fig. 5b, tegulae yellowish. Forewing with stigma transparent and often pale yellowish coloured, wing venation dark brown. Legs with coxa black, tibia and tarsomeres dark brown. Hindtarsus somewhat shorter than hindtibia, hindtibia spurs slim and nearly straight, somewhat shorter than the half length of the basitarsus.

Abdomen: Completely dark brown to black, sawsheath nearly black. Cerci brown and short, extending at most half the length of the sheath.

Sheath (Fig. 6g): With slight microsculpture and shiny, in lateral view acuminate and distal arcute-angled, slightly convex on upper margin, conspicuously emarginate on lower, in dorsal view small and nearly triangular, lateral margin not angled. Bistles conspicuously longer than greatest width of sheath, widely distributed onto the lateral areas, in dorsal view clearly curled.

Saw (Fig. 8g): In lateral view with aulax slightly arcuated, the basal half slightly broadened, usually consisting of 16 segments,. Ctenidea short, completely present from annulus 2. Serrulae flat, cypsellae and postcalcares well developed.

♂: Microstructure and colouring like in ♀, antenna black, conspicuously longer than thorax and abdomen together. Forewing with stigma completely pale brownish and transparent. Hypogydium dark brown to black, penisvalve (Fig. 10f) in lateral view nearly straight, the basal part somewhat broadened. Spiny appendix nearly straight, basal lobe with lower edge slightly angled.

Gall (Fig. 12e): leaf fold, usually only one edge of the leaf folded down, creating a flat cavity for the larva.

Host plant: *Salix daphnoides* Villars 1789, a tall shrub or straight-stemmed tree up to 15 m, belonging to the subgenus *Vetrix*, section *Daphnella* (Svortsov 1999). Often growing on sandy banks of mountain rivers together with *S. elaeagnos*. Distributed in the mountaines of central and partially southern Europe.

In Lithuania similar galls were found on *S. acutifolia* Willdenow 1806 which may be another willow host of *plicadaphnoides*. However, this needs confirmation because no adults could be reared to date.

Distribution: central Europe, locally occurring in high densities.

Comment: *Ph. plicadaphnoides* sp. n. is the only leaf folder on *S. daphnoides* and possibly *S. acutifolia* (see tab. 2, Kopelke, in press). In the literature the leaf folder on *S. daphnoides* was wrongly regarded as *P. leucapsis* (Zinovjev 1998). The morphological characters of the new species do not correspond with any other species of this group.

Phyllocolpa plicaglauca sp. n.

Pontania acutiserra Lindquist 1948 — Vikberg (1970: 11, 22) "in rolled leaf-edges" on "*S. glauca*", misidentification.
Pontania acutiserra Lindquist 1948 — Zinovjev (1998: 216), on "*S. glauca*", partim; misidentification.
Phyllocolpa ?sp. 4 — Kopelke (1999: 151), on *S. glauca*.
Phyllocolpa ?sp. 5 — Kopelke (1999: 151), on *S. glaucosericea*.
Phyllocolpa sp. 4 — Kopelke (2003a: 171), on *S. glauca*.
Phyllocolpa sp. 5 — Kopelke (2003a: 171), on *S. glaucosericea*.
Phyllocolpa sp. 4/*glauca* — Kopelke (2003b: 277–312), on *S. glauca*.
Phyllocolpa sp. 4/*glaucosericea* — Kopelke (2003b: 277–312), on *S. glaucosericea*.

Holotype: ♀ (SMFH 2549), Norway, Finnmark: N.-Varanger, Reppen, Kopelke galls leg. 5. viii. 2001, galls on *S. glauca*, rearing no. SZ 16 2001, emerged 3. v. 2002, in coll. Senckenberg, Frankfurt am Main, Germany.

Fig. 12a–g: Galls of the European species of the *Phyllocolpa leucosticta*-group. Fig. 12a. *carinifrons* (Benson 1940) on *Salix pentandra* Linnaeus 1753. Fig. 12b. *ischnocera* (Thomson 1862) on *Salix myrsinifolia* Salisbury 1796. Fig. 12c. *leucosticta* (Hartig 1837) on *Salix caprea* Linnaeus 1753. Fig. 12d. *oblita* (Serville 1823) on *Salix alba* Linnaeus 1753. Fig. 12e. *plicadaphnoides* sp. n. on *Salix daphnoides* Villars 1789. Fig. 12f. *plicaglauca* sp. n. on *Salix glauca* Linnaeus 1753. Fig. 12g. *polita* (Zaddach 1883) on *Salix purpurea* Linnaeus 1753. Fig. 12h. *prussica* (Zaddach 1883) on *Salix cinerea* Linnaeus 1753.

Paratypes (in total 10 ♀♀, 10 ♂♂): 2 ♀♀ (SMFH 2550a–b), 1 ♂ (SMFH 2551a) together with holotype; 1 ♀ (SMFH 2550c) Norway, Finnmark: Ifjordfjellet, Gilojokka (Kopelke galls leg. 8. viii. 2001), 1 ♂ (SMFH 2551b) Ifjordfjellet II (Kopelke galls leg. 8. viii. 1997), 2 ♀♀ (SMFH 2550d–e) Nordland: Lofot, Sandsletta (Kopelke galls leg. 11. viii. 2001), 5 ♀♀ (SMFH 2550f–j), 8 ♂♂ (SMFH 2551c–j) Lofot, Austvagoya, Delp (Kopelke galls leg. 13. viii. 2004). — The HT and PT were reared from *Salix glauca*.

Additional material: ♀♀, ♂♂ reared from a total of 1868 galls, Kopelke leg.

Galls (n = 1034) collected from *Salix glauca:* Norway, Finnmark: Ifjordfjellet, Gilojokka (8. viii. 2001: 190 galls); Ifjordfjellet II (8. viii. 1997: 108); N.-Varanger, Reppen (5. viii. 2001: 56); N.-Varanger, Sandfjord (3. viii. 2001: 12); Hordaland: Vikafjell nr. Viksöyri (19. viii. 2001: 26); Vikafjell bei Viksöyri II (19. viii. 2001: 42); Nordland: Korgfjellet (17. viii. 1997: 22); Lofot, Austvagoya, Moksnes, (14. viii. 2001: 5); Lofot, Austvagoya, Rörvika (13. viii. 2001: 27); Lofot, Austvagoya, Delp (13. viii. 2004: 98); Lofot, Austvagoya, Morfjord (13. viii. 2004: 168); Lofot, Flakstad (14. viii. 2001: 71, 14. viii. 2004: 12); Lofot, Sandsletta (11. viii. 2001: 54); Tennholmfjorden, Gimstad (17. viii. 2004: 32); Arctic Circle I (15. viii. 2001: 38); Oppland: Jotunheimen, Breiseterdalen (22. viii. 1997: 46); Troms: Lapphaugen nr. Bardu (10. viii. 2001:12) — Finland, Lappin, Kilpisjärvi (10. viii. 2001: 15).

Galls (n = 834) collected from *Salix glaucosericea:* Austria, Tirol: Ötztal, Obergurgl (2. ix. 1991: 38 galls; 29. vii. 1995: 80); Tirol, Ötztal, Vent/Gample (29. vii. 1995: 66; 28. viii. 1996: 171) — Switzerland, Valais: Grimselpaß, Grimselsee (10. ix. 1995: 240; 29. viii. 1998: 62); Valais, Grimselpaß, Räterichsbodensee (4. ix. 1991: 76; 2. ix. 1992: 101

Description

♀: Head: Frontal area with flat and broad depression, inner orbits sparsely pubescent at the margins of the eyes as in Fig. 2a, upper head shiny and slightly sculptured, weakly pubescent. Antenna thin, longer than head and thorax together. Anterior margin of the clypeus deeply incised. Colouring: Face black apart from basis of mandibels, labrum, and clypeus yellowish to brown, upper head normally black, sometimes with hind orbits slightly gleaming brownish. Antenna black.

Thorax: Black, mesonotum with slight microsculpture, mesopleuron smoothly and conspicuously shiny, with sparse pubescense on the upper half as in Fig. 4a. Pronotum black, sometimes with lateral angles marginally brownish, tegulae brownish to dark brown. Forewing with stigma transparent and pale brownish, basal half paler, wing venation dark brown. Legs with coxa black, tibia and tarsomeres dark brown. Hindtarsus about as long as hindtibia, hindtibia spurs slim and nearly straight, somewhat shorter than the half length of the basitarsus.

Abdomen: Completely black, sawsheath black. Cerci dark brown and long, extending more than half of the sheath length.

Sheath (Fig. 6h): Without microsculpture and shiny, in lateral view acuminate, nearly straight on upper margin, only slightly emarginate on lower, in dorsal view nearly triangular, lateral margin slightly angled. Sheath hairs widely distributed onto the lateral areas, in dorsal view clearly curled.

Saw (Fig. 9a): In lateral view with aulax only slightly arcuated, the basal half broadened, usually consisting of 17 segments,. Ctenidea short, fragmentary present from annulus 2. Serrulae flat, cypsellae and postcalcares well developed.

♂: Microstructure and colouring like in ♀, antenna black, longer than thorax and abdomen together. Forewing with stigma completely dark brownish and transparent. Hypogydium dark brown, penisvalve (Fig. 10g) in lateral view slightly arcuated, the basal part usually slightly broadened. Spiny appendix acuminate and narrow, nearly straight, basal lobe with lower edge nearly ripple shaped.

Gall (Fig. 12f): leaf fold, usually only one edge of the leaf folded down, creating a flat cavity for the larva.

Host plant: *S. glauca* Linnaeus 1753 and *S. glaucosericea* Floderus 1943, belonging to the subgenus *Chamaetia*, section *Glaucae,* growing as medium-sized shrubs up to 2 m tall, occurring in variable habitats like wetlands, lowlands, river valleys, tundras, etc. It is a rather polymorphic, manifold species (Skvortsov 1999). The views concerning the taxonomical status of these two willow species diverge clearly in the literature. Most authors regard *S. glauca* and *S. glaucosericea* as valid species (Hegi 1957, Rechinger 1964, Neumann 1981, Chmelar & Meusel 1986, Hörandl 1992, Newsholme 1992, Lautenschlager-Fleury & Lautenschlager-Fleury 1994) except for Skvortsov (1968, 1999) who assumes them to be synonymous and to be of boreoalpine distribution. The results of the morphological studies on the gall former and oviposition experiments support Skvortsov's point of view (Kopelke 2003a).

Distribution: Alps and northern Europe.

Comment: In the literature the leaf folder on *S. glauca* was misattributed to *acutiserra* (Lindquist 1948) (Vikberg 1970, Hellén 1977, Liston 1995, Zinovjev 1998, Lacourt 1999). The morphological characters of the new species *plicaglauca* do not correspond with any other species of this group.

Phyllocolpa plicalapponum sp. n.

Phyllocolpa ?sp. 9 — Kopelke (1999: 151), on *S. lapponum*.
Phyllocolpa sp. 9 — Kopelke (2003a: 171), on *S. lapponum*.
Phyllocolpa sp. 9/*lapponum* — Kopelke (2003b: 277–312), on *S. lapponum*.

Holotype: ♀ (SMFH 2552), Norway: Finnmark: S.-Varanger, Ferdesmyra, Kopelke galls leg. 5. viii. 2001, galls on *S. lapponum*, rearing no. SZ 14 2001, emerged 2. v. 2002, in coll. Senckenberg, Frankfurt am Main, Germany.

Paratypes: 14 ♀♀ (SMFH 2553a–n), 1 ♂ (SMFH 2553o) together with holotype — the HT and PT were reared from *Salix lapponum*.

Additional material: ♀♀, ♂♂ reared from a total of 303 galls, Kopelke leg.: Norway: Finnmark: S.-Varanger, Ferdesmyra (5. viii. 2001: 88); Nordland: Arctic circle I (14. viii. 1993: 2; 12. viii. 2004: 17); Hordaland: Seljestad nr. Odda (22. viii. 2001: 196).

Description

♀: Head: Frontal area with deep and broad depression as in Fig. 1, inner orbits sparcely pubescent at the margins of the eyes as in Fig. 2a, upper head shiny and slightly sculptured between shallow punctures, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus deeply incised. Colouring: Face bicolorous, with upper part black and lower part yellowish to brownish. In detail: Basis of mandibels, labrum, clypeus yellowish, supraclypeal area and inner orbits brownish, upper head black with hind orbits slightly gleaming brownish as in Fig. 3. Antenna black.

Thorax: Black, mesonotum slightly sculptured between shallow punctures, mesopleura smoothly and shiny, with sparse pubescence as in Fig. 4a. Pronotum black, with lateral angles largely yellowish as in Fig. 5a, tegulae pale yellowish. Forewing with stigma transparent and pale brownish, the basal half paler, wing venation dark brown. Coxa black, tibia and tarsus yellowish brown. Hindtarsus conspicuously shorter than hindtibia, hindtibia spurs nearly straight and slim, shorter than the half length of the basitarsus.

Abdomen: Completely dark brown to black, sawsheath black. Cerci pale brown and long, extending more than half of the sheath length.

Sheath (Fig. 7a): Without microsculpture and shiny, in lateral view acuminate and sharply pointed, nearly straight on upper and lower margin, in dorsal view nearly triangular, lateral margin clearly angled. Bristles conspicuously longer than greatest width of sheath, widely distributed onto the lateral areas, in dorsal view clearly curled.

Saw (Fig. 9b): In lateral view with aulax slightly arcuated, the basal half broadened, usually consisting of 18 segments. Ctenidea short, completely present from annulus 2. Serrulae flat, cypsellae and postcalcares slightly developed.

♂: Microstructure and colouring like in ♀, antenna black, longer than thorax and abdomen together. Forewing with stigma completely dark brownish and transparent. Hypogydium dark brown to black, penisvalve (Fig. 11a) in lateral view only slightly arcuated, the basal part usually not broadened. Spiny appendix narrow and nearly straight, basal lobe with lower edge homogeneously curved.

Gall: Leaf fold, usually only one edge of the leaf folded down, creating a flat cavity for the larva.

Host plant: *S. lapponum* Linnaeus 1753, belonging to the subgenus *Vetrix*, section *Villosae*, a shrub up to 1.5 m, occurring on eutrophic and mesotrophic wetlands, damp meadows and forests, common in the forest-tundra belt and subalpine zone of northern mountains (Skvortsov 1999).

Distribution: northern Europe.

Comment: In the literature the leaf folds on *S. lapponum* were misattributed to *Ph. ischnocera* (Thomson 1862) (Hieronymus 1891) which is known now to be a separate species on *S. myrsinifolia* and *S. miliechhoferi*. *Ph. acutiserra* is another gall former on *S. lapponum* (Vikberg 1970, Hellén 1977, Zinovjev & Vikberg 1998, Kopelke 1999, 2003a) which in contrast to the new species induces twisted leaf rolls. The morphological characters of the new species *plicalapponum* do not correspond with any other species of this group.

Phyllocolpa plicaphylicifolia sp. n.

Pontania coriacea (Benson 1953) — Vikberg (1970: 12, 22) "merely smoothly rolled leaf-edges" on "*S. phylicifolia*", misidentification.

Pontania excavata (Marlatt 1896) — Vikberg (1970: 11), on "*S. phylicifolia*", partim; misidentification; Zinovjev (1998: 216), on "*S. phylicifolia"*, partim; misidentification.

Pontania leucapsis (Tischbein 1846) — Vikberg (1970: 11, 22) "folded leaf-edge rolls" on "*S. phylicifolia*", misidentification; Zinovjev (1998: 216), on "*S. phylicifolia"*, partim; misidentification.

Holotype: ♀ (SMFH 2554), Norway: S.-Trondelag: Dovrefjell, Grönbakken, (Kopelke galls leg. 22. viii. 2004), galls on S. phylicifolia, rearing no. SZ 61 2004, emerged 21. iv. 2005, in coll. Senckenberg, Frankfurt am Main, Germany.

Paratypes (in total 1 ♀, 2 ♂♂): 1 ♀ (SMFH 2555a), Norway: Finnmark: N.-Varanger, Reppen (Kopelke galls leg. 5. viii. 2001), 1 ♂ (SMFH 2555b) Lakselv, Stabursnes (Kopelke galls leg. 2. viii. 2001), 1 ♂ (SMFH 2555c) Oppland: Peer Gynt veien II (Kopelke galls leg. 24. viii. 2004). — The HT and PT were reared from *Salix phylicifolia*.

Additional material: ♀♀, ♂♂ reared from a total of 81 galls, Kopelke leg.: Norway: Finnmark: Karasjok (3. viii. 2001: 25); N.-Varanger, Reppen (5. viii. 2001: 8), Lakselv/Stabursnes (2. viii. 2001: 27); Oppland: Peer Gynt veien II (24. viii. 2004: 6); S.-Trondelag: Dovrefjell, Grönbakken (22. viii. 2004: 15).

Description

♀: Head: Frontal area with deep and broad depression as in Fig. 1, inner orbits sparcely pubescent at the margins of the eyes as in Fig. 2a, upper head shiny and slightly sculptured between shallow punctures, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus deeply incised. Colouring: Face black, basis of mandibels and labrum yellowish, clypeus yellowish with median black spot, upper head entirely black, antenna black.

Thorax: Black, mesonotum slightly sculptured between shallow punctures, mesopleura smoothly and

Tab. 1: *Phyllocolpa* species of the *leucosticta*-group with notes to their distribution in Europe and their willow hostplants.

***Phyllocolpa* spp**.	***Salix* spp.**	**distribution**
Ph. carinifrons (Benson 1940), **stat. n.**	*S. pentandra* Linnaeus 1753	central, northern Europe
Ph. erythropyga (Förster 1854), **stat. n.**	*S. aurita* Linnaeus 1753	central, northern Europe
Ph. ischnocera (Thomson 1862), **stat. n.** = *Nematus leucostigmus* Cameron 1876, **syn. n.**	*S. myrsinifolia* Salisbury 1796, *S. mielichhoferi* Sauter 1849	central, northern Europe
Ph. kopelkei (Lacourt 1996)	*S. retusa* Linnaeus 1763, *S. reticulata* Linnaeus 1753 (both unconfirmed)	central Europe, western Alps
Ph. leucosticta (Hartig 1837) = *Nematus crassulus* Thomson 1862 = *Nematus nigrifrons* Konow 1897, **syn. n.**	*S. caprea* Linnaeus 1753	central, northern Europe
Ph. oblita (Serville 1823) = *Nematus oblitus* Lepeletier 1823 = *Nematus pineti* Hartig 1837 = *Nematus puella* Thomson 1871	*S. alba* Linnaeus 1753, *S. fragilis* Linnaeus 1753, *S.* × *rubens* Schrank 1789	central, southern Europe
Ph. plicadaphnoides sp. n.	*S. daphnoides* Villars 1789	central Europe
Ph. plicaglauca sp. n.	*S. glauca* Linnaeus 1753, *S. glaucosericea* Floderus 1943	central, northern Europe
Ph. plicalapponum sp. n.	*S. lapponum* Linnaeus 1753	northern Europe
Ph. plicaphylicifolia sp. n.	*S. phylicifolia* Linnaeus 1753	northern Europe
Ph. polita (Zaddach 1883) = *Nematus sieboldii* Zaddach 1884, **syn. n.** = *Pontania connata* Enslin 1915, **syn n.**	*S. purpurea* Linnaeus 1753	central, southern Europe
Ph. prussica (Zaddach 1883), **stat. n.**	*S. cinerea* Linnaeus 1753	central Europe
Ph. pschornwalcheri sp. n.	*S. appendiculata* Villars 1789	Alps, central Europe

shiny, with sparse pubescence as in Fig. 4a. Pronotum entirely black, tegulae pale yellowish. Forewing with stigma transparent and pale brownish, the basal half paler, wing venation dark brown. Coxa black, tibia and tarsus yellowish brown. Hindtarsus shorter than hindtibia, hindtibia spurs nearly straight and slim, shorter than the half length of the basitarsus.

A b d o m e n : Completely black, sawsheath black. Cerci dark brown, extending at most half the length of the sheath..

S h e a t h (Fig. 7b): Without microsculpture and shiny, in lateral view acuminate and sharply pointed, slightly convex on upper margin and slightly emarginated on lower, in dorsal view nearly triangular, lateral margin slightly angled. Bistles conspicuously longer than greatest width of sheath, widely distributed onto the lateral areas, in dorsal view clearly curled.

S a w (Fig. 9c): In lateral view with aulax nearly straight, the basal half broadened, usually consisting of 18 segments. Ctenidea short, completely present from annulus 2. Serrulae flat, cypsellae and postcalcares well developed.

♂: Microstructure and colouring like in ♀, antenna black, longer than thorax and abdomen together. Forewing with stigma completely dark brownish and transparent. Hypogydium dark brown to black, penisvalve (Fig. 11b) in lateral view nearly straight, the basal part usually broadened. Spiny appendix narrow and nearly straight, basal lobe with lower edge slightly angled.

G a l l : Leaf fold, usually only one edge of the leaf folded down, creating a flat cavity for the larva.

H o s t p l a n t : *S. phylicifolia* Linnaeus 1753, belonging to the subgenus *Vetrix*, section *Arbuscella*, a medium-sized shrup, occurring on edges of wetlands, damp lowlands banks of streams, common in willow shrublands in tundras (Skvortsov 1999).

D i s t r i b u t i o n : Northern Europe.

C o m m e n t : In the literature the willow *S. phylicifolia* was misattributed as host to various species of the genus *Phyllocolpa* (see Kopelke 1999: tab. 17), primarily producers of leaf rolls which are strongly twisted (*leucapsis*-group: *leucapsis*) and/or rolled down (*crassispina*-group: *tuberculata*). A gall former with flat leaf folds on *S. phylicifolia*, belonging to the *leucosticta*-group, was not known so far. The morphological characters of the new species *Ph. plicaphylicifolia* do not correspond with any other species of this group. In addition, *S. phylicifolia* harbours another gall type, forming a curled spiral along the longitudinal axis and belonging to *Ph. nudipectus* of the *crassispina*-group (Kopelke, in press).

Phyllocolpa polita (Zaddach 1883)

Nematus politus Zaddach (*in* Brischke & Zaddach 1883: table I (7), Fig. 14). Type locality: Danzig, Königsberg, Bautzen, Scotland.

= *Nematus sieboldii* Zaddach (*in* Brischke & Zaddach 1884: 171–172); syn. n. Type locality: Danzig.

= *Pontania connata* Enslin (1915: 347), syn. n. Type locality: central and northern Europe.

Pontania leucapsis (Tischbein 1846) — Benes (1968: 119), "leaf edge is rolled underneath almost throughout its whole length" on "*S. purpurea*"; misidentification. Zinovjev (1998: 217), on "*S. purpurea"*, partim; misidentification.

Type material: *Nematus politus* Zaddach, NT ♀ (SMFH 2556*);* here designated. Neotype locality: Germany, Hesse: Wetterau, Ortenberg I (Nidder) (Kopelke galls leg. 4. vii. 1995). *Pontania connata* Enslin, LT ♀, here designated.

Additional material: ♀♀, ♂♂ reared from a total of 3661 galls, Kopelke leg.: Austria, Lower Austria: Waldverchs (14. vii. 2003: 211); Frankenreith (26. vii. 2005: 201, 15. vii. 2006: 209, Altenhofer leg); Neustift (25. vii. 2005: 82, Altenhofer leg); Salzburg: Dachsteingebirge, Hoferalm nr. Filzmos (23. viii. 1998: 292); Defereggental, Erlsbach (7. viii. 2002: 340); Defereggental, St. Jakob, Trojer Alm (7. viii. 2002: 107); Murtal, Muhr (11. viii. 1994: 232); Ramsau, Silberklamm (29. vii. 2003: 147) — Switzerland, Thurgau: Neuwilen, Bommer Weiher (16. vi. 2005: 32); Weinfelden/Thur (14. vi. 2005: 48); Valais: Obergoms, Obergesteln (12. ix. 1995: 28) — Germany, Baden-Württemberg: Honau (5. vii. 1999: 75, 6. vii. 1999: 108, 19. vii. 2000: 98); Rheinau (5. vii. 1999: 29); Markelfingen (3. vii. 2006: 102); Markelfingen/Schlafbach (17. vi. 2005: 40, 4. vii. 2006: 40); Radolfzell, Mettnau (10. vi. 2005: 62, 18. vi. 2005: 55, 2. vii. 2006: 74); Hesse: Griesheim nr. Darmstadt (27. vi. 1995: 47; 17. vii. 1996: 9); Kühkopf, Mordhecke I (27. vi. 1995: 60); Kühkopf, Mordhecke II (17. vii. 1996: 22); Mörfelden (27. vi. 1995: 28); Wetterau, Kilianstätten (12. vii. 1995: 82; 18. vii. 1996: 57; 9. vii. 1997: 89, 12. vii. 1998: 123); Wetterau, Limeshain-Rommelhausen (2. vii. 1995: 49); Wetterau, Ortenberg I (4. vii. 1995: 153; 18. vii. 1996: 176) — Italy: Lombardia, Paso di Gavia, Pezzo (26. vii. 1995: 85); Trentino, Val Vermiglio, Pellizano (26. vii. 1995: 47) — Poland, Mazurskie, nr. Grabnik (3. viii. 2006: 22).

Description

♀: Head: Frontal area with deep and broad depression as in Fig. 1, inner orbits sparcely pubescent at the margins of the eyes as in Fig. 2a, upper head shiny and slightly sculptured between shallow punctures, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus deeply incised. Colouring: Face bicolorous, with upper part black and lower part yellowish to brownish. In detail: Basis of mandibels, labrum, clypeus, supraclypeal area, and basal parts of the inner orbits yellowish, upper head black with hind orbits slightly gleaming brownish as in Fig. 3. Antenna dark brown to black.

Thorax: Black, mesonotum slightly sculptured between shallow punctures, mesopleura smoothly and shiny, with sparse pubescence as in Fig. 4a. Pronotum black with lateral angles marginally brownish, tegulae pale yellowish. Forewing with stigma transparent and pale brownish, the basal half hardly paler, wing venation brown. Coxa black, femur dark brown, tibia and tarsus yellowish brown. Hindtarsus nearly as long as hindtibia, hindtibia spurs straight and slim, nearly as long as the half length of the basitarsus.

Abdomen: Completely dark brown to black, sawsheath nearly black. Cerci dark brown, extending at most half the length of the sheath.

Sheath (Fig. 7c): Without microsculpture and shiny, in lateral view acuminate, nearly straight on upper and lower margin, in dorsal view nearly homogeneously curved. Bristles hardly longer than greatest width of sheath, widely distributed onto the lateral areas, in dorsal view slightly curled.

Saw (Fig. 9d): In lateral view with aulax slightly arcuated, the basal half not broadened, usually consisting of 18 segments. Ctenidea short, completely present from annulus 2. Serrulae flat, cypsellae and postcalcares well developed.

♂: Microstructure and colouring like in ♀, antenna dark brown, longer than thorax and abdomen together. Forewing with stigma completely dark brownish and transparent. Hypogydium dark brown, penisvalve (Fig. 11c) in lateral view nearly straight, the basal part hardly broadened. Spiny appendix narrow and slightly arcuated, basal lobe with lower edge conspicuously angled.

Gall (Fig. 12g): leaf fold, usually only one edge of the leaf folded down, creating a flat cavity for the larva.

Host plant: *S. purpurea* Linnaeus 1753, belonging to the subgenus *Vetrix*, section *Helix*, growing as a medium-sized or tall shrub, sometimes up to 6–8 m tall, occurring on the banks of streams often in close proximity to the flowing water (Skvortsov 1999).

Distribution: Central and Southern Europe.

Comment: *N. politus* was originally published in Briscke's illustration (Brischke & Zaddach 1883: table I, 14), a description in words followed in Brischke *in* Brischke & Zaddach (1884: 164, 167–168), who attributed the name to Zaddach (Blank & Taeger 1998: 148). In the literature *N. politus* was generally misinterpreted as a junior synonym of *leucapsis* Tischbein 1846 (Enslin 1915, Dittrich 1924, Blank & Taeger 1998, Lacourt 1999) and/or *viminalis* Hartig 1840 *nec* Linnaeus 1758 (Konow 1901, Jörgensen 1906). Brischke described the larvae, living in leaf folds on *S. helix* (= *purpurea* × *viminalis*, Hegi 1957). *Ph. purpureae* (Cameron 1890) is another valid species on *S. purpurea* which, in contrast to *polita,* produces curled leaf rolls. Some authors misinterpreted *politus* as a junior synonym of *leucostigmus* Cameron 1876 (Cameron 1885, Konow 1890), which has meanwhile proved to be a junior synonym of *ischnocera* (Thomson 1862) (see above).

Zaddach (*in* Brischke & Zaddach 1884: 171) described *Nematus sieboldii,* referring to the great similari-

ties between *sieboldii* and *polita*. The only differences he found were in the lengths of the antennae. In the literature *sieboldii* was regarded as a junior synonym of *leucapsis* Tischbein 1846 (Enslin 1915, Scobiola-Palade 1981, Blank & Taeger 1998, Lacourt 1999) and/or *viminalis* Hartig 1840 *nec* Linnaeus 1758 (Konow 1901, Jörgensen 1906). The type deposition was supposed to be in ZMHU due to the hint in the last sentence of Zaddach's description: "3 ♀ aus dem Berl. Museum, wohin Siebold sie aus Danzig geliefert hat" (Blank & Taeger 1998, Kopelke 1999). However, the original material was not found there (note by Dr. Frank Koch, ZMHU, Berlin). Due to the hint in the describtion ("sehr ähnlich meiner *politus*") as well as the great conformity of the original description with morphological characters of reared material, *sieboldii* is regarded here as a junior synonym of *Ph. polita*.

Enslin (1915) described *connata* as a new variety of *Phyllocopa leucapsis* (Tischbein 1846). However, the study of the types and reared material clearly show that *connata* and *polita* are conspecific. Thus, *connata* is regarded as a junior synonym of *polita*.

Zaddach's collection was deposited in the Zoological Museum in Königsberg and, as several authors assumed, was completely destroyed during world war II (Blank & Taeger 1998). A neotype of *Nematus politus* Zaddach is designated above in the interest of promoting nomenclatural stability. The morphological characters of the neotype reared from *S. purpurea* by the author correspond clearly with Zaddach's description.

Phyllocolpa prussica (Zaddach 1883)

‡*Nematus prussicus* Zaddach (1882, *in* Brischke 1882: 191) [*nomen nudum*].

Nematus prussicus Zaddach (1883, *in* Brischke & Zaddach 1883: table I (7), Fig. 4 [right leaf gall]), stat. n. Type locality (*in* Brischke & Zaddach 1884: 166): Nehrung, Schnakenburg, Neufähr, partim, on *S. cinerea*.

Pontania leucosticta (Hartig 1837) — Benson (1958: 200), on "*S. cinerea"*, partim; misidentification; Zinovjev (1998: 216), on "*S. cinerea"*, partim; misidentification.

Type material: *Nematus prussicus* Zaddach, NT ♀ (SMFH 2557*);* here designated. Neotype locality: Germany: Mecklenburg-Western Pomerania: Rügen, Zittvitz (Kopelke galls leg. 15. vii. 2005).

Additional material: ♀♀, ♂♂ reared from a total of 3331 galls, Kopelke leg. Austria: Lower Austria: Nondorf (20. vii. 2005: 181); Waldverchs (14. vii. 2003: 208) — Switzerland: Thurgau: Neuwilen, Bommer Weiher (15. vi. 2005: 52) — Germany: Baden-Württemberg: Honau (6. vii. 1999: 155); Hegne (10. vi. 2004: 102, 17. vi. 2005: 154, 4. vii. 2006: 128); Kattenhorn/Untersee (10. vi. 2004: 44, 14. vi. 2005: 29, 3. vii. 2006: 21); Markelfingen (10. vi. 2004: 35, 3. vii. 2006: 119); Markelfingen-Schlafbach (17. vi. 2005: 68); Möggingen (11. vi. 2004: 49); Radolfzell, Mindelsee (11. vi. 2005: 33); Hesse: Griesheim bei Darmstadt (17. vii. 1996: 8); Kühkopf, Mordhecke I (13. vii. 1988: 144; 12. vii. 1994: 46); Kühkopf, Mordhecke II (17. vii. 1996: 98, 9. vii. 1997: 64); NWR Kinzigaue (25. vi. 2001: 126); Taunus, Dorfweil (12. vii. 1995: 135); Rhön, Wüstensachsen, NWR Stirnberg (26. vi. 2003: 15); Mecklenburg-Western Pomerania: Rügen, Bergen/Kaiseritz (20. vii. 2005: 100); Rügen, Bergen/Nonnenweiher (22. vii. 2005: 108); Rügen, Dolgemost (21. vii. 2005: 105); Rügen, Glowitz (19. vii. 2005: 18); Rügen, Kiekut (23. vii. 2005: 100); Rügen, Neuensien (18. vii. 2005: 97); Rügen, Neukamp (28. vii. 2005: 15); Rügen, Stedar (17. vii. 2005: 110); Rügen, Zittvitz (15. vii. 2005: 73); Usedom, Trassenheide (12. viii. 2003: 242); Schleswig-Holstein: Katinger Watt (24. vi. 2005: 32); Kiel, Dietrichsdorf (21. vi. 2003: 15) — Danmark: Jylland: Logumkloster (25. vi. 2005: 20); Tondern (24. vi. 2005: 15) — Sweden: Jämtland: Östersund (6. viii. 2004: 48) — Lithuania: Jurbarkas (5. viii. 2006: 55); Neringa, Juodkrante (12. viii. 2006: 62), nr. Rociskiau (9. viii. 2006: 21), Palanga (13. viii. 2006: 61), Sudargas (9. viii. 2006: 20).

Description

♀: Head: Frontal area with only flat and broad depression, inner orbits sparcely pubescent at the margins of the eyes as in Fig. 2a, upper head shiny and slightly sculptured between shallow punctures, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus deeply incised. Colouring: Face bicolorous, with upper part black and lower part yellowish to brownish. In detail: Basis of mandibels, labrum, clypeus, supraclypeal area, and basal parts of the inner orbits pale yellowish to brownish, upper head black with hind orbits slightly gleaming brownish as in Fig. 3. Antenna dark brown to black.

Thorax: Black, mesonotum slightly sculptured between shallow punctures, mesopleura smoothly and shiny, with sparse pubescence as in Fig. 4a. Pronotum black with lateral angles marginally pale yellowish to whitish, tegulae pale yellowish. Forewing with stigma transparent and pale yellowish, the basal half paler, wing venation dark brown. Coxa black, femur, tibia, and tarsus yellowish brown, femur dark brown lined. Hindtarsus somewhat shorter than hindtibia, hindtibia spurs straight and slim, nearly as long as the half length of the basitarsus.

Abdomen: Completely dark brown to black, sawsheath black. Cerci pale brown and short, extending at most half the length of the sheath.

Sheath (Fig. 7d): Without microsculpture and shiny, in lateral view acuminate and sharply pointed, slightly convex on upper margin and slightly emarginated on lower, in dorsal view triangular and widish, lateral margin clearly angled. Bistles conspicuously longer than greatest width of sheath, widely distributed onto the lateral areas, in dorsal view clearly curled.

Saw (Fig. 9e): In lateral view with aulax only slightly arcuated, the basal half somewhat broadened, usually consisting of 19 segments. Ctenidea short, completely present from annulus 2. Serrulae flat, cypsellae and postcalcares well developed.

♂: Microstructure and colouring like in ♀, antenna dark brown, longer than thorax and abdomen togeth-

er. Forewing with stigma completely dark brownish and transparent. Hypogydium dark brown, penisvalve (Fig. 11d) in lateral view nearly straight, the basal part not broadened. Spiny appendix narrow and straight, basal lobe with lower edge conspicuously acute-angled.

Gall (Fig. 12h): Leaf fold, usually only one edge of the leaf folded down, creating a spacious cavity for the larva.

Host plant: *S. cinerea* Linnaeus 1753, belonging to the subgenus *Vetrix*, section *Vetrix,* growing as a medium-sized shrub, up to 4–5 m tall, occurring on eutrophic wetlands and muddy banks (Skvortsov 1999).

Distribution: central Europe.

Comment: *Ph. prussica* was originally published in Briscke's illustration (Brischke & Zaddach 1883: table I, Fig. 4 [right leaf gall]), the description in words followed a year later (Brischke & Zaddach 1884: 164, 166–167). Blanck & Taeger (1998) attributed the description to Zaddach which to their opinion is evident from the last sentence, showing the different opinion of Brischke on *N. prussicus*. This is supported by an earlier published list of the gall formers on *Salix,* in which Brischke (1882) has already mentioned *prussicus* with its gall type (leaf fold), attributing the name to Zaddach, but misattributing it to *S. viminalis*. In the literature this gall type on *S. cinerea* and/or on *S. viminalis* was misattributed to several species (see Kopelke 1999: tab. 17). *Ph. prussicus* (auct.) was generally regarded as a synonym of *leucapsis* Tischbein (Enslin 1915, Dittrich 1924, Lacourt 1999) and/or *viminalis* Hartig 1840 *nec* Linnaeus 1758 (Konow 1901, Jörgensen 1906). However, the authors did not consider the presence of different gall types on the same host plant species which derive from different leaf folders.

The description of *prussicus* is based on material from *S. viminalis* and/or *S. cinerea*. Brischke (*in* Brischke & Zaddach 1883: 166) already mentioned certain differences between the larvae reared from the different host plants. Therefore, due to the distinct host plant specificity of the gall formers the original material might have consist of two leaf-folding species: *Phyllocolpa prussica,* the leaf-folder on *Salix cinerea*, and/or *Ph. scotaspis* (Förster 1854), the leaf-roller on *S. viminalis*. Since Zaddach's collection was completely destroyed during world war II, a neotype is designated above in the interest of promoting nomenclatural stability. The morphological characters of the neotype reared from *S. cinerea* correspond clearly with Zaddach's description.

Phyllocolpa pschornwalcheri sp. n.

Phyllocolpa sp. 1 — Kopelke (1999: 151), on *S. appendiculata.*

Phyllocolpa sp. 1 — Kopelke (2003a: 163–189), on *S. appendiculata*.

Phyllocolpa sp. 1/*appendiculata* — Kopelke (2003b: 277–312), on *S. appendiculata*.

Holotype: ♀ (SMFH 2558), Austria: Salzburg: Ramsau, Silberklamm (Kopelke galls leg. 29. vii. 2003), galls on *S. appendiculata*, rearing no. SZ 27-2003, emerged 29. i. 2004 (laboratory), in coll. Senckenberg, Frankfurt am Main, Germany.

Paratypes (in total 2 ♀♀, 2 ♂♂): Austria: 1 ♀ (SMFH 2559a), 2 ♂♂ (SMFH 2559c–d) together with holotype; 1 ♀ (SMFH 2559b) Austria: Salzburg: Defereggental, St. Jakob, Trojer Alm (Kopelke galls leg. 7. viii. 2002) — The HT and PT were reared from *Salix appendiculata*.

Additional material: ♀♀, ♂♂ reared from a total of 253 galls, Kopelke leg.: Austria: Salzburg: Defereggental, St. Jakob, Trojer Alm (7. viii. 2002: 9 galls); Austria: Salzburg, Ramsau, Silberklamm (29. vii. 2003: 180 galls); Ramsau, Schladming, Untertal (30. vii. 2003: 52); — Switzerland: Graubünden: Lago di Lei (14. viii. 2000: 12).

Description

♀: Head: Frontal area with deep and broad depression, inner orbits sparcely pubescent at the margins of the eyes as in Fig. 2a, upper head shiny and slightly sculptured between shallow punctures, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus deeply incised. Colouring: Face bicolorous, with upper part black and lower part yellowish to brownish. In detail: Basis of mandibels, labrum, clypeus, supraclypeal area, and basal parts of the inner orbits yellowish to brownish, upper head black with hind orbits slightly gleaming brownish as in Fig. 3. Antenna black.

Thorax: Black, mesonotum slightly sculptured between shallow punctures, mesopleura smoothly and shiny, with sparse pubescence as in Fig. 4a. Pronotum black with lateral angles marginally pale yellowish to whitish, tegulae pale yellowish. Forewing with stigma transparent and pale yellowish, the basal half paler, wing venation dark brown. Sometimes cell 1RS and 2RS of forewing not devided by vein 2r–m. Coxa black, tibia and tarsus yellowish to dark brown. Hindtarsus somewhat shorter than hindtibia, hindtibia spurs straight and slim, nearly as long as the half length of the basitarsus.

Abdomen: Completely black, sawsheath black. Cerci dark brown and long, extending more than half of the sheath length.

Sheath (Fig. 7e): Without microsculpture and shiny, in lateral view shortish and acuminate, sharply pointed, slightly convex on upper margin and conspicuously emarginated on lower, in dorsal view triangular and widish, lateral margin angled. Bistles conspicuously longer than greatest width of sheath, widely distributed onto the lateral areas, in dorsal view clearly curled.

Saw (Fig. 9f): In lateral view conspicuously arcuated, usually consisting of 19 segments. Ctenidea short, completely present from annulus 2. Serrulae flat, cypsellae and postcalcares well developed.

♂: Microstructure and colouring like in ♀, antenna black, longer than thorax and abdomen together. Forewing with stigma completely dark brownish and transparent. Hypogydium pale to dark brown, penisvalve

(Fig. 11e) in lateral view nearly straight, the basal part usually not broadened. Spiny appendix acuminate and narrow, slightly arcuated, basal lobe with lower edge homogeneously curved.

Gall: Leaf fold, usually only one edge of the leaf folded down, creating a spacious cavity for the larva.

Host plant: *S. appendiculata* Villars 1789, belonging to the subgenus *Vetrix*, section *Vetrix,* with a shrubby habit and occurring on rocks, moist slopes, and banks of streams in the montane forest and subalpine zones (Skvortsov 1999).

Distribution: Alps, central Europe.

Comment: *S. appendiculata* was not known so far as a host plant of a leaf folder. Two different gall types of *Phyllocolpa* were found on this willow host by the present author, one of which belonging to the species described in this paper. The leaf folds on *S. appendiculata* which are twisted along the longitudinal axis are made by an so far undescribed species of the *leucapsis*-group (Kopelke in press). The morphological characters of *Ph. pschornwalcheri* do not correspond with any other species of the *leucosticta*-group.

The species name is dedicated to Prof. Dr. Hubert Pschorn-Walcher of Neulengbach, Austria, a collegue helpful at all times who died in October 2006 on his 80th birthday. I owe to him countless fruitful discussions and generous support for my studies on sawflies. Last but not least we do not forget his special humor.

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