



Revision of the *Myopa testacea* Species-Group in the Palaearctic Region (Diptera: Conopidae)

JENS-HERMANN STUKE¹ & DAVID K. CLEMENTS²

1. Dr. Jens-Hermann Stuke, Roter Weg 22, D-26789 Leer, Germany; email: jstuke@zfn.uni-bremen.de

2. David Clements, 7 Vista Rise, Llandaff, Cardiff, CF5 2SD, U.K.; email: dave.clements1@ntlworld.com

Abstract

The *Myopa testacea* Species-Group is revised. Seven valid species are considered to belong to this group, and an identification key to these is presented. The known distribution information is evaluated, and the sparse information available on the biology is summarised. *Myopa claussenii* **sp. nov.** and *Myopa hirsuta* **sp. nov.** (= *Myopa strandi* auct., nec Duda 1940) are described; *Myopa arabica* Macquart, 1850 is reinterpreted as a valid species (**stat. rev.**) and *Myopa strandi* Duda, 1940 is placed as a junior synonym of *Myopa vicaria* Walker, 1849 (**syn. nov.**).

Key words: Revision; *Myopa testacea* Species-Group; Conopidae; Diptera; Palaearctic species; spp. nov.; stat. rev.; syn. nov.

Introduction

The genus *Myopa* Fabricius, 1775 currently includes about 25 valid species in the Palaearctic region according to Chvála & Smith 1988, supplemented by Clements (2000), Stuke (2001; 2003a, 2004; 2005), Stuke & Clements (2005) and Stuke & Maeta (2004). The species in the *testacea*-group are taxonomically some of the most difficult in this region.

Following the description of *Myopa testacea* by Linnaeus (1767), and up until the middle of the 19th Century, only very few other species were described in this group — mostly inadequately — by other authors including Meigen, Macquart and Robineau-Desvoidy. Schiner (1862) accepted only two species, *Myopa testacea* and *Myopa stigma*, and several later authors agreed with this assessment (e.g. Chen 1939, Becker 1922, Wahlgren 1917), whilst others regarded *Myopa stigma* as no more than a form of *Myopa testacea* (Kröber 1936). Collin (1960), and later Chvála (1965), Bańkowska (1979) and Zimina (1999b), recognised four species in the *Myopa testacea* Species-Group as defined here.

Following examination of a large number of *Myopa* specimens from many locations throughout the Palaearctic region, it has become apparent that there remain a number of problems in the current taxonomy of the genus, and that additional revisional work is required. The following account therefore represents the first stage of such a revision.

Materials and Methods

Morphological terminology follows McAlpine (1981) and Stuckenberg (1999). For the examination of genital structures and taxonomically important sternites it is usually necessary to detach the entire abdomen, or at

least from segment 4 onwards, and to macerate this in a suitable agent such as 10% aqueous potassium hydroxide (KOH), prior to dissection. The microtrichiation of the epandrial plate (i.e. sternite 10) can only be satisfactorily seen under a binocular microscope, with illumination from the side, following the dissection and maceration of the epandrium (the epandrial plate is located in the ventral wall of the epandrium, behind the aedeagus). For the assessment of dusting characteristics of the abdomen it is necessary to examine the specimen from various directions at low magnification under a binocular microscope, with strong illumination from the side. The dusting characteristics should be carefully examined and recorded before maceration. Soiled or greasy specimens may require careful cleaning, for example, using ethanone (=acetone: $(\text{CH}_3)_2\text{CO}$), prior to the examination of dusting.

In the following accounts, the data given on the original labels of type specimens which have been examined is rendered as follows: the labels are listed and numbered in the order found, commencing with the uppermost. Line-breaks on labels are indicated by a slash-mark (“/”) and handwritten text is shown underlined.

The redescriptions given below refer primarily to the features of primary taxonomic value. Wing length is measured from the apical margin of the tegula to the furthest extent of the wing apex. Body length, where given, is approximate and is measured from the base of the antennae to the furthest limit of the abdomen in natural posture, viewed from above.

The following abbreviations are used for institutional collections:

BMNH: British Museum (Natural History), London, England.

ETHZ: Zoology Department, Eidgenössische Technische Hochschule, Zürich, Switzerland.

MNHN: Muséum National d'Histoire Naturelle, Paris, France.

NHCM: Zoologiska Museet, Naturhistoriska Centralmuseet, Helsinki, Finland.

NML: National Museums, Liverpool, England.

NHMW: Naturhistorisches Museum Wien, Vienna, Austria.

RMNH: Nationaal Natuurhistorische Museum ("Naturalis"), Leiden, The Netherlands.

UMB: Universitetet i Bergen, Naturhistoriske Samlinger, Bergen, Norway.

UMBB: Überseemuseum, Bremen, Germany.

UMC: Department of Zoology, University of Cambridge, England.

UMO: University Museum, Oxford, England.

USNM: National Museum of Natural History, Washington D.C., U.S.A.

UZMC: Universitets Zoologiske Museum Copenhagen, Denmark.

ZMAN: Universiteit van Amsterdam, Instituut voor Taxonomische Zoologie, Zoological Museum, Amsterdam, Holland.

ZMHB: Museum für Naturkunde der Humboldt-Universität, Berlin, Germany.

Results

The *Myopa testacea* Species-Group

The *testacea*-group is, together with the closely related *polystigma*-group, distinguished from all other *Myopa* species-groups by the following combination of characters: (1) conspicuous white hairs on the ventral occiput (i.e. white ‘cheek whiskers’); (2) the crossvein r-m is black, and usually lies within a conspicuous blackish wing marking; and (3) the absence of a conspicuous, dense and isolated wing marking in the centre of cell r4+5. Segregation of the *testacea*-group from the *polystigma*-group is more difficult, although this is normally possible through the more strongly spotted wings of the latter. In the *polystigma*-group there is normally

blackish marking of the wing membrane along much of the length of vein M, but the marking along the outer section of this vein (M2) is usually obviously interrupted in the middle section so as to produce distinct and obviously isolated spots at the wing apex and at the junction of M2 with the outer crossvein dm-cu (Fig. 2). In the *testacea*-group these markings are either absent entirely (Fig. 1), or if present then the blackish coloration along vein M2 runs uninterrupted from the outer crossvein dm-cu to the wing apex. This distinction is sometimes unclear in *Myopa vicaria* Walker, 1849 which is currently considered to belong to the *polystigma*-group, but this species also differs from the *testacea*-group in lacking any distinct rows of setose bristles in the basal part of the undersides of tibiae 1 and 2. *Myopa vicaria* is usually also distinctive in having very long hairs on the body, the longest of which are clearly longer than the hind metatarsus, as well as in having markedly pale (i.e. yellowish-orange) abdominal coloration.

These two species-groups have been separated as a matter of expediency and probably do not form natural taxonomic groupings. Their maintenance may therefore eventually prove to be unsustainable. However, their separation is presently invoked in order to allow the early revision of the *testacea*-group.

As far as can be ascertained, all species of the *testacea*-group are univoltine and fly mainly in the spring months, although at higher altitudes and in northern areas especially, the flight period may extend until July or later. The *testacea*-group appears to be confined to the Palearctic region.



FIGURES 1–2: Wing of *Myopa*. —1: *testacea* Linnaeus, [Germany, Berlin, Forst Düppel]; —2: *polystigma* Rondani, 1857 [Germany, Ldk Uelzen, Galgenberg/Grünhagen].

Checklist of the *Myopa testacea* Species-Group

The following seven species are presently recognised in the *testacea*-group:

- Myopa arabica* Macquart, 1850 [stat. rev.]
Myopa argentata Stuke, 2005
Myopa claussenii sp. nov.
Myopa hirsuta sp. nov.
 = *Myopa strandi* auct., nec. Duda, 1940
Myopa pellucida (Robineau-Desvoidy, 1830)
 = *Myopa fulvipalpis* (Robineau-Desvoidy 1853)
 = *Myopa extricata* Collin, 1960
Myopa stigma Meigen, 1824
 = *Myopa nigrodorsata* (Robineau-Desvoidy, 1853)
 = *Myopa flavipennis* (Robineau-Desvoidy, 1853)
 = *Myopa scutellaris* (Robineau-Desvoidy, 1853)
Myopa testacea Linnaeus, 1767
 = *Myopa longirostris* Robineau-Desvoidy, 1830
 = *Myopa pictipennis* Robineau-Desvoidy, 1830
 = *Myopa umbripennis* Robineau-Desvoidy, 1830
 = *Myopa japonica* Kröber, 1916

Identification Key for the *Myopa testacea* Species-Group

Identification of species in the *testacea*-group is not straightforward, and it will not always be possible to determine every individual specimen using the following key. Dusting and coloration characteristics are sometimes indeterminate, especially in old or worn specimens. Coloration characteristics which are referred to in the key may also depend very much on the state of preservation, and there is considerable infraspecific variation. The length of hairs on the body, another important characteristic, is also subject to some infraspecific variation. Specimens identified using the key should therefore be checked against the species descriptions to confirm their identification.

It should be noted that within the species segregated here there are a number of distinctive forms or varieties, particularly from the eastern Palaearctic, which may ultimately be found to be valid species in their own right but for which there is presently insufficient material available to determine their true status.

- 1 Hairs on anterior margin of mesoscutum more than half the length of hairs on posterior margin; Parafacialia and/or gena with black hairs that equal or exceed the length of postpedicel; Hairs on tergite 5 at least as long as diameter of hind tibia, usually longer..... 2
- Hairs on anterior margin of mesoscutum mostly less than half the length of hairs on posterior margin; Parafacialia and gena usually without black hairs, or with only a scattering of short black hairs; Hairs on tergite 5 usually shorter than the diameter of the hind tibia, occasionally about as long 3
- 2 Tergite 4, and tergite 5 at least medially, extensively undusted; Black coloration on disc of mesoscutum does not extend right up to posterior margin, and mesoscutum is uniformly fine grey dusted at this point; Tergite 2 without dark midstripe; Abdomen usually blood-red in coloration, occasionally orange-brown; ♂: Epandrium as in Fig. 7; Larger species, wing length 5.4–8.7mm; Widespread in the Palaearctic..... *hirsuta* sp. nov.
- Tergite 5 completely silver dusted, and tergite 4 silver dusted up to the anterior margin in the mid-plane; Black coloration on disc of mesoscutum extends to posterior margin, and mesoscutum is partially undusted medially at this point; Tergite 2 with dark midstripe; Abdomen orange-brown; ♂: Epandrium as in Fig. 5; Smaller species, wing length 4.8–5.5mm; Presently known only from the eastern Mediterranean & the Middle East..*argentata* Stuke, 2005

- 3 Black coloration on disc of mesoscutum does not extend to posterior margin, at least medially (may do so very rarely); Palp pale orange; Parafacialia, and sometimes gena, with scattered short black hairs; Tergite 1 usually dark in anterior part, but with paler orange-brown towards posterior margin, at least submedially; ♂: Epandrium in side view without ventrally expanded vesicle (Fig. 8), and with only a few short microtrichia on ventral side; Posterior surstylus broad and bluntly rounded; ♀: Tooth at side of apical sytergosternite relatively short (Fig. 22)
*pellucida* (Robineau-Desvoidy, 1830)
- Black coloration on disc of mesoscutum extends to posterior margin, at least medially (*M. claussemi* usually has two indistinct submedial orange-brown markings near the posterior margin, and very rarely the posterior marginal area may be orange-brown in other species); Palp usually dark brown, rarely pale; Parafacialia and gena usually lacking short black hairs, but may have a very few scattered, short hairs; Tergite 1 usually darkened across whole disc to posterior margin, but may be paler towards rear; ♂: Epandrium in side view with ventrally expanded vesicle, (Figs. 4,6,9,10), with microtrichia on the ventral side; Posterior surstylus variable, but usually narrower and more pointed; ♀: Tooth at side of apical sytergosternite longer (Figs. 18, 20, 23, 24) 4
- 4 ♂: Tergite 4 at most only narrowly dusted medially on the posterior margin, and dusting does not reach the anterior margin of this tergite anywhere. ♀: Tergite 4 dusted medially in posterior half or less, and dusting only rarely reaching the anterior margin of this tergite submedially; Tergite 5 at least partially undusted in mid-line; Wing membrane usually with obvious brownish or blackish markings alongside long veins, but may be hyaline 5
- Tergite 4 usually dusted medially from posterior margin for at least half its length, and dusting may reach as far as the anterior margin of this tergite submedially; Tergite 5 usually dusted for whole length, at least medially; Wings hyaline alongside long veins, or uniformly weakish brown-toned 6
- 5 Black coloration on disc of mesoscutum usually extends to the posterior margin, at least medially, without any submedial orange-brown markings (mesoscutum may very rarely be orange-brown at posterior margin); ♂: Tergite 5 continuously dusted on posterior margin; Epandrium in side view with strongly expanded ventral vesicle (Fig. 10); ♀: Sternite 7 relatively short and oblong, not sharply pointed towards base (Fig. 17); Widespread in the Palaearctic region *testacea* Linnaeus, 1767
- Disc of mesoscutum usually with submedial orange-brown markings at, or shortly before, the posterior margin; ♂: Tergite 5 completely undusted medially, and therefore not continuously dusted at the posterior margin; Epandrium in side view with ventral vesicle less strongly expanded (Fig. 6); ♀: Sternite 7 long, and sharply pointed towards base (Fig. 13); Presently known only from Crete *claussemi* **sp. nov.**
- 6 Generally a dark brownish species; Tergite 2 at least with distinct blackish marking in middle, and tergite 1 blackish up to the posterior margin, at least medially; Widespread in Europe *stigma* Meigen, 1824
- Generally a pale orange-brown species; Tergite 2 and the posterior margin of tergite 1 usually orange-brown; Presently known from southern Europe and the Near East *arabica* Macquart, 1850

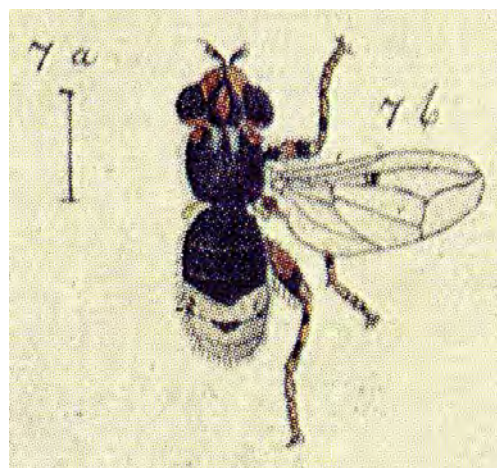


FIGURE 3: *Myopa stigma* Meigen, 1820 from the original illustrations of Meigen (Morge 1976).

Descriptions of Species in the *Myopa testacea* species-group

Myopa arabica Macquart, 1850 (Figs. 4, 11, 18)

Myopa arabica Macquart 1850: 138

Locus typicus: “Arabia, Djidda” [N21°32'; E39°10' – Saudi Arabia].

Holotype: 1♀: (1) round yellow label, possibly with faded writing on the upper side, the underside with the number “288 39”; (2) “*Myopa arabica* / [illegible text] / n. sp.”; (3) “Holotypus”, “*Myopa arabica* / Macquart, 1850 ♀ / J.-H. Stuke, 2003”. —[The holotype is badly soiled and the dusting pattern is incapable of certain recognition. The wing membrane is brownish tinged, but this is a contaminant. The holotype is deposited at MNHN, and was loaned to JHS for examination].

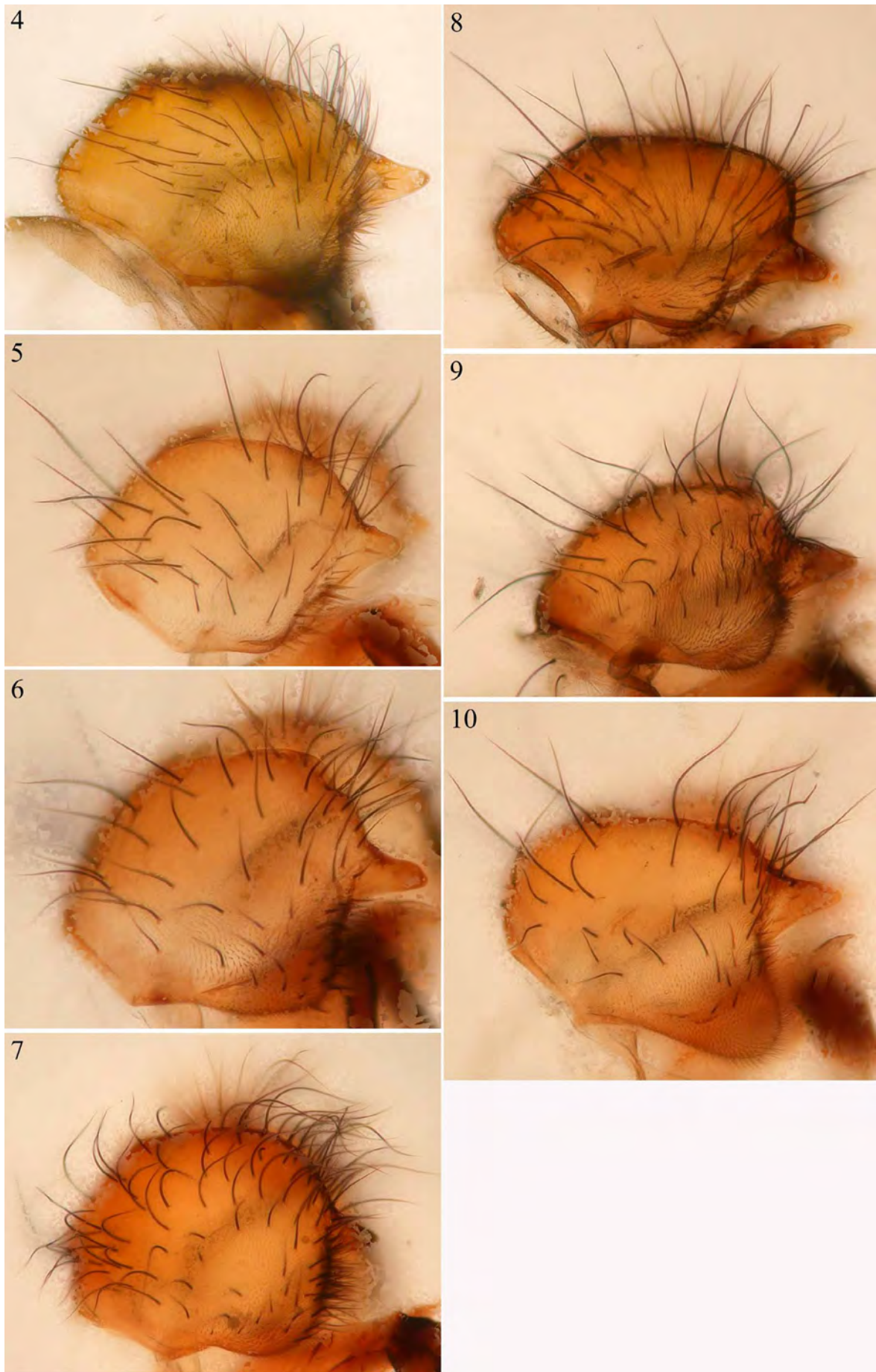
Literature: Becker (1922): Synonymised the species with “*stigma* Meig.”, taxonomic comments.—Kröber (1925): uncertain species. —Stuke (2004b): taxonomic comments, photo of the holotype.

Other material: **Greece:** 1♂ (13.III.2001, Platania, Volos, leg. Standfuss, coll. Stuke); 1♂ (11.IV.2001, ditto); 1♀ (09.III.2002, ditto); 1♀ (20.III.2002, ditto, coll. Standfuss); 1♂, 1♀ (19.III.2004, coll. Stuke & Standfuss); 1♀ (03.V.2004, ditto, coll. Stuke); 1♂ (22.IV.1999, Peloponnese, Rizos SW 4km, 600m NN, 37°26'N, 22°29'E, leg. Blank & Kutzscher, coll. Hauser); 2♂♂ (23.IV.2004; Skamnelli-Ioannina, 39°54'15"N, 20°50'30"E, leg. Renema, coll. Stuke); **Turkey:** 1♂, 1♀ (23.V.1998, Province Konya, Hill 2km SE Sefaköy (Kizilören Dagil) WSW Konya, ca. 37°48'N, 032°12'E, 1400m, leg. Lange & Ziegler, coll. Ziegler & Stuke); 1♂ (21.V.1998, Province Konya, Güneydere (Erenler Dağlan), WNW Hatunsaray SSW Konya, 37°37'32"N, 032°18'23"E, 1100m, leg. Lange & Ziegler, coll. Ziegler); 1♂ (27.V.1994, Oltu Erzurum, leg. et coll. Hayat); 1♂ (20.VI.1990, Atatürk Ü., Erzurum, leg. et coll. Hayat); 1♂ (14.V.1994, Kayseri, 19km E of Cayirlaran, leg. Mawdsley, coll. NML); 1♀ (10.V.1994, Niğde, Selime Bridge, leg. Mawdsley, coll. NML); **Russia, Belarus:** 1♂ (12.V.-07.VI.1914, Falzfeinowa a. Dniepr, leg. W. Ramme S. G., coll. ZMHB).

Redescription

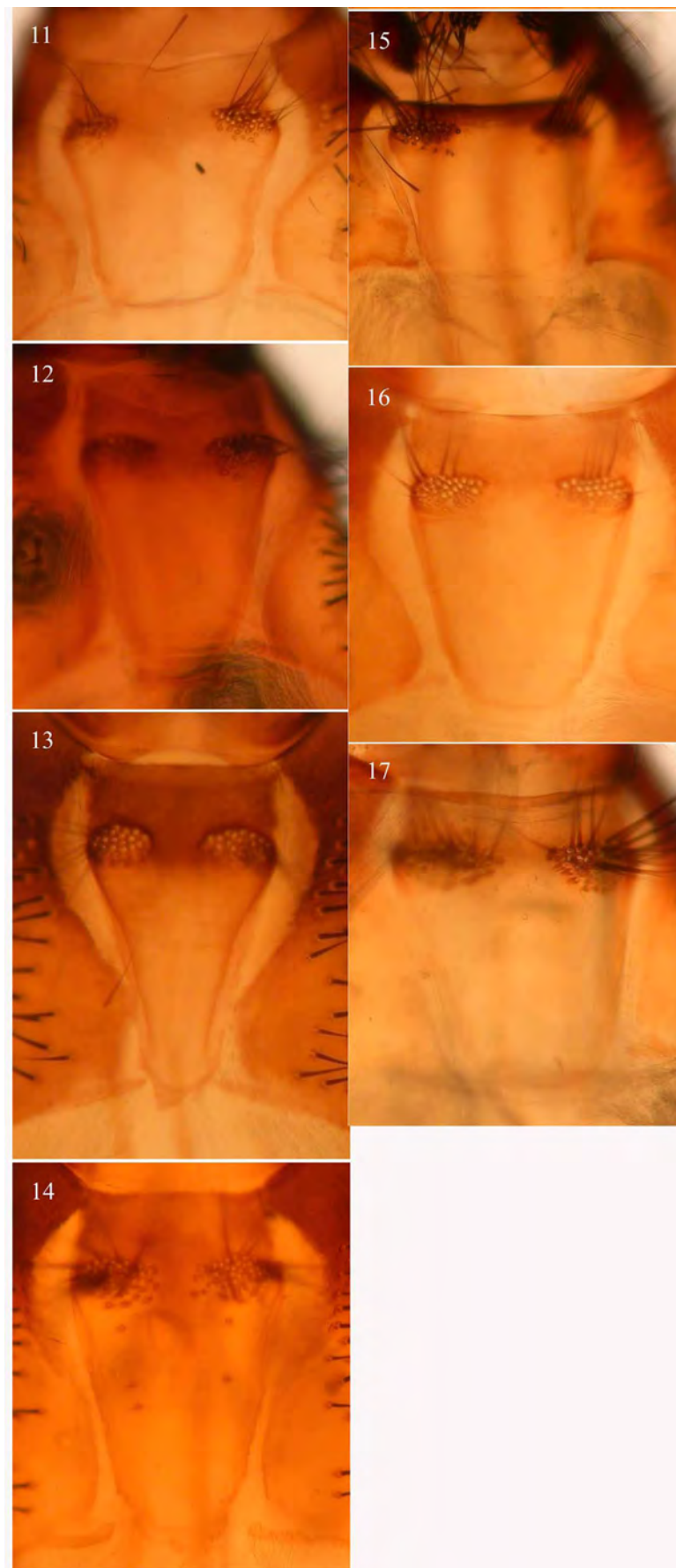
Head: Palp orange-brown. Usually no black hairs on the parafacialia or gena, or if present these are short and sparse. **Thorax:** Posterior margin of mesoscutum black, with coarse silvery or golden dusting which is interrupted in the mid-line. Katepisternum completely orange-brown. Underside of scutellum mostly blackish, only rarely orange-brown. Upper side of scutellum may also be darkened, especially at sides. Hairs of mesoscutum comparatively short, those at the anterior margin less than half as long as those at the posterior margin. Femora and tibiae with darker brownish markings. Dark marking around vein r-m often weak, and wing usually without other dark markings. Wing length 5.2–7.2mm. **Abdomen:** Generally dark orange. Tergite 1 dark at base, with orange-brown at margins and usually also on disc towards the posterior margin, although sometimes the darker coloration at the base extends across the whole disc. Remainder of tergites orange-brown. Tergite 4 dusted at least submedially on whole length, and always with a wide dusting at the posterior margin which occupies at least half of the length. Tergite 5 usually completely dusted, or at least in the middle. ♂♂ — Hairs in centre of tergites 4 and 5 not very obviously longer than those on tergite 2. Hairs on tergite 6 often shorter than diameter of hind tibia, and only rarely approximately as long as diameter of tibia. **Genitalia:** ♂♂ —Epaandrium in side view as in Fig. 4, somewhat expanded ventrally to form a vesicle which is felted with fine pile. Angle between anterior margin and underside of epaandrium is acute. Epandrial plate with microtrichia. ♀♀ —Sternite 7 as shown in Fig. 11, shortly oblong. Lateral tooth of apical syntergosternite fairly long, its length being usually at least twice its width at base (Fig. 18).

FIGURES 4–10: *Myopa testacea* Species-Group. Epandria of males in side view. —**4:** *arabica* Macquart, 1850 [27.V.1994, Oltu Erzurum]; —**5:** *argentata* Stuke, 2005 [Paratype, 13.IV.2003, Afilianes]; —**6:** *clauseni* spec. nov. [Paratype, 18.IV.1987, Chersónissos]; —**7:** *hirsuta* spec. nov. [Paratype, 08.IV.1989, Mönchswald]; —**8:** *pellucida* (Robineau-Desvoidy, 1830) [14.V.1992, SW Gaibach]; —**9:** *stigma* Meigen, 1824 [03.IV.1999, Purgstall]; —**10:** *testacea* Linnaeus, 1767 [03.V.1994, Inzmühlen].



TERM OF USE

This pdf is provided by Magnolia Press for private/research use.
Commercial sale or deposition in a public library or website site is prohibited.



FIGURES 11–17: *Myopa testacea* Species-Group. Sternite 7 of females in ventral view. —**11:** *arabica* Macquart, 1850 [23.V.1998, SE Sefaköy]; —**12:** *argentata* Stuke, 2005 [Paratype, 15.IV.2003, 60km SE Volos]; —**13** *claussemi* spec. nov. [Paratype, 18.IV.1987, Chersónissos]; —**14:** *hirsuta* spec. nov. [Paratype, 31.III.1991, Trockenaue Griessheim]; —**15:** *pellucida* (Robineau-Desvoidy, 1830) [21.IV.1991, Schönberg]; —**16:** *stigma* Meigen, 1824 [06.IV.1999, Purgstall]; —**17:** *testacea* Linnaeus, 1767 [03.V.1998, Heseler Wald].



Diagnosis

This species can usually be distinguished on the basis of: (1) the extensive dusting of tergites 4 and 5, which normally reaches at least in part as far as their anterior margins; (2) the dark ventral coloration of the scutellum, which usually reaches to the posterior margin; (3) the weak pattern of the wing coloration, which is usually restricted to a darkening around the median crossvein r-m, with the wing membrane elsewhere being either hyaline or uniformly weakish brown-tinged; and (4) the relatively small size (about 5.5-6mm in length).

Myopa arabica appears to be closely related to *Myopa stigma*, but is differentiated from this species by its altogether paler coloration, which is most reliably reflected in the completely orange-brown tergite 2.

Taxonomic Discussion

Chvála & Smith (1988) adopted the synonymy introduced by Becker (1922), under which *Myopa arabica* was synonymised with *Myopa stigma*. However, recent examination of the holotype indicated that there were problems with this assignment (Stuke 2004b), when it was recognized that the holotype of *Myopa arabica* is identical to other specimens of the *testacea*-group that had already previously been segregated as distinct from *Myopa stigma*. The precise assignment of the holotype could not be confirmed, however, because of its poor condition, which obscures the characteristic dusting pattern of the tergites. *Myopa arabica* and *Myopa stigma* are very similar to each other, and we cannot yet entirely exclude the possibility that they are simply two different colour forms of the same species. Nevertheless, because we can consistently segregate much of the material presently available to us using the differences set out above, we therefore propose *Myopa arabica* as a valid species [stat. rev.].

Distribution

The distribution of this species is not well known since it has not previously been adequately distinguished from related species. As with *Myopa stigma*, and some other species, some considerable doubt therefore remains as to the true distribution. On the basis of the present study, however, this species appears to have a restricted distribution which extends from southern Europe (Greece) to the Near and Middle East (Turkey, Saudi Arabia).

Myopa argentata Stuke, 2005 (Figs. 5, 12, 19)

Myopa argentata Stuke 2005: 543-545.

Locus typicus: Greece: Thessalia, Prov. Magnesia, Peninsula Pilio, Platania 60km SE Volos, Afilianes, 39°09'5N, 023°17'0E, 200m.

Holotype 1♂: (1) "Greece: Thessalia / Prov. Magnesia, Peninsula Pilio / Platania 60km / SE Volos, Afilianes / 39°09'5N, 023°17'0E / 15.IV.2003 200m / leg. C. Lange & J. Ziegler"; (2) "Holotypus / *Myopa argentata* / spec. nov. ♂ / Stuke det. 2003". —[The holotype is in excellent condition, and is deposited at ZMHB. It was loaned to JHS for examination.]

Paratypes: **Greece:** 1♀ (15.IV.2003, Thessalia, Prov. Magnesia, Peninsula Pilio, Platania 60km SE Volos, Mousgies, 39°09'4N, 023°16'3E, 20m, leg. C. Lange & J. Ziegler, coll. Stuke); 1♂ (13.IV.2003, Thessalia, Prov. Magnesia, Peninsula Pilio, Platania 60km SE Volos, Afilianes, 39°09'5N, 023°17'0E, 200m, coll. Ziegler); 1♂ (20.III.2002, Volos,

Platania, leg. L. Standfuss, coll. Stuke); 1♂ (21.-22.V.1994, Ipiros, Smólikas Mts., 700-1500m, leg. V. Michelsen, coll. Stuke); 1♂ (15.-19.V.1990, Pelopónnisos Taïyétos Mts., 950-1800m, leg. Zool. Mus. Copenhagen Exp., coll. UZMC); **Israel**: 1♂ (22.II.1995, Israel, Haifa, Har Camel, leg. J. A. W. Lucas, coll. ZMAN).

Description

Head: Palp brownish-black. Black hairs on parafacialia and gena obviously shorter than postpedicel. **Thorax:** Posterior margin of mesoscutum black, with coarse silvery or golden dusting which is interrupted in the mid-line. Katepisternum orange-brown, with a more-or-less distinct dark central marking. Underside of scutellum mainly orange-brown, like the upper side. Hairs of the mesoscutum comparatively long, those at the anterior margin at least half as long as those at the posterior margin. Femora and tibiae with darker brown markings. Dark marking around vein r-m often weak, and wing usually without other dark wing markings. Wing length 4.8–5.5mm. **Abdomen:** Generally dark orange. Tergite 1 orange-brown at side-margins, but with darker basal coloration usually extending across the disc as far as the posterior margin. Tergite 2 with anterior margin darkened, and usually with a narrow darkened mid-stripe. Remainder of tergites mainly orange-brown. Tergite 3 usually extensively dusted. Tergite 4 completely dusted, and tergite 5 usually completely dusted centrally, elsewhere less so. ♂♂—Hairs in middle of tergites 4-5 longer than those on tergite 2. Hairs on tergite 6 longer than diameter of hind tibia. **Genitalia:** ♂♂—Epandrium in side view as shown in Fig. 5, only slightly expanded ventrally to form a vesicle which has only a few short microtrichia. Angle between anterior margin and underside of epandrium obtuse. No microtrichia on epandrial plate. ♀♀—Sternite 7 as shown in Fig. 12, narrowing somewhat towards base. Lateral tooth of apical syntergosternite fairly long, its length being usually at least twice its width at base (Fig. 19).

Diagnosis

Myopa argentata appears to be related to *Myopa stigma* on the basis of: (1) the black mid-stripe on tergite 2; (2) the restricted darkening of crossvein r-m and the weak clouding of the wing; (3) the relatively small size; and (4) the black posterior margin of the mesoscutum. However, *Myopa argentata* differs from both the latter species and most of the other members of the *testacea*-group by virtue of the long hairs of the mesoscutum, the characteristic dense, silvery dusting of tergites 3-5 and the comparatively weakly expanded vesicle on the epandrium of the male. In addition, the epandrial plate appears to bear no microtrichia, in contrast with all of the other species in the *testacea*-group, although this characteristic requires careful examination.

Distribution

Presently this species is known only from the eastern Mediterranean and the Middle East (Greece, Israel).

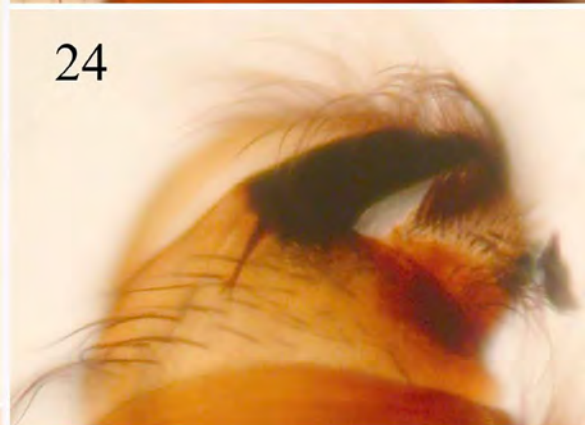
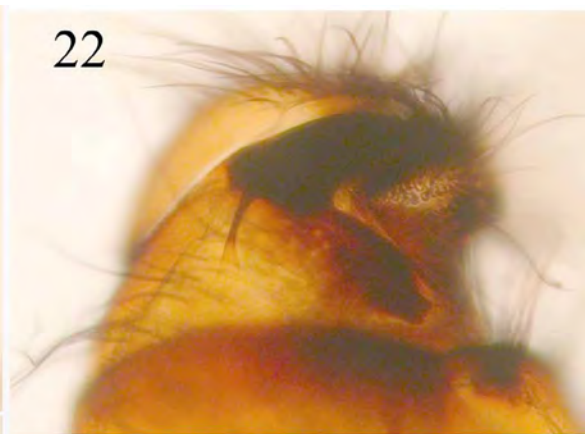
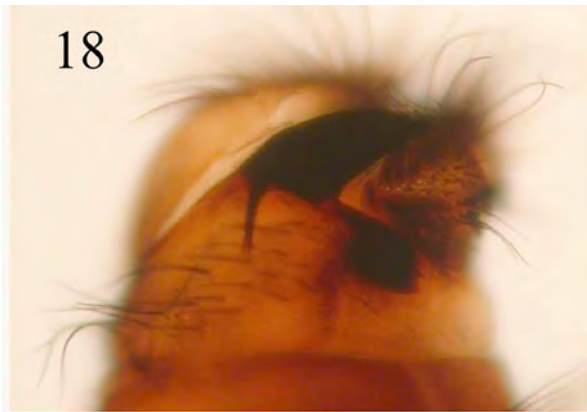
Myopa clausseni spec. nov. (Figs. 6, 13, 20, 25)

Locus typicus: Greece: NE-Crete, upper part of Chersónnissos, at 100–200m [35,34°N, 25,49°E].

Holotype: 1♀: (1) “NE-Kreta, oberhalb / Chersónnissos, / 100–200m / leg. Claußen 18.4.1987”; (2) “*Myopa* ♀ / *polystigma* Rond. / det. Claußen 1988”; (3) “Holotypus / *Myopa clausseni* / spec. nov. ♀ / Stuke & Clements / det. 2004”. —[The holotype is in excellent condition, and is deposited at ZMHB. It was loaned to JHS for examination].

Paratypes: **Greece, Crete:** 3♂♂, 2♀♀ (Data as holotype, coll. Claußen & Stuke); 1♂ (26.IV.1984, Potamies, leg. Claußen, coll. Claußen); 2♀♀ (03.IV.1986, Gebirge ca. 2km S Chersónnissos, 100-200m, leg. Claußen, coll. Claußen & Stuke); 1♀ (04.V.1995, Réthimnon District, Vall. near Mélabes 15km SE Spíli, 35,08°N, 24,39°E, 200m, leg. Lange & Ziegler, coll. Ziegler).

FIGURES 18–24: *Myopa testacea* Species-Group. Tips of female abdomens in side view. —**18:** *arabica* Macquart, 1850 [23.V.1998, SE Sefaköy]; —**19:** *argentata* Stuke, 2005 [Paratype, 15.IV.2003, 60km SE Volos]; —**20** *clausseni* spec. nov. [Paratype, 18.IV.1987, Chersónnissos]; —**21:** *hirsuta* spec. nov. [Paratype, 31.III.1991, Trockenaue Griessheim]; —**22:** *pellucida* (Robineau-Desvoidy, 1830) [21.IV.1991, Schönberg]; —**23:** *stigma* Meigen, 1824 [06.IV.1999, Purgstall]; —**24:** *testacea* Linnaeus, 1767 [03.V.1998, Heseler Wald].



Derivatio nominis

This species is named in honour of Claus Claußen (Flensburg), who collected most of the type series. In addition, the first author in particular wishes to express his deep gratitude to Claus, who has in the past greatly motivated him (along with numerous other dipterists) through his friendly and helpful nature, the depth of his knowledge and his exemplary means of scientific working.

Description

Head: Palp brownish-black. Black hairs on parafacialia and gena lacking, or if present then obviously shorter than postpedicel. **Thorax:** Posterior margin of mesoscutum black, with two submedial orange-brown markings (which are sometimes hard to distinguish), and with coarse silvery or golden dusting which is interrupted in the mid-line. Katepisternum orange-brown, sometimes with an indistinct blackish marking. Underside of scutellum mostly orange-brown, like the upper side. Hairs of mesoscutum comparatively short, those at the anterior margin less than half as long as those at the posterior margin. Femora and tibiae with darker brownish markings. Wing veins margined brownish or blackish. Wing length 4.8–7.2mm. **Abdomen:** Generally blood-red to dark orange. Tergite 1 orange-brown on side-margins, but with the darker basal coloration usually extending across the disc as far as the posterior margin. Remainder of tergites mainly orange-brown. Tergite 4 undusted, except at the sides on the posterior margin, being undusted medially right up to the anterior margin. In ♀♀ there is usually more extensive dusting along the posterior margin of tergite 4, although this is mainly confined to the depressed posterior marginal area which is bounded-off from the rest of the tergite by an impressed line or crease. Tergite 5 undusted medially for whole length in ♂♂, (in ♀♀ undusted as far as the depressed posterior margin). ♂♂ —Hairs in centre of tergites 4–5 not obviously longer than those on tergite 2. Hairs on tergite 6 often shorter than diameter of hind tibia, or more rarely about as long as diameter of tibia. **Genitalia:** ♂♂ —Epandrium in side view as shown in Fig. 6, somewhat expanded ventrally to form a vesicle which is felted with long microtrichia. Angle between anterior margin and underside of epandrium slightly obtuse. Epandrial plate covered with microtrichia. ♀♀ —Sternite 7 strongly tapering towards base, as shown in Fig. 13. Lateral tooth of apical syntergosternite fairly short, being about 1.5–2.0 times as long as its width at base (Fig. 20).

Diagnosis

Myopa claussenii (Fig. 25) has a combination of characteristics which places it as an intermediate between other species of the *testacea*-group. On the basis of: (1) the undusted anterior part of tergite 4; (2) the conspicuously dark-margined wing veins; and (3) the black coloration of the mesoscutum, which at least partially reaches the posterior margin, the species is reminiscent of *Myopa testacea*. *Myopa claussenii* differs from this species, however, by virtue of the submedial pale markings near to the posterior margin of the mesoscutum (although these may sometimes be hard to distinguish), the more elongated and attenuated sternite 7 of the female (Fig. 13), the medially undusted tergites 6 and 7 of the male and the less expanded ventral vesicle of the male epandrium (Fig. 6).

Distribution

Presently this species is known only from the island of Crete.

Myopa hirsuta spec. nov. (Figs. 7, 14, 21, 26)

Locus typicus: Germany: Döttlingen (52,94°N, 8,38°E).

Holotype 1♂: (1) “NW.-D: Döttlingen / [Oldb] 30.4.1978 / leg. BARKEMEYER” [copied label]; (2) “Holotypus / *Myopa hirsuta* / spec. nov. ♂ / Stuke & Clements / det. 2004”. —[The holotype is in excellent condition and is deposited at ZMHB. It was loaned to JHS for examination].

Paratypes: France: 1♂ (06.IV.1999, Elsass, 21km NNW Mullhouse, S Westhalten, Bollenberg, 47°57'N, 07°16'E, leg. Schmid-Egger, coll. Hauser); 1♂ (20.IV.1992, Hte Savoia, Bossy/Frangy, leg. Steffen, coll. Stuke); 1♀ (05.IV.1933, Hte Savoie, Etrembières, leg. J. de Beaumont, coll. Stuke); 1♂ (14.IV.1965, Versailles, Grand Parc, leg. R. de Sacy, coll. Stuke); 1♂ (31.V.1965, ditto); 1♂ (03.V.1955, Moisson (S.O), leg. J. d'Aguilar, coll. Stuke); **Germany:** 1♂ (12.IV.1992, Baden-Württemberg, Ettlingen, Oberweier, Gartenacker, 180m, leg. Doczkal, coll. Stuke); 1♀ (12.IV.1992, Baden-Württemberg, Ettlingen Oberweier, Wiese N Gefällwald, 130m, leg. Doczkal, coll. Stuke); 3♂♂, 1♀ (31.III.1991, Baden-Württemberg, Südliche Oberrheinebene, Trockenau Griesheim, leg. Schmid-Egger, coll. Hauser & Stuke); 1♂ (08.IV.1992, Baden-Württemberg, Südliche Oberrheinebene, Trockenau Griesheim, leg. et coll. Stuke); 1♀ (30.III.1993, ditto); 1♀ (01.V.1993, ditto); 1♀ (29.IV.1993, Baden-Württemberg, Südliche Oberrheinebene, Burkheim, leg. et coll. Stuke); 2♂♂ (09.IV.1989, Baden-Württemberg, 2km N Heildesheim, Mönchswald, 170m, leg. Hassler, coll. Stuke); 1♂ (03.IV.2001, Berlin, Grunewald, leg. Schmid-Egger, coll. Stuke); 1♂ (01.V.2001, Brandenburg, 10km NE Neuruppin, Lindow-Gühlen, leg. Schmid-Egger, coll. Stuke); 1♀ (27.IV.1996, Brandenburg, Altenhof SW 1,4km, on *Salix cinerea*, leg. Blank, coll. Hauser); 1♀ (09.IV.1995, Brandenburg, Friedrichsfelde E, Silbergrasrasen, leg. Blank, coll. Stuke); 1♀ (21.V.1996, Brandenburg, Niederfinow, 52°50,7'N, 013°54,4'E, leg. Flügel, coll. Stuke); 1♂ (06.IV.1994, Brandenburg, Oderberg, Uferstreifen on *Salix cf. cinerea*, 52°51,9'N, 14°01,4'E, leg. Flügel, coll. Stuke); 1♂ (28.IV.1996, Brandenburg, Steinhöfel SE, 750m, on *Salix fragilis*, leg. Blank, coll. Stuke); 1♂ (IV.1993, Hessen, Darmstadt, leg. et coll. Hauser); 1♀ (08.V.1902, Mecklenburg-Vorpommern, Greven, leg. Lange, coll. Stuke); 1♀ (19.IV.1985, Niedersachsen, Ahlhorner Teiche, leg. Barkemeyer, coll. Stuke); 1♂ (16.IV.1988, Rheinland-Pfalz, Arzheim, Ranschbachtal, collector unknown, coll. Stuke); 1♂ (IV.1987, Rheinland-Pfalz, Eisenberg/Erdekaut, leg. et coll. Hauser); 1♂, 1♀ (06.IV.2002, Sachsen-Anhalt, Riebau (Klärteiche), leg. Lange, coll. Stuke); **Great Britain:** 1♂ (15.IV.1981, Cavenham Heath, Suffolk, leg. Perry, coll. Clements); 1♀ (5.IV.1981, Cavenham Heath, Suffolk, leg. Perry, coll. Clements); **Greece:** 1♂ (24.III.1978, Crete, Vai, 104km E Heraklion, leg. Hohmann, coll. UMBB); 1♂ (30.III.1988, Crete, Paleochora, leg. Schmid-Egger, coll. Hauser); 1♂, 1♀ (29.III.2000, Cyprus, 2km NW Asprogia, Argakitis Ayias, 600m, 34°56'N, 32°37'E, leg. Bartsch & Berg, coll. Stuke); 1♀ (19.III.1918, Nicola, leg. Fehringer, coll. ZMHB); **Latvia:** 2♂♂ (Curland, Liebau, leg. Siebert, coll. Stuke & Hauser); **Morocco:** 1♂ (17.-19.IV.1989, Azrou, Ifrane area, 1400-2000m, leg. Zool. Mus. Copenhagen. exp., coll. Stuke); **Spain:** 1♀ (02.IV.1926, Vicalvara pr. Madrid, leg. Lindberg, coll. NHCM); **Switzerland:** 1♂ (1888, Sierre, coll. ETHZ ex coll. Huegenin); **Turkey:** 1♂ (03.V.1992, Province Antalya, Bey-gebirge near Aslanbutak W Kemer, 500m, leg. Ziegler & Lange, coll. Ziegler); 1♂ (23.V.1988, Province Konya, Hill 2km SE Sefaköy, (Kizilören, Dağy) WSW Konya, c. 37°48'N, 32°12'E, 1400m, leg. Ziegler & Lange, coll. Ziegler).

= *Myopa strandi* auct., nec Duda, 1940

Literature: Collin (1960, under "*Myopa strandi* Duda (1940)"); description, key. —Bańkowska (1979, under "*Myopa strandi* Duda, 1940"); description, key. —Chvála (1965, under "*Myopa strandi* Duda, 1940"); description, key.

Derivatio nominis

The name refers to the vestiture of long hairs on the body which are unusual in the *testacea*-group, and which were previously recognised as an important diagnostic characteristic by earlier authors.

Description:

Head: Palp blackish-brown or brown. Black hairs on parafacialia and/or gena always present and often quite long, in most specimens equalling or exceeding length of postpedicel. **Thorax:** Posterior margin of mesoscutum orange-brown, with fine grey dusting which often extends around the whole of the posterior margin. Katepisternum orange-brown. Underside of scutellum mostly orange-brown, like the upper side. Hairs of mesoscutum long, those at the anterior margin at least half as long as those at the posterior margin. Femora and tibiae usually with darker brownish markings. Wing veins usually weakly margined brownish, sometimes unmargined. Wing length 5.4–8.7mm. **Abdomen:** Typically blood-red, occasionally orange-brown. Tergite 1 orange-brown at side-margins, the disc with darker coloration which usually extends as far as the posterior margin. Tergite 2 reddish orange-brown, rest of tergites darker reddish-brown. Tergites 3–4 usually only dusted on sides at the posterior margin, especially in ♂♂. In ♀♀ there is usually more extensive dusting along the posterior margin, although this is mainly confined to the depressed posterior marginal area which is bounded-off from the rest of the tergite by an impressed line or crease. Tergite 5 may rarely be dusted on whole length submedially, but is more usually undusted medially on whole length. In ♀♀ there is usually dusting on the depressed posterior margin of tergite 5. Hairs on tergite 6 longer than diameter of hind tibia, occa-

sionally only about as long. In ♂♂ these hairs often as long or longer than hind metatarsus. **Genitalia:** ♂♂ — Epandrium in side view as shown in Fig. 7, only very slightly expanded ventrally to form a weak vesicle which bears long microtrichia. Angle between anterior margin and underside of epandrium is about right-angled. Posterior surstylus fairly pointed triangular, usually somewhat longer than width at base. Epandrial plate covered with microtrichia. ♀♀ — Sternite 7 as shown in Fig. 14, rather long and somewhat attenuated towards base. Lateral tooth of apical syntergosternite relatively short, about 1.5–1.75 times as long as its width at base (Fig. 21).

Diagnosis

Myopa hirsuta (Fig. 26) is primarily distinguished from the other species in the *testacea*-group by: (1) the vestiture of long hairs on the body, especially the mesoscutum, abdomen and gena, and also by the combination of: (2) the orange-brown posterior margin of the mesoscutum; (3) the lack of dusting medially for the whole length of tergites 4 and 5 (in ♀♀ at least as far as the depressed posterior margin of the tergites, which are usually completely dusted); and (4) the form of the epandrium, which is distinguished by having no large ventral vesicle which is felted with fine pile, and by the more-or-less rectangular profile made by the forward and ventral margins.

When using the present key, some individuals of *Myopa hirsuta* with unusually short hairs on the mesoscutum may be mistaken for *Myopa pellucida* due to the orange-brown coloration near the posterior margin of the mesoscutum. Males can, however, be assigned unequivocally through the form of the epandrium and posterior surstylus, whilst for females the long black hairs on the parafacialia and/or gena, the dark coloration extending to the posterior margin of tergite 1, the light greyish dusting at the posterior margin of the mesoscutum which is not interrupted in the middle, and the somewhat longer tooth of the apical syntergosternite (Fig. 21) are important recognition characteristics for *hirsuta*. It may not always be possible to assign all females unambiguously, however.

Myopa hirsuta (as *Myopa strandi* auct.) has often previously been compared with *Myopa vicaria* Walker, 1849 due to presence of the long body hairs. However, *Myopa hirsuta* is readily distinguished from *Myopa vicaria* through a combination of: (1) the darker abdominal coloration (abdomen yellowish-orange in *Myopa vicaria*); (2) the presence of rows of black setose hairs ventrally at the bases of tibiae 1–2; (3) the pale, orange-brown sides of tergite 1; (4) the less uniform length of hairs on the mesoscutum; (5) the less dusted tergite 5; and (6) the more even and uniform darkening of vein M2 along its whole length between veins dm-cu and the wing margin.

Taxonomy

The species we identify here as *Myopa hirsuta* is the one which previously has been identified by other authors as *Myopa strandi* Duda, 1940. The following 14 syntypes of *Myopa strandi* are held in ZMHB: 1♀ (21.IV.1900, Nimptsch, leg. Duda, with Duda's handwritten identification label and type label); 1♂, 1♀ (17.IV.1911, ditto); 2♂♂, 1♀ (18.IV.1911, ditto); 1♀ (27.III.1912, ditto); 1♀ (18.IV.1912, ditto); 3♂♂, 1♀ (20.IV.1912, ditto); 1♀ (11.IV.1921, ditto); 1♀ (20.IV.1924, Wustung b. Habelschwerdt). All of the available material was examined by JHS in 2003, and all were determined as being conspecific with *Myopa vicaria* Walker, 1849. The name *Myopa strandi* Duda, 1940 must therefore be placed as a junior synonym of *Myopa vicaria* Walker, 1849 [**syn. nov.**]

The holotype of *Myopa vicaria* Walker, 1849 was also examined by JHS in October 2003. This comprises 1♂: (1) “**R**” [blue shield]; (2) “Holo- / type” [round label, red bordered]; “Identified as the type / by E. A. Waterhouse”; (3) “HOLOTYPE of / *Myopa vicaria* / Walker, 1849 / CANADA: Nova Scotia / ex Lt. Redman coll.” The holotype, which is in good condition, is deposited at BMNH and conforms well with the concept of this species as currently understood by authors.



FIGURES 25–26: Holotypes of new *Myopa* species in side view. —25: *clausseni* spec. nov.; —26: *hirsuta* spec. nov.

Distribution

On the basis of the findings presented here, and the records for “*Myopa strandi*” given by Bańkowska (1979), Chvála (1965), Stuke & Petersen (2001), Tomasovic (2000), van Veen (2002), van der Weele (1998)

and Zimina (1974, 1999b), this species is evidently widespread in the Palaearctic. There are presently records from throughout Europe (Belgium, Chechnya, Denmark, Germany, Great Britain, France, Hungary, Italy, the Netherlands, Poland, Slovenia and Switzerland), the eastern Mediterranean area (Crete, Cyprus), Turkey, North Africa (Morocco, Tunisia) and the Far East (Mongolia). Chvála & Smith (1988) cite a record without source from Finland, and locations in the former U.S.S.R.

Myopa pellucida (Robineau-Desvoidy, 1830) (Figs. 8, 15, 22)

Myopa pellucida Robineau-Desvoidy 1830: 244.

Locus typicus: “Paris”.

Lectotype: 1 ♂: (1) “M. / pellucida / coll. Big.” [round white label]; (2) “Phorosia / pellucida R. D.” [pale blue label]; (3) “Lectotypus / *Myopa pellucida* / Robineau-Desvoidy, 1830 / des. Stuke & Clements, 2004” [red label]. — [Other than lacking the left middle leg, the lectotype is in good condition. It is deposited in the Hope collection at UMO and was examined by DKC and JHS in 2003].

Literature: Bańkowska (1979, under “*Myopa extricata* Collin, 1959”): description, key. — Chvála (1965, under “*Myopa extricata* Collin”): description, key. — Stuke & Clements (2005): Lectotype designation, status review. = *Myopa fulvipalpis* (Robineau-Desvoidy, 1853)

Pictina fulvipalpis Robineau-Desvoidy 1853: 96

Locus typicus: “environs de Paris”.

Lectotype: (1) 1 ♀: “M. / fulvipalpis / coll. Big.” [round white label]; (2) “Pictina / fulvipalpis R. D.” [pale blue label]; (3) “Lectotypus / *Myopa fulvipalpis* / Robineau-Desvoidy, 1853 / des. Stuke & Clements, 2004” [red label]. — [the right middle leg is missing, otherwise the specimen is in good condition. It is deposited in the Hope collection of the Museum of UMO and was examined by DKC and JHS in 2003].

Literature: Stuke & Clements (2005): Lectotype designation, synonymy with “*Myopa pellucida* Robineau-Desvoidy, 1830”.

= *Myopa extricata* Collin, 1960

Myopa extricata Collin 1960: 151

Locus typicus: England: Southend, Essex; Darenth, Kent; Chiddingly, Sussex; Isle of Wight; Edington, Somerset; Padstow, Cornwall; Ely, Cambridgeshire; Grantchester, Cambridgeshire; Woodditton Wood, Cambridgeshire.

Syntypes: 1 ♀: “Cornwall, Padstow, IV.1903, Lamb”; 1 ♂, 1 ♀: “Cornwall, Padstow, IV.1906”; 3 ♂♂: “Somerset, Edington, 6.V.1947, Cowley”; 1 ♂: “Isle of Wight, Kingston, 15.IV.1945, Saunt”; 1 ♀: “E Cowes, 8.IV.1945, Saunt”; 1 ♂: “E Cowes, 1.V.1947”; 1 ♂: “Sussex, Chiddingly, 2.V.1874, Verrall”; 1 ♂: “Kent, near Darenth, 2.V.1869, Verrall”; 1 ♀: “Darenth, 13.V.1868”; 1 ♀: “Essex, Southend?, 1870, F. Smith”; 1 ♂: “Cambs, Woodditton Wood, 8.V.1949, Collin”; 1 ♂: “Cambs, Woodditton Wood, 11.V.1949, Collin”; 1 ♂: no data — “Old collection, Cambridge Museum”: all held in the Hope Department at UMO. Pont (1995) also reports several specimens from “Edington” in the Cowley collection at BMNH, but these are labelled “*?polystigma*” by Collin, and were not collected in May as indicated in the description. There are also evidently scattered specimens from Padstow, Ely and Grantchester standing under “*testacea* Linn.?” and other names at UMC, some of which may also be syntypes. The material held at UMO was examined by DKC in 2003.

Literature: Stuke & Clements (2005): Synonymy with “*Myopa pellucida* Robineau-Desvoidy, 1830”.

Other material: **Austria:** 1 ♂ (08.VI.1918, Kaltenleutgeben, leg. Curti, coll. Hauser); 1 ♂, 1 ♀ (03.-15.VI.1973, Kärnten, Fresach, 600m, leg. Wolschrijn, coll. Stuke); 1 ♀ (17.-26.V.1972, Leithagebirge, Donnerskirchen, leg. Wolschrijn, coll. Stuke); 1 ♂ (03.V.1995, Purgstall, leg. Ressler, coll. Stuke); **Belgium:** 1 ♀ (08.V.1954, Bassenge, coll. ZMAN); **Bulgaria:** 1 ♀ (10.VII.-07.VIII.1998, Sofia, Univ. Experimental Farm, 600m, leg. Atanassova, coll. ZMAN); **Chechnya:** 2 ♀♀ (01.IV.-01.V.2000, Březno nr. Chomutov nr. Hutná brook, 285m, 50°24'24"N, 013°23'21"E, leg. Barták, coll. Stuke); 1 ♂ (19.V.-16.VI.2002, Březno nr. Chomutov nr. Hutná brook, 50°24'19"N, 013°23'34"E, leg. Barták, coll. Stuke); 1 ♂, 2 ♀♀ (27.-29.IV.2002, Březno nr. Chomutov, Březenská rokla, 50°24'56"N, 013°24'59"E, leg. Bartáková, coll. Stuke); 1 ♀ (Pouzďfany, leg. Zeman, coll. Barták); **China:** 1 ♂ (08.IV.1931, Tsinan, Shantung, leg. Jacot, coll. USNM); 1 ♂ (13.IV.1932, ditto) [These two specimens are listed under “*Myopa testacea*” by Camras (1960)]; **Cyprus:** 1 ♂ (Trimiktini, 26.III.1956, leg. Mauromoustakis, coll. Camras); **France:** 1 ♂ (17.V.1992, Elsass, Kastental Neuf Brisacht, leg. et coll. Stuke); 1 ♂ (06.VII.1995, Pyrénées-Orientales, Nohédès “La Farge”, 1000m, leg. Cocquempot, coll. Stuke); 1 ♀ (14.VI.1992, Col du Joncin, Forêt de la Cantinière, Rhône-Alpes, leg. Withers, coll. Clements); **Germany:** 1 ♂ (22.IV.1993, Baden-Württemberg, Freiburg, Mooswald Lehen, leg. et coll. Stuke); 1 ♀ (21.IV.1991, Baden-Württemberg, Freiburg, Schönberg, leg. et coll. Stuke); 1 ♂ (14.V.1993, ditto); 1 ♀ (14.V.1961, Baden-Württemberg, Freiburg, Zarten, leg. Gauss, coll. Stuke); 1 ♂ (30.V.1991, Baden-Württemberg, Kaiserstuhl, Badberg, leg. et coll. Stuke); 1 ♀ (16.IV.1993, Baden-Württemberg, Kaiserstuhl, Liliental, leg. et coll. Stuke); 1 ♂

(13.IV.1990, Baden-Württemberg, Kaiserstuhl, Mühlental, leg. et coll. Stuke); 1♂ (07.V.1993, Baden-Württemberg, Kaiserstuhl, Schehlingen, leg. et coll. Stuke); 1♀ (20.V.1993, Baden-Württemberg, Südliche Oberrheinebene, Burkheim, leg. et coll. Stuke); 3♂♂ (14.V.1992, Bayern, Aschaffenburg, Standortübungsplatz SW Gaibach, leg. Doczkal, coll. Doczkal & Stuke); 1♂ (Berlin, leg. Erichson, coll. ZMHB); 1♂ (30.V., Berlin, Buckow, leg. Oldenberg, coll. Hauser); 1♂ (24.IV.1995, Brandenburg, Oderhänge near Mallnow, NSG "Adonishänge", leg. Blank, coll. Hauser); 1♂, 1♀ (01.VI.1999, Brandenburg, Potsdam-Mittelmark, Dahnsdorf, Versuchsfelder BBA, leg. Saure, coll. Stuke); 1♂ (30.IV.1920, Brandenburg, Priegnitz, Triglitz, leg. Jaap, coll. ZMHB); 1♂ (12.V.1998, Hessen, Heppenheim, U.-Hambach, leg. Tischendorf, coll. Hauser); Material listed by Stuke (2003b) from Lower Saxony and Bremen (Germany) was also examined, but is not listed again here; **Great Britain**: 1♀ (10.V.1992, Bearse Common, Gloucestershire, leg. Carter, coll. Clements); 1♀ (16.IV.1990, Quenington, Gloucestershire, leg. et coll. Clements); 2♀♀ (22.IV.1990, Quenington, Gloucestershire, leg. et coll. Clements); 1♀ (27.IV.1993, Tewkesbury, Gloucestershire, leg. et coll. Clements); 1♂ (6.V.1991, Nottingham Hill, Gloucestershire, leg. Iliff, coll. Clements); 1♂ (IV.1990, Sutton Poyntz, Dorset, leg. Parker, coll. Clements); 1♂ (6.V.1986, Prawle Point, Devon, leg. Coldwell, coll. Clements); 1♂ (15.V.1963, Bredwardine, Herefordshire, leg. J. M. N., coll. Clements); 1♂ (13.V.1978, Near Steephill Cove, Ventnor, Isle of Wight, leg. Else, coll. Clements); **Greece**: 1♀ (24.–28.V.1994, Ipiros, Peristéri Mts., 1200–1700m, leg. Andersen, coll. Stuke); 1♂ (14.V.1994, Peloponese, Kallithea NW Megalopoli, 1000m, leg. Ohl, coll. Stuke); 1♂ (23.IV.2000, Platania, Volos, leg. Standfuss, coll. Stuke); 1♀ (06.IV.2001, ditto); 1♀ (08.IV.2001, ditto); 1♂ (14.IV.2001); 1♂ (18.IV.2001, ditto); 1♀ (25.IV.2002, ditto); 1♂ (11.V.2002, ditto); **Hungary**: 1♀ (22.V.1991, Hóduna-gátornáz, coll. Hauser); **Iraq**: 1♀ (III.1986, Beiji, leg. Carl, coll. Stuke); **Italy**: 1♂ (28.IV.1966, Anfo, Brescia, 370m, leg. Haeselbarth, coll. Stuke); 1♀ (08.IV.1981, Sicily, 5km S Giardini, S. Marco, leg. Barkemeyer, coll. Stuke); 1♂ (04.IV.1981, Sicily, Cala, Zabiano, 100–200m, leg. Barkemeyer, coll. Stuke); 1♀ (31.V.1993, Varena, leg. Merlin, coll. Stuke); 1♂ (31.V.1993, Vinschgau, Planeital, 1600–2000m, leg. et coll. Stuke); 1♂, 1♀ (01.VI.1993, Vinschgau, Tartscher Wald, 1500–1900m, leg. et coll. Stuke); **Kyrgyzstan**: 1♂ (VII.1998, Alai Mts., Sufi, Korghon, 2300m, leg. Gurko, coll. Stuke); **Macedonia**: 1♀ (20.V.1983, 4km NE Ohrid, leg. Thomas, coll. Stuke); **Morocco**: 1♀ (22.IV.1989, Chechaouèn, 600m, leg. Zool. Mus. Copenhagen Exp., coll. Stuke); 1♂ (30.IV.1982, Hoher Atlas, Oureka, leg. Lucas, coll. Stuke); **Norway**: 1♀ (17.VI.1982, Hol, Ullensvang Lofthuis, leg. Hesjedval coll. UMB); 1♀ (10.V.1975, Hoy, Bergen, leg. Fjellberg, coll. UMB); **Poland**: 1♂ (17.IV., _i_ elice, coll. Stuke); **Portugal**: 1♂ (23.III.1995, Algarve, 2km W Carrapateira, leg. Simon-Thomas, coll. Stuke); **Russia**: 1♂ (24.–27.V.1993, Khabarovskiy, Krey Boitsovo, 20km N Bikin, 47°02'N, 134°21'E, 250m, leg. Lange & Ziegler, coll. Hauser); **Russia, Belarus**: 1♀ (12.V.-07.VI.1914; Falzfeinowo a. Dnjepr, leg. Ramme, coll. ZMHB); **Spain**: 1♂ (Barcelona, coll. Hauser); 2♂♂, 1♀ (13.–17.VI.1982, Gerona, Caralps, 1200–1300m, leg. Andersen *et al.*, coll. Stuke); 1♂ (22.IV.1982, Ferrandet nr Calpe, leg. Systemans, coll. Stuke); 1♂ (18.IV.1990, Prov. Almería, Mojacar, leg. Gijswijt, coll. Stuke); **Switzerland**: 1♀ (28.V.1996, Tessin, Mt. S. Giorgio, leg. v. Oosterstroom, coll. Amsterdam); **Tunisia**: 1♀ (10.III.1994, 10km ESE Maktar, 900m, leg. Oorschot & Rubbrecht, coll. Stuke); 1♂ (07.–13.V.1988, 21km E Tabarka, leg. Zool. Mus. Copenhagen Exp., coll. Stuke); 1♀ (10.III.1994, 4km E Msaken, 100m, leg. v. Oorschot & Rubbrecht, coll. ZMAN); 1♀ (05.–18.V.1988, Ain Draham area, leg. Zool. Mus. Copenhagen Exp., coll. Stuke); 1♀ (24.III.2001, Bou Chebka, 35°11'N, 08°26'E, leg. Schmid-Egger, coll. Stuke); **Turkey**: 1♂, 1♀ (15.VI.1988, Atatürk Ü., Erzurum, leg. et coll. Hayat); 1♂ (11.VI.1990, ditto); 1♀ (20.VI.1990, ditto); 1♂ (16.VI.1991, ditto); 1♂ (28.V.1994, ditto); 1♂, 2♀♀ (10.VI.1997, ditto); 1♂ (04.VI.1992, Demirözü, Bayburt, leg. Bostan, coll. Hayat); 1♂ (20.VII.1988, Horasan, leg. et coll. Hayat); 1♂ (10.–12.V.1993, Izmir, Bergama, Kozak rd., 700m, leg. Michelsen, coll. Stuke); 1♂ (26.–30.V.1979, Konya, Sultan Daglari, Engilli, 1150m, leg. van Oorschot & Wiering, coll. Stuke); 1♀ (27.VI.1996, Kargapazari, Erzurum, leg. et coll. Hayat); 1♂, 1♀ (20.VI.1996, Köşkköyü-Dumhi, Erzurum, leg. et coll. Hayat); 1♂ (07.V.1996, Kronsias-Berge, leg. Gross, coll. Stuke); 1♀ (15.VI.1996, K. Geçit Aşkale, Erzurum, leg. et coll. Hayat); 2♂♂ (31.V.20000, Mugla, ca. 12km NE Agla, Lake Kartal Gölü NE Çiçekbaba, 1900m, leg. Smit, coll. Stuke); 1♂ (23.V.1994, Ormanli, Şenkaya, Erzurum, leg. et coll. Hayat); 1♀ (29.VI.1996, Palandöken, Erzurum, 2200m, leg. et coll. Hayat); 1♂ (15.VII.1989, Palandöken, Erzurum, leg. et coll. Hayat); 1♂ (10.VII.1990, Pasinler, Erzurum, leg. Hayat, coll. Stuke); 1♀ (03.VI.1998, Province Antalya, Sekli N Saklikent WSW Antalya, 36°52'32"N, 030°21'01"E, 1550m, leg. Ziegler & Lange, coll. Ziegler); 1♀ (23.V.1998, Province Konya, Hill 2km SE Sefaköy, WSW Konya, 1400m, 37°48'N, 32°12'E, leg. Lange & Ziegler, coll. Ziegler); 1♂ (01.V.1994, S. Karaağac, Isparta, leg. et coll. Hayat); 1♀ (08.VI.1996, Tortum, Erzurum, leg. Yildirim, coll. Hayat); **Turkmenistan**: 1♂ (28.III.–04.IV.1992, Sandykathy, leg. Halada, coll. Hauser).

Description

Head: Palp pale, orange or orange-brown. Black hairs usually present on parafacialia and/or gena (although these may be lacking), obviously shorter than postpedicel. **Thorax:** Posterior margin of mesoscutum usually orange-brown, at least medially, with coarse silvery or golden dusting which is interrupted in the mid-line. Very rarely the mesoscutum may be blackish at the posterior margin. Katepisternum normally pale,

orange-brown. Underside of scutellum mainly orange-brown like upper side, but may be darker laterally. Hairs of mesoscutum relatively short, those at the anterior margin less than half as long as those at the posterior margin. Femora and tibiae often lacking darker brownish markings, but not always. Wing veins usually obviously margined brownish or blackish, often quite densely so, although may be unmargined. Wing length 5.0–9.0mm. **Abdomen:** Generally dark orange or orange-brown. Tergite 1 brownish-orange at least at the side-margins, the disc usually darkened in the anterior part but paler orange-brown towards the posterior margin, at least submedially: there is often quite a distinct contrast in colour. Remainder of tergites orange-brown. Tergite 4 normally undusted at least in anterior half, but may be quite extensively dusted in posterior half; Tergite 5 usually dusted on whole length, at least submedially. ♂♂ —Hairs in centre of tergites 4–5 not obviously longer than those on tergite 2. Hairs on tergite 6 usually shorter than diameter of hind tibia, and only rarely approximately as long as diameter of tibia. **Genitalia:** ♂♂ —Epandrium in side view as shown in Fig. 8, never expanded ventrally to form a vesicle. Angle between anterior margin and underside of epandrium is strongly obtuse. Epandrial plate covered with microtrichia. Posterior surstylus characteristically broad and bluntly rounded, usually with a small group of setose bristles ventrally at base. ♀♀ —Sternite 7 as shown in Fig. 15, quadrate or not much longer than wide. Lateral tooth of apical sytergosternite quite short, about 1.5 times as long as its width at base (Fig. 22).

Diagnosis

Myopa pellucida can be distinguished by: (1) the orange-brown posterior margin of the mesoscutum; (2) tergite 1 mostly paler orange-brown towards the posterior margin (may occasionally be entirely pale); (3) pale, usually orange palps; (4) anterior margin of tergite 4 undusted; (5) the ventral epandrium of the male lacking vesicle in side view, and with the anterior and ventral faces in profile forming a strongly obtuse angle (see Fig. 8); and (7) the broad, bluntly-rounded posterior surstylus. In *Myopa hirsuta* the mesoscutum is also orange-brown at the posterior margin, and the separation of these two species, which may be problematic, is discussed under the diagnosis of *Myopa hirsuta* above. It is also possible that specimens of *Myopa claussenii* may be found with the submedial orange-brown markings of the posterior mesoscutum extended so that the posterior margin is completely orange-brown. These specimens may be readily segregated through the male genitalia (Fig. 6) and by the form of sternite 7 in the female (Fig. 20).

Myopa pellucida is usually a medium-sized species, varying in length between about 8 to 10mm or more. However, small specimens of about 5-6mm in length may occasionally be encountered, as may larger specimens of 11mm or more in length.

Taxonomy

Collin (1960) chose to ignore the works of Robineau-Desvoidy (1830; 1853) which contained descriptions of several new *Myopa* species, citing a quotation from Schiner (1862: 382) to the effect that ‘all who study the works of Robineau-Desvoidy cannot be other than astonished at the vast army of synonyms’, and bemoaning the time wasted in fruitlessly attempting to disentangle the chaos of his types. As a result, Collin failed to notice the synonymy of the species he described as *Myopa extricata* with Robineau-Desvoidy’s *Myopa pellucida*, which is surprising when one considers that specimens identified as *pellucida* by Robineau-Desvoidy lay in Collin’s own collection at the time.

The single specimen standing under *Myopa testacea* in the collection of Linnaeus at BMNH was examined by Thompson (1997), and also by DKC in 1995, and seemingly corresponds to the concept of *Myopa pellucida* as used in the present work. An application to have this ‘type’ specimen set aside and to preserve the current concept of *Myopa testacea* is about to be presented before the I.C.Z.N. (Clements *et al.* in prep.) – this situation is discussed further below under *Myopa testacea*.

The degree of hairiness and the extent of dusting on the abdomen, the form of posterior surstylus, and the quantity and extent of the wing markings are all subject to quite striking variation in specimens currently iden-

tified as *Myopa pellucida*, therefore raising the possibility that there may be more than one species combined under the present species-concept.

Distribution

On the basis of the findings presented here, and the records given by Bańkowska (1979), Chvála (1965, 1968), Chvála & Weinberg (1969), Kehlmaier (2001), Smith (1961), Stuke & Petersen (2001), Tomasovic (2000), van Veen (2002) and Zimina (1999b), *Myopa pellucida* is evidently widespread in the Palaearctic region, with records from throughout western Europe (Austria, Cyprus, Belgium, Bulgaria, Chechnya, Denmark, Eire, France, Germany, Great Britain, Greece, Hungary, Macedonia, Mallorca, Menorca, the Netherlands, Norway, Poland, Portugal, Rumania, Slovakia, Spain, and Switzerland), North Africa (Morocco, Tunisia), the Near and Middle East (Afghanistan, Iraq, Kirgistan, Turkey and Turkmenistan) and from the Far East (Bikin [Eastern Russia] and China).

Myopa stigma Meigen, 1824 (Figs. 3, 9, 16, 23)

Myopa stigma Meigen 1824: 148

Locus typicus: "Oesterreich"

Type: Not seen.

Literature: Bańkowska (1979): description, key; —Chvála (1965): description, key; —Kröber (1916, 1925, 1930): description; Morge (1976): Gives Meigen's original figures; —Schiner (1862): description.

= *Myopa nigrodorsata* (Robineau-Desvoidy, 1853)

Myopella nigrodorsata Robineau-Desvoidy 1853: 106

Locus typicus: "environs de Paris".

Type material: Lost.

Literature: Schiner (1862): Synonymy with "*Myopa stigma*".

= *Myopa flavipennis* (Robineau-Desvoidy, 1853)

Myopella flavipennis Robineau-Desvoidy 1853: 107

Locus typicus: "environs de Paris".

Type material: Lost.

Literature: Schiner (1862): Synonymy with "*Myopa stigma*".

= *Myopa scutellaris* (Robineau-Desvoidy, 1853)

Myopella scutellaris Robineau-Desvoidy 1853: 108

Locus typicus: "environs de Paris".

Type material: Lost.

Literature: Schiner (1862): Synonymy with "*Myopa stigma*".

Other material: **Austria:** 1 ♀ (19.IV.1996, Purgstall, leg. Ressler, coll. Stuke); 1 ♂, 1 ♀ (03.IV.1999, ditto); 1 ♂ (04.IV.1999, ditto); 1 ♂, 2 ♀♀ (06.IV.1999, ditto), 1 ♀ (19.IV.1999, ditto), 1 ♀ (12.IV.2000, ditto); **Cyprus:** 1 ♂ (10.IV.2003, reed beds and costal area NW of Akrotiri, 34°37,493'N, 032°55,585'E, leg. et coll. Stuke); **France:** 1 ♂ (30.III.1979, Béziers, Bessan, leg. Barkemeyer, coll. Claußen); 1 ♂ (19.-23.IV.1987, Crest-Drome, leg. de Rand, coll. ZMAN); 1 ♀ (1.V.1996, Saone et Loire, Solutré, leg. Withers, coll. Clements); **Germany:** 1 ♂ (17.V.1975, Baden-Württemberg, Südliche Oberrheinebene, Olgaberg, Hohentviel, leg. Gauss, coll. Stuke); **Greece:** 1 ♀ (17.IV.1989, Peloponnese, Provinz Argolida, Mikines, leg. M. J. Gijswijt, coll. ZMAN); 1 ♂ (13.IV.1989, Peloponnese, Provinz Argolida, Arahneo, leg. M. J. Gijswijt, coll. ZMAN); 2 ♂♂ (23.IV.2004; Skamnelli-Ioannina, N39°54'15", E20°50'30", leg. Renema, coll. Stuke); 1 ♀ (01.V.2000, Thraki, Rhodopi, Mitrikou Esmarida Lake, leg. W. van Steenis & Bakker, coll. W. van Steenis); **Hungary:** 1 ♂ (03.V.1993, Balaton, Tihany, Balatonfüred, leg. et coll. Hauser); 1 ♀ (22.IV.1991, Gyula, Kisökörfjárs, leg. et coll. Hauser); 1 ♂ (Hild, leg. Thalhammer, coll. Stuke); 1 ♂ (Ujpest, leg. Meusel, coll. ZMHB); **Italy:** 1 ♂ (21.IV.2000, Lazio Roma, Tenula della Cervelletta, leg. Mei, coll. Stuke); **Kazakhstan:** 1 ♂ (09.-10.VI.2001, NE Rudnichyi Koku Valley, 1300-1400m, 44°41'N, 78°58'E, leg. Hauser, coll. Stuke); **Switzerland:** 1 ♀ (20.V.1991, Wallis, Sion, leg. et coll. Hauser); 1 ♂, 1 ♀ (16.V.1996, Leuk Brentjong, leg. Merz & Bächli, coll. Coll. ETHZ); 1 ♀ (12.V.1986, Sierre, coll. ETHZ ex coll. Huguenin); **Turkey:** 1 ♂ (28.V.1994, Atstürk, leg. et coll. Hayat); 2 ♂♂, 1 ♀ (31.V.2000, Mugla, ca. 12km NE Ağla, Lake Kartal, Gölü NE Cikekbaba Tepe, 1900m, leg. J. T. Smit, coll. Stuke); 1 ♂ (21.IV.2001, Prov. Antalya, Mountains S Cevizli, N Akseki (Toros Daglari), 37°08'40"N, 031°47'44"E, 1200m, leg. Lange & Ziegler, coll. Ziegler); 1 ♂ (23.V.1998, Province Konya, Hill 2km SE Sefaköy, (Kizilören Dağı) WSW Konya, ca. 37°48'N, 032°12'E, 1400m, leg. Lange & Ziegler, coll. Ziegler); 1 ♀ (23.IV.2004; Skamnelli-Ioannina, N39°54'15", E20°50'30", leg. Renema, coll. Stuke).

Description

Head: Palp blackish-brown to brownish-orange. Black hairs on parafacialia and/or gena usually lacking, or if present then obviously shorter than postpedicel. **Thorax:** Posterior margin of mesoscutum black, with coarse silvery or golden dusting which is interrupted in the mid-line. Katepisternum at least partially dark brown or blackish. Underside of scutellum usually completely darkened. Upper surface usually also dark, at least at sides. Hairs on mesoscutum relatively short, those at the anterior margin less than half as long as those at the posterior margin. Femora and tibiae with darker brownish markings. Other than a blackish marking around crossvein r-m, wings usually without dark markings, normally hyaline or rarely uniformly weak brownish. Wing length 3.8–6.0mm. **Abdomen:** Coloration and pattern variable but generally dark, brownish-orange to blackish. Tergite 1 may be pale or dark at side-margins, and is usually dark across the disc as far as the posterior margin. Tergites 2–3 usually dark at anterior margin and in mid-line of disc, with a narrow paler band posteriorly, or at least at sides. Often the side-margins are also paler, at least indistinctly, but tergites may be uniformly dark. Remainder of tergites usually all dark, at least medially. Tergite 4 usually dusted on whole length, at least submedially, and always with a wide dusted band towards the posterior margin which normally occupies at least half the width of the tergite (sometimes somewhat less in ♀♀). Tergite 5 usually completely dusted at least centrally. ♂♂—Hairs in centre of tergites 4–5 not obviously longer than those on tergite 2. Hairs on tergite 6 usually shorter than diameter of hind tibia, and only rarely about as long as diameter of tibia. **Genitalia:** ♂♂—Epandrium in side view as shown in Fig. 9, strongly expanded ventrally to form a vesicle which is felted with microscopic pile. Angle between anterior margin and underside of epandrium is about right-angled. Epandrial plate covered with microtrichia. ♀♀—Sternite 7 as shown in Fig. 16, somewhat tapering towards base. Lateral tooth of apical syntergosternite long, usually 3–4 times as long as its width at base (Fig. 23).

Diagnosis

Myopa stigma is generally a small (4–6mm long), dark species which resembles *Myopa arabica* through: (1) the extensive dusting on tergites 4 and 5; (2) the hyaline or weakly clouded wings; and (3) the black marking on the disc of the mesoscutum which continues right up to the posterior margin. *Myopa stigma* differs from this species, however, through the dark brown or blackish coloration that often stretches over the entire abdomen, or is at least clearly indicated in the mid-line of tergites 1 and 2. Problems may also arise in distinguishing lighter forms of *Myopa stigma* from *Myopa testacea*, especially where the differences in dusting alluded to in the key are not visible and where the latter occurs as a small specimen. The genitalia of both male and female *Myopa stigma* are very similar to those of *Myopa testacea*, although the epandrium in the male is usually somewhat wider in *testacea*. The differentiation of females can be very difficult, however. A characteristic which still requires testing in a larger series of specimens, and which is not always clearly evident, lies in the dusting of the mesoscutum: in most specimens of *Myopa stigma*, two wide medial dusted strips can be seen which are delimited at their outer edges by a narrow shining area. So far, this characteristic has not been seen in any other species of the *testacea*-group.

Taxonomy

The type material of this species was not available for the present study. However, the original drawing of Meigen (Fig. 3) shows all the characteristics necessary for identification, and the assignment of the species is therefore considered to be unequivocal. Kröber (1930) considered *Myopa stigma* to be conspecific with *Myopa testacea* but we do not agree with this assessment, since there appear to be reliable differences between the two which can be very striking when well expressed, and no obvious intermediates have been seen by us to date. In the U.K. small specimens of *Myopa testacea* are frequent, but none seen by the authors have ever shown the distinctive dark coloration which is so characteristic of *Myopa stigma*. Chvála & Smith (1988) recognised *Myopa stigma* as an independent species.

The type material of the species *nigrodorsata*, *flavipennis* and *scutellaris* described by Robineau-Desvoidy (1953) is missing, and the published descriptions do not allow any certain interpretation of these species. We therefore follow Schiner's (1862) synonymy of these species with *stigma*, a course which was also accepted by subsequent authors, including Kröber (1917) and Chvála & Smith (1988).

Distribution

The extent to which this species has previously been confused with *arabica* and *testacea* is debatable, rendering past literature records unreliable. On the basis of the present study however, *Myopa stigma* occurs throughout the southern and central parts of Europe including Austria, Cyprus, France, Germany, Greece, Hungary, Italy and Switzerland, as well as the near and Middle East (Turkey, Kazakhstan). Chvála & Smith (1988) state that the distribution also extends to eastern Siberia.

Myopa testacea (Linnaeus, 1767) (Figs. 1, 10, 17, 24)

Conops testacea Linnaeus 1767: 1006.

Locus typicus: "Europa australis, Ascanius" (the last element may refer to the collector or collection – see Clements *et al.* in prep.).

Type material: A single specimen stands under this name in the Linnaean collection held at BMNH (Box 23): 1♀, labelled (1) "testacea ex deper" and "ferruginea", label verso "4". [Specimen examined by DKC in September 1995].

Literature: Bańkowska (1979): Description, key; Chvála (1965): Description, key; Collin (1960): Diagnosis, key; Thompson (1997): Lectotype designation, taxonomic discussion; Clements *et al.* (in prep.) Application to conserve the name "testacea".

= *Myopa longirostris* Robineau-Desvoidy, 1830

Myopa longirostris Robineau-Desvoidy 1830: 243

Locus typicus: Not given (Carcel collection).

Type material: Lost.

Literature: Becker (1922): Synonymy with "testacea L."

= *Myopa pictipennis* Robineau-Desvoidy, 1830

Myopa pictipennis Robineau-Desvoidy 1830: 243-244

Locus typicus: Not given (Carcel collection).

Type material: Lost.

Literature: Kröber (1916): Synonymy with "testacea L."

= *Myopa umbripennis* Robineau-Desvoidy, 1830

Myopa umbripennis Robineau-Desvoidy 1830: 243

Locus typicus: Not given (Dejean collection).

Type material: Lost.

Literature: Kröber (1916): Synonymy with "testacea L."

= *Myopa japonica* Kröber, 1916

Myopa testacea var. *japonica* Kröber 1916: 89

Locus typicus: "Japan".

Lectotypus 1♀: (1) "Roretz / 1876 / Japan"; (2) "Typus" [red label]; (3) "Myopa stigma [sic!] / var. japonica Krb. / O. Kröber det. 1914"; (4) "Lectotypus / *Myopa testacea* / var. *japonica* Kröber, 1916 / des. Stuke 2002" [red label]. [The lectotype is in good condition, and is deposited at NHMW, where it was examined by JHS in 2002].

Paralectotype: A syntype, which according to the original description is most probably a ♀, is also held at NHMW (Contreras-Lichtenberg in litt. 2002), but was not examined for the present study.

Literature: Stuke (2003a): Lectotype designation, photograph of the lectotype, taxonomic discussion.

Other material: **Austria:** 1♀ (17.-26.V.1972, Leitha Gebirge, Donnerskirchen, leg. Wolschrijn, coll. ZMAN); **Bulgaria:** 1♂ (11.-31.V.1998, Pastra near Rila, ca. 850m, leg. Achterberg et al., coll. Amsterdam); **Finland:** 1♂ (03.VII.2004, Inari, Kaunipää, leg. et coll. Kahanpää); 1♀ (15.VII.2004, Ivalo Ort, 68°39,42'N, 027°32,48'E, leg. et coll. Stuke); 1♀ (02.VII.2004, Sodankylä, Luono, leg. et coll. Kahanpää); 1♀ (04.VI.2003, Espoo, Isotakkula, Pellonpiennar, leg. Väänänen, coll. Kahanpää); **France:** 1♂ (30.III.1979, Béziers, Bessan, leg. Barkemeyer, coll. Claußen); 2♂♂ (17.V.1992, Elsass, Mittelwald Dessenheim, leg. et coll. Stuke); 1♂ (25.IV.1991, Hte-Savoie, Bossy, Frangy, leg. Steffen, coll. Stuke); **Great Britain:** 1♂ (06.V.1991, Nottingham Hill, Gloucestershire, leg. Iliff, coll. Clements); 1♂

(10.V.1992, Bearse Farm, Gloucestershire, leg. Alexander, coll. Clements); 1♂ (08.V.1994, Delcombe Wood, Dorset, leg. Parker, coll. Clements); 1♂ (17.IV.1989, Maplehurst, Sussex, leg. Edwards, coll. Clements); 1♀ (17.V.1992, Thorney Island, Sussex, leg. Edwards, coll. Clements); 1♂, 1♀ (20.V.1978, Forset of Bere, Near Wickham, Botley Wood, Hampshire, pair in cop., leg. Else, coll. Clements); 1♂ (13.V.1960, Goring on Thames, Oxfordshire, leg. Arnold, coll. Clements); 1♀ (24.IV.1965, Goring on Thames, Oxfordshire, leg. Arnold, coll. Clements); 1♂ (6.V.1992, Crook Peak, Somerset, leg. Oates, coll. Clements); 1♂ (Wayland Wood, Norfolk, leg. Withers, coll. Clements); 1♀ (30.IV.1997, Cwm Ogwr Fach, Glamorgan, Wales, leg. et coll. Clements); **Germany**: 1♀ (10.VI.1992, Baden-Württemberg, Hochschwarzwald, Feldberggebiet, Toter Mann, leg. et coll. Stuke); 1♀ (24.V.1992, Baden-Württemberg, Hochschwarzwald, Zastler Tal, leg. et coll. Stuke); 1♀ (20.IV.1990, Baden-Württemberg, Freiburg, Schönberg, leg. et coll. Stuke); 1♀ (16.IV.1993, Baden-Württemberg, Kaiserstuhl, Lilienthal, leg. et coll. Stuke); 1♀ (09.V.1991, Baden-Württemberg, Kaiserstuhl, Badberg, leg. et coll. Stuke); 1♀ (07.V.1993, Baden-Württemberg, Kaiserstuhl, Schehlingen, leg. et coll. Stuke); 1♀ (20.V.1991, Baden-Württemberg, südliche Oberrheinebene, Umgebung Griessheim, leg. et coll. Stuke); 1♀ (24.V.1991, Baden-Württemberg, südliche Oberrheinebene, Trockenaue Griessheim, leg. et coll. Stuke); 1♀ (17.V.1997, ditto); 1♂ (27.V.1991, Baden-Württemberg, Stromberg, Ochsenbach, Geigersberg, leg. Schmid-Egger, coll. Hauser); 1♀ (25.V.2003, Berlin, Pankow, Blankenfelde, Old Botanical Gardens, leg. Esser, coll. Stuke); 2♀♀ (30.IV.2001, Berlin, Grunewald, Kiesgrube Jagen 86, leg. Saure, coll. Stuke); 1♀ (03.V.1990, Berlin, Forst Düppel, Böttcherberg, leg. Wolff, coll. Stuke); 1♂ (01.V.2002, Berlin, Finkenkrug, leg. Esser, coll. Stuke); 1♀ (30.IV.1994, Berlin, Gartenschule, 52°26,6'N, 13°27,1'E, on *Taraxacum officinale*, leg. et coll. Flügel); 1♂ (04.V.1905, Berlin, Pichelsberg, leg. Oldenberg, coll. Hauser); 1♀ (1920-1921, Brandenburg, Priegnitz, Trieglitz, leg. Jaap, coll. ZMHB); 1♂ (04.V.1939, Brandenburg, Ruhlsdorf, leg. Zwick, coll. ZMHB); 1♂ (29.V.1995, Brandenburg, Schiessstand 1.2km NE Greifenberg, leg. Blank, coll. Hauser); 1♂ (25.IV.2004, Bremen, Rekumer Geest, leg. et coll. Stuke); 1♀ (25.IV.2004, Bremen, Teiche W Neustädter Hafen, leg. et coll. Stuke); 1♂ (22.III.1997, Hamburg, Mellingburger Schleife, leg. Niebei-Lohmann, coll. Hauser); 1♂, 4♀♀ (24.IV.1995, Hessen, Darmstadt, Truppenplatz between A5 und A67, leg. Geller-Grimm, coll. Stuke); 1♀ (08.V.1902, Mecklenburg-Vorpommern, Ganzlich, Torf, leg. Lange, coll. Stuke); 1♀ (22.IV.1994, Rheinland-Pfalz, Wachenheim, Kemmersberg, leg. Niehuis, coll. Hauser); 1♀ (02.V.2003, Sachsen-Anhalt, Goltewitz near Oranienbaum E Dessau, leg. Lange & Ziegler, coll. Stuke); 1♂ (01.V.2003, Sachsen-Anhalt, Stromleitungsstrasse, Oranienbaum E Dessau, 60m, leg. Ziegler & Lange, coll. Stuke); 1♀ (07.V.1990, Schleswig-Holstein, Bahnhof Büchen, leg. Wolff, coll. Stuke); 1♀ (02.V.1997, Schleswig-Holstein, Büchen, Bundesgrenzschutz Übungsplatz, leg. van der Smissen, coll. Hauser); 1♀ (29.V.1998, Schleswig-Holstein, Büchen Dorf, Sommerweg Fitzen, leg. van der Smissen, coll. Hauser); 1♂ (30.IV.1998, Schleswig-Holstein, Flensburg Stadtgebiet, leg. Zachau, coll. Stuke); 1♀ (14.V.1996, Schleswig-Holstein, Meierwik NE Flensburg, leg. Barkemeyer, coll. Claußen); 1♂ (11.V.2002, Schleswig-Holstein, Schlotfeld, leg. Lange, coll. Stuke); 1♂, 1♀ (16.V.1903, ditto); 1♀ (30.IV.1998, Schleswig-Holstein, Segrahn, Heideweg, leg. van der Smissen, coll. Hauser); Material listed by Stuke (2003b) from Lower Saxony and Bremen (Germany) was also examined, but is not listed again here; **Greece**: 1♂ (01.V.2000, Thraki, Rodopi, Mitrikou, Esmarida Lake, leg. W. van Steenis & Bakker, coll. W. van Steenis); 1♀ (09.IV.2000, Volos, Platania, leg. et coll. Standfuss); **Italy**: 1♂ (21.VI.1995, Martellital, 2100-2250m, emergency hut, leg. Blank, coll. Hauser); 1♂ (28.VI.1992, Vinschgau, Planailtal, leg. et coll. Stuke); **Japan**: 1♂ (29.IV.1986, Honshu, Mt. Makuragi, Shimane Pref., leg. et coll. Maeta); **Netherlands**: 1♀ (12.-17.V.1992, Schonloër Strubben, leg. Delfos & Pronk, coll. RMNH); 1♂ (06.VII.1995, Twello, Rijksstr.weg, leg. Wolschrijn, coll. ZMAN); **Norway**: 1♂ (22.V.1984, Bø Huum, Filtvedt, leg. Midtgaard, coll. UMB); 1♀ (29.V.1982, N Vay, Fledieljord, Djupvik, Bi-Skog, leg. Johanssen, coll. UMB); **Spain**: 1♂ (07.V.1991, Albarracin, Valdevacar, leg. Wolschrijn, coll. ZMAN); **Switzerland**: 1♀ (25.VI.1992, Maggia Tal, Lago del Sambuco, leg. et coll. Stuke); 1♀ (30.VI.1992, Vinschgau, Langtaufertal, 1900-2100m, leg. et coll. Stuke); **Tunisia**: 1♀ (10.III.1994, 10km ESE Maktar, 900m, leg. Oorschot & Rubbrecht, coll. ZMAN); **Turkey**: 1♀ (09.VI.1989, Askale Erzurum, leg. et coll. Hayat); 1♀ (19.VI.1991, Atatürk Ü., Erzurum, leg. et coll. Hayat); 1♂ (13.VI.1996, Pasinler Erzurum, leg. Aslan, coll. Hayat).

Redescription

Head: Palp dark, brownish or blackish. Black hairs on parafacialia and gena usually lacking, or if present then few and obviously shorter than postpedicel. **Thorax**: Posterior margin of mesoscutum usually black, at least medially, with coarse silvery or golden dusting which is normally interrupted in the mid-line. Very rarely the mesoscutum may be orange-brown at the posterior margin. Katepisternum mostly dark brown to blackish. Underside of scutellum usually orange-brown (but may be darker at base), dorsal surface similar. Hairs of mesoscutum comparatively short, those at the anterior margin less than half as long as those at the posterior margin. Femora and tibiae with darker brownish markings. Wing veins often weakly margined with brownish, although this may be lacking (Fig. 1). Wing length 5.6–8mm. **Abdomen**: Generally dark orange to blood-red.

Tergite 1 with side-margins orange-brown, the dark brown or blackish coloration of the disc usually broadly extending to the posterior margin. Tergite 2 sometimes with medial darkish marking towards the anterior margin. Remainder of tergites orange-brown, or in some specimens from Japan, partially black (var. *japonica* Kröber, 1916). Tergite 4 only narrowly dusted at posterior margin; in ♀♀ the dusting is mainly confined to the depressed posterior marginal area which is bounded-off from the rest of the tergite by an impressed line or crease. Tergite 5 undusted medially, at least in anterior half (in ♀♀ the dusting is often mainly confined to the depressed posterior marginal area). ♂♂ —Hairs in centre of tergites 4–5 not obviously longer than those on tergite 2. Hairs on tergite 6 may be shorter than, to just slightly longer than, diameter of hind tibia. **Genitalia:** ♂♂ —Epiandrium in side view as shown in Fig. 10, somewhat quadrate in profile, and very strongly expanded ventrally to form a globose vesicle which is felted with downy pile. Posterior surstylus usually more-or-less triangular in profile, with a bluntly-pointed tip, although sometimes somewhat broader and more rounded. Angle between anterior margin and underside of epiandrium somewhat acute. Epiandrial plate covered with microtrichia. ♀♀ —Sternite 7 as shown in Fig. 17, somewhat tapering towards base. Lateral tooth of apical syntergosternite long and narrow, its length being usually 4–5 times its width at base (Fig. 24).

Diagnosis

Myopa testacea is characterised by: (1) black coloration of the mesoscutum extending right up to the posterior margin; (2) anterior margin of tergite 4 undusted (although individual ♀♀ can have some weak submedial dusting) and often at least the anterior margin of tergite 5 undusted medially; and (3) wing veins often dark margined (although this is usually weak, and can be lacking). Distinctions from unusually short-haired specimens of *Myopa hirsuta* include the lack, or great sparsity, of short black hairs on the parafacialia and gena, and the highly characteristic vesicular swelling of the male epiandrium (Fig. 10), as well as the lack of medial orange-brown coloration at the posterior margin of the mesoscutum.

Myopa testacea is very variable in size. Typically the species has a length of about 7–10mm, but individuals may vary from about 4mm to 11mm or more. Small specimens of about 4–6mm in length are common in some parts of its distribution, including in the U.K., but these are otherwise indistinguishable from more typically-sized specimens.

Taxonomy

According to Thompson (1997), based on advice from DKC, the assumed type material of *Myopa testacea* in the Linnaean collection appears to correspond with the current concept of *Myopa pellucida* (Robineau-Desvoidy, 1830). In order to avoid having to change the current concept of *Myopa testacea* auct., which is well understood and universally recognised since it was so clearly set out by Collin (1960) — an action which would require that the name *testacea* be applied to the species presently known as *pellucida* (i.e. the *extricata* of Collin 1960) and cause a new name to be assigned to the species previously known as *testacea* — an application is being made to the I.C.Z.N. to preserve the existing concept and name of *Myopa testacea* and to set aside the specimen standing under this name in the collection of Linnaeus (Clements *et al.* in prep.).

The three species described by Robineau-Desvoidy (1930), comprising *longirostris*, *pictipennis* and *umbripennis*, cannot safely be interpreted since the descriptions are inadequate and the whereabouts of the type material is unknown. We therefore follow Kröber (1916) and Becker (1922) in synonymising these species with *testacea* auct., an action which has not subsequently been challenged by later authors. It should, however, be noted that the species of the *testacea*-group were poorly understood at the time when Kröber and Becker made their judgements, and that the present-day standards for justifying these synonymies were therefore unlikely to have been met. In this regard we further note that whilst the three species described by Robineau-Desvoidy in 1830 have subsequently been assigned to *Myopa testacea*, three other species described in 1853 have subsequently been assigned to the closely related *Myopa stigma*, and that there must therefore be considerable scope for errors in the presently accepted synonymies.

Distribution

On the basis of the findings presented here, and the records given by Bańkowska (1967, 1979), Carles-Tolrá (2006), Carles-Tolrá & Báez (2002), Carles-Tolrá & Blasco-Zumeta (2001), Chvála (1965, 1968), Chvála & Weinberg (1969), Maeta & Macfarlane (1993), Rivosecchi (1996), Smith (1952, 1973), Stuke & Petersen (2001), Tomasovic (2000), Tóth (2004), van Veen (2002), Wanqi and Chienming (1998) and Zimina (1999b), *Myopa testacea* is widely distributed in the Palaearctic region, occurring throughout Europe (Austria, Belgium, Bulgaria, Chechnya, Denmark, Finland, Eire, France, Germany, Great Britain, Greece, Hungary, Italy, Luxemburg, the Netherlands, Norway, Poland, Portugal, Rumania, Slovakia, Spain and Switzerland), as well as in North Africa (Tunisia), the Near and Middle East (Turkey, Afghanistan), and in the outer eastern Palaearctic area (Japan, China and Mongolia). Literature references prior to 1960 are considered to be unreliable, as the species of the *testacea*-group were inadequately segregated before this date.

Biology

Myopa testacea is the only species of the *Myopa testacea* Species-Group for which there is information regarding the larval biology. According to Paxten *et al.* (1996) and Erteld (1998) the larvae of this species have been recorded developing in adults of *Andrena scotica* Perkins, 1917 (= *A. carentonica* Pérez, 1902) and *Andrena vaga* Panzer, 1799 (Hymenoptera: Apidae). De Meijere (1912) reports an observation of a newly hatched specimen of '*Myopa testacea*' near a colony of *Andrena ovina* Klug, 1810 (= *A. vaga* Panzer, 1799). In the absence of any voucher material this latter record must, however, be regarded as unreliable given the subsequent changes in taxonomy.

Acknowledgments

The following colleagues very kindly made material or records available to us: Prof. Dr. Miroslav Barták (Prague), Dr. Stephan Blank (Eberswalde, Germany), Claus Claußen (Flensburg, Germany), Dieter Doczkal (Malsch, Germany), Hans-Joachim Flügel (Knüllwald, Germany), Fritz Geller-Grimm (Frankfurt), Prof. Dr. Martin Hauser (Columbia University, U.S.A.), Christiane Lange (Bernau, Germany), Dr. Maurizio Mei (Rome), Dr. Michael Ohl (Berlin), Dr. Willem Renema (Leiden, Germany), Dr. Christian Schmid-Egger (Herrsching, Germany), Prof. Dr. Rustem Hayat (Erzurum, Turkey), Lutz Lange (Elsfleth, Germany), Franz Ressler (†), Dr. Christoph Saure (Berlin), John T. Smit (Leiden), Lisa & Prof. Dr. Klaus Standfuss (Dortmund, Germany), Wouter & Dr. Liesbeth van Steenis (Utrecht), Danny Wolff (Ebsterf) and Dr. Joachim Ziegler (Bernau, Germany).

The following people helped in preparing the present paper, or by making collections in their care available to us: Dr. Kees van Achterberg (RMNH); Ben Brugge (ZMAN); Dr. Ruth Contreras-Lichtenberg (NHMW), Lita Greve (UMB); Dr. Bernhard Merz (formerly of ETHZ); Dr. Thomas Pape (UZMC); Adrian Pont (UMO); Helmut Riemann (UMBB); Dr. Gunilla Ståhls (NHCM); Dr. Christian F. Thompson (USNM); Dr. Nigel Wyatt (BMNH) and Dr. Joachim Ziegler (ZMHB).

Joachim Ziegler helped us in procuring older literature references, and Dr. Martin Hauser made valuable comments and gave advice regarding the whereabouts of type specimens.

References

- Bańkowska, R. (1967) Matériaux pour l'études des diptères de Bulgarie. *Fragmenta Faunistica*, 13, 303–314.
 Bańkowska, R. (1979) Conopidae Wslepki (Insecta: Diptera). *Polska Akademia Nauk. Fauna Polski*, 7, 1–134.
 Becker, T. (1922) Neue Dipteren meiner Sammlung. Conopidae. Paläarktische Region (Schluss.). *Konowia. Zeitschrift für systematische Insektenkunde*, 1, 282–295.
 Brunetti, E. (1923) *The Fauna of British India. Diptera. Vol. III. Pipunculidae, Syrphidae, Conopidae, Oestridae*. Today & Tomorrows, Printer & Publisher, New Delhi, 424 pp.

- Camras, S. (1953) A review of the Genus *Myopa* in North America (Diptera: Conopidae). *The Wasmann Journal of Biology*, 11, 97–114.
- Camras, S. (1960) Flies of the family Conopidae from Eastern Asia. *Proceedings of the United States National Museum*, 112, 107–131.
- Carles-Tolrá, M. (2006) Algunos dípteros capturados en la provincia de Salamanca (España) (Insecta, Diptera). *Boletín Sociedad Entomológica Aragonesa*, 38, 353–355.
- Carles-Tolrá, M. & Báez, M. (2002) Conopidae: 157. In: Carles-Tolrá, M. (Eds.) Catálogo de los Diptera de España, Portugal y Andorra (Insecta). *Monografías de la Sociedad Entomológica Aragonesa*, 8, 157.
- Carles-Tolrá, M. & Blasco-Zumeta, J. (2001) Estudio comparativo de veintinueve familias de dípteros colectados en un sabinar de *Juniperus thurifera* L. en Los Monegros (Zaragoza) (Diptera: Orthorrhapha y Cyclorrhapha). *Boletín Sociedad Entomológica Aragonesa*, 29, 49–64.
- Chen, S.H. (1939) Étude sur les Diptères Conopides de la Chine. *Notes d'Entomologie Chinoise*, 6, 161–231.
- Chvála, M. & Smith, K.G.V. (1988) Conopidae. In: Sóos, A. & Papp, L. (Eds.) *Catalogue of Palearctic Diptera*. Volume 8. Elsevier, Amsterdam-Oxford-New York-Tokyo, 363 pp.
- Chvála, M. (1965) Czechoslovak species of the subfamilies Myopinae and Dalmanniinae (Diptera, Conopidae). *Acta Universitatis Carolinae-Biologica*, 65, 93–149.
- Chvála, M. (1968) Beiträge zur Kenntnis der Fauna Afghanistans. Conopidae, Diptera. *Casopis Moravského Musea (Acta Musei Moraviae). Supplementum. Scientiae Naturales*, 53, 181–184.
- Chvála, M. & Weinberg, M. (1969) A review of the Conopid-flies (Diptera, Conopidae) of Rumania. *Acta Faunistica Entomologica Musei Nationalis Pragae*, 13, 191–204.
- Clements, D.K. (2000) *Myopa vaulogeri* (Séguy) a synonym of *M. minor* Strobl, with a redescription (Dipt., Conopidae). *Entomologist's Monthly Magazine*, 136, 235–240.
- Clements, D.K., Stuke, J.-H. & Chandler, P.J. (in prep.) *Conops testacea* Linnaeus, 1767 (currently *Myopa testacea*) (Insecta, Diptera) proposed conservation of usage of the specific name by the designation of a neotype.
- Collin, J.E. (1960) The British species of *Myopa* (Dipt., Conopidae). *Entomologist's Monthly Magazine*, 95 (1959) 145–151.
- De Meijere, J. C. H. (1912) Neue Beiträge zur Kenntnis der Conopiden. *Tijdschrift voor Entomologie*, 55, 184–207.
- Erteld, C. (1998) Untersuchungen zur Wildbienenfauna der Döberitzer Heide, Lebensgemeinschaft an einem *Andrena vaga*-Nistplatz und Einnischung von *Dasygaster hirtipes* und *Halictus sexcinctus* (Hymenoptera: Apidae). Dissertation am Fachbereich Biologie der Freien Universität Berlin, 255 pp.
- Kehlmaier, C. (2001) Records of Stratiomyidae, Pipunculidae and Conopidae (Diptera) from northern Spain. *Munibe (Ciencias Naturales)*, 51, 79–84.
- Kröber, O. (1916) Die palaearktischen Myopaarten. *Archiv für Naturgeschichte (Abteilung A)*, 81, 71–93.
- Kröber, O. (1917) Katalog der Conopiden, nebst Beschreibung der Gattungen und Bestimmungstabellen der Gattungen und Arten. *Archiv für Naturgeschichte (Abteilung A)*, 83, 1–52.
- Kröber, O. (1925) 35. Conopidae. In: Lindner, E. (Eds.) *Die Fliegen der Paläarktischen Region*. Schweitzerbartsche Verlagsbuchhandlung, Stuttgart, 1–48.
- Kröber, O. (1930) Familie Conopidae (Blasenkopffliegen). In: Dahl, F. (Eds.) *Die Tierwelt Deutschlands und der angrenzenden Meeresteile. 20. Teil Zweiflügler oder Diptera. IV: Syrphidae-Conopidae*. Verlag Gustav Fischer, Jena, 119–142.
- Kröber, O. (1936) Katalog und Bestimmungstabellen palaearktischer Conopiden. *Acta Instituti et Musei Zoologici Universitatis Atheniensis*, 1, 121–159.
- Kröber, O. (1939) Beiträge zur Kenntnis der Conopiden. I. *Annals and Magazine of Natural history (Ser. II)*, 4, 362–395.
- Linnaeus, C. (1767) *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. Editio duodecima, reformata. L. Salvii, Holmiae [=Stockholm], 533–1327.
- Macquart, P.J.M. (1850) Diptères exotiques nouveaux ou peu connus. 4^e supplément [part]. *Mémoires de la Société des Sciences, de l'Agriculture et des Arts de Lille*, 1849, 309–479.
- Maeta, Y. & Macfarlane, R.P. (1993) Japanese Conopidae (Diptera) Their biology, overall distribution, and role as parasites of bumble bees (Hymenoptera, Apidae). *Japanese Journal of Entomology*, 61, 493–509.
- McAlpine, J.F. (1981) Morphology and Terminology —Adults. In: McAlpine, J. F., Peterson, B. V. Shewell, G. E., Teskey, H. J., Vockeroth, J. R., Wood, D. M. (coords.) *Manual of Nearctic Diptera. Volume 1*. Ontario: Research Branch Agriculture Canada, Monograph, 27, 9–63.
- Meigen, J.W. (1824): *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. Vierter Theil*. Schultz-Wundermann, Hamm, 428p.
- Morge, G. (1976) Dipteren-Farbtafeln nach den bisher nicht veröffentlichten Handzeichnungen Meigens: “Johann Wilhelm Meigen: Abbildungen der europäischen zweiflügeligen Insekten nach der Natur”. Pars III². Farbtafeln CLXI–CCCV. *Beiträge zur Entomologie*, 26, 543–689.
- Paxton, R., Tengö, J. & Hedström, L. (1996) Dipteran parasites and other associates of a communal bee, *Andrena scotica* (Hymenoptera: Apoidea), on Öland, SE Sweden. *Entomologisk Tidskrift*, 177, 165–178.

- Pont, A.C. (1995) The Type-Material of Diptera (Insecta) Described by G. H. Verrall and J. E. Collin. *Oxford University Museum Publication*, 3, 223 pp.
- Rivosecchi, L. (1996) Chiavi analitiche illustrate sui Conopidae (Diptera) della Fauna Italiana. *Bollettino del Museo Civico di Storia Naturale di Verona*, 20, 135–151.
- Robineau-Desvoidy, A.J.B. (1830) Essai sur les Myodaires. *Mémoires présentés par divers savants à l'académie royale des sciences de l'institut de france et imprimés par son ordre [sciences mathématiques et physiques]*, 2, 1–813.
- Robineau-Desvoidy, A.J.B. (1853) Diptères des environs de Paris (1). Famille des Myopaires. *Bulletin de la société des sciences historiques et naturelles de Lyonne*, 7, 83–160.
- Schiner, J.R. (1862) *Fauna Austriaca. Die Fliegen (Diptera). Erster Theil*. Verlag von Carl Gerold's Sohn, Wien, 674 pp + 2 tables.
- Smith, K.G.V. (1952) The Irish Conopidae (Diptera). *Proceedings of the Royal Irish Academy (Section B)* 54, 203–208.
- Smith, K.G.V. (1959) The distribution and habits of the British Conopidae. *Transactions of the Society for British Entomology*, 13, 113–136.
- Smith, K.G.V. (1961) Supplementary records of the distribution and habits of the British Conopidae. *The Entomologist*, 94, 237–239.
- Smith, K.G.V. (1989) 39. Family Conopidae. In: Crosskey, R. W. (Eds.) *Catalogue of the Diptera of the Afrotropical Region*. British Museum, London, 511–517.
- Smith, K.G.V. (1973) 255. Conopidae II. Ergebnisse der zoologischen Forschungen von Dr. Z. Kaszab in der Mongolei (Diptera). *Faunistische Abhandlungen*, 4, 127–134.
- Stuckenberg, B. R. (1999) Antennal evolution in the Brachycera (Diptera), with a reassessment of terminology relating to the flagellum. *Studia Dipterologica*, 6, 33–48.
- Stuke, J.-H. (2001) Der taxonomische Status von *Myopa curtirostris* Kröber, 1916 (Diptera: Conopidae). *Entomologische Zeitschrift*, 111, 258–261.
- Stuke, J.-H. (2003a) Eine neue *Myopa*-Art aus Japan (Diptera: Conopidae). *Studia Dipterologica*, 9, 413–419.
- Stuke, J.-H. (2003b) Die Blasenkopffliegen (Diptera: Conopidae) Niedersachsens und Bremens. *Drosera*, 2003, 81–94.
- Stuke, J.-H. (2004) Anmerkungen zu den von P. Gabriel Strobl beschriebenen Conopidae (Diptera). *Studia Dipterologica*, 10, 704–706.
- Stuke, J.-H. (2005) Eine neue *Myopa*-Art aus der östlichen Mediterraneis (Diptera: Conopidae). *Studia Dipterologica*, 11, 543–548.
- Stuke, J.-H. & Clements, D.K. (2005) The interpretation of some Conopidae (Diptera) described by Robineau-Desvoidy. *Zootaxa*, 886, 1–12.
- Stuke, J.-H. & Maeta, Y. (2002) Eine weitere *Myopa*-Art aus Korea und Japan (Diptera, Conopidae). *Japanese Journal of Systematic Entomology*, 8, 281–285.
- Stuke, J.-H. & Petersen, F.T. (2001) Conopidae. In: Petersen, F. T. & Meier, R. (Eds.) A preliminary list of the Diptera of Denmark. *Steenstrupia*, 26, 192–193.
- Thompson, F.C. (1997) Linnean species of Conops (Diptera: Conopidae, Muscidae, Sciomyzidae, Syrphidae & Tachinidae), with designation of lectotypes. *Entomological News*, 108, 265–272.
- Tomasovic, G. (2000) Conopidae (Diptera Brachycera) de Belgique et du Grand-Duché de Luxembourg. *Bulletin S.R.B.E. / K.B.V.E.*, 136, 91–123.
- Tóth, S. (2004) Az Aggteleki Nemzeti Park fejeslégy-faunájának vizsgálata Malaise-scapdával (Diptera: Conopidae). *Folia Historico-Naturalia Musei Matraensis*, 28, 273–278.
- Veen, M.P. van (2002) Conopidae. In: Beuk, P. L. T. (Eds.) *Checklist of the Diptera of the Netherlands*. K.N.N.V. Uitgeverij, Utrecht, 223–224.
- Wahlgren, E. (1917) Svensk Insektenfauna. 11. Tvåvingar. Diptera, II. Cyclorapha, 2. Schizophora, Fam. 5–12. Conopidae, Cordyluridae, Coelopidae, Cypselidae, Dryomyzidae, Clusiidae, Helomyzidae, Sciomyzidae. Almqvist & Wiksells Boktryckeri - A.B., Uppsala, 113–224.
- Wanqi, X. & Chienming, C. (1998) *Flies of China. Volume 1*. Liaoning Science and Technology Press, Shenyang, 1365 pp.
- Weele, R. van der (1998); Rare and interesting species of Xylophagidae, Stratiomyidae, Acroceridae, Therevidae and Conopidae collected in Hungary (Diptera). *Folia Entomologica Hungarica*, 59, 103–109.
- Zimina, L.V. (1968) The genus *Myopa* Fabr. (Diptera, Conopidae) in the U.S.S.R. *Entomological Review*, 42, 211–218.
- Zimina, L.V. (1974) On the fauna of Conopidae (Diptera) of the Mongolian People's Republic. II. *Nasekomye Mongolii*, 2, 348–353. [in Russian]
- Zimina, L.V. (1988) *Family Conopidae*. Keys to the insect of the European Part of the U.S.S.R. V. Part 2, Pauls Press, New Dehli, 162–175.
- Zimina, L.V. (1999a) 71. *Family Conopidae*. Key to the insects of Russian Far East VI. Pt 1, Vladivostock, 523–531. [in Russian]
- Zimina, L.V. (1999b) Key to the species of parasitic flies of the family Conopidae (Diptera) of Middle Asia. *Entomologicheskoe-Obozrenie*, 79, 723–733. [in Russian]