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Redescription of *Cerodontha mellita* SPENCER and *Ophiomyia definita* SPENCER (Diptera Agromyzidae)

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Abstract

Two agromyzid species, *Cerodontha mellita* and *Ophiomyia definita*, are redescribed. Both species were recently recorded for the first time from Belgium, for *Cerodontha mellita* this was the first record since its description. We give a differential diagnosis between *Cerodontha mellita* and *Cerodontha angulata*, as both species were previously confused with one another. *Ophiomyia sueciae* is proposed as a junior synonym of *Ophiomyia definita*.

Keywords : Diptera, Agromyzidae, systematics.

Introduction

The family Agromyzidae is, in respect to the number of species, the most diversified family of acalyptrate Diptera occurring in the Palaearctic region (VON TSCHIRNHAUS, 1994). However, this large number of described species, the many brief and incomplete descriptions, and the large number of undescribed species (according to VON TSCHIRNHAUS at least 200 in Europe) makes it difficult to identify Agromyzidae to the species level.

The Belgian agromyzid fauna is poorly known. The check-list of Belgian Diptera mentions only 88 species (DE BRUYN & VON TSCHIRNHAUS, 1991), a low number compared to surrounding countries (United Kingdom : 313 (SPENCER, 1972); Netherlands : >150, (OOSTERBROEK, 1981); Germany : 552 (VON TSCHIRNHAUS, 1999)). Recent investigations of trapping series have brought this number up to approximately 173 species (SCHEIRS *et al.*, 1995, 1997, 1999).

During 1986, the insect fauna of the nature reserve "Lac de Virelles" was sampled by means of a Malaise trap (see SCHEIRS *et al.*, 1999). When identifying the Agromyzidae captured in this trap, we encountered two agromyzid species of uncertain status. In this paper, we clarify the status of both species by making a redescription based on the original type specimens and material collected at Virelles, Belgium.

Abbreviations used to indicate the position of bristles : *ors* : upper orbital; *ori* : lower orbital; *or* : orbital; *oc* : ocellar; *pvt* : postvertical; *vte* : outer vertical; *vti* : inner vertical; *vi* : vibrissa; *dc* : dorsocentral; *pp* : propleural; *m* : mesopleural; *st* : sternopleural; *h* : humeral; *prs* : presutural; *n* : notopleural; *sa* : supraalar; *ipa* : inner postalar; *epa* : outer postalar; *ia* : interalar; *prsc* : prescutellar; *la* : lateral scutellar; *ap* : apical scutellar.

Redescriptions

Cerodontha (Butomomyza) mellita SPENCER, 1971
(Figs 1-4)

Type material : Holotype, ♂ : United Kingdom, Orford, 19.VI.1907, genitalia dissected by K.A. SPENCER and mounted on the same pin (slide number 2512). Paratypes, 1♂ 1♀ : United Kingdom, Orford, 19.VI.1907, male genitalia dissected by K. A. SPENCER and mounted on the same pin (slide number 2513). Holotype and paratypes collected by J. E. Collin (not mentioned on label but in SPENCER (1971)), deposited in University of Oxford, Hope Entomological Collections, University Museum, Oxford, U.K.

Additional material : Belgium : Virelles, Reserve "Lac de Virelles", Malaise trap, leg. M. ROUARD : 1♂ (V.199) on 1.VI.1986, 1♂ (V. 13) on 21.VII.1986, 1♂ (V.51) on 4.VIII. 1986, 1♀ (V.351) on 12.VIII.1986, 1♀ (V. 352) on 12.VI.1986 (within brackets number in SCHEIRS collection). All specimens are now stored in the SCHEIRS collection and will later be deposited at the Royal Belgian Institute of Natural Sciences, Brussels, Belgium.

Redescription

Head (Fig 1). Frons 1.2-1.5 times broader than eye at level of anterior ocellus. Ocellar triangle occupying about 1/5 of head width, tip just reaching level of the uppermost *ors*. Orbits moderately projecting above eye in profile, not broadening towards base of lunula. Normally two reclinated *ors* which slightly project outwards and 2 incurved *ori* present (Fig. 1). However, exceptions on this scheme are common but mostly limited to one side. Individuals with 3 *ors* (like holotype) or with a third, smaller, lower *ori* on one side occur. Orbital setulae present, stout, and upright on a single line. *oc*, *pvt*, *vte*, *vti*, and *vi* present, *vti* stronger than *oc*, *pvt*, and *vte*. Peristomal bristles long, from equal to 1/2 the size of *vi*. Lunula broad, higher than a semicircle reaching beyond *ori*. Gena (jowls and cheeks) posteriorly 1/5-1/6 times eye height. Eye oval and bare. First antennal segments separated by 1/2-1/3 diameter of first antennal segment, pubescence on 3rd antennal segment shorter than basal diameter of arista, arista thickened at base and 5 times as long as 3rd antennal segment. Palpi normal.

Thorax. Three post-sutural and one pre-sutural *dc* on mesonotum, decreasing in size from back to front. Acrostichals (*acr*) in 6-7 irregular rows. Macrochaetae : *pp*, 1*m*, 1*st*, 1*h*, *prs*, 2*n*, *sa*, *ia*, *epa*, *ipa*, *prsc*, *la*, and *ap* present. *epa* stronger than *ipa*, 1/2-1/3 in length. Setulae in the *ia*-area present. Mesopleura has in addition to the mesopleural bristle two rows of hairs, a row formed by the mesopleural bristle and 4-5 hairs on the posterior edge of the mesopleura, and a row anteriously of this row formed by 6-9 hairs. Wing 2.50-2.75 mm in male and 2.95-3.05 mm in female, costa reaching M_{1+2}, wing tip between R_{4+5} and M_{1+2} but most closely to M_{1+2}, ratio of costal sections 2-4; 3.9-5.0 : 1.2-1.6 : 1.0, last section of M_{3+4} 1.2-1.6 times penultimate.

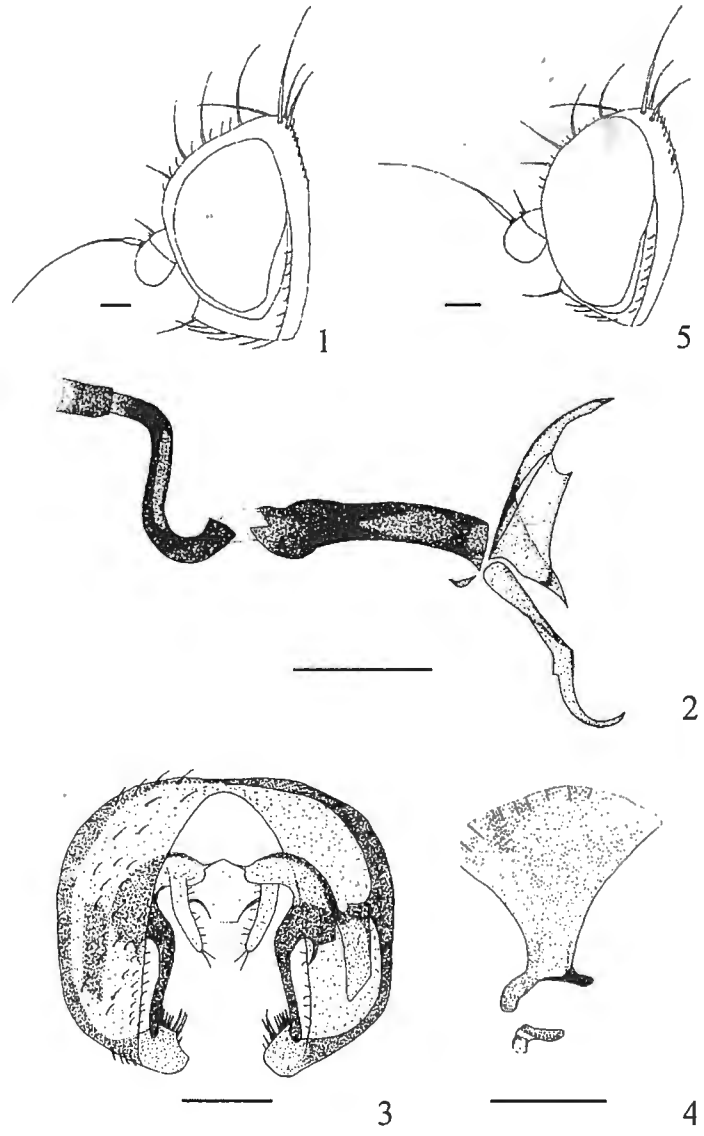
Male genitalia and abdomen. Epandrium (Fig. 2) with slightly raised extension (Analfortsatz, *e.g.* NOWAKOWSKI, 1973), surstyli with five spines and additional 3-4 long hairs, tip of bacilliform sclerite (Langfortsatzes, *e.g.* NOWAKOWSKI, 1973) blunt and without hook, cerci fine and curving inwards. Aedeagus as in Fig. 3, distiphallus with pronounced distal tubules, tubules parallel or slightly diverging, paraphalli present, hypophallus with obvious curvature at end. Sperm pump as in Fig. 4, small at the base and abruptly broadening. Length 5th abdominal tergite 282-289 µm and 6th abdominal tergite 350-368 µm.

Female abdomen. 5th sternite large, 1.7-1.9 times broader than 4th sternite and 1.2-1.3 times broader than length of oviscape (measured on ventral side).

Colour. Almost completely black species. Wings : squamae yellowish, fringe brown. Halters white. Legs : femora black, only fore-knees distinctly yellow, tibiae and tarsi paler than femora, coloured yellowish brown particularly on fore-legs.

Remarks

Cerodontha mellita was originally described by SPENCER in 1971. He gives a brief description of the outer morphology and the male aedeagus (+ drawing). He stated that his description of *C. mellita* was based on one male holotype and 2 female paratypes. Inspection of this material revealed indeed a male holotype, but one male and one female paratype. Both paratypes carry a paratype label and were labelled by SPENCER.



Figs 1-5. *Cerodontha* spp. 1 : *C. mellita* SPENCER, head, left lateral view; 2 : *C. mellita*, aedeagus, left lateral view; 3 : *C. mellita*, epandrium, caudal view; 4 : *C. mellita*, sperm pump, side view; 5 : *C. angulata* (LOEW), head, left lateral view. Scale = 0.1 mm.

The European species of the genus *Cerodontha* RONDANI, 1861 were revised by NOWAKOWSKI (1973). This state-of-the-art work gives detailed descriptions of most European *Cerodontha* species. *C. mellita* is included in this work. When making a redescription of *C. mellita*, NOWAKOWSKI did not see the type material (not included in the list of checked material). We requested the material on which NOWAKOWSKI based his description (material listed in NOWAKOWSKI (1973)) and concluded that all three specimens he identified as *C. mellita* belong to *C. angulata* (LOEW, 1869), a resembling species. Therefore, NOWAKOWSKI's description of *C. mellita* must be omitted (NOWAKOWSKI (1973) : general description p. 156-157, drawings of genitalia Fig. 203 (p. 281), drawings of larvae Fig. 203 (p. 303) and puparium Fig. 241 (p. 313)), and replaced by the above one.

C. mellita and *C. angulata* are readily distinguishable by both outer morphology and the shape of the male genitalia. Here we give the most important distinctions between the two species (characters of *C. angulata* in brackets) : gena 1/5-1/6 times height of eye (1/9-1/10 times,

see Fig. 5 for head of *C. angulata*); orbits moderately projecting above eye (not projecting); peristomal bristles long, from equal to 1/2 size of *vi* (always considerable smaller than *vi*, smaller than 1/2 size of *vi*); only fore knees yellow (all knees yellow), last section of M_{3+4} 1.2-1.6 times longer than penultimate (last 0.9-1.2 times penultimate); 5th sternite large, width 1.7-1.9 times length of oviscape (0.7-0.8 times); sursŧyli with five spines and additional 3-4 long hairs (three spines); tip of bacilliform sclerite blunt, without hook (with hook); shape of the male genitalia, especially distal part (compare Fig. 3 with Fig. 145 in NOWAKOWSKI (1973)).

One reason why one could misidentify *C. angulata* as *C. mellita* is the fact that the curvature of the anterior part of the distiphallus (which carry the tubules) is very variable in *C. angulata*. All drawings of the genitalia of *C. angulata* show the distiphallus in an upright position (Figures in SPENCER (1973) : p. 203; NOWAKOWSKI (1973) : p. 281; SPENCER (1990) : p. 348). This is misleading because the curvature of the anterior part of the distiphallus may also be rather flat like in *C. mellita*. Because of this variability, the curvature of the anterior part of the distiphallus can not be used to distinguish both species.

NOWAKOWSKI (1973) published a key to identify the European representatives of the genus *Cerodontha*. In this key, *Cerodontha mellita* runs to couplet 7 in the subgenus *Butomomyza* NOWAKOWSKI, 1967 where it is separated from *C. angulata* by the number of *ori* (2 in *C. angulata* and 2-3 in *C. mellita*) and the shape of the genitalia. However, the number of *ori* is not helpful to separate both species. Both *C. mellita* and *C. angulata* possess two or three *ori*. Instead of the *ori*, the above mentioned characters should be used to separate both species.

The host plant of *C. mellita* is still unknown. Host records listed in NOWAKOWSKI (1973) and SPENCER (1990) must be discarded because they are based on wrongly identified material.

Cerodontha mellita was recently recorded for the first time from Belgium (SCHEIRS *et al.*, 1999), this was the first record of this species after its description.

***Ophiomyia definita* SPENCER, 1971**
(Figs 6-11)

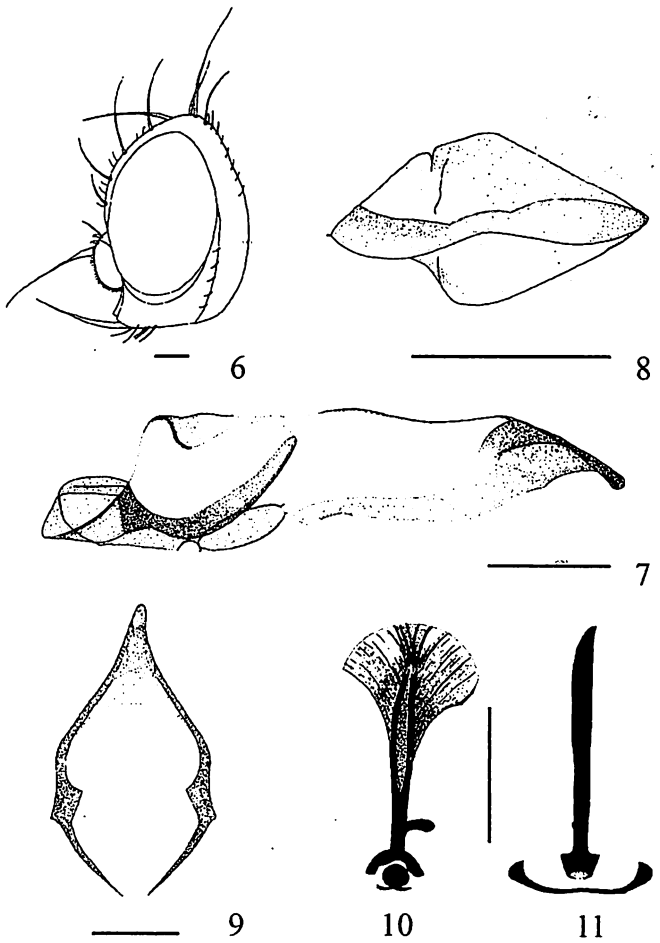
Nec homonym *Ophiomyia definita* SPENCER, 1981 = *O. subdefinita* SPENCER, 1986
Ophiomyia sueciae SPENCER, 1976 **syn. n.**

Type material : Holotype ♂ of *O. definita* : United Kingdom, Norfolk, Barton Mills, 9.V. 1939, genitalia dissected by K. A. SPENCER and mounted on the same pin (slide number 2462). Paratype ♂ *O. definita* : United Kingdom, Woodditton Wood, 1.V.1930, male genitalia dissected by K.A. SPENCER and mounted on the same pin (slide number 2463). Holotype and paratypes collected by J.E. COLLIN (not mentioned on labels but in SPENCER (1971)), deposited in University of Oxford, Hope Entomological Collections, University Museum, Oxford, U.K. Holotype ♂ of *O. sueciae* : Sweden, Arkelstorp, 20.VI.1955, genitalia dissected by K.A. SPENCER and mounted on the same pin (slide number 3022). Holotype collected by H. ANDERSSON, deposited in University of Lund, Museum of Zoology, Lund, Sweden.

Additional material : Belgium : Virelles, Reserve "Lac de Virelles", Malaise trap, leg. M. ROUARD : 1♂ (V.365) on 25.V.1986, and 1♂ (V.366) on 1.VI.1986 (within brackets number in SCHEIRS collection). All specimens are now stored in the SCHEIRS collection and will later be deposited at the Royal Belgian Institute of Natural Sciences, Brussels, Belgium.

Redescription

Head (Fig. 6). Frons 1.4-1.5 times broader than eye at level of anterior ocellus. Ocellar triangle occupying about 1/4 of head width, tip reaching level of the lower *ors* or just ending above it. Orbits moderately projecting above eye in profile. Two reclinated *ors* and 2 incurved *ori* present. Orbital setulae present, reclinated, and in a single line. *oc*, *pvt*, *vte*, *vti*, and *vi* present. Vibrissal fasciculus in male slender, jowls at its base forming an angle of about 80-90°. Gena (jowls and cheeks) posteriorly about 1/6-1/7 times height of eye. Eye oval and bare. First antennal segments separated by fascial keel, fascial keel narrow and widening twice in width just below antennae, quickly narrowing again to original width, keel flat and only slightly raised to about the height of the first antennal segment. Pubescence on 3rd antennal segment just shorter than basal diameter of arista, arista thickened at base, 3th antennal segment longer than broad. Palpi normal, proboscis normal.



Figs 6-11. *Ophiomyia definita* SPENCER. 6 : head, left lateral view; 7 : aedeagus, left lateral view; 8 : aedeagus, ventral view; 9 : hypandrium, ventral view; 10 : Sperm pump, side view; 11 : Sperm pump, front view. Scale = 0.1 mm.

Thorax. Two stout post-sutural *dc*, frequently 1 to 3 post-sutural *dc* present, but these always much smaller than the posterior two. Acrostichals (*acr*) in 5-6 irregular rows. Macrochaetae : *pp*, 1*m*, 1*st*, 1*h*, *prs*, 2*n*, *sa*, *ia*, *epa*, *ipa*, *prsc*, *la*, and *ap* present. *epa* 3 times longer than *ipa*. Setulae in the *ia*-area present. Wing 1.70-2.35 mm in male, costa reaching M_{1+2}, wing tip between R_{4+5} and M_{1+2}, ratio of 2nd to 4th costal sections; 4.3-4.8 : 1.1-1.2 : 1.0, last section of M_{3+4} 0.8-0.9 times penultimate.

Male genitalia. Side view of aedeagus as in Figs 7 and 8, its distiphallus weakly sclerotized. Hypandrium as in Fig. 9 but length of anterior part variable. Sperm pump as in Figs 10 and 11 with long stalk and small blade.

Colour. Completely black species. Orbits, ocellar triangle and mesonotum only moderately shining black with no metallic sheen. Wings : squamae dark, fringe black. Halters black. Legs completely black.

Remarks

When inspecting male genitalia of this or any other *Ophiomyia* species, it is necessary that the genitalia are in the good position to make comparison with the drawings possible. Slight deviations in rotation can give a completely different sight as also discussed by PAKALNIŠKIS (1998).

SPENCER (1976) described *O. sueciae* from one specimen found in Sweden. We suspected *O. sueciae* to be a junior synonym of *O. definita*

because of the great resemblance of both description and genitalia drawings. After investigation of the male holotype we concluded that in all aspects *O. sueciae* resembles *O. definita* and we therefore synonymise both taxa.

O. definita and its junior synonym *O. sueciae* are keyed out wrongly in the most recent key of the European *Ophiomyia* (CERNÝ, 1994) using its extension (PAKALNIŠKIS, 1998). Correct placement of *O. definita* in this key is impossible at the moment because of the many unreliable characters, for instance variable coastal ratio and wing length, used to discriminate between species resembling *O. definita*.

Recently recorded for the first time from Belgium (SCHEIRS *et al.*, 1999), previously also recorded from United Kingdom (original description : SPENCER, 1971), Sweden (as *O. sueciae* : SPENCER, 1976), and Estonia (identified as *O. sueciae*, material not seen : ELBERG & ZLOBIN, 1992). The female of this species is still unknown. There are no host records available for *O. definita*.

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