

Studies on European species of the genus *Phytoliriomyza* Hendel (Diptera: Agromyzidae)

Изучение европейских видов рода *Phytoliriomyza* Hendel (Diptera: Agromyzidae)

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KEY WORDS. Diptera, Agromyzidae, *Phytoliriomyza*, Europe, new species, synonymy.

КЛЮЧЕВЫЕ СЛОВА. Diptera, Agromyzidae, *Phytoliriomyza*, Европа, новый вид, синонимия.

ABSTRACT. Description of *Phytoliriomyza papei* sp.n. from Sweden is given. Two new synonyms are established. Key for identification of European *Phytoliriomyza* species is provided.

РЕЗЮМЕ. Дано описание нового вида *Phytoliriomyza papei* sp.n. из Швеции. Два видовых названия сведены в синонимы. Составлена определительная таблица для европейских видов рода *Phytoliriomyza*.

The genus *Phytoliriomyza* has been erected as a subgenus by Hendel [1931–1936] for a single *Liriomyza* species having entirely proclinate hairs. Frey [1941] raised *Phytoliriomyza* to full generic rank. Among Agromyzidae *Phytoliriomyza* is a moderately large genus with 111 World species. Only 17 *Phytoliriomyza* species have been recorded from Palaearctic region. In the collection of the Zoological Institute (St.Petersburg) there are some species from Palaearctic region which should be described as new to science in the future. Present paper deals with some results of re-examination of Scandinavian Agromyzidae conducted under the Swedish-Russian project on Northern European Diptera.

Phytoliriomyza dorsata (Siebke, 1864)

Figs 1–9.

Agromyza dorsata Siebke, 1864

Siebke, 1864: 169. Holotype in the Zoologisk Museum, Oslo.

Lemurimyza dorsata (Siebke, 1864) — Spencer, 1965: 28; 1969: 18, 20, 22, 163, 194, 195; 1971: 163; 1972: 50, 59, 61.

Phytoliriomyza dorsata (Siebke, 1864) — Spencer, 1976: 223, 225, 291, 292, 294; 1981: 322, 323; Hackman, 1980: 149; Papp, 1984: 306; Spencer & Steyskal, 1986: 153, 303; Zlobin, 1986: 52; Pakalniškis, 1988: 93; Elberg & Zlobin, 1992: 60; Tschirnhäus, 1992: 471, 475, 481; 1999: 125; Iwasaki, 2000: 142, 147; Pakalniškis et al., 2000: 40.

Agromyza reverberata Malloch, 1924

Malloch, 1924: 191. Holotype lost, paratype in the Canadian National Collection, Ottawa.

Liriomyza reverberata (Malloch, 1924) — Frick, 1959: 409; Spencer, 1969: 194.

Liriomyza striata Hendel, 1931

Hendel, 1931–1936: 249; Spencer, 1965: 28. Holotype in the Naturhistorisches Museum, Vienna.

Phytoliriomyza bornholmensis Spencer, 1976, **syn.n.**

Spencer, 1976: 294. Holotype in the Zoological Museum, Copenhagen.

Phytoliriomyza islandica Olafsson, 1988, **syn.n.**

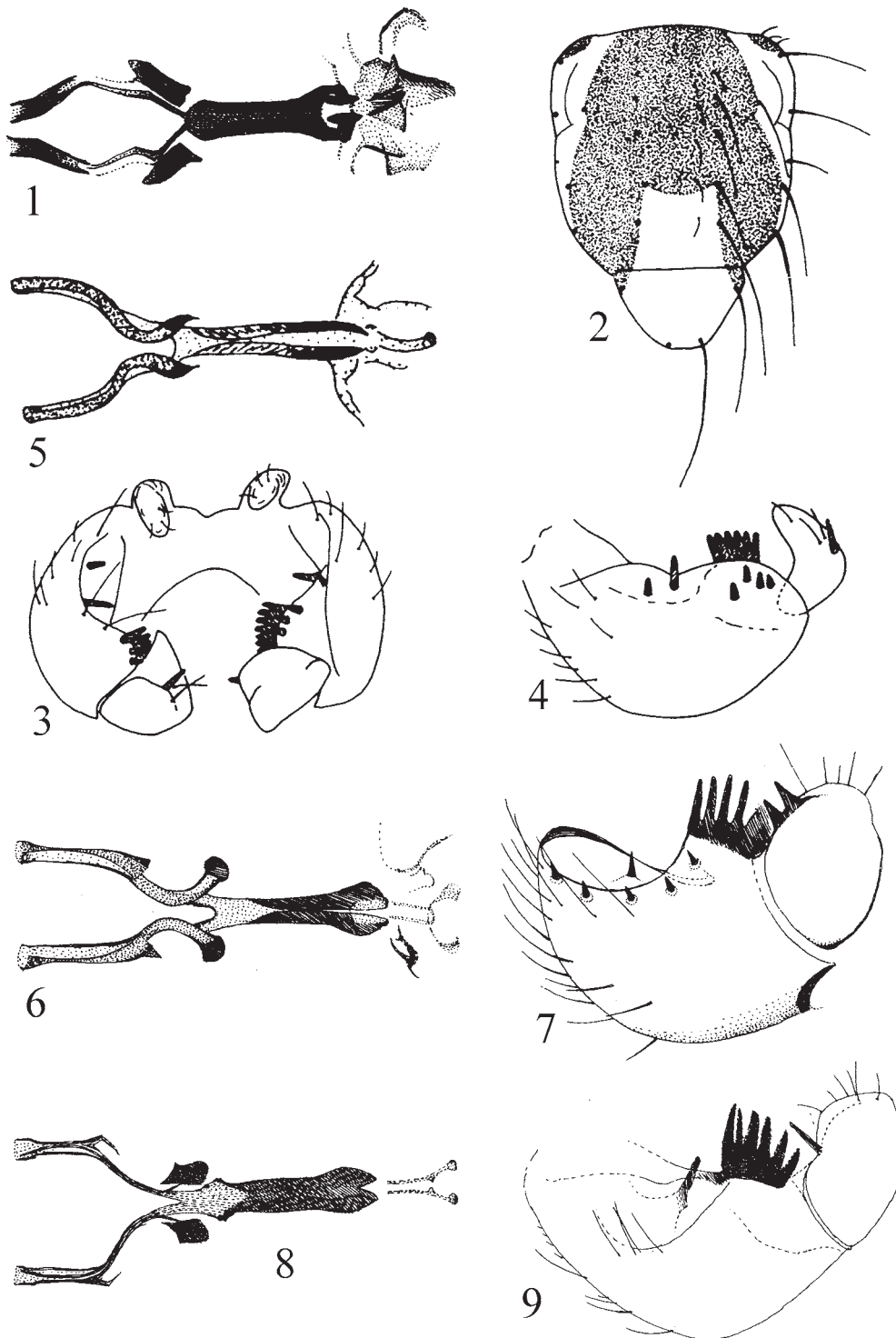
Olafsson, 1988: 359–361. Holotype in the Icelandic Museum of Natural History, Reykjavik.

DISTRIBUTION. England, Iceland, Ireland, France, Austria, Germany, Poland, Spain, Roumania, Norway, Sweden, Denmark, Finland, Estonia, Lithuania, Russia (Northwest European Russia, Central European part, East Siberia, Far East), Canada, USA.

HOST AND EARLY STAGES. Unknown.

In his Monograph on the Palaearctic Agromyzidae Hendel [1931–1936] erroneously interpreted *Agromyza dorsata* Siebke and incorrectly synonymised this species with *Phytoliriomyza perpussilla* (Meigen). Later this mistake led to numerous confusion in the literature. Ryden [1955] stated that *dorsata* was identical with *halterata* (Becker). Spencer [1965] has been able to examine the holotype of *dorsata* and established that the species is identical with *striata* which has been described by Hendel as *Liriomyza* species. In Canada and USA this species has been recorded under name *Agromyza reverberata* Malloch, 1924. Frick [1952, 1959] transferred it to the genus *Liriomyza*. Spencer [1969] synonymised *reverberata* with *dorsata*.

The Swedish entomologists during several years monitored the changes of the insect fauna in the relict forest in the vicinity of Stockholm after strong fire. I studied about 800 agromyzid specimens collected by Malaise traps from this locality. *Phytoliriomyza dorsata* significantly dominated among other species. The studies on individual variation of this species led me to conclusion that the check-list of synonymy should be expanded. Spencer [1976] in his famous Monograph on the Fennoscandian Agromyzidae described *Phytoliriomyza bornholmensis* after a single male from Bornholm Island. Spencer mentioned that the new species closely resembles *dorsata* but he believed that the paler third antennal segment and differing shape of aedeagus are sufficiently distinctive to justify treating it as distinct. Later Olafsson [1988] after one male and two females described *Phytoliriomyza islandica* from Iceland which is closely resembles Holarctic *Ph. dorsata*, Palaearctic *Ph. bornholmensis* and Nearctic *Ph. pacifica* (Melander). Both Spencer [1976] and



Figs 1-9. *Phytoliriomyza* spp (after Olafsson and Spencer), ♂: 1 — *P. bornholmensis* Spencer, 2-5 — *P. islandica* Olafsson, 6-7 — *P. dorsata* (Siebke), 8-9 — *P. pacifica* (Melander). 1, 5-6, 8 — aedeagus, ventral view, 2 — mesonotum, dorsal view; 3-4 — epandrium (3 — ventral view, 4 — lateral view); 7, 9 — epandrium and surstyli, ventral view.

Рис. 1-9. *Phytoliriomyza* spp (по Олафссону и Спенсеру), ♂: 1 — *P. bornholmensis* Spencer, 2-5 — *P. islandica* Olafsson, 6-7 — *P. dorsata* (Siebke), 8-9 — *P. pacifica* (Melander). 1, 5-6, 8 — эдеагус, вид снизу; 2 — среднеспинка, вид сверху; 3-4 — эпандрий (3 — вид снизу, 4 — вид сбоку); 7, 9 — эпандрий и сурстии, вид снизу.

Olafsson [1988] pointed out that the number and arrangement of strong bristles on inner margin of epandrium in *dorsata* and *islandica* might be a subject of significant individual variation. Olafsson illustrated some details in the structure of male terminalia which he considered of specific importance for species mentioned above (Figs 1, 3–9).

In all these species the epandrium bearing a characteristic black area of sclerotization forming a comb of finger-like projections. These projections are external protuberances of epandrial wall and therefore cannot be a subject of homology with another chaetotaxy of epandrial complex. But Spencer incorrectly interpreted them as bristles. Inner margin of epandrium just below cerci usually bearing 1–2 stout spines near middle of inner margin and another smaller spines placed below. Surstylus usually with 1–2 strong spines externally similar to epandrial projections but represent true spines. After detailed examination of 20 male specimens collected by Dr. Bert Viklund (Sweden, SO, Tyresta NR, Brandfalt fran 1997 vid Avavagen Malaise-falla, Sodra, 28.05–15.07.1997) I established significant variability of the characters mentioned above. Number of spines situated just below cerci varying from 2 to 0. Number of smaller spines along inner margin of epandrium varying from 4 to 10. Epandrial comb consists of 4–10 finger-like projections. Surstyli usually with 1–2 spines, sometimes they replaced by some bristle-like setulae. The number of spines and projections frequently is variable on the two sides in the same specimen. The shape of distiphallus may be variable as well. Distal tubules usually parallel, but frequently converging or diverging distally. In my opinion the small differences between aedeagi figured by Spencer and Olafsson caused by small deviation of illustrated dissections from horizontal plane. Spencer and Olafsson gave a special importance to colour differences as diagnostic features. The colour of the third antennal segment may be pale brown to deep black. Mesonotum with dark area divided into bands, frequently only just detectably so or solidly mat grey, always with large rectangular yellow spot adjoining scutellum. No congruent relations between characters mentioned above are established. This individual variability of characters mentioned above is much wider than hiatus between *dorsata*, *bornholmensis* and *islandica*. Therefore two latter species are synonymised with *dorsata* herewith.

Phytoliriomyza papei sp.n.

Figs. 10–16.

MATERIAL. Holotype, ♂, Sweden: Öland, Gösslunda, RN 04G2J2-O, *Potentilla fruticosa* L., 07.06.1978 (leg. P.I. Persson). Paratypes, 1 ♂, 1 ♀, Sweden: Öland, Möckelmossen, RN 04GJ2-4, *Sedum album* – *Tortella* – Ass., 23.08.1977 (leg. P.I. Persson); 1 ♂, same data, *Potentilla fruticosa* L.; 2 ♂, 3 ♀, Öland, Mörbylilla, RN 03G8H-1, *Potentilla fruticosa* L., 24.08.1977; 1 ♀, Öland, NE Kalkstad, RN 04G5IL-4, 05.06.1978; 2 ♂, 2 ♀, Öland, Dröstorp, RN 04G4J3-1, *Potentilla fruticosa* L., 06.07.1978; 1 ♂, 1 ♀, Öland, Mörbylilla, RN 03G8H1-3, 08-10.06.1978 (all leg. P.I. Persson). Types specimens are deposited in the Naturhistoriska Riksmuseet (Stockholm); 4 paratypes in the collection of the Zoological Institute of the Russian Academy of Sciences (St. Petersburg).

DESCRIPTION. MALE. Frons parallel-sided or as long as wide, slightly converging ventrally, 1.1–1.2 times width of eye, linearly projecting above eye in profile. Frontal plate small, equilateral, ill differentiated. Ocellar bristles extending to upper margin of lunule. Frontal vitta moderately broad, about half width of frons. Orbits moderately broad. Lunule deep sunken, low. 2 strong reclinate *ors*, the upper longer. 1 strong incurved *ori*, distance between *ors* twice longer than distance between lower *ors* and *ori*. Orbital hairs upright or

partly reclinate, very short, in a row, sparse. Antennal bases approximated. Third antennal segment moderately large, rounded, slightly longer than broad, covered with dense short pubescence. Arista normal, distinctly swollen at base, densely pubescent. Eye oval, upright or slightly slanting, bare. Face low, keel widening below. Mouth margin broadly rounded. Epistoma absent. Cheeks forming narrow ring below eye. Jowls deepest at rear, 0.25 height of eye, peristomal margin straight, bearing 3–4 setulae. *vi* well developed. Palps short, normal. 3+1 strong *dc*, gradually decreasing in size towards, fourth *dc* about twice shorter than first one. *acr* in 4 irregular rows, extending to midway between first and second *dc*. *prsc* absent. Interlar setulae sparse, in 2 irregular rows, *ia* absent. *ipa* twice shorter than *opa*. Mesopleura with a few short upcurved setulae along upper margin. 4 equal scutellar bristles. Notopleura with 2 equal bristles. Fore- and mid-tibiae without strong bristles. Costa strongly extending to vein M_{1+2} . Costal sections *mg2*: *mg3*: *mg4* in ratio 1: 0.22: 0.23. Radial and medial veins of subequal thickness. Distance between *ta* and *tp* about as long as length of *tp*. *ta* at mid-point of discal cell. *tp* perpendicular to vein M_{1+2} . Last section of vein M_{3+4} 1.56–2 times longer than penultimate. Wing length 2.4–2.5 mm.

Head largely bright yellow. Ocellar triangle black. Hind margin of eye partly darkened, both *vt* on yellow ground. Antennae bright yellow, arista dark. Humeral callus largely yellow, with small blackish spot before base of *h*. Notopleura entirely bright yellow. Mesonotum with dark area divided into bands, black, moderately shining, broadly yellow adjoining scutellum. Scutellum entirely yellow. Mesopleura with brown triangular spot at front lower corner and very small patch at hind lower corner. Sterno- and hypopleura largely black, broadly yellow above, divided by yellow. Coxae largely yellow, slightly brownish basally. All femora largely yellow, brownish basally, frequently with brownish striations. Tibiae and tarsi light brownish. Abdominal tergites indistinctly yellowish bordered, weakly shining. Wings hyaline, veins dark. Halter entirely yellow. Squamae yellow, margin and fringe blackish.

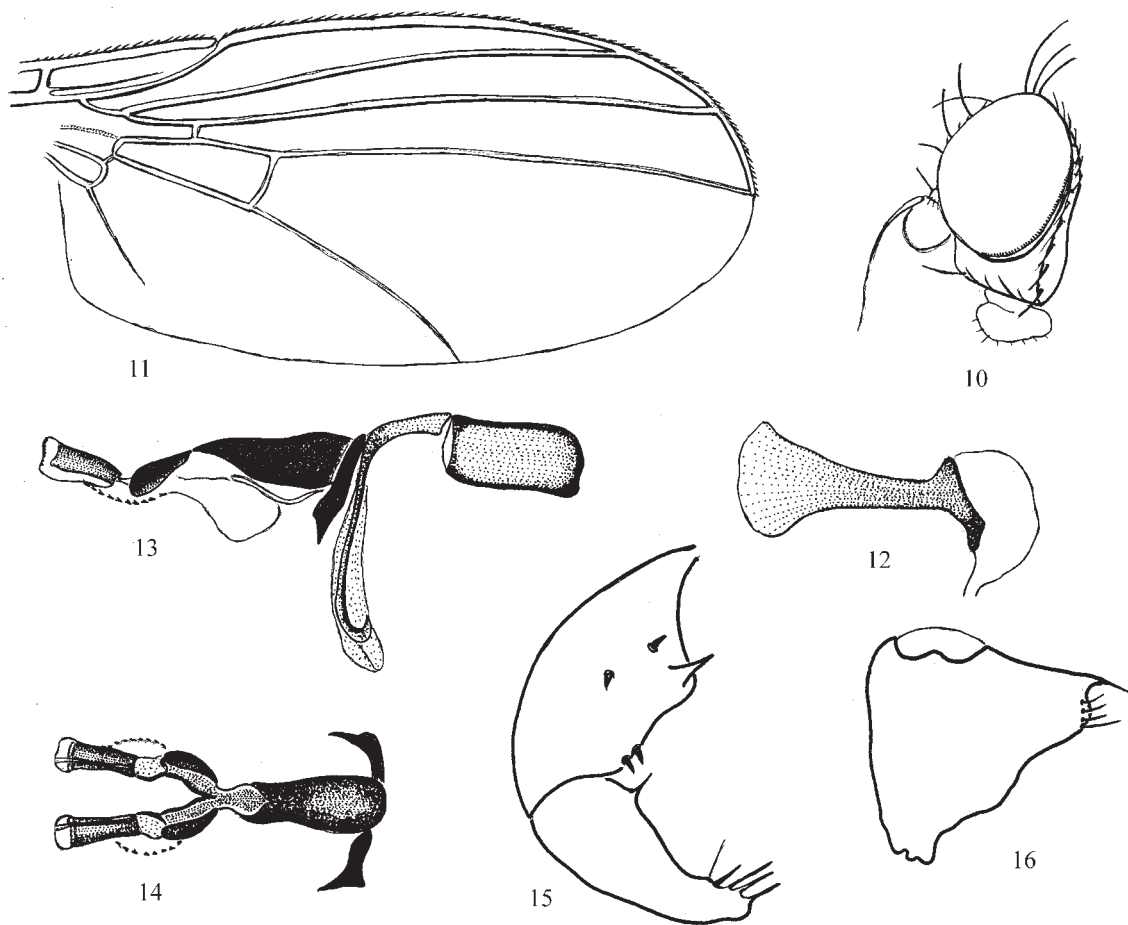
Pallapodeme long, forked basally. Epandrium near cerci with a acute spine-like projection, bearing a pair of approximated spines and a pair of widely spaced spines. Surstylus unusually large, triangular, separated from epandrium by suture; inner margin with a row of 4–5 bristles, ventral margin with 3 small corn-shaped protuberances. Bacilliform sclerites fused each other, hind projections short, bearing a pair of long bristles. Phallopore moderately long, with deep incision below. Basiphallus deeply extended ventrally. Hypophallus present. Near base of mesophallus there are pair of plate-like sclerites directed ventrally. Mesophallus fused with distiphallus. Distiphallus consists of a pair of moderately long tubules slightly diverging apically; medial part of tubules membranous. Hypandrium V-shaped, with slender side-arms; each pregonite with long projection. Ejaculatory apodeme long, narrow, pump entirely membranous.

FEMALE. Closely resembles male. Abdominal tergites uniformly dark brown, sometimes 4–5 tergites yellow laterally. Ovipositor sheath black, shining. Wing length 2.8 mm.

HOST PLANT and LARVA unknown.

DISTRIBUTION. Sweden.

DIAGNOSIS. The structure of male genitalia clearly indicates that the new species belongs to mikii-group. The shape of aedeagus, especially unusually large triangular surstylus very similar to those of *Phytoliriomyza triangulata* Boucher and Wheeler recently described from Northern Canada [Boucher & Wheeler, 2001]. The Nearctic species can be distinguished from *Ph. papei* sp.n. by the broader frons (1.6–



Figs 10–16. *Phytoliriomyza papei* sp.n., ♂: 10 — head; 11 — wing; 12 — ejaculatory apodeme; 13–14 — aedeagus (13 — lateral view, 14 — ventral view); 15 — epandrium and surstyli, ventral view; 16 — surstyli, lateral view.

Рис. 10–16. *Phytoliriomyza papei* sp.n., ♂: 10 — голова; 11 — крыло; 12 — аподема эякулятора; 13–14 — эдеагус (13 — вид сбоку, 14 — вид снизу); 15 — эпандрий и сурстили, вид снизу; 16 — сурстили, вид сбоку.

2.1 width of eye), yellowish brown squamal margin and fringe, and largely black mesopleura.

ETYMOLOGY. The species name is a patronym in honour of famous dipterist Dr. Thomas Pape, in recognition of his support for the study of North European dipteran biodiversity through the Swedish Institute.

KEY FOR IDENTIFICATION OF THE EUROPEAN *PHYTOLIRIOMYZA* SPECIES

- 1 Antennae entirely black. Legs entirely black *alpicola* Hendel
- At least first and second antennal segments yellow. At least knees distinctly yellow 2
- 2 Last section of vein M_{3+4} about as long as penultimate ... 3
- Last section of vein M_{3+4} 1.5–2.5 times longer than penultimate 4
- 3 Dark area of mesonotum solid, mat black. Scutellum largely yellow.....*ornata* (Meigen)
- Mesonotum broadly yellow centrally adjoining scutellum. Scutellum largely black, narrowly yellow at apex. *melampyga* (Lw.)
- 4 Femora black with all knees yellow. *acr* in 4 irregular rows *variegata* (Meigen)

- Femora largely yellow, at most with variable dark striations. *acr* in 2 rows 5
- 5 Third antennal segment with conspicuously long pubescence *scotica* Spencer
- Third antennal segment with slight normal pubescence .. 6
- 6 Third antennal segment black 7
- Third antennal segment largely yellow, sometimes brownish on outside 10
- 7 Scutellum broadly bright yellow centrally 8
- Scutellum predominantly black, at most narrowly yellowish centrally 9
- 8 Palps bright yellow. Mesonotum broadly yellow adjoining scutellum *dorsata* (Siebke)
- Palps dark, brownish black. Mesonotum narrowly yellowish centrally adjoining scutellum or entirely dark *pectoralis* (Becker)
- 9 Mesonotum uniformly mat black or narrowly yellowish centrally adjoining scutellum. Wing length 2 mm *miki* (Strobl)
- Dark area of mesonotum divided into bands, broadly yellow adjoining scutellum. Wing length 1.4 mm *venustula* Spencer
- 10 Orbital setulae proclinate 11

- Orbital setulae upright or partially reclinate 13
- 11 Last section of vein M_{3+4} little more than 1.5 times length of penultimate *arctica* (Lundbeck)
- Last section of vein M_{3+4} at least 2 times length of penultimate 12
- 12 *tp* conspicuously oblique. Palps darkened apically
..... *perpusilla* (Meigen)
- *tp* at right angles to vein M_{3+4} . Palps entirely yellow
..... *oasis* (Becker)
- 13 Mesonotum uniformly dark, grey or black 14
- Mesonotum yellow centrally adjoining scutellum 15
- 14 2+1 *dc* *mesnili* d'Aguilar
- 3+1 *dc* *papei* sp.n.
- 15 Distiphallus consists of long, hyaline, curving, S-shaped paired tubules, with 2 small processes
..... *hilarella* (Zetterstedt)
- Aedeagus ending in broad strongly sclerotized tubule (mesophallus), divided into 2 large paired processes distally (distiphallus) *pteridii* Spencer

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