

**Eight new species of *Ophiomyia* from the Czech Republic and Slovak Republic
(Diptera: Agromyzidae)**

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Taxonomy, Agromyzidae, *Ophiomyia*, new species, key to European species, Czech Republic, Slovak Republic

Abstract. Descriptions of eight new species of *Ophiomyia* (*O. orientalis* sp. n., *O. vimmeri* sp. n., *O. slovaca* sp. n., *O. pseudonasuta* sp. n., *O. moravica* sp. n., *O. mohelensis* sp. n., *O. bohémica* sp. n. and *O. subheracleivora* sp. n.) from the territory of the former Czechoslovakia are given. Distinguishing characters are documented by the illustrations including those of the male terminalia and the taxonomic positions of all the new species are briefly discussed. A key to all the European *Ophiomyia* species is added.

INTRODUCTION

The genus *Ophiomyia* Braschnikov with its 243 world species is known from all the main zoogeographical regions (Palearctic 56, Nearctic 31, Oriental 25, Afrotropical 29, Neotropical 67 and Australasian 35) and belongs to one of the larger genera of Agromyzidae (*Phytomyza* 455, *Melanagromyza* 364 and *Liriomyza* 352). Although the biology is unknown in many species, most European forms are known as external miners of stems or leaves of Apiaceae, Asparagaceae, Asteraceae, Brassicaceae, Campanulaceae, Caryophyllaceae, Dipsacaceae, Lamiaceae, Fabaceae, Ranunculaceae, Rubiaceae (Spencer, 1990), and *Verbascum* was recorded as the first host plant of an *Ophiomyia* from the family Scrophulariaceae quite recently (Černý, 1991).

Nine and 2 species of *Ophiomyia* have been recorded from the Czech and Slovak Republic respectively. *O. verbasci* Černý, 1991 and *O. spenceri* Černý, 1985 were described as new. In the last decade I had an opportunity to study a fairly large series of specimens (420) from the genus including 41 species originating mainly from Central Europe. All this material is deposited in my collection. A surprisingly great amount of specimens (including the majority of the type specimens recorded here) was collected on the famous forest steppe locality called Mohelnská hadcová step, lying in the cadastres of Dukovany and Mohelno (SW Moravia). This unique locality, with a status of National Nature Reserve is well known as a geocomplex of specific flora and fauna on the serpentine ground providing suitable conditions for development of many nanistic forms of plants as well as animals. The steppe-like vegetation on southwards oriented slopes is characterized by *Stipa stenophylla*, *S. dasyphylla*, *Carex humilis*, *Festuca ovina*, *Gagea bohémica*, *Verbascum phoeniceum*, *Armeria elongata*, etc. The plant formations include a rich complex of xerotherm communities embracing many unusual host plants for Agromyzidae. My collections from 1985–1994 resulted in recording 117 species of Agromyzidae.

The new species described here were discovered during a study of the material originating from the faunistic investigation of eastern and southern Slovakia in 1984–1988 (M. Vála et al.) and from samples obtained in the framework of the special research project focused on Agromyzidae of the serpentine steppe at Mohelno in Moravia in 1984–1992 (M. Černý). Also, some specimens from the private collections of V. Kneifl and M. Vála are included. Terminology used here follows the studies by Griffiths (1972), Spencer & Steyskal (1986) and Spencer (1990).

Ophiomyia orientalis sp. n.

(Figs 1–10)

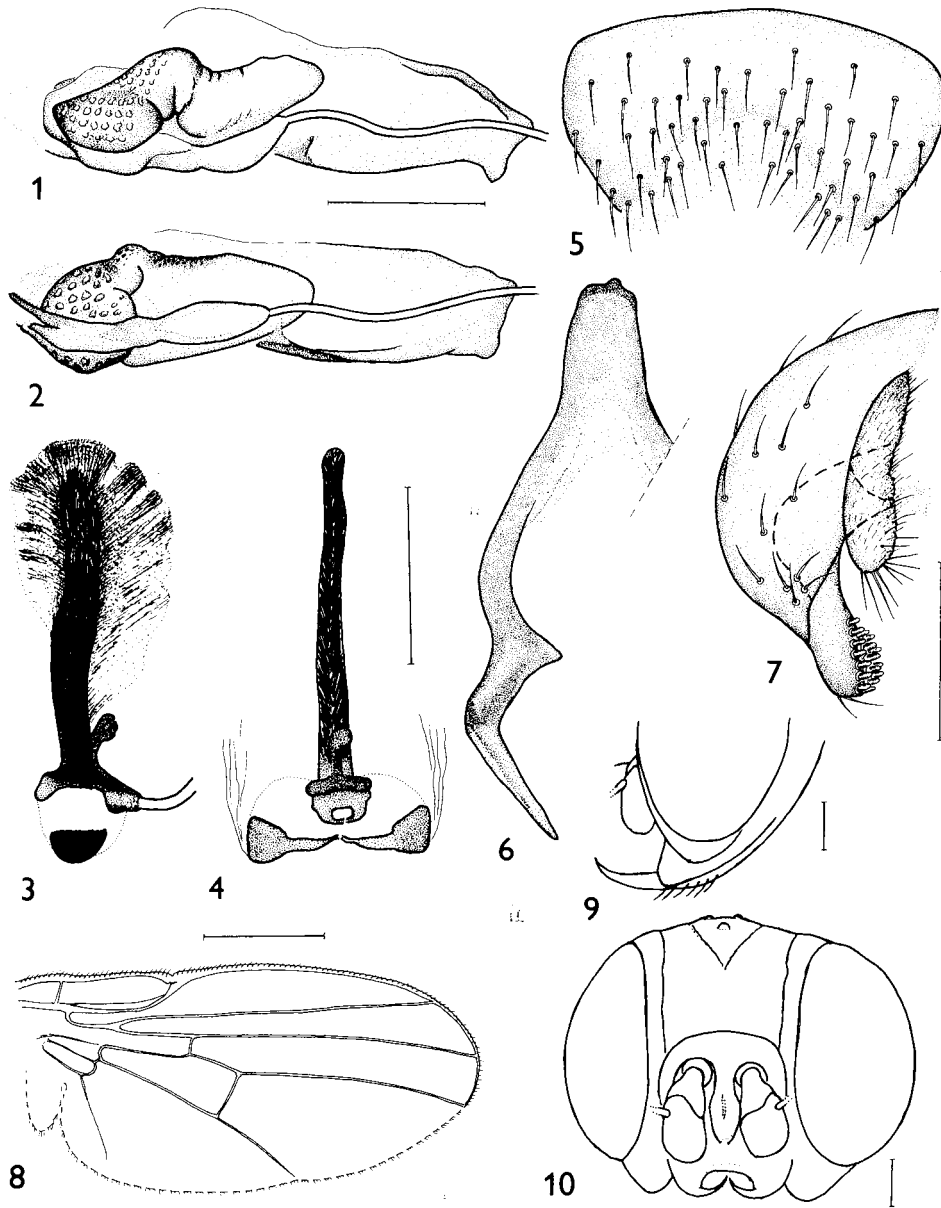
Body length 2.0 mm. Frons broader than high, about 1.8 times as wide as eye (at level of anterior ocellus). Narrow orbits barely overreaching level of frons, occupying only 0.15 of frontal width. In profile frons and orbits not visible in front of eye. Ocellar triangle large, slightly projecting above frontal plane, its anterior tip reaching below lower orbital bristle. Lunule broad, forming low and flat arch. Facial keel (Fig. 10) moderately produced and broadened below bases of antennae, about as wide as first antennal segment in broadest portion, with conspicuous groove in middle. Gena (Fig. 9) narrower than 0.2 height of eye, parafacial in lowest part reaching 0.7 height of eye. Vibrissal angle about 75°, vibrissal fasciculus only short, broad at base, projecting into a sharp and upwards curved tip. Two strong and long orbitals and two frontals placed on orbits. Orbital setulae only sparse, arranged in one row, reclinate. Third antennal segment longer than wide, covered with short hairs. Thorax stout, without expressive transverse suture. Two strong and long dorsocentrals present, acrostichal hairs in 8 rows at level of 2nd dorsocentral bristle, posteriorly reaching level of 1st dorsocentral.

Wing (Fig. 8) 2.1 mm long, costa developed to end of M_{1+2} . Length of costal sections 2–4 as 3.7 : 1.0 : 0.9. Vein R_{2+3} straight, veins R_{4+5} and M_{1+2} slightly arched. Last portion of M_{3+4} shorter than penultimate as 1.0 : 1.2. Anterior crossvein situated apically in 0.6 length of discal cell. Distance between anterior and posterior crossveins only slightly longer than length of posterior crossvein.

Abdomen broad, covered with setulae, sternum 5 (Fig. 5) narrowly oval, with rounded emargination. Male genitalia (Figs 1–7): Periandrium (Fig. 7) higher than broad, with sparse long bristles. Gonostylus bearing dense spines on inner side. Cerci narrow and long, slightly arched, densely covered with short hairs. Aedeagus (Figs 1, 2) symmetrical, spherical distiphallus divided by a sclerotized lamella in distal part. Sperm pump (Figs 3, 4) large, blade narrower than broad, with moderately arched stalk penetrating through blade to its end. Hypandrium (Fig. 6) with narrow arms, hypandrial apodeme elongate and broad.

Colouring uniformly black. Frontal vitta velvety black, contrast to shining black orbits and ocellar triangle. Gena, parafacial, antenna, palpus and occiput dull black. Thorax and abdomen black, semilustrous, slightly pruinose. Wing base brown, veins ochre brown. Squamae white, their margin and fringe blackish brown. All legs blackish brown. Halteres black.

TYPE MATERIAL: Holotype ♂, Slovakia or., Humenné distr., Kolbasov, 10.vi.1985, genitalia dissected, mounted on the same pin below the holotype; leg. M. Vála, deposited in the Entomological Department of the Moravian Museum in Brno.



Figs 1–10. *Ophiomyia orientalis* sp. n., holotype. 1 – aedeagus in lateral view; 2 – the same in ventral view; 3 – sperm pump in lateral view; 4 – the same in dorsal view; 5 – 5th sternum; 6 – hypandrium; 7 – perianthrium, gonostylus and cercus in caudal view; 8 – wing; 9 – head in lateral view; 10 – the same in frontal view. Scale lines: Figs 1–7, 9, 10 = 0.1 mm, Fig. 8 = 0.5 mm.

NAME DERIVATION: The specific name indicates the most eastern type locality among the newly described species of *Ophiomyia*.

Female and biology unknown.

Discussion: *O. orientalis* sp. n. is apparently closely related to *O. asparagi* Spencer which was described from southern Europe. *O. orientalis* differs by its larger size and a remarkably producing facial keel below the bases of antennae (the facial keel is quite flat in *O. asparagi*). A conspicuous shine of the mesonotum and abdomen, the broader frons and the narrower gena in *O. asparagi* belong to further distinguishing characters. The main diagnostic characters found in the shape and structures of the male genitalia confirm the state of *O. orientalis* as a separate species. Especially the shape of aedeagus and that of distiphallus in particular are distinctly different (cf. Spencer, 1964, Figs 9, 10).

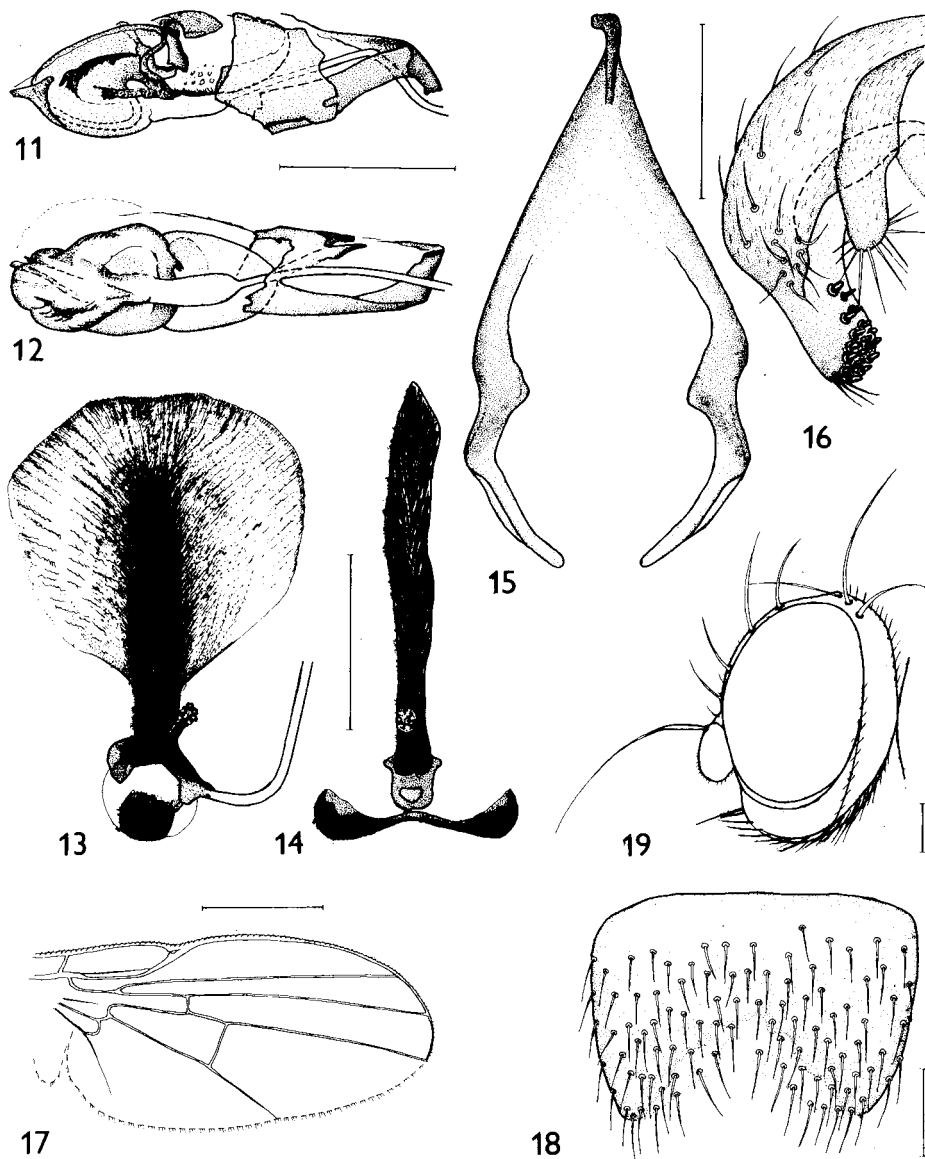
Ophiomyia vimmeri sp. n.
(Figs 11–19)

Body length 2.0–2.3 mm, frons broad, parallel, wider than high, 1.5–1.8 times as wide as eye. Orbits narrow, reaching 0.15 width of frons, protuberant as a narrow ring above level of eye in profile. Ocellar triangle large, with tip reaching level of upper orbital bristle. Lunula broad, forming a low arch. Antennae separated in a distance being as long as 0.3 width of first antennal segment. Facial keel virtually missing. Gena (Fig. 19) only narrow, reaching 0.2 height of eye in broadest part. Parafacial in a form of narrow stripe below eye. Two strong orbitals of same length, upper directed upwards and out, inserted closer to lower orbital than to external vertical bristle. Lower orbital bristle directed up and innerwards. Two weaker frontal bristles mediocliniate. Orbital setulae oriented posteriorly, scattered in one irregular row. 3rd antennal segment barely longer than broad. A broad and massive thorax with two strong dorsocentrals, acrostichal hairs arranged irregularly in 7–8 rows, only in four rows at level of first dorsocentral bristle.

Wing (Fig. 17) 1.8–2.0 mm long, costa reaching tip of vein M_{1+2} . Length of costal sections 2–4 as 3.5–4.1 : 1.0 : 0.7–0.8. Last portion of M_{3+4} shorter than penultimate as 1.0 : 1.2 or of same length. Anterior crossvein placed apically in 0.7 length of discal cell.

Abdomen broad, sternum 5 (Fig. 18) rectangular, densely covered with bristles, provided with a V-shaped incision. Male genitalia (Figs 11–16): Periandrium (Fig. 16) rather high, with long bristles and a group of long setulae in anal part above gonostyles. Ventral portion of gonostylus with a group of spines and 3 stronger setules. Cerci narrow and long, broadened in middle, with a group of setulae in ventral part. Aedeagus (Figs 11, 12) small, with characteristically divided, swollen distiphallus. Basiphallus with short arms and typical, broad sclerite. Sperm pump (Figs 13, 14) as large as aedeagus, with oval and broad blade. Hypandrium (Fig. 15) with narrow arms, hypandrial apodeme short, with laterally flattened and down oriented tip.

Colouring completely black. Frontal vitta velvety black. Orbits and ocellar triangle shining black. Gena, parafacial, antenna, palpus and occiput dull black. Thorax and abdomen black, semilustrous, slightly pruinose on mesonotum and scutellum. Notopleural triangle, posterior and upper margin of mesopleuron leathery brown. Wing base brown, veins ochre brown. Squamae grey, their margin and fringe blackish brown. All legs brownish black.



Figs 11–19. *Ophiomyia vimmeri* sp. n., holotype. 11 – aedeagus in lateral view; 12 – the same in ventral view; 13 – sperm pump in lateral view; 14 – the same in dorsal view; 15 – hypandrium; 16 – periandrium, gonostylus and cercus in caudal view; 17 – wing; 18 – 5th sternum; 19 – head in lateral view. Scale lines: Figs 11–16, 18, 19 = 0.1 mm, Fig. 17 = 0.5 mm.

TYPE MATERIAL: Holotype ♂, Czech Republic, Moravia centr., Zlín distr., Halenkovice, 8.viii.1988, genitalia dissected, mounted on the same pin below the holotype; leg. M. Černý, deposited in the Entomological Department of the Moravian Museum in Brno. Paratypes: Moravia centr., Olomouc distr., Hněvotín 1 ♂ 5.viii.1989; Slovakia or. Humenné distr., Kolbasov, 1 ♂ 10.vi.1985; leg. et coll. M. Vála.

NAME DERIVATION. This species is named in honour of the founder of Czech dipterology and famous specialist in mining insects Antonín Vimmer (1864–1941).

Female and biology unknown.

Discussion. *O. vimmeri* sp. n. particularly resembles *O. pulicaria* (Meigen) being described from Austria and distributed mainly in Central Europe (Spencer, 1964). External characters are only slightly different: the frons of *O. vimmeri* is 1.5 times broader than the eye and the gena is higher than in *O. pulicaria*. Orbits are distinctly protuberant in profile in *O. vimmeri*. A reliable distinguishing of both species is possible only on the ground of the shape of male genitalia, particularly according to the structure of the aedeagus (cf. Spencer, 1964, Figs 71, 72).

Ophiomyia slovaca sp. n.

(Figs 20–29)

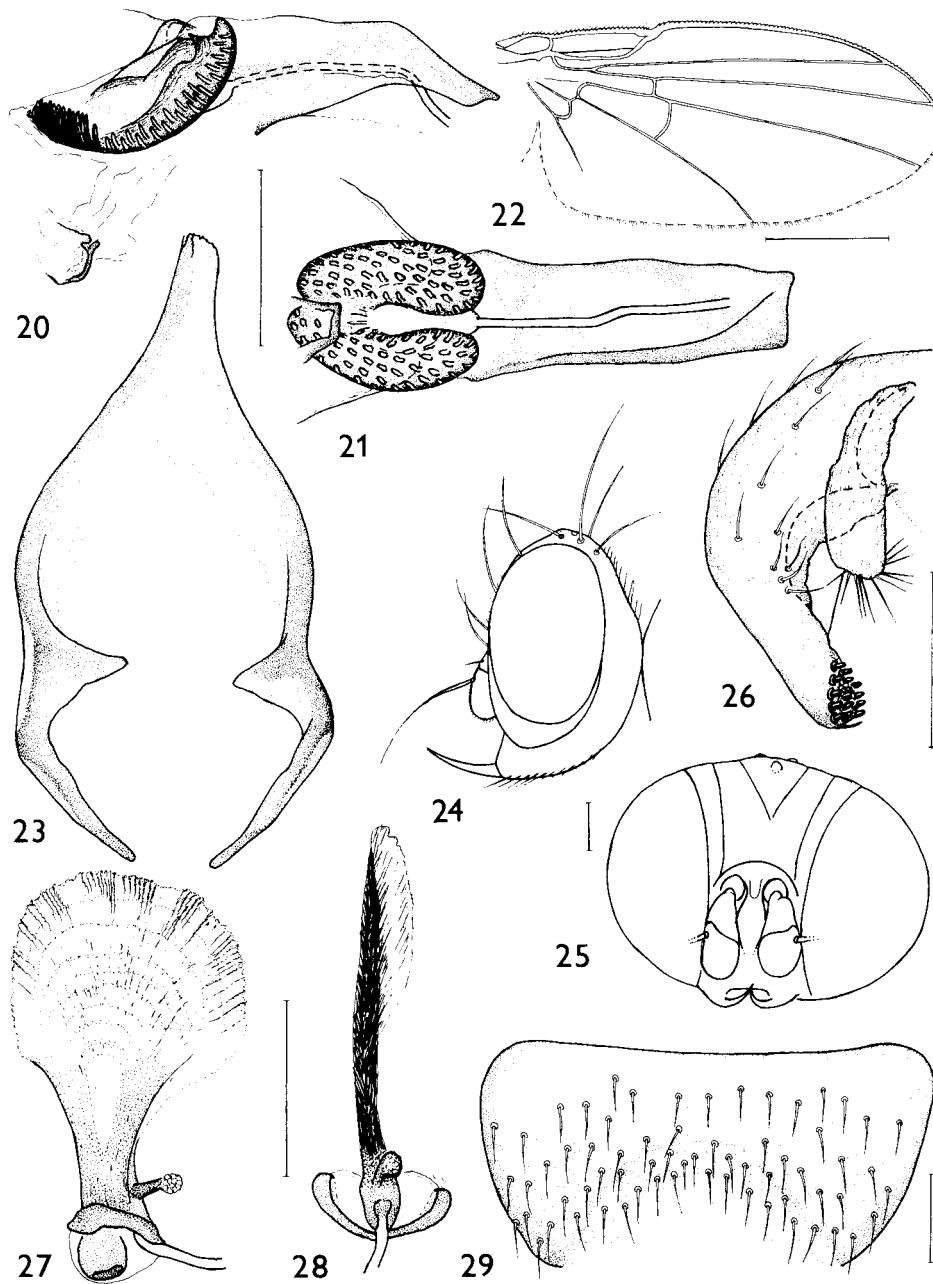
Body length 2.0–2.1 mm in male and 2.1 mm in female. Frons broader than high, 1.8–2.0 times wider than eye, tapering anteriorly. Orbit narrow, reaching 0.15 width of frons in its upper part. Frons and orbits not visible in lateral aspect in front of eye. Lunula broad, forming a low arch. Facial keel (Fig. 25) broadened and moderately swollen below base of antennae, barely broader than 1st antennal segment. Gena (Fig. 24) broad, reaching 0.3 height of eye. Parafacial protuberant above level of eye in lateral aspect, in its lower part about as wide as a half height of gena. Vibrissal angle about 70°. Vibrissal fasciculus moderately long, with slightly bent tip. Two orbitals and two frontals present, upper orbital inserted closer to lower orbital than to external vertical bristle. Orbital setulae sparse, oriented posteriorly, arranged in one irregular row. Two dorsocentrals on stout thorax present, acrostichal hairs in 4 rows.

Wing (Fig. 22) 1.8–1.9 mm long in male and 1.9 mm in female. Costa reaching tip of vein R_{4+5} . Length of costal sections 2–4 as 3.7–3.9 : 1.0 : 1.0. Vein R_{2+3} barely arched, veins R_{4+5} and M_{1+2} distinctly curved. Last portion of M_{3+4} longer than penultimate as 1.6 : 1.0. Anterior crossvein placed apically in 0.8 length of discal cell.

Abdomen broad, sternum 5 (Fig. 29) narrow, with a deep incision reaching a half length of sternite. Male genitalia (Figs 20, 21, 23, 24, 26–28): Periandrium (Fig. 26) with a sparse growth of long bristles. Gonostylus with numerous spines and one bristle on ventral part. Cerci narrow and long, broadened in ventral part. Aedeagus (Figs 20, 21) symmetrical, distiphallus bilobate and swollen, with typical surface structure and a separated sclerite in shape of U. Mesophallus small, placed between lobes of distiphallus. Sperm pump (Figs 27, 28) large, with broad and short stalk continuing as a broad blade. Hypandrium (Fig. 23) with narrow arms, hypandrial apodeme elongate into a broad and blunt tip.

Colouring completely black. Frontal vitta velvety black. Orbits, ocellar triangle, gena and occiput matt black. Parafacials blackish brown. Thorax and abdomen shining black, wing base brown, veins ochre brown. All legs brownish black.

TYPE MATERIAL: Holotype ♂, Slovakia mer., Trebišov distr., Viničky, 17.v.1987, genitalia dissected, mounted on the same pin below the holotype; leg. M. Vála, deposited in the Entomological Department of the Moravian Museum in Brno. Paratype: Slovakia mer., Nové Zámky distr., Kováčov, 1 ♂ 17.v.1984;



Figs 20–29. *Ophiomyia slovaca* sp. n., holotype. 20 – aedeagus in lateral view; 21 – the same in ventral view; 22 – wing; 23 – hypandrium; 24 – head in lateral view; 25 – the same in frontal view; 26 – perianthrium, gonostylus and cercus in caudal view; 27 – sperm pump in lateral view; 28 – the same in dorsal view; 29 – 5th sternum. Scale lines: Figs 20, 21, 23–29 = 0.1 mm, Fig. 22 = 0.5 mm.

leg. et coll. M. Vála.

NAME DERIVATION. The name of this species reflects the type locality laying in the Slovak Republic.

Female and biology unknown.

Discussion. *O. slovacica* sp. n. distinctly differs from the related *O. submaura* Hering described from Germany and distributed mainly in southern and central Europe (Spencer, 1964). The facial keel is in *O. submaura* swollen below the base of the antennae (flat in *O. slovacica*), the length of the last section of M_{3+4} to the penultimate section of the same vein as 1.6 : 1.0 (1.2 : 1.0 in *O. submaura*). A quite different shape of the male genitalia proves a full validity of the new species. *O. submaura* (cf. Spencer, 1964, Figs 81–82) displays an asymmetrical aedeagus with the two distinctive flaps projecting upwards above the level of the distiphallus. The aedeagus of *O. slovacica* consists of two lobes of a different shape and the basiphallus bears remarkably short arms.

Ophiomyia pseudonasuta sp. n.

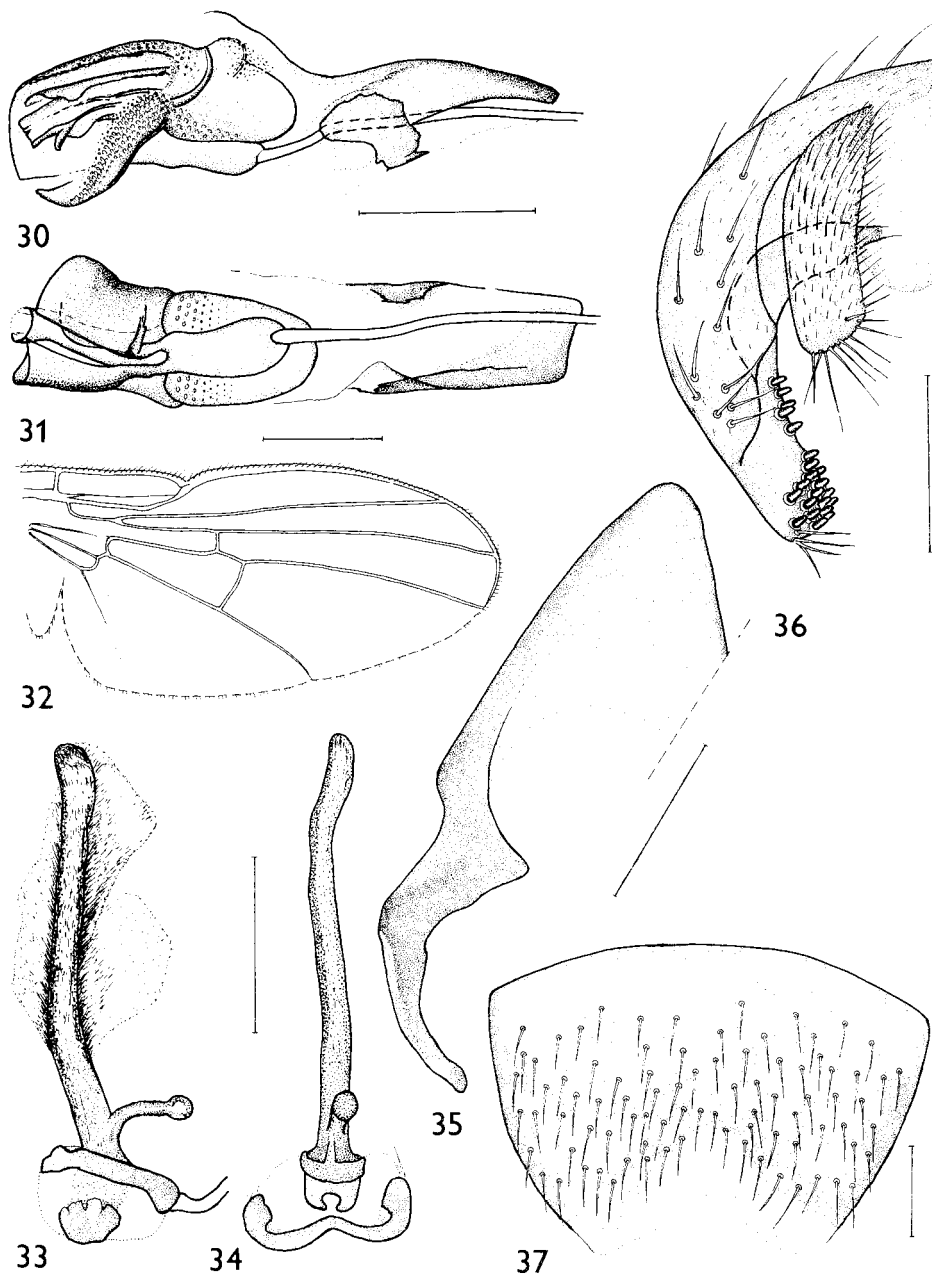
(Figs 30–37, 73, 74)

Body length 2.4–2.6 mm in male and 2.7 mm in female. Frons broad, reaching 1.5 width of eye. Orbits protuberant about level of frons, their width in middle of frons reaching 0.25 width of frons. In lateral aspect orbit visible as a narrow ring in front of eye. Ocellar triangle large, slightly projecting above level of frons, its blunt anterior tip reaching level of upper frontal bristle. Lunula broad, low, forming a moderate arch. Facial keel (Fig. 73) broad, broader than 1st antennal segment near base of antennae and hemispherically projecting below base of antennae. Gena (Fig. 74) reaching 0.2 width of eye in broadest part, parafacial in a form of a narrow ring in facial part of head and below eye. Only two medioclinate frontal bristles, orbitals quite missing in male and present in female. Orbital setulae arranged in more rows, long and proclinate in upper part. Among frontals only several hairs oriented upwards and anteriorly. 3rd antennal segment almost round. Thorax stout and arched, if 3 dorsocentral present, then 3rd distinctly shorter. Acrostichal hairs arranged in 8 rows, overreaching level of 1st dorsocentral, where reduced into 4 rows.

Wing (Fig. 32) 2.1–2.3 mm long in male and 2.5 mm long in female. Costa reaching tip of vein M_{1+2} . Length of costal sections 2–4 as 3.1–3.5 : 1.0 : 0.7. Vein R_{2+3} slightly arched in basal part, veins R_{4+5} and M_{1+2} somewhat convex in middle. The last section of M_{3+4} shorter than penultimate as 1.0 : 1.2. Anterior crossvein placed apically in 0.8 length of discal cell.

Abdomen broad, 5th sternum (Fig. 37) tapering distally, middle incision reaching only 0.3 length of sternite. Male genitalia (Figs 30, 31, 33–36): Aedeagus (Figs 30, 31) with typically shaped distiphallus consisting of two lateral and one medial parts, latter being strongly divided. Basiphallus bearing short, differently long and broad arms. Periandrium (Fig. 36) large, sparsely covered with long bristles. Gonostylus with spines on inner side divided into two separated groups. Cerci long and tapered toward tips, with long setules. Sperm pump (Figs 33, 34) with a long and arched stalk penetrating through narrow blade to its tip. Hypandrium (Fig. 35) with moderately broad arms and without distinct hypandrial apodeme.

Colouring uniformly black. Frontal vitta, antenna, palpus, gena, parafacial and occiput black without any shining. Orbits semilustrous, black, ocellar triangle strongly shining. Thorax and abdomen semilustrous, black, mesonotum and scutellum slightly pruinose.



Figs 30–37. *Ophiomyia pseudonasuta* sp. n., holotype. 30 – aedeagus in lateral view; 31 – the same in ventral view; 32 – wing; 33 – sperm pump in lateral view; 34 – the same in dorsal view; 35 – hypandrium; 36 – periandrium, gonostylus and cercus in caudal view; 37 – 5th sternum. Scale lines: Figs 30, 31, 33–37 = 0.1 mm, Fig. 32 = 0.5 mm.

Upper and posterior margin of mesopleuron and bases of wings leathery brown, wing veins ochre brown. All legs completely black.

TYPE MATERIAL: Holotype ♂, Slovakia or, Humenné distr., Nová Sedlica, 8.vi.1988, genitalia dissected, mounted on the same pin below the holotype; leg. M. Vála, deposited in the Entomological Department of the Moravian Museum in Brno. Paratypes: Czech Republic, Moravia centr., Olomouc, 1♂, 1♀, 31.v.1988; leg. et coll. M. Vála.

NAME DERIVATION. The specific name expresses the external similarity of the new species to *O. nasuta* (Melander).

Biology unknown.

Discussion. According to the arrangement of orbital setulae *O. pseudonasuta* sp. n. belongs to the species group *O. pinguis* (Fallén) and particularly resembles the related *O. nasuta* (Melander) that was discovered in the USA for the first time and now is known as worldwide distributed. The size of both species is virtually the same and the shape of the body is also similar. In *O. pseudonasuta* sp. n., however, the lengths of the costal sections closer to each other than in *O. nasuta* (3.5–4.8 : 1.0 : 0.8–1.0) and the distance of both crossveins is distinctly longer. Distinctness of both species is clearly supported by the structures of the male genitalia. The shape of the aedeagus and especially the distiphallus is very different in both species (cf. Spencer, 1964, Fig. 62). The hypandrium of *O. pseudonasuta* sp. n. displays no hypandrial apodeme and its distal part is only slightly arched downwards. Its arms are smooth, without a sharp lateral projection in the basal part. The hypandrium of *O. nasuta* is distinctly elongate into a narrow and flattened hypandrial apodeme that is strongly arched downwards. The arms bear remarkable lateral projections in the basal third.

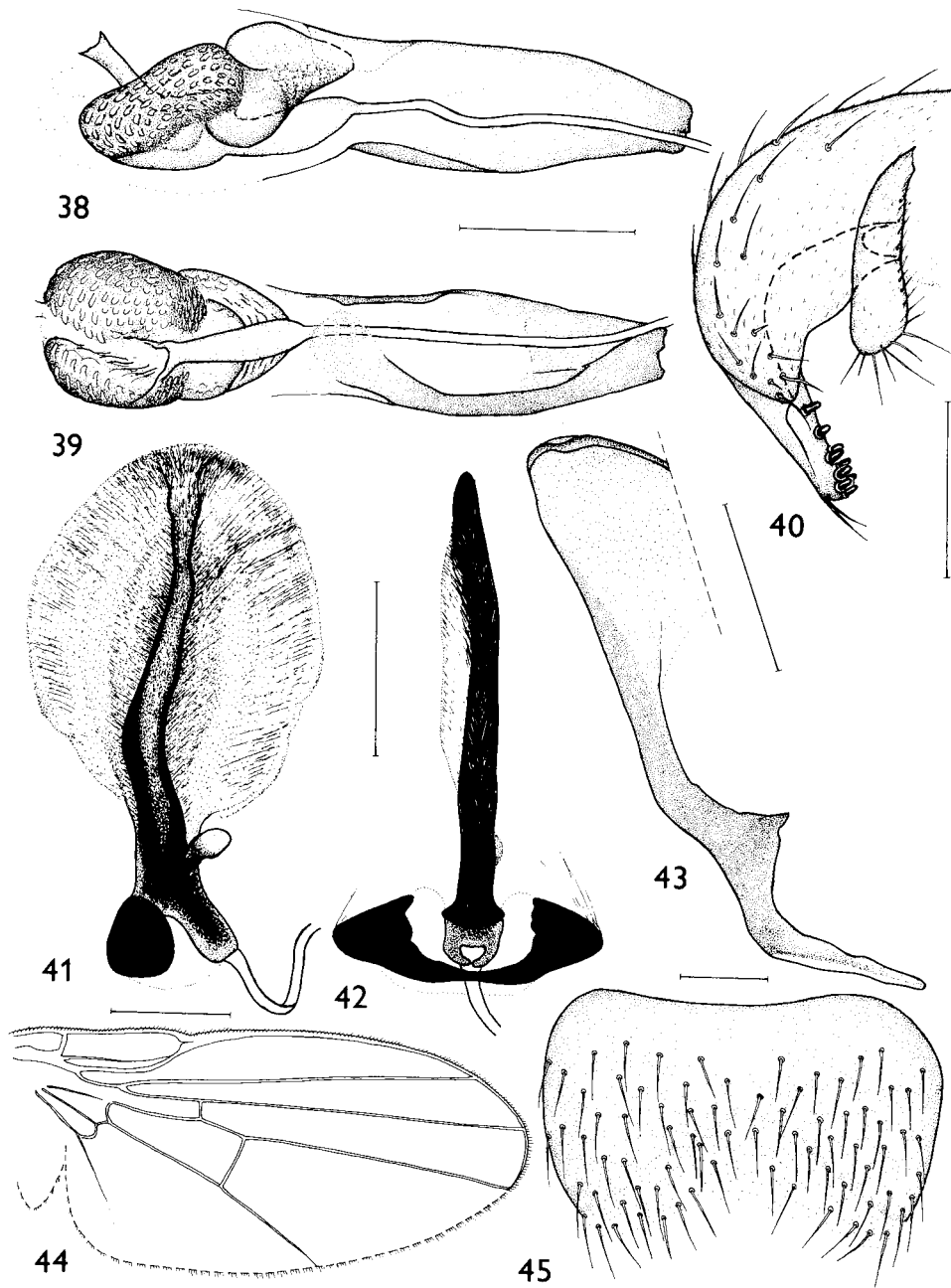
Ophiomyia moravica sp. n.

(Figs 38–45, 75, 76)

Body length 2.2 mm, frons about 1.8 times as broad as eye, slightly tapering anteriorly. Orbits in plane of frons, reaching 0.2 width of frons. In lateral aspect only slightly protuberant in front of eye. Ocellar triangle large, its tip overreaching level of lower orbital. Lunula broad and low, with a small convex arch in middle. Facial keel (Fig. 76) narrow near base of antennae but broadened below antennae to width of 1st antennal segment, ending with a sharp tip separating both antennal depressions. Gena (Fig. 75) high, reaching 0.3 height of eye in broadest point. Parafacials about as high as a half of gena. Vibrissal angle about 80°, vibrissal fasciculus long, with a curved tip being disintegrated to individual setae. Two orbitals and two frontals present. Orbital setulae sparse, reclinate. Stout thorax with two strong dorsocentrals, acrostichal hairs in irregular 4–6 rows reaching level of first dorsocentral bristle.

Wing (Fig. 44) 2.3 mm long, costa reaching tip of vein M_{1+2} . Length of costal sections 2–4 as 4.0 : 1.0 : 0.9. Veins R_{2+3} , R_{4+5} and M_{1+2} straight, divergent apically. Last section of vein M_{3+4} barely longer than penultimate section. Anterior crossvein placed distally in 0.6 length of discal cell.

Abdomen broad, 5th sternum (Fig. 45) oval, slightly emarginate at basal margin. Weakly sclerotized distal part occupying about a half length of sclerite. Male genitalia (Figs 38–43): Aedeagus (Figs 38, 39) symmetrical with a swollen distiphallus and a tubelike projection in dorsal part. Basiphallus with long and differently broad arms.



Figs 38–45. *Ophiomyia moravica* sp. n., holotype. 38 – aedeagus in lateral view; 39 – the same in ventral view; 40 – perianthrium, gonostylus and cercus in caudal view; 41 – sperm pump in lateral view; 42 – the same in ventral view; 43 – hypandrium; 44 – wing; 45 – 5th sternum. Scale lines: Figs 38–43, 45 = 0.1 mm, 44 = 0.5 mm.

Periandrium (Fig. 40) arched, sparsely covered with long bristles, gonostylus bearing several rows of spines on inner side and two setulae on ventral part. Cerci long, slightly clublike, broadened, with numerous setulae. Sperm pump (Figs 41, 42) large, with a broad stalk protruding through broad and oval blade to its tip. Hypandrium (Fig. 43) broad, with narrow arms, hypandrial apodeme indistinct.

Colouring uniformly black. Frontal vitta velvety black, orbits, ocellar triangle and occiput semilustrous, black. Gena, parafacial, antenna and palpus brownish black, margin of oral cavity brown. Thorax and abdomen black, mesonotum and scutellum slightly pruinose. Posterior and upper margin of mesopleuron and wing base brown, veins ochre yellow. All legs blackish brown.

TYPE MATERIAL: Holotype ♂, Czech Republic, Moravia centr., Prostějov distr., Kostelec, 13.vi.1977, genitalia dissected, mounted on the same pin below the holotype; leg. M. Vála, deposited in the Entomological Department of the Moravian Museum in Brno.

NAME DERIVATION. The species is named according to the location of collecting sites in Moravia as a historical part of the Czech Republic.

Female and biology unknown.

Discussion. *O. moravica* sp. n. clearly belongs to the species group *O. maura* (Meigen) owing to its external characters. It appears to be closely related to *O. melandryi* de Meijere which was described from the Netherlands and now is known as generally distributed throughout Europe. As regards the size, *O. moravica* is distinctly smaller, its frons is slightly narrower, the vibrissal fasciculus is longer, and its tip is more curved than in *O. melandryi*. The main diagnostic characters were discovered in the structure of the male genitalia. The aedeagal complex of *O. melandryi* is characterized by a black U-shaped projection and by an asymmetrical membranose flap (Spencer, 1964: Figs 60, 61) and differs in this way remarkably from that in *O. moravica*.

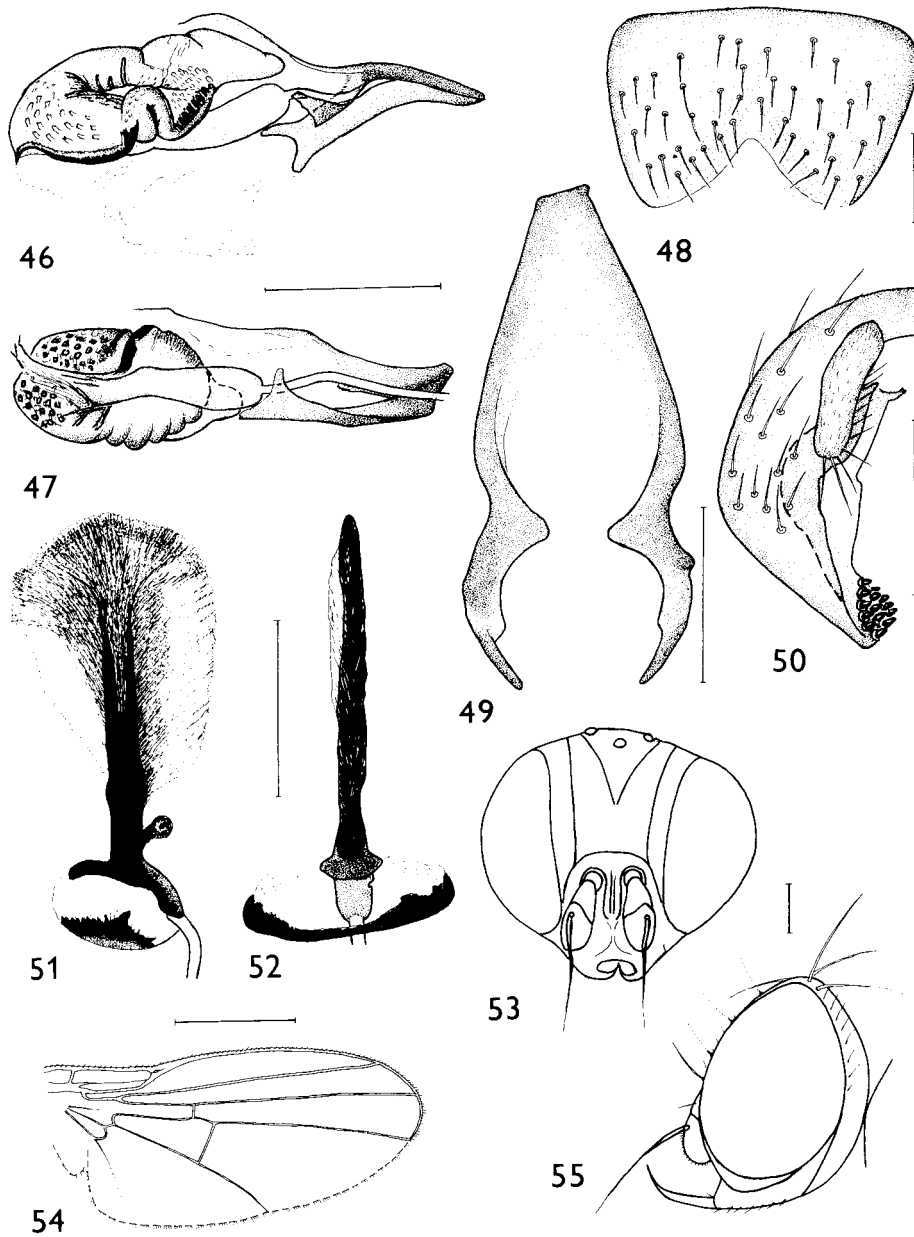
Ophiomyia mohelensis sp. n.

(Figs 46–55)

Body length 1.8–1.9 mm, frons broad, 1.8–2.0 times as broad as eye, slightly tapering towards anterior margin. Orbits narrow, reaching 0.2 width of frons, tapering anteriorly. Broad ocellar triangle reaching with its blunt tip between both orbital bristles. Lunula broad, forming low and flat arch. Facial keel (Fig. 53) barely narrower than 1st antennal segment near base of antennae, slightly broadened below antennae, with a deep groove in middle along all its length. 3rd antennal segment almost round. Gena (Fig. 55) low, reaching 0.16 height of eye. Parafacial reaching a half height of gena in broadest point. Vibrissal angle about 70°, vibrissal fasciculus long, broad at base and with a sharp and curved tip. Two orbitals and two frontals present, orbital setulae only sparse, reclinate. Stout thorax with 2 dorsals, acrostichal hairs arranged in 4–6 rows, some hairs even at level of 1st dorsocentral.

Wing (Fig. 54) 1.6–1.7 mm long, costa reaching tip of M_{1+2} . Length of costal sections 2–4 as 4.1 : 1.0 : 0.8. Vein R_{2+3} straight, veins R_{4+5} and M_{1+2} slightly arched and diverging towards wing apex. Last portion of M_{3+4} equal or somewhat shorter than penultimate section of same vein. Anterior crossvein placed apically in 0.8 length of discal cell.

Abdomen broad, 5th sternum (Fig. 48) small, tapering distad, V-shaped emarginate posteriorly in 0.3 of its length. Male genitalia (Figs 46, 47, 49–52): Periandrium (Fig. 50)



Figs 46–55. *Ophiomyia mohelensis* sp. n., holotype. 46 – aedeagus in lateral view; 47 – the same in ventral view; 48 – 5th sternum; 49 – hypandrium; 50 – periandrium, gonostylus and cercus in caudal view; 51 – sperm pump in lateral view; 52 – the same in ventral view; 53 – head in frontal view; 54 – wing; 55 – head in lateral view. Scale lines: Figs 46–53, 55 = 0.1 mm, Fig. 54 = 0.5 mm.

small, sparsely covered with long setulae. Gonostylus with a group of spines on inner side. Cerci as long as 0.4 height of periandrium, somewhat arched. Aedeagus (Figs 46, 47) with asymmetrical distiphallus, mesophallus long, tapering distally. Basiphallus with short arms. Sperm pump (Figs 51, 52) larger than aedeagus, blade higher than broad. Hypandrium (Fig. 49) small and narrow, hypandrial apodeme broad and obliquely cut.

Colouring uniformly black. Frontal vitta velvety blackish brown, orbits and ocellar triangle shining black. Occiput, antenna and palpus black, gena and parafacial brownish black. Thorax and abdomen shining black, mesonotum and scutellum slightly pruinose. Mesopleuron brownish black, wing base brown, veins ochre brown. All legs brownish black.

TYPE MATERIAL: Holotype ♂, Czech Republic, Moravia mer, Třebíč distr., Mohelno steppe 23.vii.1988, genitalia dissected, mounted on the same pin below the holotype; leg. M. Černý, deposited in the Entomological Department of the Moravian Museum in Brno. Paratypes: The same locality label 1♂ 20.vii.1991, 1♂ 13.viii.1991; leg. et coll. M. Černý.

NAME DERIVATION. This species is named according to the type locality, a serpentine steppe near Mohelno in south-western Moravia.

Female and biology unknown.

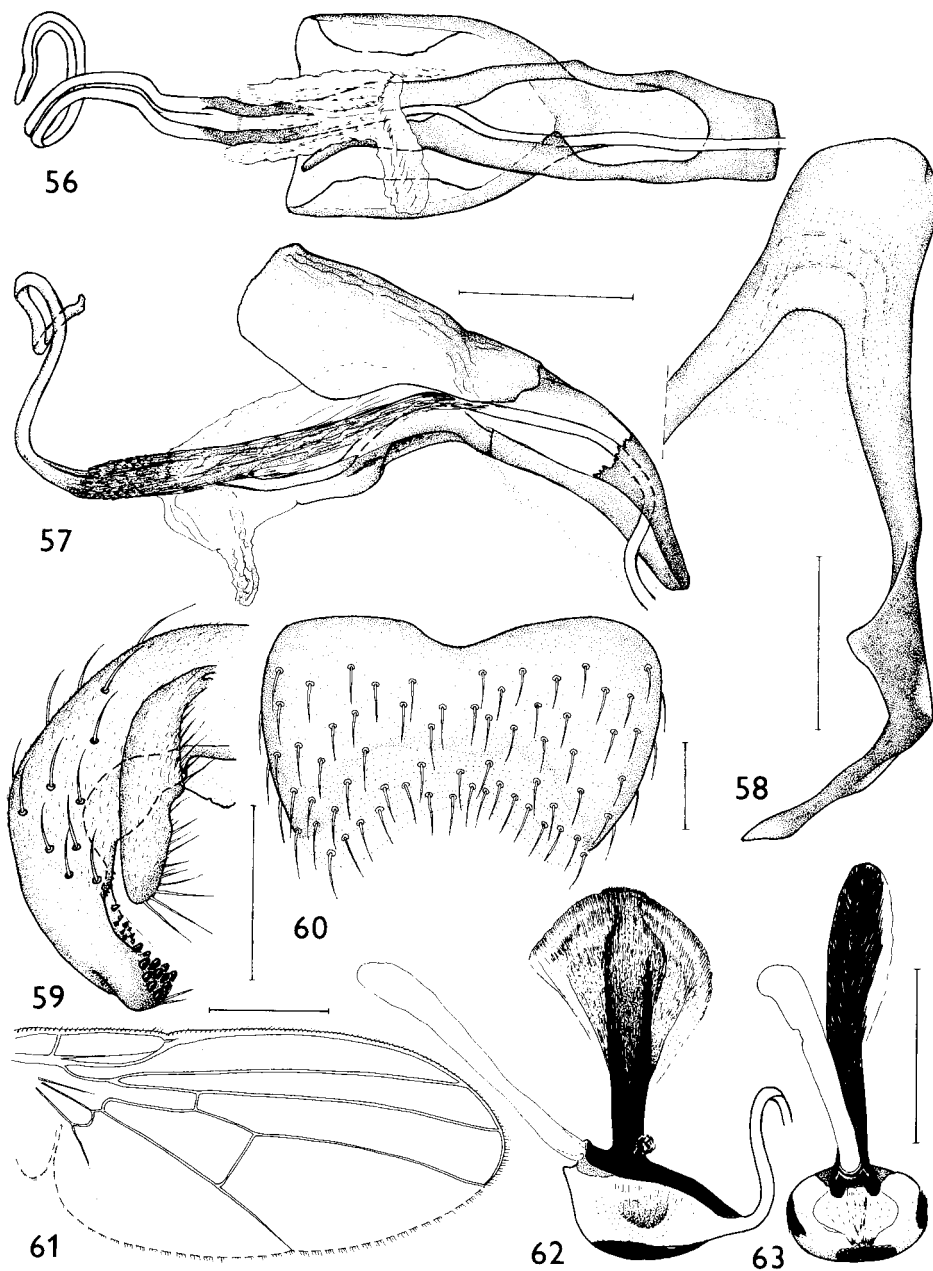
Discussion. *O. mohelensis* sp. n. is very similar to *O. asparagi* Spencer that was described from Italy and the known distribution of which covers chiefly southern Europe, and to *O. orientalis* sp. n. described above. All these species belong to rather small species of *Ophiomyia*, *O. mohelensis* being the smallest. The facial keel in *O. mohelensis* is narrow and flat, bearing a remarkable longitudinal groove and is thus not swollen below the antennae as in both other species. The distance between both crossveins is in *O. mohelensis* only slightly longer than the length of the anterior crossvein and almost twice as long in the other species under discussion. The specific validity of all three species is well documented by the structure of the male genitalia (cf. Spencer, 1964, Figs 9, 10), especially in the arrangement of the aedeagal complex, the shape of the hypandrial apodeme and the form of the sperm pump base.

Ophiomyia bohémica sp. n.

(Figs 56–63, 77, 78)

Body length 2.2 mm, frons twice as broad as eye, indistinctly tapered toward anterior margin. Orbits narrow, reaching 0.2 width of frons in upper part. Orbits and frons not visible in lateral aspect in front of eye. Ocellar triangle large, its sharp tip reaching between both orbital bristles. Lunula broad and low, semicircular. Facial keel (Fig. 78) narrower than 1st antennal segment near base of antennae, slightly broadened below antennae. Gena (Fig. 77) rather high, reaching almost 0.3 height of eye, parafacial as broad as a half width of gena. Vibrissal angle about 70°, vibrissal fasciculus long and bent upwards. Stout thorax with 2 dorsocentrals, acrostichal hairs in 4–6 irregular rows reaching level of 1st dorsocentral bristle.

Wing (Fig. 61) 2.2 mm long, costa reaching tip of M_{1+2} . Length of costal sections 2–4 as 4.7 : 1.0 : 1.0. Vein R_{2+3} almost straight, veins R_{4+5} and M_{1+2} somewhat undulate, divergent distally. Last portion of vein M_{3+4} shorter than penultimate as 1.0 : 1.2. Anterior crossvein placed apically in 0.7 length of discal cell.



Figs 56–63. *Ophiomyia bohémica* sp. n., holotype. 56 – aedeagus in ventral view; 57 – the same in lateral view; 58 – hypandrium; 59 – perianthium, gonostylus and cercus in caudal view; 60 – 5th sternum; 61 – wing; 62 – sperm pump in lateral view; 63 – the same in ventral view. Scale lines: Figs 56–60, 62, 63 = 0.1 mm, Fig. 61 = 0.5 mm.

Abdomen broad, 5th sternum (Fig. 60) strongly concave in proximal part, posterior margin broadly emarginate. Male genitalia (Figs 56–59, 62, 63): Periandrium (Fig. 59) sparsely covered with long setulae. Gonostylus bearing small spines on inner side with 2 bristles on ventral part. Cerci long, reaching 0.6 height of periandrium. Aedeagus (Figs 56, 57) with atypically shaped distiphallus consisting of two long and distally bent tubes. Basiphallus with long arms covered by a large sclerotized structure in dorsal part. Sperm pump (Figs 62, 63) small, with a short stalk and triangular blade. A long and clublike, weakly sclerotized structure distinct at its base. Hypandrium (Fig. 58) large, its arms broadly divergent, hypandrial apodeme wide.

Colouring uniformly black. Frontal vitta velvety black, orbits and ocellar triangle black, slightly shining. Gena, parafacial, antenna and palpi brownish black, vibrissal fasciculus black at base, its tip reddish brown. Thorax and abdomen black, semilustrous. Mesonotum and scutellum pruinose. Wing base brown, veins ochre yellow. All legs brownish black.

TYPE MATERIAL: Holotype ♂, Czech Republic, Bohemia centr., Nymburk distr., Lysá nad Labem, 18.v.1971, genitalia dissected, mounted on the same pin below the holotype; leg. V. Kneifl, deposited in the Entomological Department of the Moravian Museum in Brno.

NAME DERIVATION. The specific name indicates the historical part of the Czech Republic, where the type locality is situated.

Female and biology unknown.

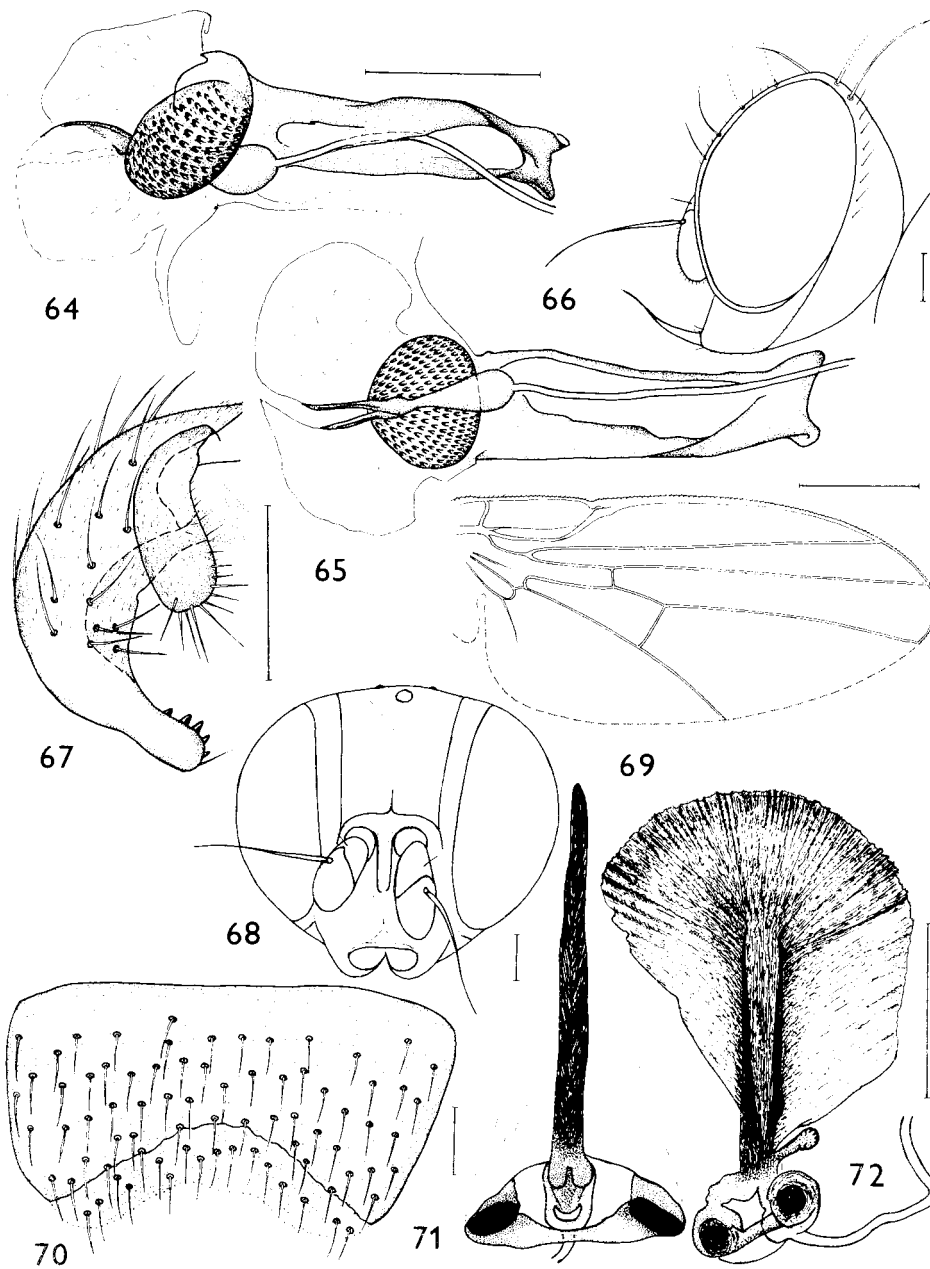
Discussion. *O. bohemica* sp. n. is very similar to *O. heracleivora* Spencer that was described from England and to *O. melandryi* de Meijere commented above. It differs from both these species by the smaller size and the smaller vibrissal angle (about 70°). The shape and the structure of the male genitalia confirm the full validity of the new species (cf. Spencer, 1964, Figs 43, 44, 60, 61). The typical distiphallus resembles the North American *O. bernardinensis* Spencer, but the overall shape of the aedeagus is distinctly different. Some further differences are found in some external characters, the colouring of the mesonotum and abdomen with a greenish shade and in the absence of the vibrissal fasciculus (cf. Spencer, 1981: Figs 74, 75).

Ophiomyia subheracleivora sp. n.

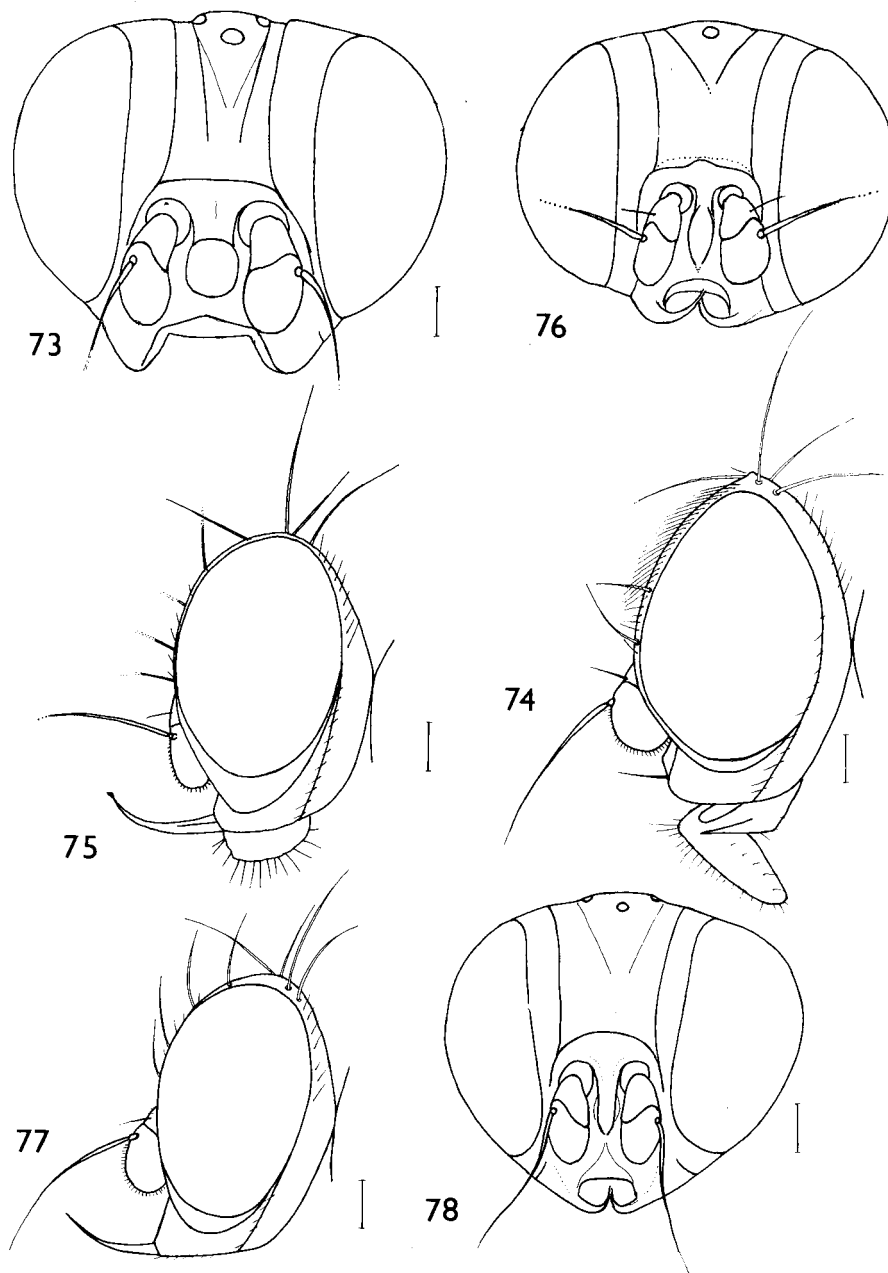
(Figs 64–72)

Body length 2.2 mm, frons 1.8 times broader than eye, tapering anteriorly. Orbits reaching only 0.2 width of frons. Frons and orbits protuberant as a narrow ring in front of eye in lateral aspect. Ocellar triangle large and not too prominent, its sharp anterior tip reaching mid-point between both orbital bristles. Lunula broad and very low, with a mid-groove continuing in frontal vitta. Facial keel (Fig. 68) narrow, reaching a half length of 1st antennal segment, not broadened below antennae. Gena (Fig. 66) as high as 0.2 height of eye in broadest point, parafacial in a form of narrow border along eye. Vibrissal angle about 80°, vibrissal fasciculus long and tapering into a slightly undulate, thin tip. Two orbital and two frontal bristles present, orbital setulae sparse, reclinate. Stout thorax with 2 dorsocentral bristles, sparse acrostichal hairs arranged in 4 irregular rows, some hairs reaching level of 1st dorsocentral bristle.

Wing (Fig. 69) 2.4 mm long, costa reaching tip of M_{1+2} . Length of costal sections 2–4 as 3.7 : 1.0 : 0.9. Vein R_{2+3} slightly convex, vein R_{4+5} straight and vein M_{1+2} slightly arched, all veins divergent at apex. Last section of vein M_{3+4} shorter than penultimate as 1.0 : 1.3.



Figs 64-72. *Ophiomyia subheracleivora* sp. n., holotype. 64 - aedeagus in lateral view; 65 - the same in ventral view; 66 - head in lateral view; 67 - periandrium, gonostylus and cercus in caudal view; 68 - head in frontal view; 69 - wing; 70 - 5th sternum; 71 - sperm pump in ventral view; 72 - the same in lateral view. Scale lines: Figs 64-68, 70-72 = 0.1 mm, Fig. 69 = 0.5 mm.



Figs 73–78. 73–74 – *Ophiomyia pseudonasuta* sp. n., holotype. 73 – head in frontal view; 74 – the same in lateral view. 75–76 – *Ophiomyia moravica* sp. n., holotype. 75 – head in lateral view; 76 – the same in frontal view. 77–78 – *Ophiomyia bohemica* sp. n., holotype. 77 – head in lateral view; 78 – the same in frontal view. Scale lines: 0.1 mm.

Anterior crossvein placed apically in 0.6 length of discal cell.

Abdomen broad, sternum 5 (Fig. 70) low and densely covered with short setulae, broadly V-shaped marginate in distal part. Male genitalia (Figs 64, 65, 67, 71, 72): Periandrium (Fig. 67) small and with sparse long bristles. Gonostylus with several strong spines on inner side and one long bristle on ventral part. Cerci broad and slightly tapered in dorsal part. Aedeagus (Figs 64, 65) large, distiphallus formed as an oval structure with typical surface pattern and a characteristically split sclerite in distal part. Basiphallus with very long arms. Mesophallus strongly broadened toward basal part. Sperm pump (Figs 71, 72) large, with a broad blade.

Colouring generally black. Frons velvety brownish black, orbits shining black, ocellar triangle, gena, antenna and palpus brownish black. Thorax and abdomen semilustrous, black. Notopleural triangle and mesopleuron brownish black. Wing base brown, veins ochre yellow. All legs brownish black.

TYPE MATERIAL: Holotype ♂, Slovakia mer., Nové Zámky distr., Čenkov, 18.v.1984, genitalia dissected, mounted on the same pin below the holotype; leg. M. Vála, deposited in the Entomological Department of the Moravian Museum in Brno.

NAME DERIVATION. The specific name indicates the similarity of the new species to *O. heracleivora* Spencer.

Female and biology unknown.

Discussion. *O. subheracleivora* sp. n. resembles particularly *O. heracleivora* Spencer by its external characters but differs in several important features. The frons is narrower, the facial keel is also narrow, not broadened below antennae, parafacials form a narrow inner margin along the eyes, and the length of costal sections 2–4 are closer to each other than in *O. heracleivora* (4.1–4.7 : 1.0 : 1.0). The shape and the structure of the male genitalia distinguish both species without any doubts. Especially the aedeagal complex of *O. subheracleivora* sp. n. is clearly different from that of *O. heracleivora* where the distiphallus consists of a pair of symmetrical projections (Spencer, 1964, Figs 43, 44). Also the base of the sperm pump is widely different forming conspicuously broad blade in *O. heracleivora*.

Key to the European species of *Ophiomyia*

(adapted from Spencer, 1964, 1966, 1976)

- 1 No obvious facial keel present between antennae, vibrissa normal 2
- Distinct facial keel separating antennae or male with vibrissal fasciculus 10
- 2 Orbital setulae all reclinate 3
- Orbital setulae both proclinate and reclinate 9
- 3 Frons and orbits not projecting above eye 4
- Frons and orbits projecting above eye 7
- 4 Costa extending to vein M_{1+2} 5
- Costa ending at or shortly beyond vein R_{4+5} 6
- 5 Orbits projecting in front of eyes as a narrow ring; acr setae in four rows at level of first dc seta; host plants: *Crepis*, *Hieracium*, *Hypochoeris*, *Leontodon*, *Picris*, *Sonchus*, *Taraxacum*
..... *pulicaria* (Meigen)
- Orbits not visible in front of eyes; acr setae in 8 rows at level of first dc seta *vimmeri* sp. n.
- 6 Last section of vein M_{3+4} little longer than penultimate; acr in 8 rows *inaequabilis* (Hendel)
- Last section of vein M_{3+4} almost twice as long as penultimate; acr in 6 rows *improvisa* Spencer
- 7 Costa ending at R_{4+5} ; host plant: *Asparagus officinalis* *simplex* (Loew)

– Costa extending to M_{1+2}	8
8 Frons and orbite projecting only as narrow ring above eye; third and fourth dc bristle normally short, position irregular; host plants: <i>Pisum</i> sp., <i>Vicia</i> sp.	<i>orbiculata</i> (Hendel)
– Frons and orbit strongly projecting above eye; third dc bristle long, at suture	<i>suavis</i> Spencer
9 Orbital setulae long, mainly proclinate, a few in front reclinate; host plants: <i>Crepis</i> , <i>Hypochoeris</i> , <i>Lampsana</i> , <i>Mycelis</i> , <i>Picris</i> , <i>Sonchus</i> , <i>Taraxacum</i>	<i>cunctata</i> (Hendel)
– Orbital setulae shorter, mainly reclinate, a few above proclinate; host plants: <i>Crepis</i> , <i>Hypochoeris</i> , <i>Launea</i> , <i>Leontodon</i> , <i>Picris</i> , <i>Taraxacum</i> , etc.	<i>beckeri</i> (Hendel)
10 Proboscis greatly elongated	11
– Proboscis short, normal	12
11 Two dc bristles, 2nd in same level as sa seta; acr in 6 rows; last section of vein M_{3+4} shorter than penultimate; host plant: <i>Knautia arvensis</i>	<i>longilingua</i> (Hendel)
– Three dc bristles, 3rd in same level as sa seta; last and penultimate sections of vein M_{3+4} of same length; acr in 10 rows	<i>rostrata</i> (Hendel)
12 Orbital setulae all proclinate; ors bristle and vibrissal fasciculus lacking in male	13
– Orbital setulae all reclinate; ors bristle present in both sexes; vibrissal fasciculus present in male .	15
13 Two dc bristles; first cross-vein at midpoint of discal cell; host plants: <i>Cichorium inthybus</i> , <i>Lampsana communis</i> , <i>Leontodon</i> sp.	<i>pinguis</i> (Fallén)
– Three dc bristles; first cross-vein approximated to second cross-vein	14
14 Costal sections 2–4 as 3.5–4.8 : 1 : 0.8; host plant: <i>Taraxacum officinale</i>	<i>nasuta</i> (Melander)
– Costal sections 2–4 only as 3.1–3.5 : 1 : 0.7	<i>pseudonasuta</i> sp. n.
15 Squamae and squamal fringe white; second cross-vein lacking; male without vibrissal fasciculus
.....	<i>aeneonitens</i> (Strobl)
– Squamae and squamal fringe black; second cross-vein present; male with vibrissal fasciculus . . .	16
16 Costa extending only to apex of vein R_{4+5}	17
– Costa reaching apex of vein M_{1+2}	25
17 Small species; wing length at most 2.4 mm	20
– Larger and stouter species; wing length 2.6–3.0 mm	18
18 Last and penultimate sections of vein M_{3+4} approximately equal	<i>rapta</i> Hendel
– Last section of vein M_{3+4} , distinctly longer than penultimate	19
19 Last section of M_{3+4} almost 1.5 times as long as penultimate in ratio 1.00 : 1.35; very large species, wing length 2.8 mm; vibrissal fasciculus conspicuously broad and short	<i>penicillata</i> Hendel
– Last section of M_{3+4} almost twice as long as penultimate, in ratio 1.00 : 1.75; wing length 2.6 mm; vibrissal fasciculus longer, normal curvature	<i>cornifera</i> Hendel
20 Vibrissal fasciculus short, broad, blunt at end, and white; facial keel low and narrow; host plants: <i>Campanula</i> , <i>Crepis</i> , <i>Hypochoeris</i> , <i>Jasione</i> , <i>Lampsana</i> , <i>Phyteuma</i>	<i>heringi</i> Starý
– Vibrissal fasciculus long and bent; acr in eight rows at level of 2nd dc bristle	21
21 Facial keel broad, bulbous; small species, wing length 1.75–2.0 mm	22
– Facial keel narrow; larger species, wing length up to 2.4 mm	23
22 Vibrissal fasciculus long; acr in six rows at level of 2nd dc bristle; host plants: <i>Alliaria officinalis</i> , <i>Cardamine bulbifera</i>	<i>alliariae</i> Hering
– Vibrissal fasciculus distinctly shorter; acr in eight rows at level of 2nd dc bristle; host plant: <i>Delphinium staphysagria</i>	<i>delphinii</i> Hendel
23 Vibrissal fasciculus long, dark; last section of vein M_{3+4} longer than penultimate . . .	<i>vitiosa</i> Spencer
– Vibrissal fasciculus short	24
24 Vibrissal fasciculus distinctly white at end; facial keel broad and bulbous; last section of M_{3+4} as long as or slightly longer than penultimate (as 1.2 : 1)	<i>submaura</i> Hering
– Vibrissal fasciculus all black; without pale tip; facial keel broad and flat; last section of vein M_{3+4} longer than penultimate (as 1.6 : 1)	<i>slovaca</i> sp. n.
25 Vibrissal angle acute, at most 60°	26
– Vibrissal angle 70°–90°	30
26 Vibrissal fasciculus long and bent	27
– Vibrissal fasciculus conspicuously short and thick or greatly reduced, weak and white	28

27	Last and penultimate sections of vein M_{3+4} equal; wing length only up to 1.9 mm; host plant: <i>Galium mollugo</i>	<i>gallii</i> Hering
–	Last section of vein M_{3+4} substantially shorter than penultimate; wing length 2.0–2.2 mm; host plants: <i>Hieracium</i> sp.	<i>hieracii</i> Spencer
28	Vibrissal angle shorter, vibrissal fasciculus developed as a stout bundle of incompletely fused hairs; host plant: <i>Gnaphalium silvaticum</i>	<i>gnaphalii</i> Hering
–	Vibrissal angle conspicuously elongated	29
29	Facial keel broad but relatively flat below antennae; vibrissal fasciculus thick, fused, flat in base section, slender and white at end; host plants: <i>Achillea</i> , <i>Anthemis</i> , <i>Artemisia</i> , <i>Matricaria</i> , etc.	<i>curvipalpis</i> (Zetterstedt)
–	Facial keel forming conspicuous protuberance below antennae; host plant: <i>Ononis spinosa</i>	<i>ononidis</i> Spencer
30	Jowls relatively narrow (0.12–0.20 eye height) one-eighth to one-fifth eye height	31
–	Jowls broader (0.25–0.50) one-quarter to a half eye height	46
31	Last section of vein M_{3+4} substantially shorter than penultimate, approximately in ratio 2 : 3	32
–	Last and penultimate sections of vein M_{3+4} about equal	34
32	Ocellar triangle brilliantly shining; third antennal segment enlarged; host plants: <i>Senecio</i> sp.	<i>senecionina</i> Hering
–	Ocellar triangle only moderately shining; third antennal segment normal	33
33	Mesonotum brilliantly shining black; facial keel not greatly raised below base of antennae; host plant: <i>Thalictrum</i> sp.	<i>thalictraulicis</i> Hering
–	Mesonotum less shining; facial keel conspicuously high and narrow; host plants: <i>Stachys</i> , <i>Lamium</i> , <i>Calamintha</i> , <i>Galeopsis</i>	<i>labiatarum</i> Starý
34	Frons broad, twice as wide as eye	35
–	Frons at most one and a half times as wide as eye	38
35	Larger species, wing length 2.5 mm; facial keel conspicuously widening below antennae; host plants: <i>Ranunculus</i> sp.	<i>ranunculicaulis</i> Hering
–	Very small species, wing length up to 2.00 mm	36
36	acr in 4–6 rows; facial keel with a broad longitudinal groove in middle, along all its length	<i>mohelensis</i> sp. n.
–	acr in 8 rows; facial keel without broad longitudinal groove in middle	37
37	Mesonotum and abdomen brilliantly shining; facial keel narrow but conspicuously raised above antennae; host plants: <i>Asparagus</i> sp.	<i>asparagi</i> Spencer
–	Mesonotum and abdomen black, semilustrous, slightly pruinose; facial keel moderately produced and broadened below base of antennae	<i>orientalis</i> sp. n.
38	Facial keel broad	39
–	Facial keel narrow	41
39	Keel conspicuously raised above antennae	40
–	Keel moderately broad and raised below antennae; host plants: <i>Aster</i> , <i>Solidago</i> sp.	<i>maura</i> (Meigen)
40	acr setae in 6 rows; host plants: <i>Campanula</i> sp.	<i>campanularum</i> Starý
–	acr setae in 8 rows; host plant: <i>Centaurea jacea</i>	<i>spenceri</i> Černý
41	Small species, wing length at most 2.3 mm; costal sections 2–4 as 4.5–4.7 : 1 : 1	44
–	Larger species, wing length 2.4–2.6 mm; costal sections 2–4 as 4 : 1 : 1	42
42	Mesonotum distinctly matt black; host plants: <i>Aquilegia</i> , <i>Thalictrum</i> '	<i>aquilegiana</i> Lundquist
–	Mesonotum shining black	43
43	Jowls narrow, one-eighth height of eye; facial keel conspicuously raised	<i>skanensis</i> Spencer
–	Jowls broader, one-fifth height of eye; facial keel flat	<i>sueciae</i> Spencer
44	– Frons about 1.5 times broader than eye; host plants: <i>Melandrium</i> sp. and <i>Moehringia</i> sp.	<i>melandricaulis</i> Hering
–	Frons about 1.8 times broader than eye; host plant: <i>Verbascum thapsus</i>	<i>verbasci</i> Černý
45	Jowls reaching half vertical height of eye	<i>major</i> Strobl
–	Jowls narrower, one-third to a quarter eye height	46
46	Frons twice as wide as eye	47

- Frons narrower, one and a half times as wide as eye 48
- 47 Distance separating cross-veins about equal to length of first cross-vein; host plants: *Campanula* sp. .
..... *eucodonus* Hering
- Distance separating cross-veins at least twice as long as first cross-vein 53
- 48 Facial keel conspicuously raised below base of antennae 49
- Facial keel broad and flat, not raised below base of antennae 51
- 49 Larger species, wing length 2.5–2.9 mm 50
- Small species, wing length at most 2.2 mm *moravica* sp. n.
- 50 Jowls reaching one-quarter vertical height of eye; parafacial in deepest point overreaching half height
of jowl; vibrissal fasciculus rather short; host plants: *Melandrium* sp., *Lychnis* sp.
..... *melandryi* de Meijere
- Jowls nearly one-third height of eye; parafacial forming broader ring below eye being as high as
one-third of jowl height; vibrissal fasciculus slender *fennonienseis* Spencer
- 51 Parafacial only as a narrow ring below eye *subheracleivora* sp. n.
- Parafacial almost as high as half height of jowl 52
- 52 Facial keel below base of antennae conspicuously narrow, broadened toward mouth margin; host
plant: *Heracleum sphondylium* *heracleivora* Spencer
- Facial keel below base of antennae broad, narrowed toward mouth margin *bohémica* sp. n.
- 53 Vibrissal fasciculus conspicuously short, blunt at end; parafacial broad; jowls and parafacial about
one-third vertical height of eye; host plant: *Cichorium inthybus* *cichorii* Hering
- Vibrissal fasciculus with normal curvature; parafacial narrower; jowls and parafacial one-quarter
height of eye *buccata* Hendel

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