

The European species of the genus *Phyllocolpa*, part II: the *leucapsis*-group

(Insecta, Hymenoptera, Tenthredinidae, Nematinae)

JENS-PETER KOPELKE

Abstract

The European species of the *Phyllocolpa leucapsis*-group (Tenthredinidae: Nematinae) are revised. This species group is composed of 6 species, including 2 new taxa: *Phyllocolpa acutiserra* (LINDQUIST 1948), *Ph. alienata* (FÖRSTER 1854), stat. n., *Ph. leucapsis* (TISCHBEIN 1846) (= *Nematus (Pontania) coriaceus* BENSON 1953, syn. n.), *Ph. rolleri* LISTON 2005, *Ph. spirappendiculata* sp. n., *Ph. spirhelvetica* sp. n. The species of the *leucapsis*-group induce open leaf galls with both edges of the leaf rolled down, often intensely twisted along the longitudinal axis. Oviposition occurs at one of the freshly unfolded young leaves below the apical bundle. Collections for this study have been made since 1991 in 79 natural sites of 9 European countries. About 8200 galls of this species-group were reared in the laboratory under ambient conditions. The material was collected from 6 willow species and two hybrids. Host specificity was tested by lots of ovipositing experiments. An identification key, descriptions, and illustrations are presented for the adults and galls, supplemented by distribution data. The females of the *leucapsis*-group can be separated from related genera by the normally longer cerci and acuminate sheath which in lateral view is usually not emarginate ventrally as it is, for example, in species of the *leucosticta*-group of the genus *Phyllocolpa*.

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

Die europäischen Arten der Gattung *Phyllocolpa*, Teil II: die *leucapsis*-Gruppe (Hymenoptera, Tenthredinidae, Nematinae)

Z u s a m m e n f a s s u n g : Die Arten der *Phyllocolpa leucapsis*-Gruppe (Tenthredinidae: Nematinae) in Europa werden revidiert. Diese Verwandtschaftsgruppe setzt sich aus 6 Arten zusammen, von denen 2 neu beschrieben werden: *Phyllocolpa acutiserra* (LINDQUIST 1948), *Ph. alienata* (FÖRSTER 1854), stat. n., *Ph. leucapsis* (TISCHBEIN 1846) (= *Nematus (Pontania) coriaceus* BENSON 1953, syn. n.), *Ph. rolleri* LISTON 2005, *Ph. spirappendiculata* sp. n., *Ph. spirhelvetica* sp. n. Die Weibchen dieser Verwandtschaftsgruppe erzeugen auf ihren Wirtspflanzen (*Salix* spp.) offene Blattgallen in Gestalt von nach unten umgelegten Rollen, die oft der Länge nach verdreht sind. Sie werden im Bereich der Sproßspitze oftmals auf nacheinander folgenden Blättern erzeugt. Seit 1991 wurden ca. 8200 Gallen an 79 verschiedenen Lokalitäten in 9 europäischen Ländern gesammelt und gezüchtet. Das Material stammt von 6 verschiedenen Weidenarten und zwei 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 *leucapsis*-Gruppe können von ihren Verwandten durch die meist längeren Cerci und eine zugespitzte Sägescheide unterschieden werden, die ventral gewöhnlich nicht wie bei Arten der *leucosticta*-Gruppe der Gattung *Phyllocolpa* konkav ausgerandet ist.

Author's address: Dr. Jens-Peter KOPELKE, Forschungsinstitut Senckenberg, Senckenberganlage 25, D-60325 Frankfurt am Main, Germany; jens.kopelke@senckenberg.de

Introduction

The systematics and biology of the European leaf folders of the genus *Phyllocolpa* BENSON 1960 is still little known. It was generally assumed that *Phyllocolpa* species are able to induce their galls on a broader spectrum of host plant species (BENES 1968, MUCHE 1970, VIKBERG 1970, HELLEN 1977, ZINOVJEV 1993, LISTON 1995, LACOURT 1999). Thus, up to 12 willow species were listed as host plants of *Ph. leucapsis* auct. (TAEGER et al. 1998). Otherwise, from certain host plant species is mentioned to harbour two different species of leaf rollers (LISTON 1995, TAEGER et al. 1998, LACOURT 1999), what is confirmed by the studies of the present author: The species pairs, for example, *Ph. prussica* (ZADDACH 1883) with *Ph. leucapsis* (TISCHBEIN 1846) living on *Salix cinerea* LINNAEUS 1753 and/or *Ph. erythropya* (FÖRSTER 1854) with *Ph. alienata* (FÖRSTER 1854) living on *Salix aurita* LINNAEUS 1753 were reared from different gall types of the same host plant species. Thus, different *Phyllocolpa* species living on the same host plant species apparently produce different gall types and belong to different species groups (see KOPELKE 2007b: tab. 2).

The separation of species-groups is based on biological characters, the gall type, and morphological characters mainly of females (KOPELKE 2007a). Five species-groups of the genus *Phyllocolpa* are separated by the present author, i.e. the *leucosticta*-, *leucapsis*-, *crassispinata*-, *scotaspis*-, and the *piliserra*-group, only two of which are revised to date. The species-richest *leucosticta*-group in Europe is dealt with in a separate paper (KOPELKE 2007a). The *crassispinata*-group including North American species was recently revised by ZINOVJEV & VIKBERG (1999), the revision of the European species is updated by the present author (KOPELKE 2007b). The present study is based exclusively on reared and original material to identify the variability of morphological characters, supplemented by oviposition experiments for checking the host plant specificity (KOPELKE 1999, 2003a, 2007a).

Material and methods

Sampling and rearing: Since 1991 the author has reared about 8200 galls of the *Phyllocolpa leucapsis*-group from 6 willow species (*Salix appendiculata*, *aurita*, *caprea*, *cinerea*, *helvetica*, and *lapponum*) and 2 hybrids (*aurita* × *caprea*, *lapponum* × *glauca*). The material was collected in 79 natural sites of 9 European countries. The rearing of entire galls was conducted in the laboratory under ambient conditions (specification in KOPELKE 2003a, 2007a).

Types studied: Types of altogether 50 species were examined, including the designation of lectotypes for 26 species (specified in KOPELKE 2007a). For most species the records of host plants are based on reared specimens.

Types dealt with in this paper/collection: *Nematus alienatus* FÖRSTER (LT/ZSM), *Nematus leucapsis* TISCHBEIN (NT/SMF),

Nematus (Pontania) coriaceus BENSON (HT/BMNH), *Phyllocolpa rolleri* LISTON (6 PT/SMF), *Phyllocolpa spirappendiculata* KOPELKE (HT, 19 PT, SMF), *Phyllocolpa spirhelvetica* KOPELKE (HT, 2 PT/SMF), *Pontania acutiserra* LINDQUIST (HT, 11 PT/ZMH).

The following acronyms are used for Museums which have loaned type material: BMNH: The Natural History Museum, London, U.K.; SMF: Senckenberg Museum und Forschungsinstitut, Frankfurt, Germany; ZMH: Zoological Museum, University of Helsinki, ZSM: Zoologische Staatssammlung, Munich, Germany.

Key to the females of European species of the *Phyllocolpa leucapsis*-group (including some notes to males, hostplants, galls, and distribution)

- 1 Sawsheath in dorsal view triangular with lateral margin normally clearly angled, proportion (Fig. 1a) of length [a] to maximal width [b] > 1,3 (Figs. 1b, 1d, 1f)..... 2
- 1* Sawsheath in dorsal view triangular with lateral margin normally slightly angled and/or homogeneously rounded, proportion (Fig. 1a) of length [a] to maximal width [b] < 1,1 (Figs. 1c, 1e, 1g) 4
- 2 Cerci long, extending more than half of the sheath length; sheath (Fig. 1f) in lateral view slightly convex on upper margin, nearly straight on lower. Saw (Fig. 2e) consisting of 18 segments. Ctenidea short, present from annulus 2. Male: Penisvalve (Fig. 3d) in lateral view slightly arcuated, basal lobe with lower edge sharply angled. Gall (Fig. 4e) on *Salix appendiculata*, usually both edges of the leaf folded, twisted along the longitudinal axis. Distribution: Alps..... *spirappendiculata* sp. n.
- 2* Cerci shorter, extending at most half the length of the sheath (Figs. 1b, 1d) 3
- 3 Sheath (Fig. 1b) in lateral view nearly straight on upper and lower margins. Saw (Fig. 2a) consisting of 15 segments, ctenidea present from annulus 3. Gall (Fig. 4a) on *Salix lapponum*, usually both edges of the leaf folded, twisted along the longitudinal axis. Distribution: Northern Europe..... *acutiserra*
- 3* Sheath (Fig. 1d) in lateral view clearly convex on upper margin, nearly straight on lower. Saw (Fig. 2c) consisting of 17 segments, ctenidea present from annulus 3. Male: Penisvalve (Fig. 3b) in lateral view clearly arcuated, basal lobe with lower edge sharply angled. Gall (Fig. 4c) on *Salix cinerea*, usually both edges of the leaf folded, twisted along the longitudinal axis. Distribution: Central- and Northern Europe *leucapsis*

- 4 Sheath (Fig. 1c) in lateral view slightly convex on upper margin and nearly straight on lower. Saw (Fig. 2b) consisting of 17 segments, ctenidea present from annulus 3. Male: Penisvalve (Fig. 3a) in lateral view not arcuated, basal lobe with lower edge clearly angled. Gall (Fig. 4b) on *Salix aurita*, usually both edges of the leaf folded, twisted along the longitudinal axis. Distribution: Central- and Northern Europe *alienata*
- 4* Sheath (Fig. 1e, 1g) in lateral view nearly straight on upper margin 5
- 5 Sheath (Fig. 1e) in lateral view slightly emerginated on lower margin, in dorsal view triangular with lateral margin homogeneously rounded, proportion (Fig. 1a) of length [a] to maximal width [b] > 1, cerci black. Saw (Fig. 2d) consisting of 17 segments, ctenidea present from annulus 2. Male: Penisvalve (Fig. 3c) in lateral view slightly arcuated, basal lobe with lower edge sharply angled. Gall (Fig. 4d) on *Salix hastata*, usually both edges of the leaf folded, twisted along the longitudinal axis. Distribution: Lower Tatra..... *rolleri*
- 5* Sheath (Fig. 1g) in lateral nearly straight on lower margin, in dorsal view triangular with lateral margin slightly angled, proportion (Fig. 1a) of length [a] to maximal width [b] < 1, cerci dark brown. Saw (Fig. 2f) consisting of 18 segments, ctenidea present from annulus 3. Gall (Fig. 4f) on *Salix helvetica*, usually both edges of the leaf folded, twisted along the longitudinal axis. Distribution: Western Alps *spirhelvetica* sp. n.

Taxonomy

Phyllocolpa acutiserra (LINDQUIST 1948)

Pontania acutiserra LINDQUIST (1948: 66). — Type locality: Finland, Outakoski, Utsjoki.

Material: *Pontania acutiserra* LINDQUIST (ZMH), holotype ♀, 1 ♂, 10 ♀♀ paratypes (labelled by LINDQUIST as holotype, paratypes, and cotypes; holotype and paratype labels added by the present author).

Additional material: ♀♀ reared from a total of 1068 galls, KOPELKE leg.: Norway: Finnmark, Olderfjord, Hatter (9. VIII. 2001: 2 galls); Finnmark: S.-Varanger, Ferdesmyra (5. VIII. 2001: 15); Hordaland: Seljestad nr. Odda (24. VIII. 1993: 42, 22. VIII. 2001: 73); Hordaland: Vikafjell bei Viksøyri (19. VIII. 2001: 1); Nordland: Arctic Circle I (15. VIII. 2001: 174, 12. VIII. 2004, 192); Nordland: Arctic Circle II (15. VIII. 1993: 298, 16. VIII. 1997: 237); Sör-Trondelag: Dovrefjell: Grönbakken (22. VIII. 2004: 12). — Finland: Lappin Kilpisjärvi (10. VIII. 2001: 9). — Sweden: Lappland: Storuman (8. VIII. 2004: 13).

Description ♀

Head: Frontal area with deep and broad depression, inner orbits nearly entirely pubescent, upper head shiny and conspicuously sculptured, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus conspicuously incised. Colouring: Face black apart from basis of mandibels, labrum, and front margin of clypeus yellowish, upper head black, sometimes with hind orbits slightly gleaming brownish. Antenna black (primary colouring of head, thorax, and abdomen in holotype dark brown).

Thorax: Black coloured, mesonotum with microsculpture between slight punctures, mesopleura unsculptured and conspicuously shiny, with sparse pubescence on the upper half. Pronotum black, with lateral angles marginally yellowish, tegulae yellowish. Forewing with

stigma transparent and light yellowish brown, basal half paler, wing venation pale to dark brown. Legs with coxa black, tibia yellowish brown, tarsomeres somewhat darker. Hindtarsus as long as hindtibia, hindtibia spurs unequally long and nearly straight, inner spur nearly as long as the half length of the basitarsus.

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

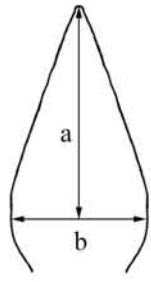
Sheath (Fig. 1b): With slight microsculpture and shiny, in lateral view acuminate, nearly straight on upper as well as lower margin, in dorsal view nearly triangular with lateral margin clearly angled, proportion (Fig. 1a) of length [a] to maximal width [b] 1,3. Sheath hairs widely distributed on the lateral areas, in dorsal view slightly curled.

Saw (Fig. 2a): In lateral view with aulax slightly arcuated, consisting of 15 segments. Ctenidea short, present from annulus 3. Serrulae flattish, cypsellae and postcalcares slightly developed.

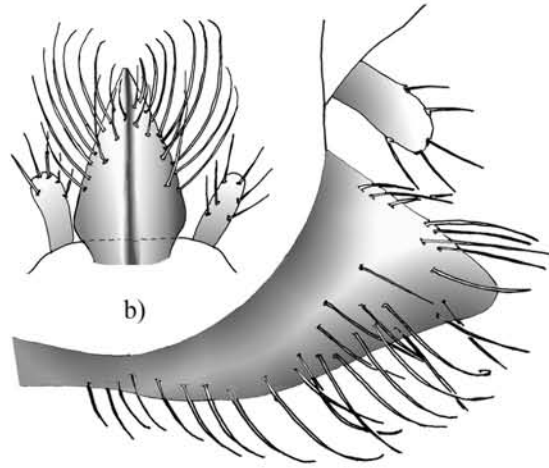
♂ (paratype): Microstructure and colouring like ♀, antenna are missing in the paratype. Forewing with stigma completely pale brownish and transparent, nearly as pale as wing area. Hypogydium pale brown, preparation of penisvalve not available.

Gall (Fig. 4a): Leaf roll, usually both edges of the leaf rolled, twisted along the longitudinal axis.

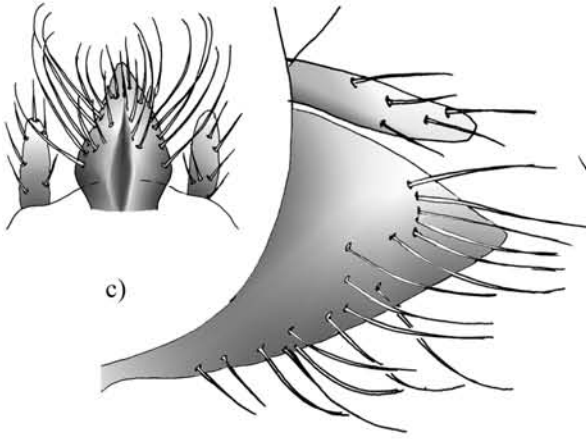
Host plant: *S. lapponum* LINNAEUS 1753, belonging to the subgenus *Vetrix*, section *Villosae*, a shrub up to 1,5 m, occurring on eutrophic and mesotrophic wetlands, damp meadows and forests, common in the forest-tundra belt and subalpine zone of northern mountains (SKVORTSOV 1999).



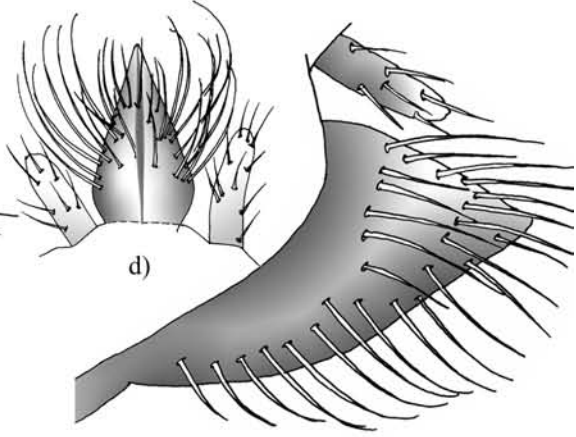
a)



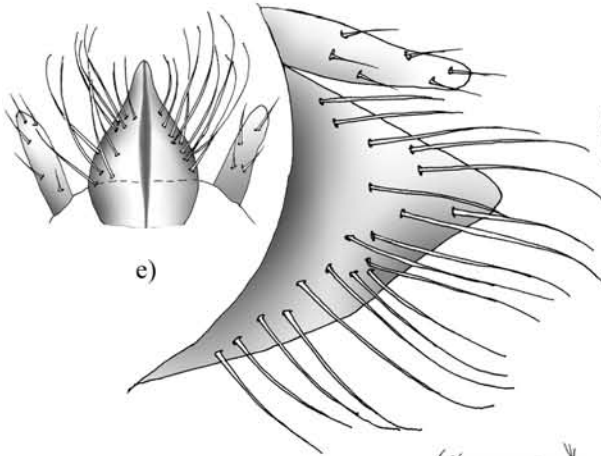
b)



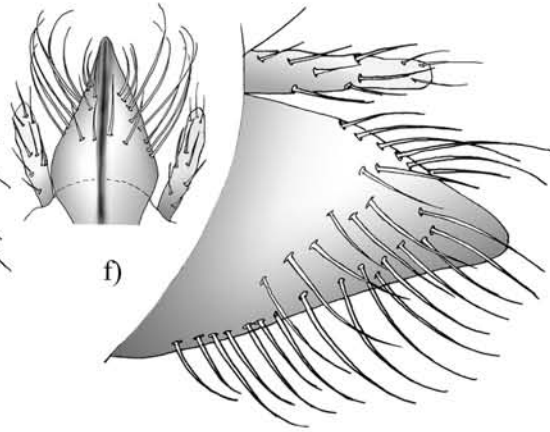
c)



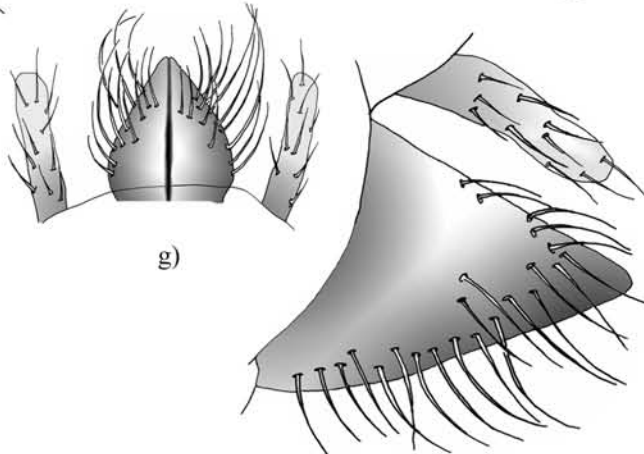
d)



e)



f)



g)

Distribution: Northern Europe, locally occurring in high densities.

Comment: LINDQUIST (1948) described *acutiserra* from material collected in Finnish Lapland. He did not mention a host plant. In the literature *acutiserra* is misattributed to the willow hosts *S. glauca* and/or *S. hastata*, (VIKBERG 1970, SCHEDL 1976, HELLEN 1977, LISTON 1995, ZINOVJEV 1998, ZINOVJEV & VIKBERG 1998). According to the present study the females of *Ph. acutiserra* induce the twisted leaf rolls only on *S. lapponum*.

***Phyllocolpa alienata* (FÖRSTER 1854)**

Nematus alienatus FÖRSTER (1854: 334), stat. n. — Type locality: Germany, Aachen.

Nematus (Pontania) coriacea BENSON (1953: 150); syn. n. — Type locality: Bucks., Whaddon Chase.

Pontania leucapsis (TISCHBEIN 1846): ZINOVJEV (1998: 216), on “*S. aurita*”, partim; misidentification.

Pontania leucosticta (HARTIG 1837): BENÉS (1968: 119), “both leaf edges rolled underneath ... and irregularly wrinkled”, fig. 4 on “*S. aurita*”; misidentification.

Material: *Nematus alienatus* FÖRSTER (ZSM), lectotype ♀ (designated by KOPELKE 2007a); *Nematus (Pontania) coriacea* BENSON (BMNH), holotype ♀.

Additional material: ♀♀, ♂♂ reared from a total of 1479 galls, KOPELKE leg.: Austria: Salzburg, Schladming, Untertal, Riesachfälle (30. vii. 2003: 15 galls). — Germany: Hesse: Taunus, Usingen (12. vii. 1995: 31); Vogelsberg, Hoherodskopf (4. vii. 1995: 11); Wetterau, Limeshain, Rommelhausen (2. vii. 1995: 42, 2. viii. 1996: 131, 13. vii. 1997: 74); Wüstensachsen, NWR Stirnberg (26. vi. 2003: 310, 28. vii. 2004: 34); Baden-Württemberg: Radolfzell, Mettnau (18. vi. 2005: 39, 2. vii. 2006: 68), Black Forest, Altglashütten (16. vii. 2004: 160); Mecklenburg-Western Pomerania: Rügen, Bergen, Nonnenweiher (22. vii. 2005: 18). — Denmark: Jylland: Skaerbaek (23. vi. 2005: 10). — Norway: Hordaland: Skutevik (21. viii. 2001: 219); Nor-Trøndelag: Hammer (19. viii. 2004: 66); Sør-Trøndelag: Nordfjorden (18. viii. 1997: 59), Leira nr. Trondheim (20. viii. 2004: 75), Ostfok: Kjölén nr. Halden (26. viii. 2004: 18). — Lithuania, Sudargas (9. viii. 2006: 99).

Description: ♀

Head: Frontal area with deep and broad depression, inner orbits nearly entirely pubescent, upper head shiny and slightly sculptured, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus conspicuously incised. Colouring: Face black apart from basis of mandibels, labrum, and front margin of clypeus yellowish, upper head black with hind orbits slightly gleaming brownish. Antenna black.

Thorax: Black coloured, mesonotum slightly sculptured between punctures, mesopleura unsculptured and conspicuously shiny, with sparse pubescence on the

upper half. Pronotum black, with lateral angles marginally yellowish, tegulae yellowish. Forewing with stigma transparent and brownish, basal half paler, wing venation dark brown. Legs with coxa black, tibia yellowish brown, tarsomeres somewhat darker. Hindtarsus somewhat shorter than hindtibia, hindtibia spurs unequally long and straight, inner spur nearly as long as the half length of the basitarsus.

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

Sheath (Fig. 1c): Nearly unsculptured and shiny, in lateral view acuminate, slightly convex on upper margin and nearly straight on lower, in dorsal view nearly triangular with lateral margin slightly to clearly angled, proportion (Fig. 1a) of length [a] to maximal width [b] 1,1. Sheath hairs widely distributed on the lateral areas, in dorsal view slightly curled.

Saw (Fig. 2b): In lateral view with aulax slightly arcuated, consisting of 17 segments. Ctenidea short, present from annulus 3. Serrulae flattish, cypsellae and postcalcares slightly developed.

♂: Microstructure and colouring like ♀, face somewhat paler, antenna dark brown, longer than thorax and abdomen together. Forewing with stigma completely dark brown and transparent. Hypogydium dark brown to black, penisvalve (Fig. 3a) in lateral view not arcuated, the basal part usually not broadened. Spiny appendix narrow, nearly straight, basal lobe with lower edge clearly angled.

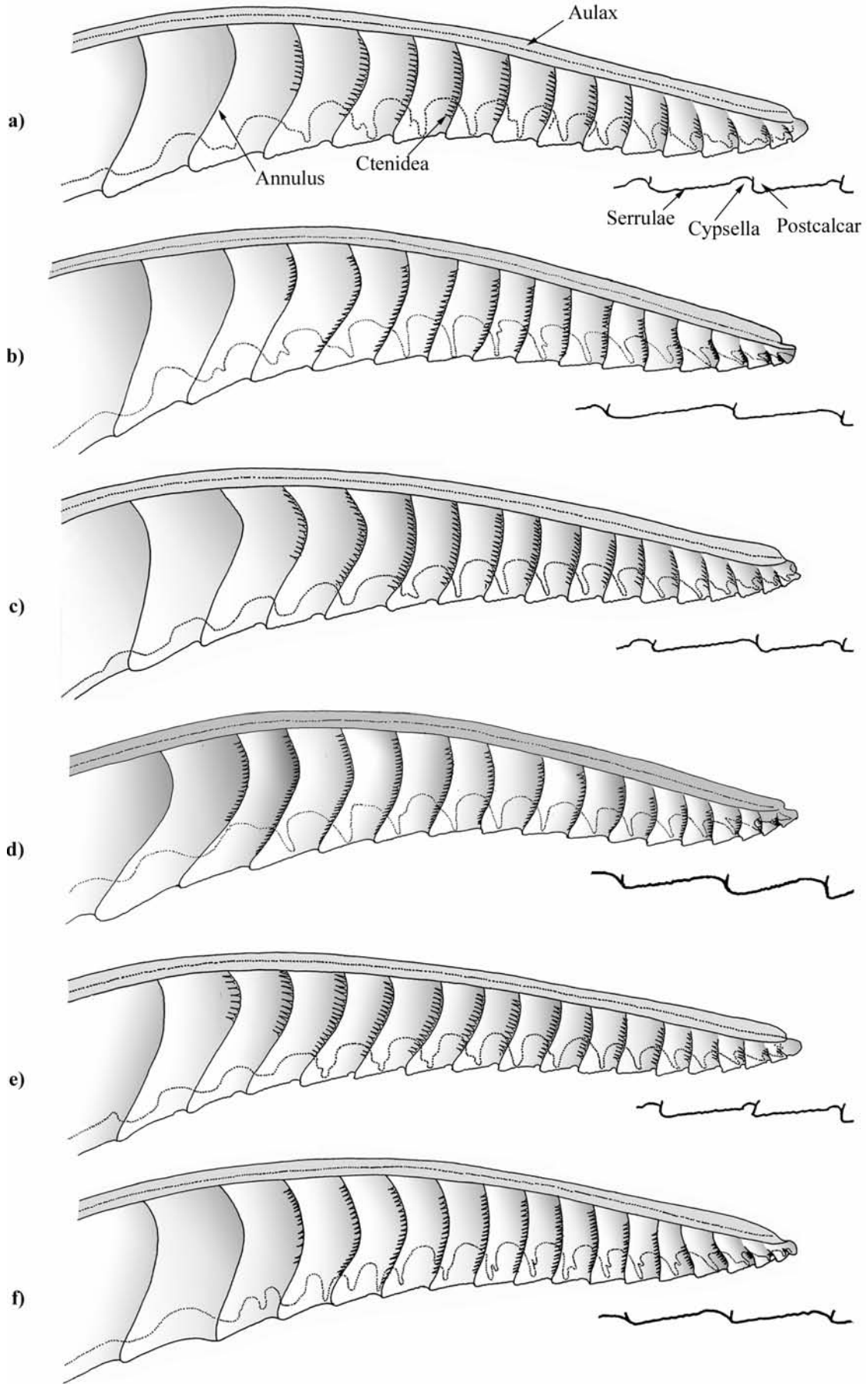
Gall (Fig. 4b): Leaf roll, usually both edges of the leaf rolled, twisted along the longitudinal axis.

Host plant: *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).

Distribution: Central and Northern Europe.

Comment: FÖRSTER described *alienata* without mentioning the host plant or the gall type of this species. In the literature *Ph. alienata* is considered as a synonym of different species, i.e. *P. viminalis* (HARTIG 1840 nec LINNAEUS 1758) (KONOW 1901, JÖRGENSEN 1906), *Ph. anglica* (CAMERON 1877) (SPOONER 1991), and *Ph. leucapsis* (TISCHBEIN 1846) (VIITASAARI & VIKBERG 1985, LACOURT 1999). Besides, a large host plant spectrum was misattributed to this gall former, i.e. *acuminata* MILL. 1768, *alba* L. 1753, *aurita* L. 1753, *caprea* L. 1753, *cinerea* L. 1753, *fragilis* L. 1753, *pentandra* L. 1753, *phylicifolia* L. 1753, *purpurea* L. 1753, and *viminalis* L. 1753 (JÖR-

Fig. 1a–g: Sawsheaths of the European species of the *Phyllocolpa leucapsis*-group in dorsal and lateral view: Fig. 1a. Measurements of maximal width [a] and length [b] of a sawsheath; Fig. 1b. *acutiserra* (LINDQUIST 1948); Fig. 1c. *alienata* (FÖRSTER 1854); Fig. 1d. *leucapsis* (TISCHBEIN 1846); Fig. 1e. *rolleri* LISTON 2005; Fig. 1f. *spirappendiculata* sp. n.; Fig. 1g. *spirhelvetica* sp. n.



GENSEN 1906, LACOURT 1999). The studies of the present author have shown that the morphological characters of the lectotype of *alienata* correspond clearly with material reared from twisted leaf rolls on *S. aurita*. Some authors (BRISCHKE & ZADDACH 1876, 1884, BRISCHKE 1882, JÖRGENSEN 1906) have already mentioned such leaf rolls on *S. aurita*, however, they misattributed them to *Ph. leucosticta* (HARTIG 1837) which makes more or less flattish leaf folds on *Salix caprea* LINNAEUS 1753.

***Phyllocolpa leucapsis* (TISCHBEIN 1846)**

Nematus leucapsis TISCHBEIN (1846: 77). — Type locality: Germany, Eutin.

Pontania coriacea (BENSON 1953): VIKBERG (1970: 12) “in rolled and curled leaves of ... *S. cinerea*”, misidentification.

Pontania coriacea (BENSON 1953): ZINOVJEV (1998: 216), on “*S. cinerea*”, partim; misidentification.

Phyllocolpa coriacea (BENSON 1953): ZINOVJEV & VIKBERG (1999: 292), “wrinkled leaf-rolls on *S. cinerea*”, misidentification.

Material: *Nematus leucapsis* TISCHBEIN (SMFH 2561), neotype ♀ (designated by KOPELKE 2007a). Neotype locality: Germany, Mecklenburg-Western Pomerania, Rügen, Zittvitz, KOPELKE galls leg. 15. vii. 2005, rearing-no. SZ 51/2005; emerging 6. v. 2006.

Additional material: ♀♀, ♂♂ reared from a total of 4238 galls, KOPELKE leg.: Sweden: Jämtland: Östersund (6. viii. 2004: 34). — Lithuania: Jurbarkas (5. viii. 2006: 44), Nemirseta nr. Palanga (14. viii. 2006: 28), Palanga (13. viii. 2006: 25), nr. Rociskiai (9. viii. 2006: 33), Siluva (6. viii. 2006: 73), Sudargas (9. viii. 2006: 81). — Denmark: Jylland: Gammelby (29. vii. 2005: 29), Logumkloster (25. vi. 2005: 5), Skaerbaek (23. vi. 2005: 18), Tondern (24. vi. 2005: 31). — Germany: Schleswig-Holstein: Kiel, Dietrichsdorf (29. vi. 2002: 81; 21. vi. 2003: 63), Katinger Watt (24. vi. 2005: 65), Mecklenburg-Western Pomerania: Rügen, Bergen, Kaiseritz (20. vii. 2005: 59), Rügen, Bergen, Nonnenweiher (22. vii. 2005: 118), Rügen, Dolgemost (21. vii. 2005: 34), Rügen, Glowitz (19. vii. 2005: 31), Rügen, Kiekut (23. vii. 2005: 14), Rügen, Neuensien (18. vii. 2005: 11), Rügen, Neukamp (24. vii. 2005: 72), Rügen, Stedar (17. vii. 2005: 71), Rügen, Zittvitz (15. vii. 2005: 21), Rügen, Zittvitz II (16. vii. 2005: 35), Hessen: Griesheim nr. Darmstadt (17. vii. 1996: 102); Mörfelden (17. vii. 1996: 135; 27. vi. 1995: 183); Taunus, Dorfweil (12. vii. 1995: 92); Taunus, Hunoldstal (12. vii. 1995: 75); Taunus, Usingen (12. vii. 1995: 84); Wetterau, Altenstadt-Höchst (2. vii. 1995: 163); Wetterau, Ortenberg III (4. vii. 1995: 25); Wüstensachsen, NWR Stirnberg (26. vi. 2003: 111, 28. vii. 2004: 33); Baden-Württemberg: Hegne nr. Allensbach (10. vi. 2004: 108, 17. vi. 2005: 111, 4. vii. 2006: 63), Bodensee, Gnadensee, Horn (11. vi. 2005: 42), Bodensee, Untersee, Kattenhorn nr. Wangen (10. vi. 2004: 180, 14. vi. 2005: 220, 4. vii. 2006: 55), Markelfingen (10. vi. 2004: 184, 3. vii. 2006: 61), Markelfingen, Schlafbach (17. vi. 2005: 99), Möggingen (11. vi. 2004: 55), Radolfzell, Mindelsee

(11. vi. 2005: 10). — Austria: Niederösterreich: Waldverchs, ALTENHOFER leg. (14. vii. 2003: 212), Nondorf, ALTENHOFER leg. (20. vii. 2005: 70), Waldreichs, ALTENHOFER leg. (22. vii. 2005: 528). — Switzerland: Thurgau: Neuwilten, Bommer Weiher (15. vi. 2005: 62).

Description: ♀

Head: Frontal area with deep and broad depression, inner orbits nearly entirely pubescent, upper head shiny and slightly sculptured, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus conspicuously incised. Colouring: Face black apart from basis of mandibels, labrum, and front margin of clypeus yellowish, supraclypeal area brownish to dark brown, upper head black, sometimes with hind orbits slightly gleaming brownish. Antenna black.

Thorax: Black coloured, mesonotum slightly punctured, mesopleura unsculptured and conspicuously shiny, with sparse pubescence on the upper half. Pronotum black, with lateral angles marginally yellowish, tegulae yellowish. Forewing with stigma transparent and dark brown, basal half paler, wing venation dark brown. Legs with coxa black, tibia yellowish brown, tarsomeres somewhat darker. Hindtarsus as long as hindtibia, hindtibia spurs unequally long and nearly straight, inner spur as long as the half length of the basitarsus.

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

Sheath (Fig. 1d): With slight microsculpture and shiny, in lateral view acuminate, clearly convex on upper margin, nearly straight on lower, in dorsal view nearly triangular with lateral margin clearly angled, proportion (Fig. 1a) of length [a] to maximal width [b] 1.4. Sheath hairs widely distributed on the lateral areas, in dorsal view slightly curled.

Saw (Fig. 2c): In lateral view with aulax slightly arcuated, consisting of 17 segments. Ctenidea short, present from annulus 3. Serrulae flattish, cypsellae and postcalcares slightly developed.

♂: Microstructure and colouring like ♀, antenna dark brown, longer than thorax and abdomen together. Forewing with stigma completely dark brown and transparent. Hypopygium dark brown, penisvalve (Fig. 3b) in lateral view clearly arcuated, the basal part usually broadened. Spiny appendix narrow, nearly straight, basal lobe with lower edge sharply angled.

Gall (Fig. 4c): Leaf roll, usually both edges of the leaf rolled, twisted along the longitudinal axis.

Host plant: *S. cinerea* LINNAEUS 1753, belonging to the subgenus *Vetrix*, section *Vetrix*, growing as a medi-

Fig. 2a–f: Saws of the European species of the *Phyllocolpa leucapsis*-group. Fig. 2a. *acutiserra* (LINDQUIST 1948); Fig. 2b. *alienata* (FÖRSTER 1854); Fig. 2c. *leucapsis* (TISCHBEIN 1846); Fig. 2d. *rolleri* LISTON 2005; Fig. 2e. *spirappendiculata* sp. n.; Fig. 2f. *spir-helveticus* sp. n.

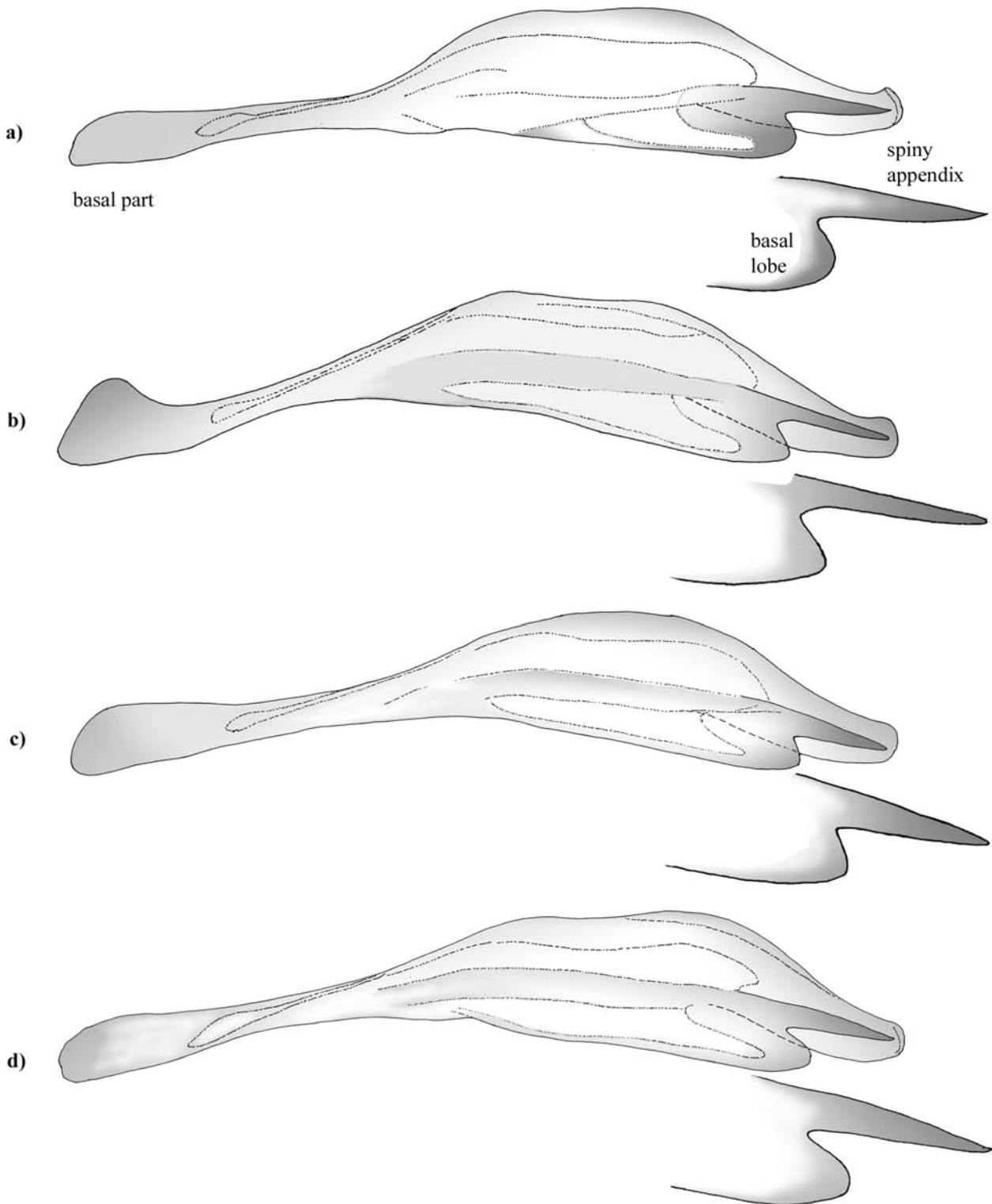


Fig. 3a–d: Penisvalves of the European species of the *Phyllocolpa leucapsis*-group. Fig. 3a. *alienata* (FÖRSTER 1854); Fig. 3b. *leucapsis* (TISCHBEIN 1846); Fig. 3c. *rolleri* LISTON 2005; Fig. 3d. *spirappendiculata* sp. n.

um-sized shrub, up to 4–5 m tall, occurring on eutrophic wetlands and muddy banks (SKVORTSOV 1999).

Distribution: Central- and Northern Europe, locally occurring in high densities.

Comment: TISCHBEIN (1846) described *leucapsis* without mentioning the host plant or the gall type. In the literature *Ph. leucapsis* is also considered as a synonym of *P. viminalis* (HARTIG 1840 nec LINNAEUS 1758)

(KONOW 1901, JÖRGENSEN 1906). Besides, a large host plant spectrum was misattributed to *leucapsis* and, vice versa, the leaf folds on *S. cinerea* were misattributed to several species (see tab. 17 in KOPELKE 1999). Furthermore, most authors did not consider the presence of different gall types on *S. cinerea*, produced by different leaf folders. The present study has shown that *leucapsis* induces the twisted leaf rolls only on *Salix cinerea*.

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 was designated in the interest of promoting nomenclatural stability, taken from reared material of the author (see KOPELKE 2007a). The morphological characters of the neotype reared from *S. cinerea* correspond clearly with TISCHBEIN's description.

Phyllocolpa rolleri LISTON 2005

Phyllocolpa rolleri LISTON (2005: 183). — Type locality: Slovak Republic, Lower Tatras, Krakova holá, 1700–1750 m, 48°58.08 N, 19°38.00 E, approx. 12 km south of Liptovský Mikuláš, 21.–22. vi. 2005.

Material: *Phyllocolpa rolleri* LISTON (SMFH 2562°-f); paratypes 4 ♀♀, 2 ♂♂ in coll. Senckenberg, Frankfurt am Main, Germany.

Description: ♀

Head: Frontal area with flattish and broad depression, inner orbits nearly entirely pubescent, upper head shiny and conspicuously sculptured between punctures, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus conspicuously incised. Colouring: Face black apart from basis of mandibels, labrum, and front margin of clypeus yellowish, upper head black with hind orbits hardly gleaming brownish. Antenna black.

Thorax: Black coloured, mesonotum with microsculpture between slight punctures, mesopleura unsculptured and conspicuously shiny, with sparse pubescence on the upper half. Pronotum black, with lateral angles marginally hardly gleaming dark brown, tegulae yellowish. Forewing with stigma transparent and dark brown, basal half paler, wing venation dark brown. Legs with coxa black, tibia brownish with extreme apex nearly blackish, tarsomeres entirely blackish. Hindtarsus nearly as long as hindtibia, hindtibia spurs unequally long and straight, inner spur as long as the half length of the basitarsus.

Abdomen: Completely black coloured, sawsheath and cerci black, cerci long, extending more than half of the sheath length.

Sheath (Fig. 1e): With slight microsculpture and shiny, in lateral view acuminate, nearly straight on upper margin, slightly emerginated on lower, in dorsal view nearly triangular with lateral margin homogeneously rounded, proportion (Fig. 1a) of length [a] to maximal

width [b] 1,1. Sheath hairs widely distributed on the lateral areas, in dorsal view slightly curled.

Saw (Fig. 2d): In lateral view with aulax slightly arcuated, consisting of 17 segments. Ctenidea short, present from annulus 2. Serrulae flattish, cypsellae and postcalcares slightly developed.

♂: Microstructure and colouring like ♀, antenna black, longer than thorax and abdomen together. Forewing with stigma completely dark brown and transparent. Hypogydium black, penisvalve (Fig. 3c) in lateral view slightly arcuated, the basal part not broadened. Spiny appendix narrow, nearly straight, basal lobe with lower edge sharply angled.

Gall (Fig. 4d): Leaf roll, usually both edges of the leaf rolled, sometimes twisted along the longitudinal axis.

Host plant: *S. hastata* LINNAEUS 1753, belonging to the subgenus *Vetrix*, section *Hastatae*, a shrub up to 1.5 m, occurring on banks of streams, meadows, depressions and small mountain valleys, common in the forest-tundra belt and subalpine zone of northern mountains, alpine zone of the Alps, Pyrenees, French Massiv Central, and Apennines (SKVORTSOV 1999).

Distribution: Previously recorded only from the Lower Tatra, locally occurring in high densities.

Comment: LISTON (2005) described *rolleri* from material swept from *S. hastata* in the Lower Tatra. Published records from *S. hastata* mostly refer to *Phyllocolpa tuberculata* (BENSON 1953) of the *crassispinata*-group (VIKBERG 1970, ZINOVJEV 1993, 1998, ZHELOKHOVTSEV 1994, LISTON 1995, TAEGER et al. 1998, LACOURT 1999), another leaf folder on *hastata* which, however, differs significantly from *rolleri* in the morphology of the imagines as well as in the gall type.

Phyllocolpa spirappendiculata sp. n.

Phyllocolpa ?sp. 1: KOPELKE (1999: 151), on *S. appendiculata*.
Phyllocolpa sp. 1: KOPELKE (2003a: 171), on *S. appendiculata*.
Phyllocolpa sp. 1/*appendiculata*: KOPELKE (2003b: 277–312), on *S. appendiculata*.

Holotype ♀ (SMFH 2563): Austria, Tirol: Defereggental, Erlsbach (KOPELKE galls leg. 7. viii. 2002), in coll. Senckenberg, Frankfurt am Main, Germany, rearing-no. SZ 17/2002; emerging 4. iv. 2003.

Paratypes: 4 ♀♀ (SMFH 2564a–d), 2 ♂♂ (2564e–f) together with holotype; 3 ♀♀ (SMFH 2565a–c), Austria, Tirol: Defereggental, Oberhausalm (KOPELKE galls leg. 7. viii. 2002); 1 ♀ (SMFH 2566a), 2 ♂♂ (2566b–c) Defereggental, Stalleralm (KOPELKE galls leg. 7. viii. 2002); 2 ♂♂ (2567a–b) Salzburg: Hohe Tauern, Kals (KOPELKE galls leg. 6. viii. 2002); 1 ♀ (SMFH 2568) Ramsau, Silberklamm (KOPELKE galls leg. 29. vii. 2003); 1 ♀ (SMFH 2569a), 3 ♂♂ (2569b–d) Schlading, Untertal, Riesachfälle (KOPELKE galls leg. 30. vii. 2003) — Altogether 10 ♀♀ and 9 ♂♂ paratypes; the holotype and paratypes were reared from *Salix appendiculata*.



a) *acutiserra*/
S. lapponum



b) *alienata*/*S. aurita*



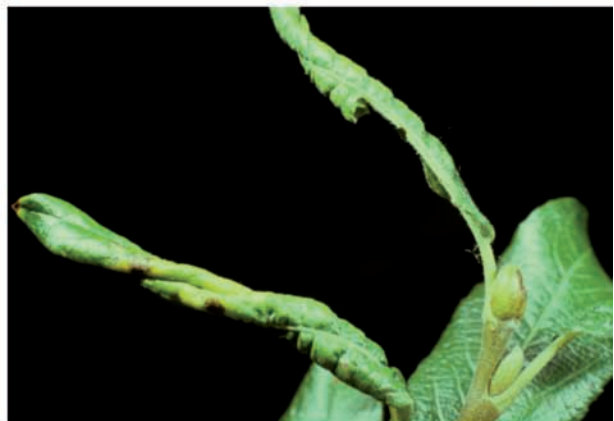
c) *leucapsis*/*S. cinerea*



d) *rolleri*/*S. hastata*



e) *spirappendiculata* sp. n./*S. appendiculata*



f) *spirhelvetica* sp. n./*S. helvetica*

Fig. 4a–f: Galls of the European species of the *Phyllocolpa leucapsis*-group. Fig. 4a. *acutiserra* (LINDQUIST 1948) on *Salix lapponum* LINNAEUS 1753; Fig. 4b. *alienata* (FÖRSTER 1854) on *Salix aurita* LINNAEUS 1753; Fig. 4c. *leucapsis* (TISCHBEIN 1846) on *Salix cinerea* LINNAEUS 1753; Fig. 4d. *rolleri* LISTON 2005 on *Salix hastata* LINNAEUS 1753 (photo: L. ROLLER, Institute of Zoology, Slovak Academy of Sciences, Bratislava, Slovak Republic); Fig. 4e. *spirappendiculata* sp. n. on *Salix appendiculata* VILLARS 1789; Fig. 4f. *spirhelvetica* sp. n. on *Salix helvetica* VILLARS 1789.

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

<i>Phyllocolpa</i> spp.	<i>Salix</i> spp. (hostplant)	Distribution
<i>acutiserra</i> (LINDQUIST 1948)	<i>lapponum</i> LINNAEUS 1753	northern Europe
<i>alienata</i> (FÖRSTER 1854), stat. n.	<i>aurita</i> LINNAEUS 1753	Central, northern Europe
<i>leucapsis</i> (TISCHBEIN 1846) = <i>Nematus (Pontania) coriaceus</i> BENSON 1953, syn. n.	<i>cinerea</i> LINNAEUS 1753	Central, northern Europe
<i>rolleri</i> LISTON 2005	<i>hastata</i> LINNAEUS 1753	Lower Tatra
<i>spirappendiculata</i> sp. n.	<i>appendiculata</i> VILLARS 1789	Alps
<i>spirhelvetica</i> sp. n.	<i>helvetica</i> VILLARS 1789	western Alps

Additional material: ♀♀, ♂♂ reared from a total of 985 galls, KOPELKE leg.: Austria, Tirol: Pitztal, nr. Mittelberg (30. VIII. 1992: 107 galls, 30. VIII. 1996, 22); Ötztal, Vent, Gampl (29. VII. 1995: 34, 29. VIII. 1996: 27); Defereggental, Stalleralm (7. VIII. 2002: 80); Defereggental, Erlsbach (7. VIII. 2002: 117); Defereggental, Oberhausalm (7. VIII. 2002: 73); Defereggental, St. Jakob, Trojer Alm (7. VIII. 2002: 77); Ramsau, Silberklamm (29. VII. 2003: 178); Schladming, Untertal, Riesachfälle (30. VII. 2003: 129); Salzburg: Hohe Tauern, Kals (6. VIII. 2002: 22). — Italy, Trentino, Mt. Altissimo di Nago (23. VII. 1995: 59).

Description: ♀

Head: Frontal area with deep and broad depression, inner orbits nearly entirely pubescent, upper head shiny and conspicuously sculptured between punctures, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus conspicuously incised. Colouring: Face black apart from basis of mandibels, labrum, and front margin of clypeus yellowish, supraclypeal area sometimes gleaming dark brown, upper head black, sometimes with hind orbits slightly gleaming brownish. Antenna black.

Thorax: Black coloured, mesonotum with microsculpture between slight punctures, mesopleura unsculptured and conspicuously shiny, with sparse pubescence on the upper half. Pronotum black, with lateral angles marginally yellowish, tegulae yellowish. Forewing with stigma transparent and dark brown, basal half paler, wing venation dark brown. Legs with coxa black, tibia yellowish brown with extreme apex dark brown, tarsomeres entirely dark brown. Hindtarsus nearly as long as hindtibia, hindtibia spurs unequally long and straight, inner spur nearly as long as the half length of the basitarsus.

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

Sheath (Fig. 1f): With slight microsculpture and shiny, in lateral view acuminate, slightly convex on upper margin, nearly straight on lower, in dorsal view nearly triangular with lateral margin clearly angled, proportion (Fig. 1a) of length [a] to maximal width [b] 1,3. Sheath hairs widely distributed on the lateral areas, in dorsal view slightly curled.

Saw (Fig. 2e): In lateral view with aulax slightly arcuated, consisting of 18 segments. Ctenidea short,

present from annulus 2. Serrulae flattish, cypsellae and postcalcares slightly developed.

♂: Microstructure and colouring like ♀, antenna dark brown, longer than thorax and abdomen together. Forewing with stigma completely dark brown and transparent. Hypopygium dark brown, penisvalve (Fig. 3d) in lateral view slightly arcuated, the basal part not broadened. Spiny appendix narrow, nearly straight, basal lobe with lower edge sharply angled.

Gall (Fig. 4e): Leaf roll, usually both edges of the leaf rolled, twisted along the longitudinal axis.

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, locally occurring in high densities.

Comment: *S. appendiculata* harbours, like some other willow hosts (i.e. *S. aurita*, *S. caprea*, *S. cinerea*, *S. lapponum*, *S. phyllicifolia*, *S. purpurea*), two *Phyllocolpa* species belonging to different species groups and producing different gall types, i.e. *Ph. pschornwalcheri* KOPELKE 2007 of the *leucosticta*-group (KOPELKE 2007a) and the new species *spirappendiculata* of the *leucapsis*-group. *Ph. pschornwalcheri* makes more or less flattish leaf folds whereas *spirappendiculata* induces the more striking twisted leaf rolls. Furthermore, the morphological characters of the new species do not correspond with any other species of the genus *Phyllocolpa*.

Phyllocolpa spirhelvetica sp. n.

Phyllocolpa ?sp. 7: KOPELKE (1999: 151), on *S. helvetica*.

Phyllocolpa sp. 7: KOPELKE (2003a: 171), on *S. helvetica*.

Phyllocolpa sp. 7/*helvetica*: KOPELKE (2003b: 277–312), on *S. helvetica*.

Holotype ♀ (SMFH 2570): Switzerland, Wallis: Grimselpaß I, Grimselsee (KOPELKE galls leg. 29. VIII. 1998), in coll. Senckenberg, Frankfurt am Main, Germany, rearing-no. SZ 32/1998; emerging 27. IV. 1999.

Paratypes: 1♀ (SMFH 2571a) together with holotype, 1♀ (2571b); Grimselpaß, Räterichsbodensee (KOPELKE galls leg. 4. IX. 1991).

Additional material: Larvae from a total of 360 galls, KOPELKE leg.: Switzerland, Wallis: Grimselpaß I, Grimselsee (10. IX. 1995: 84; 29. VIII. 1998: 14); Grimselpaß, Räterichsbodensee (4. IX. 1991: 107; 2. IX. 1992: 139); Nufenenpaß, Paßhöhe I (3. IX. 1992: 16).

Description: ♀

Head: Frontal area with deep and broad depression, inner orbits nearly entirely pubescent, upper head shiny and conspicuously sculptured between distinct punctures, weakly pubescent. Antenna thin, about as long as head and thorax together. Front margin of the clypeus conspicuously incised. Colouring: Face black apart from basis of mandibels and labrum yellowish, front margin of clypeus nearly black, upper head black with hind orbits hardly gleaming brownish. Antenna black.

Thorax: Black coloured, mesonotum with microsculpture between slight punctures, mesopleura unsculptured and conspicuously shiny, with sparse pubescence on the upper half. Pronotum black, with lateral angles marginally brownish, tegulae yellowish. Forewing with stigma transparent and dark brown, basal half paler, wing venation dark brown. Legs with coxa black, tibia brownish with extreme apex dark brown, tarsomeres entirely dark brown. Hindtarsus as long as hindtibia, hindtibia spurs unequally long and straight, inner spur nearly as long as the half length of the basitarsus.

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

Sheath (Fig: 1g): With slight microsculpture and shiny, in lateral view acuminate, nearly straight on upper as well as lower margin, in dorsal view nearly triangular with lateral margin slightly angled, proportion (Fig. 1a) of length [a] to maximal width [b] 0,8. Sheath hairs widely distributed on the lateral areas, in dorsal view slightly curled.

Saw (Fig. 2f): In lateral view with aulax slightly arcuated, consisting of 18 segments. Ctenidea short, present from annulus 3. Serrulae flattish, cypsellae and postcalcares slightly developed.

♂: unknown

Gall (Fig. 4f): Leaf roll, usually both edges of the leaf rolled, twisted along the longitudinal axis.

Host plant: *S. helvetica* VILLARS 1789, belonging to the subgenus *Vetrix*, section *Villosae*, a low shrub up to 2 m, occurring on moist slopes, bottoms of depressions, and rocks in the subalpine and alpine zones, distributed from the Maritim Alps to Tirol (SKVORTSOV 1999).

Distribution: Western Alps.

Comment: *S. helvetica* was never mentioned before as a host plant for a leaf folder. The morphological characters of the new species do not correspond with any other species of the genus *Phyllocolpa*.

References

- BENÈS, K. (1968): Galls and larvae of the European species of genera *Phyllocolpa* and *Pontania* (Hymenoptera, Tenthredinidae). — Acta Entomologica Bohemoslovaca, **65**: 112–137, Prague.
- BENSON, R. B. (1953): Some changes and additions to the list of British sawflies with the descriptions of two new species (Hym., Tenthredinidae). — Entomologist's Monthly Magazine, **89**: 150–154, London.
- BRISCHKE, C. G. A. (1882): Die Pflanzen-Deformationen (Gallen) und ihre Erzeuger in Danzigs Umgebung. — Schriften der naturforschenden Gesellschaft Danzig, **5** (3): 185–198, Danzig (today Gdansk).
- BRISCHKE, C. G. A., & ZADDACH, G. (1876): Beobachtungen über die Arten der Blatt- und Holzwespen. — Schriften der physikalisch-ökonomischen Gesellschaft Königsberg, **16**: 23–89 [for 1875], Königsberg (today Kaliningrad).
- & — (1884): Beobachtungen über die Arten der Blatt- und Holzwespen. — Schriften der physikalisch-ökonomischen Gesellschaft Königsberg, **24**: 121–173, table I (8) [for 1883], Königsberg.
- FÖRSTER, A. (1854): Neue Blattwespen. — Verhandlungen des naturhistorischen Vereins der preußischen Rheinlande und Westfalens, **11**: 265–350; Bonn.
- HELLÈN, W. (1977): Die Nematinen Finnlands VI (Hymenoptera, Tenthredinidae) Gattung *Pontania* O. COSTA. — Notulae Entomologicae, **57**: 71–81; Helsingfors.
- HORN, W., KAHLE, I., FRIESE, G., & GAEDIKE, R. (1990): Collectiones entomologicae. Ein Kompendium über den Verbleib entomologischer Sammlungen der Welt bis 1960, Teil I: A–K; Teil II: L–Z. Aus dem Institut für Pflanzenschutzforschung Kleinmachnow, Bereich Eberswalde, Abteilung Taxonomie der Insekten, der Akademie der Landwirtschaftswissenschaften der DDR. — 573 pp., Berlin (Akademie der Landwirtschaftswissenschaften der Deutschen Demokratischen Republik).
- JÖRGENSEN, P. (1906): De danske arter af Bladhvepseslægten *Pontania* COSTA (Chalastogastra). — Entomologiske meddelelser, **3**: 113–126; København.
- KONOW, F. W. (1901): Revision der Nematiden-Gattung *Pontania* COSTA (Hym.). — Zeitschrift für systematische Hymenopterologie und Dipterologie, **1**: 81–91, 127–136; Teschendorf.
- KOPELKE, J.-P. (1999): Gallenerzeugende Blattwespen Europas — Taxonomische Grundlagen, Biologie und Ökologie (Tenthredinidae: Nematinae: *Euura*, *Phyllocolpa*, *Pontania*). — Courier Forschungsinstitut Senckenberg, **212**: 1–183; Frankfurt am Main.

- — — (2003a): Gall-forming Nematinae, their willow hosts (*Salix* spp.) and biological strategies (Insecta, Hymenoptera, Symphyta, Tenthredinidae, Nematinae: *Euura*, *Phyllocolpa*, *Pontania*) — *Senckenbergiana biologia*, **82** (1/2): 163–189; Frankfurt am Main.
- — — (2003b): Natural enemies of gall forming sawflies on willows (*Salix* spp.) (Tenthredinidae: *Euura*, *Phyllocolpa*, *Pontania*). — *Entomologica Generalis*, **26** (4): 277–312; Stuttgart.
- — — (2007a): The European species of the genus *Phyllocolpa*, part I: the *leucosticta*-group (Insecta, Hymenoptera: Tenthredinidae: Nematinae) — *Senckenbergiana biologia*, **87** (1): 75–109; Frankfurt am Main.
- — — (2007b): The European species of the genus *Phyllocolpa*, part III: the groups of *crassispina*, *scotaspis*, and *piliserra* (Hymenoptera: Tenthredinidae: Nematinae) — *Senckenbergiana biologia*, **87** (2): ???–???; Frankfurt am Main.
- LACOURT, J. (1999): Répertoire des Tenthredinidae ouest-paéarctiques (Hymenoptera, Symphyta). — *Mémoires de la Société Entomologique de France*, **3**: 1–432; Paris.
- LINDQVIST, E. (1948): Neue nordische Blattwespen. — *Notulae Entomologicae*, **28**: 65–86; Helsingfors.
- LISTON, A. D. (1995): Compendium of European sawflies. — Gottfrieding (Chalastos Forestry Publ.), 190 pp.
- — — (2005): A new species of *Phyllocolpa* BENSON: *Phyllocolpa rolleri* sp. nov. (Hym.: Tenthredinidae, Nematinae) on *Salix hastata*. — *The Entomologist's Record and Journal of Variation*, **117**: 183–185; Hertfordshire.
- MUCHE, W. H. (1970): Die Blattwespen Deutschlands — I. Tenthredininae (Hymenoptera). — *Entomologische Abhandlungen und Berichte aus dem Museum für Tierkunde in Dresden*, **36** (Suppl.): 1–235; Dresden.
- SCHEDL, W. (1976): Untersuchungen an Pflanzenwespen (Hymenoptera: Symphyta) in der subalpinen bis alpinen Stufe der zentralen Ötztaler Alpen (Tirol, Österreich). — *Veröffentlichungen der Universität Innsbruck, Alpin-Biologische Studien*, **103**: 1–85; Innsbruck.
- SPOONER, B. M. (1991): The British species of *Pontania* (Hymenoptera: Tenthredinidae), with a preliminary key to galls. — *Cecidology*, **6** (2): 58–64.
- TAEGER, A., ALTENHOFER, E., BLANK, S. M., JANSEN, E., KRAUS, M., PSCHORN-WALCHER, H., & RITZAU, C. (1998): Kommentare zur Biologie, Verbreitung und Gefährdung der Pflanzenwespen Deutschlands (Hymenoptera, Symphyta). — Pp. 49–135 in: BLANK, S. M., & TAEGER, A. (eds.), *Pflanzenwespen Deutschlands* (Hymenoptera, Symphyta). Kommentierte Bestandsaufnahme. — Kelttern (Goecke & Evers), 364 pp.
- TISCHBEIN, P. F. L. (1846): Verzeichnis der in den Fürstenthümern Lübeck und Birkenfeld von mir bisher aufgefundenen Blattwespen. — *Stettiner Entomologische Zeitung*, **7**: 75–80; Stettin (today Szczecin).
- VIITASAARI, M., & VIKBERG, V. (1985): A checklist of the sawflies (Hymenoptera, Symphyta) of Finland. — *Notulae Entomologicae*, **65**: 1–17; Helsingfors.
- VIKBERG, V. (1970): The genus *Pontania* O. COSTA (Hym., Tenthredinidae) in the Kilpisjärvi district, Finnish Lapland. — *Annales Entomologici Fennici*, **36**: 10–24; Helsinki.
- ZHELOKHOVTSEV, A. N. (1994): 27. Order Hymenoptera, Suborder Symphyta (Chalastogastra). — Pp. 1–387 in: MEDVEDEV, G. S. (ed.), *Keys to the insects of the European part of the USSR, III. Hymenoptera, VI. Symphyta*. — Leiden, New York, Köln (E. J. Brill), 432 pp.
- ZINOVJEV, A. G. (1993): Host-plant specificity of the gall-making sawflies of the genus *Pontania* O. COSTA (Hymenoptera, Tenthredinidae). — *Proceedings of the Zoological Institut St. Petersburg*, **193**: 108–139; St. Petersburg. [In Russian.]
- — — (1998): Palaearctic sawflies of the genus *Pontania* COSTA (Hymenoptera: Tenthredinidae) and their host-plant specificity. — Pp. 205–225 in: CSÓKA, G., MATTSON, W. J., STONE, G. N., & PRICE, P. W. (eds.), *The biology of gall-inducing arthropods*. — USDA (United States Dept. of Agriculture), Forest Service, General Technical Report, North Central Research Station, **199**. — St. Paul, Minn.
- ZINOVJEV, A. G., & VIKBERG, V. (1998): On the biology of Nematinae with hiding larvae (Hymenoptera, Symphyta, Tenthredinidae). — *Beiträge zur Entomologie*, **48** (1): 145–155; Eberswalde-Finow.

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