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New species and new records of *Medetera* (Diptera, Dolichopodidae) from Switzerland

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Faunistic data for 28 species of *Medetera* from Switzerland is provided including 4 species new to science: *Medetera caeruleifacies* sp. n., *M. campestris* sp. n., *M. curvipyga* sp. n., *M. valaisensis* sp. n. Ten species are recorded for the first time for Switzerland: *M. cuspidata* Collin, 1941, *M. glauca* Loew, 1869, *M. inspissata* Collin, 1952, *M. mixta* Negrobov, 1967, *M. muralis* Meigen, 1824, *M. pallipes* (Zetterstedt, 1843), *M. parenti* Stackelberg, 1925, *M. plumbella* Meigen, 1824, *M. polonica* Negrobov & Capecki, 1977, and *M. unisetosa* Collin, 1941.

Keywords: Dolichopodidae, *Medetera*, Switzerland, new species, new records.

INTRODUCTION

The genus *Medetera* Fischer von Waldheim, 1819 comprises 178 Palearctic species (Naglis unpubl.). From Switzerland 33 species have been recorded so far (Naglis 2009, 2012, Naglis & Negrobov 2014, Bächli *et al.* 2014). In this work faunistic data is given for 28 species of *Medetera* including 4 new species and 10 new records for Switzerland. Actually, the Swiss fauna comprised 46 species of *Medetera*.

Adults of *Medetera* are often found on vertical surfaces as tree trunks, walls or rocks, and are predators on small, soft-bodied arthropods as mites, Collembola, Psocoptera, and small Diptera. The larvae live under bark of dead or dying trees and are known as predators of bark beetles. The genus is of considerable importance as agent of biological control (Bickel 1985). Unlike many other dolichopodid genera, males of *Medetera* have few secondary sexual characters, and the examination of the male genitalia is usually necessary for reliable identification.

MATERIAL AND METHODS

The present study is based on the large material of *Medetera* deposited in the private collection of Gerhard Bächli (Dietikon, Switzerland) who has also mounted and labeled all the specimens. The collector of most of the material is Gerhard Bächli (leg. G. Bächli) if not otherwise indicated. Records marked with an asterisk (*) are from wine-beer-traps exposed in the canopy of trees. A part of the material was collected with window traps during a project near Bubendorf BL, leg. M. Wolf (Walter *et al.* 2003). Holotypes and paratypes will be deposited at the Entomological Collection of ETH Zurich (ETHZ). Distribution data is mainly according to Pollet (2004) and Yang *et al.* (2006), but doubtful records are omitted.

Body length is measured from the base of the antennae to the tip of abdominal segment 6; wing length from wing base to wing apex. The positions of features on elongate structures such as leg segments are given as a fraction of the total length, starting from the base. The following ratios are used: relative podomere ratios: femur, tibia, tarsomere 1/2/3/4/5; length of crossvein dm-cu to distal section of CuA (= CuAx ratio); distance between veins R_{2+3} and R_{4+5} to distance between R_{4+5} and M at costal margin (= RMx ratio). In describing the hypopygium, dorsal and ventral refers to the position prior to rotation and flexion, i.e. in figures top is morphologically ventral and bottom is dorsal. If not otherwise indicated, the coloration of hairs and setae is black. Morphological terminology follows McAlpine (1981), except the terminology for thoracic chaetotaxy, wing veins and genitalia, which follows Bickel (1985).

Morphologic abbreviations: ac = acrostichal setae; ad = anterodorsal; av = anteroventral; dc = dorsocentral setae; pd = posterodorsal; ppls = proepisternal setae; pv = posteroventral; sa = postsutural supraalar setae.

Abbreviations of Cantons: AG = Aargau; BE = Berne; BL = Basel-Country; FR = Fribourg; GE = Geneva; GL = Glarus; GR = Grisons; JU = Jura; LU = Lucerne; NE = Neuchatel; SH = Schaffhausen; SO = Solothurn; SZ = Schwyz; TG = Thurgovia; TI = Ticino; VD = Vaud; VS = Valais; ZH = Zurich.

Abbreviations of institutions and collections: ETHZ = entomological collection of ETH Zurich; ZMHB = Museum für Naturkunde Berlin.

DESCRIPTIONS OF NEW SPECIES

Medetera caeruleifacies sp. n.

(Figs. 1A–B)

Diagnosis. Antenna dark brown, arista apical; face blue-violet shining; postocular setae brown; 2 pairs of strong dc, and 4–5 pairs of smaller setae in front; 4 scutellar setae; legs including coxae entirely dark brown; mid and hind femora with av setae; mid tibia with a pair of ad/pd setae; halter brownish yellow; distal section of vein CuA twice as long as crossvein dm-cu; surstylus long and slender.

Material examined. **Holotype:** ♂ SWITZERLAND, BL, Bubendorf, 6.–13.VII.2000, leg. M. Wolf. (ETHZ). — **Paratypes:** same data as holotype, but: 1 ♂ 25.–31.V.2000, 1 ♂ 31.V.–8.VI.2000, 1 ♂ 15.–22.VI.2000, 1 ♂ 29.VI.–6.VII.2000, 1 ♂ 13.–20.VII.2000, 1 ♂ 20.–27.VII.2000, 3 ♂♂ 10.–17.VIII.2000, 1 ♂ 14.–21.IX.2000, all leg. M. Wolf. (ETHZ).

Description. Body length (holotype): 2.6 mm, wing length 2.4 mm.

Head: Frons black shining, with grey pruinosity; face blue-violet shining; clypeus dark brown shining; narrowest distance between eyes about twice the distance between ocellar setae; palpus dark brown, with brown hairs and 1 strong black apical seta; proboscis dark brown; antennal segments dark brown; first flagellomere ovate, slightly higher than long; arista apical, bare; lower postocular setae brown.

Thorax: Mesonotum dark metallic green, with blue reflections, and with dense grey pruinosity; thoracic setae black; posterior 2 pairs of dc strong, 4–5 pairs of smaller setae in front strongly decreasing in size anteriorly; 6–7 pairs of ac longer than distance between rows; 2 sa; 4 scutellars, laterals half as long as medians; 3–4

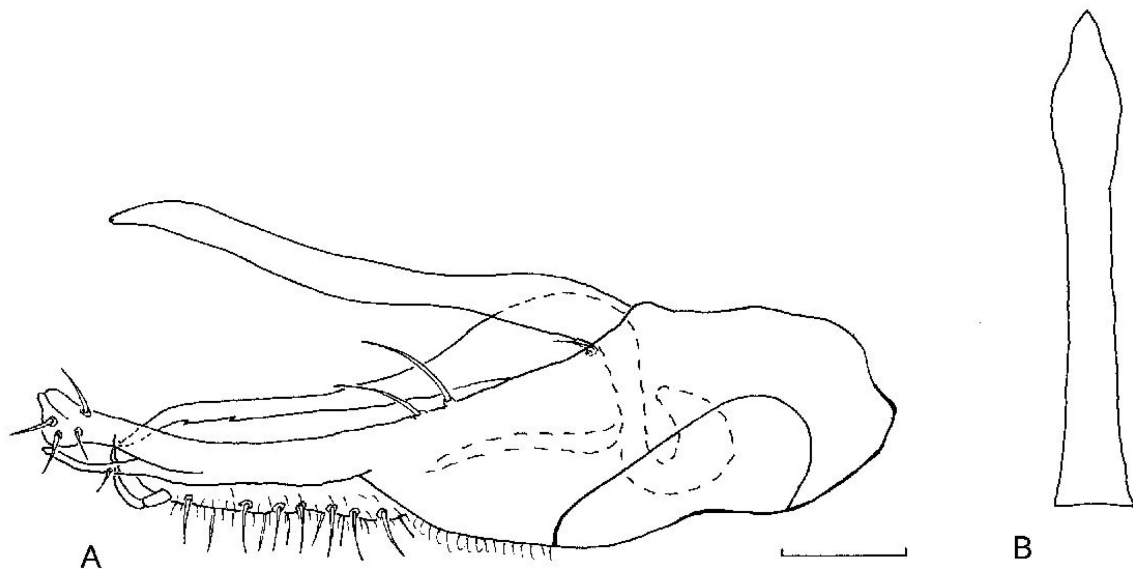


Fig. 1. *Medetera caeruleifacies* sp. n. male. A) hypopygium, lateral. — B) hypandrium, ventral. (scale bar = 0.1 mm).

brown ppls, lower setae longer; pleura dark brown shining, with blue reflections and with grey pruinosity.

Legs: All legs including coxae entirely dark brown, setae and hairs dark brown except as noted. Fore leg: Coxa with some strong anterior setae; femur with small pv setae in apical half, tibia and tarsomeres bare; relative podomere ratios: 47/40:20:11:8:5:6. Mid leg: Coxa with some anterior and a strong anterolateral seta; femur with av row of setae, almost as long as diameter of femur; tibia with ad/pd pair at $\frac{1}{4}$, and 1 strong apicoventral seta; relative podomere ratios: 52/50:28:15:10:5:5. Hind leg: Coxa with a strong lateral seta; femur with a row of strong dorsal setae on basal $\frac{1}{3}$, and with strong av setae on apical half; tibia with some strong pd setae in apical fourth; basitarsus with a very small basal tooth posteriorly; relative podomere ratios: 50/63:17:26:13:7:7.

Wing: Hyaline, veins brown; basal section of M distinctly shorter than distal section; CuAx ratio: 0.4; RMx ratio: 5.8; lower calypter pale yellow, with brown setae; halter brownish-yellow.

Abdomen: Dark metallic green, with brown hairs. Hypopygium (Figs. 1A–B): Epandrium dark brown, cercus, surstylus and hypandrium brownish-yellow. Epandrium narrow; hypandrium (ventral view) slender and parallel-sided, slightly widened in apical fourth, with triangular apex; surstylus long and slender, almost straight, with a long incision; ventral arm of surstylus with rounded apex, with a strong but simple ventroapical seta, and with 2 apical and 1 dorsoapical setae; dorsal arm of surstylus very long and slender, with a small dorsal seta; epandrial lobes separated basally, setae of same length; cercus long and narrow, with a claw-like apical projection.

Female: Unknown.

Etymology. The name refers to the conspicuous blue-violet shining face of the species.

Remarks. Because of the brownish-yellow halter, in the Palaearctic key (Negrobov & Stackelberg 1971–77) the new species runs to *M. takagii* Negrobov,

1970 (couplet 106) or *M. abstrusa* Thuneberg, 1955 (couplet 115). *M. caeruleifacies* can be separated by the characters given in the key below. The records of *M. takagii* from Belgium and Switzerland (Pollet, unpubl.), and from Germany (Meyer & Nötzold 2004) possibly belong to *M. caeruleifacies*.

Halter brown:

1. Surstylus about 5 times as long as its basal width, incision on apical $\frac{1}{4}$; hypan-drium parallel-sided in apical fourth, apex at an angle of 90° *M. takagii* Negrobov
- Surstylus about 7 times as long as its basal width, incision on apical $\frac{1}{2}$ (Fig. 1A); hypan-drium slightly widened in apical fourth; apex at an angle of 45° (Fig. 1B) *M. caeruleifacies* sp. n.

Halter yellow:

1. Surstylus about 5 times as long as its basal width, incision on apical $\frac{1}{4}$; ven-tral arm of surstylus with flattened ventroapical seta; hypan-drium with round-ed apex *M. abstrusa* Thuneberg
- Surstylus about 7 times as long as its basal width, incision on apical $\frac{1}{2}$; ven-tral arm of surstylus with simple ventroapical seta (Fig. 1A); hypan-drium with triangular apex (Fig. 1B) *M. caeruleifacies* sp. n.

***Medetera campestris* sp. n.**

(Figs. 2A–B)

Diagnosis. Antennal scape and pedicel yellow, first flagellomere dark brown, arista apical; face dark metallic green, with grey pruinosity; lower postocular setae white; 4 pairs of strong dc, with a pair of small setae in front; 4 scutellar setae; only 1 sa; coxae brown, femora slightly infuscated, tibiae and tarsomeres yellow; femora bare; mid tibia with a pair of ad/pd setae; halter pale yellow; distal section of vein CuA 2.5 times as long as crossvein dm-cu; surstylus broad in basal half.

Material examined. **Holotype:** ♂ SWITZERLAND, BL, Bubendorf, 10.–17.VIII.2000, leg. M. Wolf. (ETHZ). — **Paratypes:** 1 ♂ same data as holotype, and 1 ♂ same data as holotype but 14.–21.IX.2000, both leg. M. Wolf. (ETHZ). — **Other material:** **SO:** Bettlach, 2 ♂♂ 2005, leg. P. Duelli. **ZH:** Zürich, 1 ♂ 24.VI.–5.VIII.2006, leg. Th. Sattler.

Description. Body length (holotype): 2.2 mm, wing length 2.3 mm.

Head: Frons and face dark metallic green, with dense grey pruinosity; clypeus dark brown shining, with grey pruinosity laterally; narrowest distance between eyes about 1.5 times the distance between ocellar setae; palpus dark brown, with brown hairs and 1 strong black apical seta; proboscis dark brown; antennal scape and pedicel yellow; first flagellomere brown, triangular, about as long as high; arista apical, bare; lower postocular setae white.

Thorax: Mesonotum dark metallic green, with blue reflections, and with dense grey pruinosity; thoracic setae black; 4 pairs of strong dc of almost the same length, and 1 pair of very small setae in front; 4–5 pairs of ac longer than distance between rows; only 1 strong and long sa; 4 scutellars, laterals half as long as medians; 2 pale ppls, lower one longer; pleura dark metallic green, with grey pruinosity.

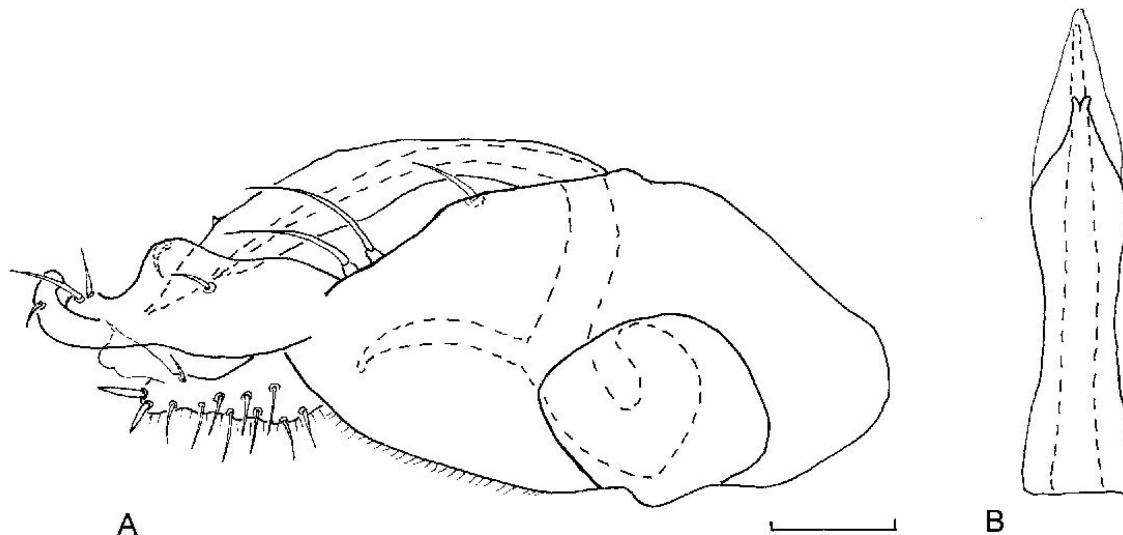


Fig. 2. *Medetera campestris* sp. n. male. A) hypopygium, lateral. — B) hypandrium, ventral. (scale bar = 0.1 mm).

Legs: Coxae dark brown, remainder of legs yellow, except mid femur slightly and hind femur distinctly infuscated in basal half, setae and hairs brownish yellow. Fore leg: Coxa with some apical setae; femur, tibia and tarsomeres bare; relative podomere ratios: 47/45:24:11:9:5:5. Mid leg: Coxa with some anterior and a strong anterolateral seta; femur with av row of short pale setae; tibia with ad/pd pair at $\frac{1}{4}$, and a strong ventroapical seta; relative podomere ratios: 55/57:32:13:10:5:5. Hind leg: Coxa with a strong lateral seta; femur with a row of small dorsal setae on basal $\frac{1}{3}$, and with a av row of small setae; tibia with a strong pale dorsal seta at $\frac{3}{4}$, with a pd row of pale setae on apical fourth, and with 2 black, spine-like apical setae anteriorly; basitarsus with a small basal tooth posteriorly; relative podomere ratios: 55/72:19:23:12:6:5.

Wing: Hyaline, veins pale; basal section of M distinctly shorter than distal section; CuAx ratio: 0.4; RMx ratio: 4.2; lower calypter pale, with white setae; halter pale yellow.

Abdomen: Dark metallic green, with grey pruinosity, and with brown hairs. Hypopygium (Figs. 2A–B): Epandrium dark brown, cercus, surstylus and hypandrium brownish-yellow. Epandrium ovate; hypandrium (ventral view) subparallel, with pointed apex, and with 2 small ventral spines; surstylus broad in basal half, narrower in apical half, with a strong lateral seta, without distinct incision; ventral arm of surstylus short, with 2 apical setae; dorsal arm of surstylus bowed, with 1 dorsoapical seta; epandrial lobes separated, setae of same length; cercus with 2 spine-like apical setae, and with a leaf-like apical projection.

Female: Unknown.

Etymology. The name refers to the lowlands habitat where the species was found.

Remarks. The new species belongs to the *Medetera betulae* group. The recently published key in Naglis & Negrobov (2014) can be enhanced as given below. An additional distinctive character of *M. campestris* are the yellow basal

antennal segments which are present within the species-group only in *M. negrobovi* Gosseries, 1988 and *M. relictata* Negrobov, 1967. In contrast to the three other species of the *betulae* group from Switzerland, *M. campestris* was collected in the lowlands at an elevation between 400 and 500 meters. Thus, the species seems not to have a boreal-montane distribution as other members of the group (Naglis & Negrobov 2014). The unique record of *M. betulae* Ringdahl, 1949 from NE (Basset 1985) possibly belongs to this species.

2. Hypandrium symmetric, ventrally with 2 or 4 small spines **2a**
 — Hypandrium asymmetric, ventrally with 1 small spine **3**
 2a. Hypandrium rounded apically, ventrally with 4 small spines; surstylus in basal half as wide as in apical half, and with deep incision; ventral arm of surstylus with fringed subapical seta ***M. helvetica* Naglis & Negrobov**
 — Hypandrium pointed apically, ventrally with 2 small spines (Fig. 2B); surstylus in basal half twice as wide as in apical half, and without deep incision (Fig. 2A); ventral arm of surstylus without fringed subapical seta
 ***M. campestris* sp. n.**

***Medetera curvipygga* sp. n.**

(Figs. 3A–B)

Diagnosis. Antenna brown, arista subapical; face metallic blue-violet shining; postocular setae white; 4 pairs of strong dc decreasing in size anteriad, with some pairs of small setulae in front of them; 4 scutellar setae; coxae and femora dark brown, tibiae and tarsomeres yellowish-brown; mid femur with av row of long setae; mid tibia with pair of ad/pd setae; distal section of vein CuA twice as long as crossvein dm-cu; surstylus U-shaped.

Material examined. **Holotype:** ♂ SWITZERLAND, **BL**, Bubendorf, 14.–21.IX.2000, leg. M. Wolf. (ETHZ). — **Paratypes:** 2 ♂♂ same data as holotype, 2 ♂♂ 22.–29.VI.2000, 1 ♂ 10.–17.VIII.2000, 1 ♂ 17.–24.VIII.2000, 1 ♂ 21.–28.IX.2000, all leg. M. Wolf. (ETHZ). — **Other material:** **TI:** Cevio, 1 ♂ 10.–11.IX.1991, leg. G. Bächli. **JU:** Delémont, 1 ♂ 2.–6.VIII.1984, leg. G. Bächli. **ZH:** Unterengstringen, 1 ♂ 15.IX.1977, leg. G. Bächli.

Description. Body length (holotype): 2.3 mm, wing length 2.6 mm.

Head: Frons metallic blue-green, with dense grey pruinosity; face metallic blue-violet shining, clypeus dark metallic green shining, with very small rim of grey pruinosity along eye margins; narrowest distance between eyes 1.5 times the distance between ocellar setae; palpus dark brown, with pale hairs and 1 strong pale seta; proboscis dark brown; scape and pedicel dark brown; first flagellomere light brown, triangular, about as long as high; arista subapical, bare; lower postocular setae white.

Thorax: Mesonotum metallic blue-green, with dense grey pruinosity; thoracic setae black; 4 pairs of strong dc, decreasing in size anteriad, with 4–5 additional pairs of small setae in front; 7–8 pairs of ac, longer than distance between rows; 2 sa, anterior distinctly smaller; 4 scutellars, laterals half as long as medians; 2–3 pale ppls, lower seta longer; pleura dark metallic blue-green shining, with grey pruinosity.

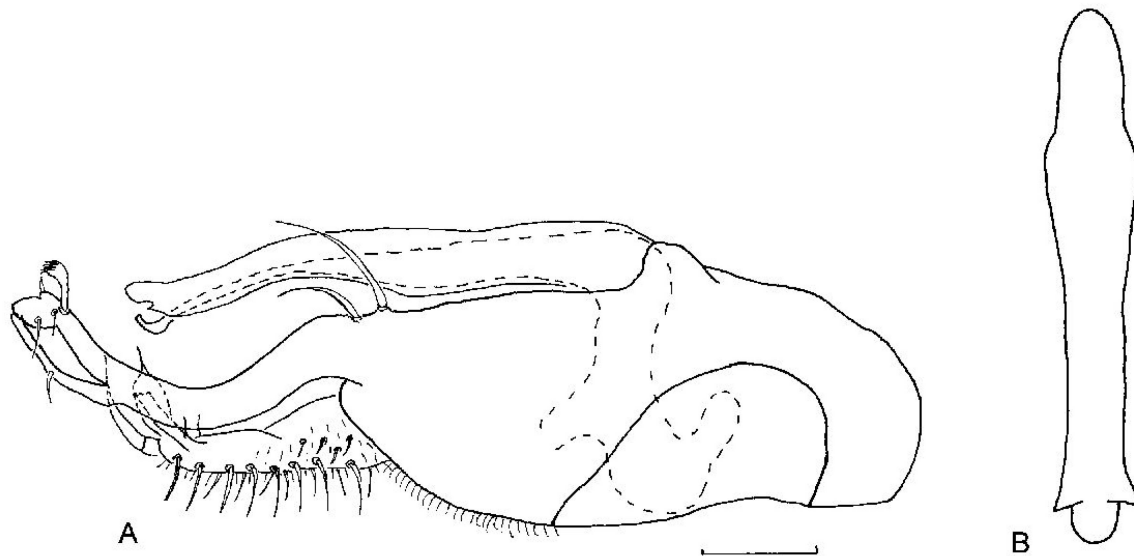


Fig. 3. *Medetera curvipyga* sp. n. male. A) hypopygium, lateral. — B) hypandrium, ventral. (scale bar = 0.1 mm).

Legs: Coxae and femora dark brown; knees yellow; tibiae and tarsomeres yellowish-brown. Fore leg: Coxa with some brownish-yellow setae; femur, tibia and tarsomeres bare; relative podomere ratios: 50/47:25:15:10:6:7. Mid leg: Coxa with a few pale anterior and a strong black anterolateral seta; femur with av row of pale setae $\frac{2}{3}$ as long as diameter of femur; tibia with pair of dark ad/pd setae at $\frac{1}{4}$, and with some small dark apical setae; relative podomere ratios: 62/62:35:17:11:7:6. Hind leg: Coxa with a strong dark lateral seta; femur with dorsal row of strong, dark setae on basal $\frac{1}{3}$, and anterior row of strong, dark setae on apical half; tibia with 3–4 small yellow pd setae at $\frac{4}{5}$, and 4–5 pale apical setae; basitarsus with a very small tooth basally; relative podomere ratios: 62/75:18:31:17:9:6.

Wing: Hyaline, veins brownish yellow; basal section of M distinctly shorter than distal section; CuAx ratio: 0.5; RMx ratio: 9.0; lower calypter whitish, with white setae; halter pale yellow.

Abdomen: Dark metallic green shining, with yellow hairs. Hypopygium (Figs. 3A–B): Epandrium dark brown, cercus yellow, surstylus brownish yellow, hypandrium yellow. Epandrium long and slender; hypandrium (ventral view) slender, subparallel, slightly widened at $\frac{3}{4}$ and becoming parallel-sided in apical fourth; surstylus U-shaped; ventral arm of surstylus with rounded apex, with flattened and fringed subapical seta, and with 3 small apical setae; dorsal arm of surstylus very slender, with dorsal seta; epandrial lobes basally separated, median seta longer than lateral seta; cercus with a strong, claw-like apical projection, with a flattened, leaf-like subapical seta, and a ribbon-like lateral projection.

Female: Unknown.

Etymology. The name refers to the conspicuous curved surstylus of the male hypopygium.

Remarks. Because of the yellowish-brown tibiae, in the Palaearctic key (Negrobov & Stackelberg 1971–77) the new species runs to *M. nebulosa* Negrobov, 1974 (couplet 93) and *M. rufipes* Negrobov, 1974 (couplet 93), both described

from Eastern Siberia, or to *M. impigra* Collin, 1941 (couplet 113). *M. curvipyga* can be separated by the characters given in the key below. *M. abstrusa* Thuneberg, 1955 and *M. seguyi* Parent, 1926 show a similar hypopygium with a flattened subapical seta on the ventral arm of surstylus, but differ by the broadened apex of the hypandrium and the straight or only slightly curved surstylus.

Tibiae yellow:

1. Hypandrium apically globularly widened *M. rufipes* Negrobov
- Hypandrium apically narrow 2
2. Surstylus straight, without flattened subapical seta *M. nebulosa* Negrobov
- Surstylus U-shaped, with a flattened subapical seta (Fig. 3A) *M. curvipyga* sp. n.

Tibiae dark:

1. Surstylus with a flattened subapical seta (Fig. 3A) *M. curvipyga* sp. n.
- Surstylus without flattened subapical seta *M. impigra* Collin

***Medetera valaisensis* sp. n.**

(Figs. 4A–B)

Diagnosis. Antenna dark brown, arista apical; frons and face metallic violet-blue, with yellowish-grey pruinosity; postocular setae brownish yellow; mesonotum metallic violet-blue, with grey pruinosity; 4 pairs of strong dc of almost the same length, with 1 pair of small setae anteriorly; 2 pairs of long ac; 2 sa; 4 scutellar setae; coxae and legs entirely dark brown; mid tibia with a pair of ad/pd setae; distal section of vein CuA 1.5 times as long as crossvein dm-cu.

Material examined. **Holotype:** ♂ SWITZERLAND, VS, Riederalp, 31.VII.–8.VIII.1976, G. Bächli leg. (ETHZ).

Description. Body length (holotype): 2.4 mm, wing length 2.6 mm.

Head: Frons and face dark metallic violet-blue, with yellowish-grey pruinosity; clypeus black metallic shining, with very small rim of grey pruinosity along eye margins; narrowest distance between eyes twice the distance between ocellar setae; palpus dark brown, with black hairs and 1 strong black apical seta; proboscis dark brown; antennal segments dark brown; first flagellomere ovate, about as long as high; arista apical, bare; lower postocular setae brownish-yellow.

Thorax: Mesonotum and scutellum metallic violet-blue shining, with grey pruinosity; thoracic setae black; 4 pairs of strong dc of almost the same length, with 1 pair of small setae in front; 2 pairs of long ac, three times as long as distance between rows, and 1 pair of small setae in front; 2 sa, anterior distinctly smaller; 4 scutellars all of about the same length; 3 dark brown ppls, all of about the same length; pleura dark brown shining, with violet and blue reflections.

Legs: Coxae and legs entirely dark brown, setae dark brown. Fore leg: Coxa with some apical setae; femur, tibia and tarsomeres bare; relative podomere ratios: 45/41:22:9:6:5:6. Mid leg: Coxa with a strong black anterolateral seta; femur with av row of setae half as long as diameter of femur; tibia with pair of ad/pd setae at

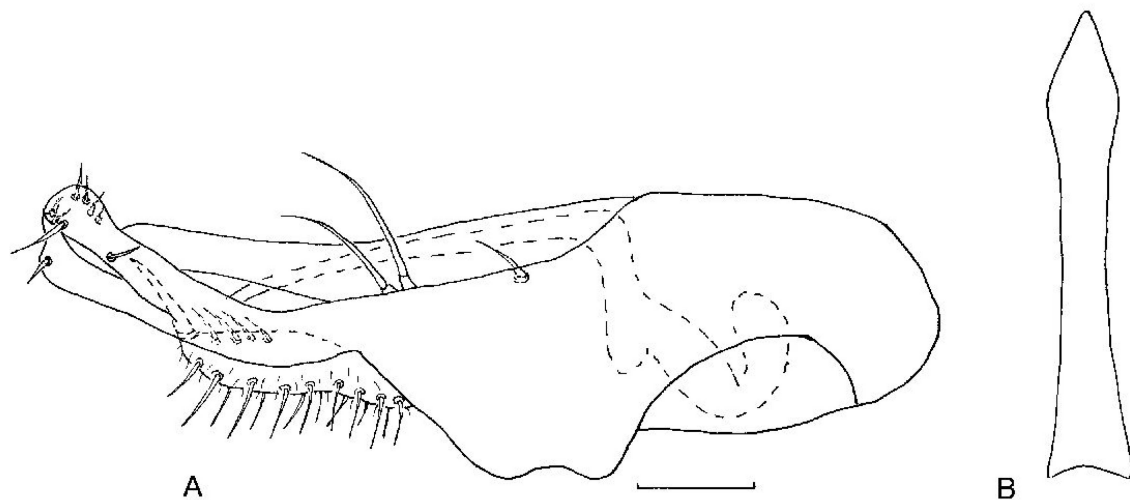


Fig. 4. *Medetera valaisensis* sp. n. male. A) hypopygium, lateral. — B) hypandrium, ventral. (scale bar = 0.1 mm).

$\frac{1}{3}$ (ad broken off), and with some strong apical setae; relative podomere ratios: 49/54:29:14:10:5:6. Hind leg: Coxa with a strong black lateral seta; femur with a row of strong, dorsal setae on basal $\frac{1}{3}$; tibia with 1 strong seta at $\frac{4}{5}$, and with some apical setae; basitarsus without basal tooth; relative podomere ratios: 50/65:16:25:12:5:6.

Wing: Hyaline, veins brownish yellow; basal section of M shorter than distal section; CuAx ratio: 0.7; RMx ratio: 3.0; lower calypter whitish, with brown rim, and with yellowish-brown setae; halter yellow.

Abdomen: Dark brown shining, with blue reflections, and with dark hairs. Hypopygium (Figs. 4A–B): Epandrium dark brown, cercus, surstylus and hypandrium yellowish-brown. Epandrium long and slender; hypandrium (ventral view) very slender, parallel-sided, with faint widening at $\frac{4}{5}$, and with acute apex; ventral arm of surstylus with round apex, with a strong dorsoapical and a strong lateral seta, and with 4 short ventroapical setae; dorsal arm of surstylus with acute apex, with a strong dorsoapical seta, and with 2 small apical setae; epandrial lobes basally separated, lateral seta shorter than median seta; cercus with a strong, beak-like apical projection.

Female: Unknown.

Etymology. The name is derived from the Canton Valais, where the species was collected.

Remarks. *M. valaisensis* has been collected in the alpine zone on an altitude above 1900 m. In the Palaearctic key (Negrobov & Stackelberg 1971–77) the new species runs to *M. tenuicauda* Loew, 1857 (couplet 65). The first author has examined the syntypes of *M. tenuicauda* (ZMHB, type locality unknown) and the two species can be distinguished by the characters given below. It must be noted that Negrobov & Stackelberg (1971–77) redescribed *M. tenuicauda* based on material from Estonia having the crossvein dm-cu shorter than the distal section of vein CuA, but this must be a different species.

1. Ac black, three times as long as distance between rows, consisting of 3 pairs only; crossvein dm-cu shorter than distal section of vein CuA; epandrial lobes basally separated (Fig. 4A) *M. valaisensis* sp. n.
 — Ac white, half as long as distance between rows, consisting of 15–17 pairs; crossvein dm-cu longer than distal section of vein CuA; epandrial lobes basally fused *M. tenuicauda* Loew

FAUNISTIC RECORDS

Medetera abstrusa Thunberg, 1955

Material examined: **BL:** Bubenberg, 1 ♂ 25.–31.V.2000, 1 ♂ 15.–22.VI.2000, 1 ♂ 29.VI.–6.VII.2000, 1 ♂ 6.–13.VII.2000, 1 ♂ 13.–20.VII.2000, 1 ♂ 20.–27.VII.2000, 1 ♂ 27.VII.–3.VIII.2000, 1 ♂ 3.–10.VIII.2000, 4 ♂♂ 10.–17.VIII.2000, 1 ♂ 17.–24.VIII.2000, 1 ♂ 24.–31.VIII.2000, 2 ♂♂ 7.–14.IX.2000, 1 ♂ 14.–21.IX.2000, all leg. M. Wolf. **GR:** Lantsch, 1 ♂ 2000, leg. P. Duelli. **ZH:** Boppelsen, 1 ♂ 21.VII.1996; Dietikon, 1 ♂ 24.V.–12.VI.1997*, 1 ♂ 26.VI.–21.VII.1997*, 1 ♂ 23.V.–12.VI.1998*, 3 ♂♂ 1.–22.VI.1999*, 1 ♂ 24.VI.–17.VII.1999*, 1 ♂ 23.VII.–12.VIII.2000*, 1 ♂ 19.VI.–7.VII.2001*; Hönggerberg, 1 ♂ 16.–20.VII.1994; Zürich, 1 ♂ 25.VI.1976, 1 ♂ May/June 1979*.

Distribution: Central, North, and Eastern Europe, Russia.

Remarks: Also recorded from ZH by Pollini & Pollet (1998). *M. abstrusa* shows a variation in the coloration of tibiae, varying from yellowish brown to dark brown, and therefore could be confused with *M. pallipes*, but can be separated by the flattened subapical seta on the ventral arm of surstylus. From similar species in the *Medetera apicalis* group it differs by the shape of the hypandrium, which is strongly broadened in apical fourth. From *M. seguyi* Parent, 1926, which has a similar hypopygium, *M. abstrusa* differs by the long, curved surstylus with a slender dorsal arm. It should be noted that the figures of *M. apicalis* in Collin (1941) in fact belong to *M. abstrusa*.

Medetera arrogans (Parent, 1927)

Material examined: **TI:** Biasca, 2 ♂♂ 7.VIII.1997.

Distribution: Italy (Lago di Como), Switzerland.

Remarks: Also recorded from TI, Sementina by Bächli *et al.* (2014). Unfortunately, no figures of the male hypopygium of *M. arrogans* have been published so far. But the specimens examined run to *M. arrogans* in the Palaearctic key (Negrobov & Stackelberg 1971–77) and match with Parent's original description. Moreover, the collecting site is near the original type locality. See also remarks under *M. plumbella*.

Medetera cuspidata Collin, 1941

Material examined: **VS:** Pfywald, 1 ♂ 15.V.1996, leg. Merz & Bächli.

Distribution: France, Germany, Belgium, England, Norway, Sweden, Finland.

Remarks: New record for Switzerland! This is the southernmost distribution area of the species. The conspicuous long and sinuate setae on the median side of the surstylus are diagnostic for this species.

***Medetera glauca* Loew, 1869**

Material examined: **JU:** Delémont, 2 ♂♂ 2.–6.VIII.1974. **TI:** Piota, 1 ♂ 19.–22.VIII.1981.

Distribution: North, Central, and Eastern Europe.

Remarks: New record for Switzerland! The male genitalia of the specimens examined are very similar to that of *M. bisecta* Negrobov, 1967 (see Figs 414, 421, 428–429 in Negrobov and Stackelberg, 1971–77), but the specimens match with the characters in the key and with the species description of *M. glauca* in Negrobov and Stackelberg (1971–77). Unfortunately, the male genitalia of *M. glauca* are not figured and the reason may be that in the Loew collection in Berlin (ZMHB) only female syntypes are present (J. Ziegler pers. comm.). The ad/pd setae on the mid tibia are very small, pale, and scarcely visible in this species; therefore a misidentification as *M. glaucella* could be possible.

***Medetera gracilicauda* Parent, 1927**

Material examined: **TI:** Bellinzona, 1 ♂ 26.–30.VIII.1981.

Distribution: Switzerland, France, Germany, Austria, Sweden (Grichanov & Viklund 2007), Italy.

Remarks: The species was mentioned by Negrobov (1991) for the Swiss fauna.

***Medetera helvetica* Naglis & Negrobov, 2014**

Material examined: **GR:** Celerina, 1 ♂ 2001, leg. P. Duelli; Nationalpark, 4 ♂♂ 2004, leg. P. Duelli. **VS:** Jeizinen, 1 ♂ 3.VII.2001.

Distribution: Switzerland.

Remarks: Also recorded from GR, TI, VS by Naglis & Negrobov (2014). *M. helvetica* shows a distribution in the alpine zone of Switzerland on an altitude between 1000 and 2000 m.

***Medetera infumata* Loew, 1857**

Material examined: **BL:** Bubendorf, 1 ♂ 15.–22.VI.2000, leg. M. Wolf. **FR:** Nuvilly, 1 ♂ 2001, leg. P. Duelli. **SZ:** Alptal, 1 ♂ 2001, leg. P. Duelli. **VS:** Pfynwald, 1 ♂ 15.V.1996, leg. Merz & Bächli.

Distribution: Central, North and Eastern Europe, Italy, Russia.

Remarks: Also recorded from TI, Prugiasco by Bächli *et al.* (2014)

***Medetera inspissata* Collin, 1952**

Material examined: **BL:** Bubendorf, 1 ♂ 14.–21.IX.2000, leg. M. Wolf.

Distribution: England, Belgium, Netherlands, Norway, Sweden, Finland, Estonia, Slovakia, Russia.

Remarks: New record for Switzerland! The species has a conspicuous basally swollen vein CuA and shows a distinctive hypopygium with spines on hypandrium and aedeagus.

***Medetera jacula* (Fallén, 1823)**

Material examined: **FR:** Nuvilly, 1 ♂ 2000, 1 ♂ 2004, 1 ♂ 2005, all leg. P. Duelli. **GR:** Il Fuorn, 10 ♂♂ VII.–VIII.1995; Nationalpark, 2 ♂♂ 2000, 2 ♂♂ 2001, all

leg. P. Duelli; S-chanf-Flin, 2 ♂♂ 7.VIII.1996, leg. Merz & Bächli; Susch-Fort., 1 ♂ 7.VIII.1996, leg. Merz & Bächli; Zernez, 4 ♂♂ 7.VIII.1996, leg. Merz & Bächli; Zuoz-Nüd, 6 ♂♂ 7.VIII.1996, leg. Merz & Bächli. **LU**: Luzern, 1 ♂ 10.VI.2006; Menzberg, 1 ♂ 3.–6.VIII.1983. **TI**: Angone/Anzonico, 6 ♂♂ 21.–31.VIII.1981; Lucomagno, 1 ♂ 6.VIII.1997; Piotta, 1 ♂ 19.–22.VIII.1981. **VS**: Bürchen, 2 ♂♂ 17.–19.VIII.1993; Guttet, 1 ♂ 31.VII.–2.VIII.1993, 1 ♂ 4.–6.VIII.1993; Leuk, 7 ♂♂ 23.VII.–2.VIII.1977, 1 ♂ 27.–29.VII.1993; Lens, 1 ♂ 2001, leg. P. Duelli; Visp, 2 ♂♂ 2001, 1 ♂ 2004, all leg. P. Duelli; Visperterminen, 1 ♂ 4.VIII.1998, 1550 m, leg. Merz & Bächli. **ZH**: Höggerberg, 1 ♂ 16.–20.VII.1994.

Distribution: Europe, Russia, Kazakhstan, Tunisia.

Remarks: Recorded from BE, GL, GR, NE, TI, VD (Keiser 1947, Ringdahl 1957, Basset 1985, Naglis 1997, Naglis 1998, Vaucher-von Ballmoos 1997, Rampazzi 2002, Germann *et al.* 2009). In the Palaearctic key (Negrobov & Stackelberg 1971–77) *M. jacula* is differentiated from *M. petrophila* Kowarz by the clypeus covered with grey pruinosity in *M. jacula* and metallic shining in *M. petrophila*. But this is not a reliable character because some specimens of *M. jacula* show a metallic shining clypeus, which is probably caused by scrubbing.

Medetera jugalis Collin, 1941

Material examined: **BL**: Bubendorf, 1 ♂ 15.–22.VI.2000, 2 ♂♂ 29.VI.–6.VII.2000, 1 ♂ 10.–17.VIII.2000, all leg. M. Wolf.

Distribution: Central and Northern Europe.

Remarks: Also recorded from NE (Basset 1985). *M. jugalis* has a conspicuous spine on the ventral side of the hypandrium which is not mentioned either in the original description or in the redescription in Negrobov & Stackelberg (1971–77). It is similar to *M. abstrusa*, but distinctly larger and without flattened seta on the ventral arm of surstylus.

Medetera kerzhneri Negrobov, 1966

Material examined: **VD**: Senarclens, 1 ♂ 2005, leg. P. Duelli.

Distribution: Switzerland, France, Kazakhstan.

Remarks: Also recorded from GE (Naglis 2010). The species was originally described from Kazakhstan. The occurrence in France and Switzerland is remarkable, but the hypopygium of the specimen is identical with the figures in Negrobov & Stackelberg (1971–77). See also remarks under *M. plumbella*.

Medetera kowarzi Negrobov, 1974

Material examined: **BL**: Bubendorf, 2 ♂♂ 11.–18.V.2000, 1 ♂ 18.–25.V.2000, 4 ♂♂ 25.–31.V.2000, 4 ♂♂ 31.V.–8.VI.2000, 20 ♂♂ 8.–15.VI.2000, 7 ♂♂ 15.–22.VI.2000, 2 ♂♂ 22.–29.VI.2000, 3 ♂♂ 29.VI.–6.VII.2000, 3 ♂♂ 6.–13.VII.2000, 2 ♂♂ 13.–20.VII.2000, 1 ♂ 20.–27.VII.2000, 1 ♂ 3.–10.VIII.2000, 4 ♂♂ 10.–17.VIII.2000, 1 ♂ 31.VIII.–7.IX.2000, all leg. M. Wolf. **GE**: Avully, 1 ♂ VI.–VII.1995*, leg. C. Besuchet. **LU**: Luzern, 2 ♂♂ 10.VI.2006. **NE**: Neuchâtel, 1 ♂ 3.VII.2010. **VS**: Leuk, 1 ♂ 23.VIII.–2.IX.1977. **ZH**: Marthalen, 1 ♂ 8.VI.2008; Katzenssee, 1 ♂ 23.VII.1991; Dietikon, 1 ♂ 24.V.–12.VI.1997*.

Distribution: Switzerland, France, Austria.

Remarks: Also recorded from GE (Naglis 2010). *M. kowarzi* was synonymised with *M. muralis* Meigen, 1824 by Grichanov (2002). This synonymy was questioned by Pollet (2004). We follow Pollet's opinion since there are distinct differences in the structure of the male aedeagus: *M. kowarzi* has a relatively broad, tube-like aedeagus with tapered apex, whereas in *M. muralis* the aedeagus is thin, long, and whipe-shaped.

***Medetera lorea* Negrobov, 1967**

Material examined: **GE:** Presinge, 1 ♂ VI.–VII.1996*, leg. C. Besuchet. **TI:** Gordola, 1 ♂ 16.–20.VI.1995, leg. Merz & Bächli. **VS:** Leuk, 1 ♂ 23.VIII.–20.IX.1977; Mörel, 2 ♂ ♂ 28.V.2010, leg. M. Obrist; Pfywald, 1 ♂ 2.–6.VIII.1999.

Distribution: Switzerland, Belgium, Germany (Bellstedt & Stark 2006), Russia.

Remarks: The record from TI, Prugiasco (Bächli *et al.* 2014) was based on a single female only. The species can now be confirmed by the examination of the genitalia of male specimens.

***Medetera mixta* Negrobov, 1967**

Material examined: **GE:** Russin, 1 ♂ 11.VIII.2000, leg. Merz & Bächli. **VS:** Pfywald, 2 ♂ ♂ 25.VI.1999; Leuk-Brentjong 1 ♂ 25.VI.1999; Leuk-Platten, 3 ♂ ♂ 22.VII.2004.

Distribution: Germany, Czech Republic, Slovakia, Romania, Bulgaria, Ukraine, Russia, Turkey (Naglis 2013).

Remarks: New record for Switzerland! See also remarks under *M. plumbella*.

***Medetera muralis* Meigen, 1824**

Material examined: **LU:** Menzberg, 1 ♂ 3.–6.VIII.1983. **TI:** Bellinzona, 1 ♂ 26.–30.VIII.1981; Lugano, 1 ♂ 24.VI.–5.VIII.2006, leg. Th. Sattler; Someo, 2 ♂ ♂ 25.–29.VII.1997.

Distribution: Europe, Russia.

Remarks: New record for Switzerland! See remarks under *M. kowarzi*.

***Medetera nitida* (Macquart, 1834)**

Material examined: **JU:** Delémont, 1 ♂ 2.–6.VIII.1974. **ZH:** Dietikon, 1 ♂ 27.V.–18.VI.2001*.

Distribution: Central and Northern Europe.

Remarks: Also recorded from VD (Ringdahl 1957).

***Medetera pallipes* (Zetterstedt, 1843)**

Material examined: **AG:** Aristau, 1 ♂ VI.1975, leg. Wunderlich; Schlossrued, 1 ♂ 2004, leg. P. Duelli; Würenlingen, 2 ♂ ♂ 25.VII.1990. **BL:** Bubenberg, 2 ♂ ♂ 11.–18.V.2000, 6 ♂ ♂ 25.–31.V.2000, 3 ♂ ♂ 31.V.–8.VI.2000, 3 ♂ ♂ 8.–15.VI.2000, 9 ♂ ♂ 15.–22.VI.2000, 3 ♂ ♂ 22.–29.VI.2000, 8 ♂ ♂ 29.VI.–6.VII.2000, 14 ♂ ♂ 6.–13.VII.2000, 8 ♂ ♂ 13.–20.VII.2000, 14 ♂ ♂ 20.–27.VII.2000, 14 ♂ ♂ 27.VII.–3.VIII.2000, 9 ♂ ♂ 3.–10.VIII.2000, 7 ♂ ♂ 10.–17.VIII.2000, 8 ♂ ♂ 17.–24.VIII.2000, 5 ♂ ♂ 24.–31.VIII.2000, 3 ♂ ♂ 31.VIII.–7.IX.2000, 1 ♂ 7.–

14.IX.2000, 2 ♂♂ 14.–21.IX.2000, all leg. M. Wolf. **FR**: Nuilly, 2 ♂♂ 2005, leg. P. Duelli. **GE**: Jussy, Prés de Villette, 1 ♂ 8.VIII.2000, leg. Merz & Bächli; Pre-singe, 1 ♂ VI.–VII.1996*, leg. C. Besuchet; Sézenove, 1 ♂ VI.–VII.1995*, leg. C. Besuchet. **JU**: Delémont, 1 ♂ 2.–6.VIII.1974. **LU**: 1 ♂ 24.VI.–5.VIII.2006, leg. Th. Sattler. **TG**: Roggwil, 1 ♂ 2004, 4 ♂♂ 2005, leg. P. Duelli. **VS**: Sion, 1 ♂ VI.–VII.1997*, leg. C. Besuchet. **ZH**: Dietikon, 1 ♂ 3.–10.VIII.1984, 2 ♂♂ 20.VII.1989, 1 ♂ 25.–29.VI.1996, 1 ♂ 13.–17.VII.1996, 1 ♂ 25.VII.–12.VIII.1996*, 6 ♂♂ 24.V.–12.VI.1997*, 1 ♂ 26.VI.–21.VII.1997*, 4 ♂♂ 23.V.–12.VI.1998*, 5 ♂♂ 6.–27.VII.1998*, 11 ♂♂ 1.–22.VI.1999*, 10 ♂♂ 24.VI.–17.VII.1999*, 2 ♂♂ 4.–22.VI.2000*, 2 ♂♂ 23.VI.–7.VII.2000*, 5 ♂♂ 23.VII.–12.VIII.2000*, 3 ♂♂ 27.V.–18.VI.2001*, 9 ♂♂ 19.VI.–7.VII.2001*, 2 ♂♂ 8.–27.VII.2001*, 1 ♂ 21.–30.VI.2002*; Hönggerberg, 1 ♂ 16.–20.VII.1986, 2 ♂♂ 16.–20.VII.1992; Rafz, 1 ♂ 2004, 1 ♂ 2005, leg. P. Duelli.

Distribution: Europe, Russia, Turkey (Tonguç *et al.* 2009, Naglis 2013).

Remarks: New record for Switzerland! The record from GR (Keiser 1947) belongs to *M. helvetica* Naglis & Negrobov, 2014.

***Medetera parenti* Stackelberg, 1925**

Material examined: **ZH**: Dietikon, 1 ♂ 24.VI.–17.VII.1999*, 2 ♂♂ 4.–22.VI.2000*.

Distribution: Belgium, England, Norway, Sweden, Finland, Hungary, Russia.

Remarks: New record for Switzerland! The metallic green shining face and mesonotum, and the long white setae on mid and hind femora are distinctive characters of this species.

***Medetera plumbella* Meigen, 1824**

Material examined: **VS**: Baltschieder, 8 ♂♂ 2.VIII.1998, leg. Merz & Bächli, 1 ♂ 24.VI.2000; Pfywald, 1 ♂ 26.–28.VII.1993.

Distribution: Europe, Russia, Turkey (Naglis 2013), China.

Remarks: New record for Switzerland! *M. plumbella*, *M. arrogans*, *M. kerzhneri*, and *M. mixta* belong to a species group having only two scutellar setae which was formerly placed in a separate genus or subgenus *Oligochaetus* Mik, 1878, now a synonym of *Medetera*.

***Medetera polonica* Negrobov & Capecki, 1977**

Material examined: **BL**: Bubendorf, 1 ♂ 8.–15.VI.2000, 1 ♂ 22.–29.VI.2000, leg. M. Wolf; **BE**: Biel, 1 ♂ 27.–31.VII.1973.

Distribution: So far known only from Poland.

Remarks: New record for Switzerland! The specimens from Switzerland show a different shape of the hypandrium, which is bottle-shaped in ventral view, in contrast to the figure in Negrobov & Capecki (1977) where the hypandrium is parallel-sided. But we regard this difference as intraspecific variation.

***Medetera signaticornis* Loew, 1857**

Material examined: **GR**: Il Fuorn, 5 ♂♂ VII.–VIII.1995*, leg. C. Besuchet.

Distribution: Europe, Russia, Mongolia, Japan, Canada, USA.

Remarks: Also recorded from ZH (Pollini & Pollet 1998).

***Medetera tristis* (Zetterstedt, 1838)**

Material examined: **BL:** Bubendorf, 1 ♂ 8.–15.VI.2000, leg. M. Wolf.

Distribution: Central, North and Eastern Europe, Russia.

Remarks: Also recorded from NE, ZH (Basset 1985, Germann & Bernasconi 2010).

***Medetera truncorum* Meigen, 1824**

Material examined: **AG:** Würenlingen, 1 ♂ 3.VII.2004. **BE:** Rümliigen, 1 ♂ 2004, leg. P. Duelli. **BL:** Bubendorf, 1 ♂ 31.V.–8.VI.2000, 1 ♂ 8.–15.VI.2000, 3 ♂♂ 22.–29.VI.2000, 2 ♂♂ 29.VI.–6.VII.2000, 2 ♂♂ 6.–13.VII.2000, 4 ♂♂ 13.–20.VII.2000, 2 ♂♂ 20.–27.VII.2000, 2 ♂♂ 27.VII.–3.VIII.2000, 8 ♂♂ 3.–10.VIII.2000, 6 ♂♂ 10.–17.VIII.2000, 6 ♂♂ 17.–24.VIII.2000, 6 ♂♂ 24.–31.VIII.2000, 3 ♂♂ 31.VIII.–7.IX.2000, 5 ♂♂ 7.–14.IX.2000, 2 ♂♂ 14.–21.IX.2000, 6 ♂♂ 21.–28.IX.2000, all leg. M. Wolf. **FR:** Courlevon, 1 ♂ 2004, leg. P. Duelli; Nuvilly, 4 ♂♂ 2004, 3 ♂♂ 2005, leg. P. Duelli. **GE:** Bernex, 1 ♂ 7.–11.VIII.2000, 1 ♂ 8.VIII.2000, 1 ♂ 12.VIII.2000; Dardagny Le Moulin 380 m, 1 ♂ 11.VIII.2000, leg. Merz & Bächli; Russin Biolay 360 m, 2 ♂♂ 9.VIII.2000, leg. Merz & Bächli. **JU:** Delémont, 3 ♂♂ 2.–6.VIII.1974. **LU:** Luzern, 1 ♂ 10.VI.2006. **SH:** Merishausen, 1 ♂ 8.–10.VIII.1992; Neunkirch, 1 ♂ 2000, leg. P. Duelli. **TG:** Roggwil, 1 ♂ 2004, 3 ♂♂ 2005, leg. P. Duelli. **TI:** Maggia, 1 ♂ 10.–12.IX.1991; Bolle di Magadino, 3 ♂♂ 17.–20.VI.1995, leg. Merz & Bächli; Lugano, 1 ♂ 24.VI.–5.VIII.2006, leg. Th. Sattler. **VD:** Senarclens, 2005, 1 ♂ leg. P. Duelli. **VS:** Leuk, 2 ♂♂ 23.VIII.–2.IX.1977, 1 ♂ 27.–29.VII.1993; Leuk-Brentjong, 1 ♂ 25.VI.1999. **ZH:** Hönningerberg, 3 ♂♂ 16.–20.VII.1986, 6 ♂♂ 24.–28.VII.1987, 2 ♂♂ 4.–9.IX.1990, 2 ♂♂ 27.–31.VIII.1991, 2 ♂♂ 16.–20.VII.1992, 1 ♂ 15.–19.VII.1993, 2 ♂♂ 16.–20.VII.1994, 1 ♂ 3.–7.VII.1998; Dietikon, 1 ♂ 26.VI.–21.VII.1997*, 1 ♂ 18.VII.–8.VIII.1999*, 2 ♂♂ 23.VI.–7.VII.2000*, 1 ♂ 23.VII.–12.VIII.2000*, 4 ♂♂ 18.–26.VII.2001; Rafz, 1 ♂ 2001, 2 ♂♂ 2004, 9 ♂♂ 2005, leg. P. Duelli; Uitikon, 3 ♂♂, 2004, leg. P. Duelli; Unterengstringen, 1 ♂ 15.IX.1977; Zürich, 1 ♂ 7.–9.VII.1999, 1 ♂ 4.VI.2011.

Distribution: Europe, Russia, Algeria, Azores, Turkey, USA, Canada.

Remarks: Also recorded from GR and VD (Becker 1889, Vaucher-von Ballmoos 1997). The species is probably an introduction into North America from the Palaearctic (Bickel, 1984). Males with only 3 pairs of strong dorsocentral setae are present in the material. Besides the male genitalia, *M. truncorum* differs from the similar *M. jacula* by the presence of 4 pairs of dorsocentral setae, whereas *M. jacula* has 5 pairs of dorsocentral setae.

***Medetera unisetosa* Collin, 1941**

Material examined: **BL:** Bubendorf, 1 ♂ 13.–20.VII.2000, leg. M. Wolf.

Distribution: England, Belgium (Pollet et al. 2005), Slovakia.

Remarks: New record for Switzerland! The species is similar to *M. pallipes* in external characters, but the single pale pd seta on the mid tibia is diagnostic. Unfortunately, no figures of the hypopygium have been published so far.

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