



## Monograph

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# The genus *Aphaniosoma* Becker, 1903 (Diptera: Chyromyidae) in the Eastern Mediterranean and Middle East, with descriptions of new species

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**Abstract.** The species of *Aphaniosoma* Becker, 1903 described from Egypt by Collin in 1949 are reviewed and lectotypes designated for *Aphaniosoma creperum* Collin, 1949, *A. fissum* Collin, 1949, *A. lamellatum* Collin, 1949 and *A. sodalis* Collin, 1949. All species known from the eastern Mediterranean and the Middle East are reviewed, with annotations, distributions and a key to species. The following 19 species are described as new and illustrated: *A. acitergum* sp. nov., *A. aegyptium* sp. nov., *A. angulitergum* sp. nov., *A. captiosum* sp. nov., *A. cristatum* sp. nov., *A. curvistylus* sp. nov., *A. daedalum* sp. nov., *A. denticulosum* sp. nov., *A. flavipyga* sp. nov., *A. freidbergi* sp. nov., *A. interispina* sp. nov., *A. kravchenkoi* sp. nov., *A. longilingua* sp. nov., *A. lucidum* sp. nov., *A. meltseri* sp. nov., *A. miricercus* sp. nov., *A. palestinense* sp. nov., *A. praeditum* sp. nov. and *A. yaromi* sp. nov. Biology and ecology are commented upon.

**Keywords.** *Aphaniosoma*, taxonomy, lectotype, distribution, Middle East.

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## Introduction

Studies on Chyromyidae Hendel, 1916 of most countries of the Middle East are scarce. The only three taxonomic accounts that described new species were by Collin (1949) and Ebejer (1996, 2008). Since then, more species have been described from neighbouring areas in the West Palaearctic (Ebejer 2021a) and Afrotropical Regions (Ebejer 2009). The primary aim of this article is to describe several new species of *Aphaniosoma* Becker, 1903 from the eastern part of the Mediterranean and the Middle East, and to provide a key for their identification. For this article, the countries of the Eastern Mediterranean that are included here are Cyprus, coastal southern Turkey, Syria, Lebanon, Israel and Egypt; for the Middle East, the whole Arabian Peninsula, Jordan and Iraq. With many more species from the Middle East being described in this article, previous keys and the distribution of species are now largely obsolete. So, it has become necessary to update these with new faunistic data. This includes the description of 19 new species, for which photographs are provided for all name-bearing types, along with those of almost all other species in the key.

It has long been recognized that Israel's geographical position in the east of the Mediterranean placed it at the zoogeographical crossroads of the Palaearctic, Afrotropical and Oriental Regions. As far as the Diptera are concerned, the dominant influence is from the Palaearctic followed by the Afrotropical (Freidberg 1988). When that account was written, the Chyromyidae was still not investigated in Israel, but a few years later, I. Yarom and the late A. Freidberg instigated a countrywide survey of this fly family's association with trees of *Tamarix* L. This resulted in a large collection, a major part of which was made available to the author for study, forming the backbone of this article.

During the preparation and examination of samples from neighbouring countries it became apparent that several species have a distribution wider than originally thought. In order to be more comprehensive, facilitate identification of species and provide a better zoogeographic context, the scope of the study was widened to include species known from neighbouring Mediterranean countries and the Middle East.

Collin (1949) described seven species of *Aphaniosoma* from the Siwa Oasis, located in the far west of northern Egypt and from Lake Karoun, located in the northeast, about 80 km southwest of Cairo. He did not designate holotypes for any of them, and neither he nor subsequent workers provided identification labels for any specimens. A detailed account of how Collin worked with specimens of new species and how syntypes of these were eventually located has been published and all Collin's material of Egyptian *Aphaniosoma* that he described is listed therein (Pont 1995). The red-circled 'type' label (in the Natural History Museum, London this denotes 'Holotype') attached to the specimens was not part of Pont's (1949) work or of any subsequent taxonomic study. These labels were affixed to specimens to 'save' a syntype from each species during the second world war. A more detailed explanation of this issue is published (Evenhuis 2022). These labels bear no name and cannot be relied upon as to the correct identity or status of the syntype. Apart from these, the only labels on each specimen were the printed data label and the accession number label. A bar code label and an identification label were added by the present author during this study.

Although most of Collin's material was examined by the present author when the Palaearctic species of *Aphaniosoma* were reviewed (Ebejer 1998) no lectotypes were designated. Each species is discussed in this account and where applicable, a lectotype is designated.

## Material and methods

### Source of specimens

Most of the material for this study originates from the collections in the Steinhardt Museum of Natural History in Tel Aviv University, Israel, with most specimens collected in Israel, but some collected in Sinai, Egypt. The Israeli material is supplemented with much smaller samples collected by the author and by Dr B. Merz. Additional material from Egypt comes from collections made separately by Prof. M. Barták and Dr P. Gatt. Specimens from Oman were collected by the author, Dr J.C. Deeming and Mr M. Gallagher, and from Jordan by Dr W. Rossi and Dr J.-H. Stuke. The material from Saudi Arabia was collected by Prof. H.A. Dawah and that from the United Arab Emirates and Yemen by Dr A. van Harten.

Individual specimens, mostly from previously published material, were selected for photography to supplement the illustrations for this article and to aid interpretation of key characters. These specimens are listed under the Material examined section for the respective species, although no taxonomic changes were introduced.

### Institutional abbreviations

CULSP        =    Czech University of Life Science, Prague, Czech Republic  
J-HS         =    private collection of Jens-Hermann Stuke, Leer, Germany

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MHNG	=	Museum d'Histoire Naturelle, Geneva, Switzerland
MJE	=	private collection of Martin J. Ebejer, Cowbridge, UK
NHMUK	=	Natural History Museum, London, UK
NMWC	=	National Museum Wales, Cardiff, UK
OUMNH	=	Oxford University Museum, Oxford, UK
PG	=	private collection of Paul Gatt, Wickford, UK
SMNHATAU	=	Steinhardt Museum of Natural History, Tel Aviv University, Israel
ZSM	=	Zoologische Staatssammlung München, Munich, Germany

### Abbreviations of structures identified and labelled in the figures

aed	=	aedeagus
bac scl	=	bacilliform sclerite
distiph	=	distiphallus
epand	=	epandrium
epiph	=	epiphallus
hyp	=	hypandrium
ph apd	=	phallapodeme
prg	=	pregonite
psg	=	postgonite
surs	=	surstylus
tg	=	tergite
st	=	sternite

### Terminology

Terminology of anatomical structures follows Cumming & Wood (2017). The distinction between seta and setula in this article is purely a convenient indication of the size of the structure and does not imply anything more. In many species of *Aphaniosoma* there are secondary sexual modifications in the male tergites 4–6, and almost always of sternites 5–6. Sometimes sternites appear fused or lost and it can be difficult to determine which segment the last sternite originates from. In this case, it is termed simply pregenital sternite, a term also used in the figures to refer to these posterior sternites in combination. The hypopygium (made up of the epandrial-hypandrial complex and the pregonite) and the phallic complex (composed of the phallapodeme, bacilliform sclerite, epiphallus, postgonite, basiphallus and distiphallus) is complex in all species. The term aedeagus is used when it is not possible to clearly differentiate between the basiphallus and distiphallus. An epiphallus is probably present in all species of *Aphaniosoma*, but it is not always possible to distinguish this separately from the basiphallus, to which it is usually very closely apposed as a sclerotized cover that partially encircles it. The apex of the epiphallus is often visible in situ in unmacerated specimens and is sometimes a useful feature in identification, being curved dorsally or ventrally at the tip, and can be sharply pointed or rounded. In earlier literature, the epiphallus was treated as part of the basiphallus and the same approach is followed here for convenience when the epiphallus cannot be clearly identified.

Descriptions of colour and pattern are subjective to some extent but still helpful. In this article, the three basic colours of almost all specimens of *Aphaniosoma* are a) a very pale yellow, b) an orange-yellow to greyish-yellow and c) a dark brownish grey to black. Unless significant postmortem changes have occurred, these colours are recognizable both in dry and wet specimens. Most then have brown, grey or black scutal vittae that vary in intensity both between and within species. The vittae may coalesce anteriorly in individual specimens. They appear paler if scutal microtomentum is dense, and they may appear darker and more distinct in wet specimens. The descriptions of new species are based on dry material.

### Identification of males

It is to be expected that the identification of males would be easier due to the presence of diverse and complex secondary sexual characters, some of which are visible without dissection. External characters of species of *Aphaniosoma* are remarkable for their individual variation in some species, and this variation has necessarily been added to each species account.

The most difficult anatomical structure to interpret and compare between species is the aedeagus. The reason for this is that the aedeagus may remain folded deep within the epandrium and the 6<sup>th</sup> tergite, but even if everted, it may not unfold completely. If everted and unfolded, it may still remain ‘deflated’. This phenomenon has been observed ‘live’ by the author on several occasions. It arose when the specimen was only partly macerated so the musculature was not totally broken down. When the specimen was taken out of KOH and placed in water, the muscles distended under osmotic pressure and these everted the aedeagus, which then unfolded at the basiphallus/distiphallus junction. On occasion, it continued to distend either throughout its length, or only over the distiphallic length. In those species with lobes (one or two pairs) at the phallic apex, these also extended and moved apart relative to each other. The entire process in water took only about one to two minutes, and this process usually stops part of the way if it commences at all, resulting in a variety of appearances of the aedeagus. There are also sometimes small elongate sclerites embedded in the proximal part of the distiphallus, that in the folded state, give a dark appearance. For these reasons, the aedeagus cannot always be relied upon as a sole means of identification.

The remainder of the hypopygial structures are more consistent in appearance and therefore more reliable, although there are complications here too. The junction of the pregenital sternites (the 5<sup>th</sup> and 6<sup>th</sup>, or just the 6<sup>th</sup>) with tergites 5–6 is sometimes unstable and a small part of the sternite may be left with the tergite during maceration, thus altering the appearance of the sternite if this is examined on its own. Many species have the 6<sup>th</sup> tergite produced posteroventrally at its margin. There is some intraspecific variation in the degree to which this happens, and as the specimen dries, bending, twisting spirally or folding medially and inwardly can markedly alter hypopygial appearance. In dry specimens, the terminal sternites also often misalign so that these become vertical and deep relative to the natural horizontal line of the abdomen, and this position may not alter after maceration. The eversion outwards, twisting or displacement in any direction of the pregonites and especially the postgonites will be affected by the specimen drying as well as by the state of the aedeagus (folded or not, everted or not, etc.). In conclusion therefore, it is the shape of the individual structure that matters and not its exact location or orientation.

### Identification of females

Many species of *Aphaniosoma* look similar externally, and since females lack species-specific secondary sexual characters, it is sometimes impossible to tell species apart in this sex. Nevertheless, it may be possible to associate females with their respective males when a series is collected where both sexes are represented in good numbers at the same time in the same locality, if not on the same tree, bush or patch of grass, and where very similar species represented by their own males are not taken.

### Photography

Photographs were taken with a Canon EOS 80D camera, a Leica 1.6x DSLR camera adapter and a Leica Z6 APO zoom objective coupled with a X2 Leica 10447178 WD39 mm Plan Apo lens. Stacked images were processed using Helicon Focus ver. 8. Subsequent editing of the images involved only cropping and adjustments to exposure, contrast and clarity. No ‘cleaning’ of the imaged specimen or enhancement of structures was done to preserve the specimen identity as much as possible. Minimal alteration of the background was occasionally undertaken to remove larger blemishes and dust spots.

Drawing the complicated hypopygium is challenging in this genus because it must be constantly viewed in three dimensions. For this reason, it is thought helpful where possible to supplement these figures with photographs of the hypopygium in situ. This has the added advantage that often the appearance of this in situ with some of its structures sometimes clearly visible can allow identification to species without dissection.

Photographs are provided for holotypes of all new species described in this article to aid their individual recognition. Many paratypes were also photographed to illustrate diagnostic characters where these could not be properly visualized (for photography) on the holotype.

Most of the previously described species have also been photographed to facilitate interpretation of characters used in the key and to aid identification where they cannot be easily or reliably keyed to species.

It must be noted that most of the yellow and orange yellow species appear somewhat greyish or pale brown in the photographs, particularly on the tergites. This is mainly due to postmortem change compounded by a photographic illusion because of the angle of the light and a reduced exposure to lessen the glare from shining structures. No attempt has been made to alter colours with software. In several cases, the wings were aligned as horizontally as possible for the photograph, but this still does not give a fair assessment of ratios between wing veins; the text takes priority.

## **Taxonomy**

All species known from the geographical area covered by this article are listed even if no new material has been seen. New records of some species are given here to supplement distribution data. Species name and the country of origin are given in alphabetical order. The repository is given at the end of all the data for that specimen or group of specimens.

## **Results**

### ***Key for identification***

All species both known and expected to occur in the eastern Mediterranean and in the Middle East are included. Some species are not separable without reference to the male hypopygium. In these instances, the small group of species matching that diagnosis will be listed together. The photographs and line drawings should then help to reach an identification. Females remain a problem. A number can be identified using the key and a few more using the photographs, but still there remain a few that are impossible to separate on external characters. For these, some guidance is given above if associated males are available (see paragraph: Identification of females).

### **Notes on the key**

- Since the publication of keys to species of *Aphaniosoma* Becker of the Palaearctic (Ebejer 1998), Central Asia (Ebejer 2007) and the Afrotropics (Ebejer 2009), more species have been described, and some are now known to have a wider distribution than previously thought. Several also exhibit significant chromatic variation such that the earlier keys are less reliable.
- The dorsocentral setae are unstable in number and length in most species and this must be borne in mind when using the key, where the numbers given apply to most specimens of a particular species and are meant only as a guide.
- A dorsocentral seta or setula is sometimes placed directly in the suture, thus affecting the distribution of the count of setae between the anterior and posterior positions relative to the suture. This occurs

only very rarely in those species similar to *A. collini* Lyneborg, 1973 whereas in others it is more frequent. It may occur on one side only and it can be different in different specimens, i.e., either from the anterior series of setae or from the posterior. Some judgement must be exercised by assessing the distances of the remaining setae from the suture.

- In the antenna, a brown colouration of the basal flagellomere is only valid if it contrasts with a pale pedicel, and if the specimen has no extensive post-mortem discolouration on the head, or if it is not excessively greasy.
- The fronto-orbital setae are considered strong if they appear darker, thicker and longer than the setae/setulae anterior to them on the fronto-orbital plate, and if there is a step in the gradation of size from back to front.

### Key to species of *Aphaniosoma* Becker, 1903 for Easter Mediterranean and Middle East

1. Scutum with well-developed presutural dorsocentral setae (not much shorter than hindmost seta); number of strong dorsocentral setae not more than 5, usually 1+3 or 2+3; prescutellar acrostichal setae usually present and almost always distinctly larger than other acrostichals ..... 2
  - Scutum without well-developed presutural dorsocentral setae, these always very much shorter than hindmost seta; acrostichal setae rarely extend as far back as hindmost dorsocentral or posterior to it ..... 14
2. No presutural intra-alar seta or setula present and usually 1+3 dorsocentral setae present ..... 3
  - A long or short presutural intra-alar seta and usually 2+3 dorsocentral setae ..... 5
3. Presutural dorsocentral seta as long as distance between its base and that of the seta on the opposite side; male tarsomeres yellow and tergite 5 2–3 × as long as tergite 4 (Fig. 77B–C); male hind trochanter without any special development; female 5<sup>th</sup> tarsomere black and apical abdominal tergites with long, dense setulae ..... *A. setigerum* Collin, 1949
  - Presutural dorsocentral seta about as long as 2/3 distance between its base and that of the seta on the opposite side; 5<sup>th</sup> tarsomeres black in both sexes; male 5<sup>th</sup> tergite narrow at middle dorsally, and laterally about 1.5–2.0 × as long as 4<sup>th</sup> tergite; posterior female abdominal segments not exceptionally long setose ..... 4
4. Male hind trochanter with short narrow projection (Fig. 5A); female tarsomeres 3–4 brown ..... *A. aegyptium* sp. nov.
  - Male without special development on hind trochanter (Fig. 84A); female tarsomeres 3 and 4 yellow ..... *A. verecundum* Ebejer, 1998
5. Males ..... 6
  - Females ..... 12
6. Hind trochanter normal, without distinctive projection ..... 7
  - Hind trochanter with distinctive projection (sometimes difficult to see) (Figs 17B, 40B, 72D) ..... 8
7. Dorsally at middle, tergite 6 twice as long as tergite 5 (Fig. 26B); ventro-lateral margin of tergite 5 with minute black denticles (Fig. 25B–C); cerci of normal shape; 4<sup>th</sup> and 5<sup>th</sup> tarsomeres yellow ..... *A. denticulosum* sp. nov.
  - Tergite 6 not longer than tergite 5; tergite 5 without denticles on ventro-lateral margin; cerci markedly elongated (Fig. 62B); 4<sup>th</sup>–5<sup>th</sup> tarsomeres black (Fig. 62A) ..... *A. mirircercus* sp. nov.

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18. Mediotergite black or dark brown; scutum sometimes with dark vittae; some abdominal tergites with brown bands ..... 19
  - Mediotergite yellow, if appearing dark due to post-mortem change, then scutal vittae at most pale brown, often indistinct, and abdomen with mostly yellow tergites ..... 22
19. Head distinctly higher than long; frons with pair of distinctly longer setae at middle in front of anterior ocellus; viewed from the side, at middle, height of gena about the same as eye height; scutum with dark grey vittae; brown bands on abdominal tergites much reduced, never reaching hind margin or sides of tergites ..... *A. egregium* Ebejer, 1998
  - Head distinctly longer than high; frons with or without longer setae at middle; height of gena about half eye height; scutal vittae pale brown (sometimes dark in *A. incudisternum* and *A. platystylum*); abdomen all yellow or when with brown bands, these reach sides and or posterior margin on at least some tergites ..... 20
20. Frons with pair of longer setae in front of anterior ocellus (as in Fig. 10); scutal vittae pale brown; abdomen with most tergites having brown bands ..... 21
  - Frons without pair of longer setae in front of anterior ocellus; scutal vittae, if present, only of deeper yellow colour; tergites all yellow ..... *A. perpallidum* Ebejer, 2008
21. Abdominal tergites with pale brown bands on anterior half, scutal vittae pale brown and indistinct at middle, male hypopygium (Fig. 41C) with some structures dark ..... *A. impeditum* Ebejer, 2008
  - Abdomen with broad dark brown bands, scutal vittae brown and distinct, male hypopygium pale yellow, only aedeagus may be brown (Fig. 45) ..... *A. incudisternum* Ebejer, 2008
22. Head longer than high; eye about 3 × as long as high; 2 strong posterior fronto-orbital setae; a strong, long pair of setae in front of the anterior ocellus placed forward to the middle of the frons; pale brown lateral scutal vittae appear to continue on to the lateral border of the scutellum, male with black aedeagus (Fig. 35B–C) ..... *A. freidbergi* sp. nov.
  - Head equal to height or longer; but eye length not more than twice height; setae when present are placed in middle of frons and not significantly long or strong; scutal vittae only of a deeper yellow hue; scutellum entirely yellow; aedeagus yellow or brownish ..... 23
23. Male hypopygium viewed obliquely from behind or laterally with very pale, long, and posteriorly curved postgonites clearly visible (Fig. 19C) ..... *A. curvistylus* sp. nov.
  - Male hypopygium without such distinctive curved postgonites ..... 24
24. Head distinctly longer than high; eye about 2 × as long as high; hypopygium viewed laterally, with long straight surstylus clearly visible; epandrium easily visible, distinctly shining bright yellow and broad relative to tergite 6 (Fig. 33) ..... *A. flavipyga* sp. nov.
  - Head as long as high or very slightly longer; hypopygium viewed laterally, with short, broad-based, antero-ventrally curved surstylus clearly visible, epandrium mostly hidden by tergite 6 and with no distinctive features (Fig. 58) ..... *A. meltseri* sp. nov.
25. Viewed dorsally at middle, tergite 5 about 2 × as long as tergite 4 and about 4 × as long as tergite 6; tergite 5 laterally with very long narrow lobe (Fig. 87A) ..... *A. yaromi* sp. nov.
  - Viewed dorsally at middle, tergite 5 about as long as tergite 4 and no more than twice as long as tergite 6; tergite 5 laterally without modification ..... 26
26. Hypopygium mainly yellow; pregonite large, pale and curved; postgonite black and long, longer than cerci, easily visible without dissection; medial surface of ventral margin of tergite 6 without spine (Ebejer 1998: 207, fig. 25) ..... *A. falciferum* Ebejer, 1998
  - Hypopygium mainly black; pregonite small and not visible without dissection; postgonite black and shorter than cerci; tergite 6 with distinct black spine on medial surface of ventral margin (Fig. 47) ..... *A. interispina* sp. nov.

27. Occiput, scutum, scutellum and pleura black or dark grey, at most postpronotal lobe, some sutures of pleura and apical margin of scutellum yellow (similar to Fig. 70A) .....	28
– Species of a more mixed colour pattern (similar to Fig. 79B); scutal vittae almost always discernible; pleura, when with dark markings on sclerites, these are broadly bordered in yellow; scutellum yellow, only rarely almost as dark as area of scutum anterior to it .....	40
28. Femora and tibiae brown for much of their length, dull brownish black species with short fronto-orbital setae .....	29
– Femora and tibiae all yellow throughout their length; 2 posterior fronto-orbital setae usually stronger than others anterior to them .....	30
29. Palpus brown; basal flagellomere dark brown in both sexes .....	<i>A. brunripes</i> Ebejer, 1996
– Palpus yellow; basal flagellomere dark brown in female and yellow in male .....	<i>A. captiosum</i> sp. nov.
30. Pleura mostly yellow; scutum usually all grey but sometimes vittate posterior to the transverse suture .....	<i>A. dhofaricum</i> Ebejer, 1996
– Most of pleura black, leaving only narrow yellow margins to some sclerites; scutum uniformly dark without distinct vittae .....	31
31. Males .....	32
– Females .....	38
32. Scutum and scutellum completely dark greyish brown to black; pleural sclerites yellow only on sutures; abdominal tergites only very narrowly yellow on hind margins .....	33
– Scutum often a little paler posteriorly with a hint of vittae or pale spot appearing near posterior callus; scutellum paler greyish brown and sometimes with yellow apical margin; pleural sclerites and abdominal tergites more broadly and variably yellow on sutures and margins .....	36
33. Tergite 5 dorsally at middle, a little longer than tergite 4 .....	<i>A. nigrum</i> Ebejer 1998
– Tergite 5 dorsally at middle, a little shorter than tergite 4 .....	34
34. Postgonite narrow in approximately its apical half and blunt at apex; pregenital sternite with heavily sclerotized midline appearing as a long spine directed caudally (Ebejer 1998: 225, figs 74–75) .....	<i>A. spiniventre</i> Ebejer, 1998
– Postgonite broader and proportionately larger with slightly sinuous and pointed apex .....	35
35. Each lobe of the bilobed distiphallus broad, about twice as long as high (Ebejer 1998: 205, fig. 22); sternite 5 weakly and uniformly sclerotized throughout, transversely more or less rectangular in shape (Fig. 16C) .....	<i>A. creperum</i> Collin, 1949
– Each lobe of the bilobed distiphallus narrow in distal half, about 3 × as long as high; sternite 5 membranous over middle third and leaving weakly sclerotized more or less rectangular parts on lateral third on each side (Ebejer 1998: 214, fig. 42) .....	<i>A. nigricauda</i> Ebejer, 1998
36. Lower lateral margin of tergite 6 with a broad almost rectangular lobe directed ventrally; surstylus broad basally and markedly twisted apically (Ebejer 1998: 213, fig. 39) .....	<i>A. necopinatum</i> Ebejer, 1998
– Lower lateral margin of tergite 6 with a narrow lobe directed ventro-medially; surstylus of different shape .....	37

37. Surstylus and postgonite dark sclerotized; pregenital sternite more or less transverse rectangular with lateral margins only slightly curved; apex of basiphallus/epiphallus dark, blunt and often a little notched dorsally (Ebejer 1998: 204, figs 16–17) ..... *A. claridgei* Ebejer, 1995
- Surstylus and postgonite pale; pregenital sternite, laterally almost triangularly extended and posterior margin with two short narrow lobes; apex of basiphallus/epiphallus translucent and smoothly rounded (Fig. 49) ..... *A. kravchenkoi* sp. nov.
38. Basal flagellomere yellow; scutum often a little paler posteriorly with a hint of vittae or pale spot appearing near posterior callus; scutellum paler greyish brown and sometimes with yellow apical margin; pleural sclerites and abdominal tergites usually with broader and variable yellow on sutures and margins ..... *A. claridgei* Ebejer, 1995
- ..... *A. kravchenkoi* sp. nov.
- ..... *A. necopinatum* Ebejer, 1998
- Basal flagellomere dark brown; scutum and scutellum completely dark greyish brown to black; pleural sclerites narrowly yellow only on sutures; abdominal tergites only very narrowly yellow on hind margins ..... 39
39. Scutellum black and very similar in hue to scutum ..... *A. creperum* Collin, 1949
- ..... *A. nigrum* Ebejer, 1998
- Scutellum often a little paler or of a different hue to scutum ..... *A. nigricauda* Ebejer, 1998
- ..... *A. spiniventre* Ebejer, 1998
40. 2–3 strong posterior fronto-orbital setae (except in *A. seticauda*, which has 3–4 short setae); acrostichals usually numerous, about 7–10 pairs and prescutellar acrostichal setae or setulae present and situated level with or posterior to the hindmost dorsocentral setae ..... 41
- Fronto-orbital setae various; acrostichal setae less numerous, about 4–7 pairs rarely reach hindmost dorsocentral and no prescutellar setae/setulae present ..... 45
41. Fore tarsus with broad, black fifth tarsomere and elongate empodium, distinctly so in the male (Fig. 60B), less obvious in the female unless compared to 5<sup>th</sup> tarsomeres of other legs; species with very little, if any dark markings on pleura ..... *A. micromacro* Carles-Tolrà, 2001
- Fore tarsus normal, not broad in either sex and empodium normal; species usually with more dark markings on pleura ..... 42
42. 2–3 posterior fronto-orbitals that are distinctly longer and stronger than any setae or setulae anterior to them ..... 43
- 3–4 short posterior fronto-orbitals not distinctly longer or stronger than any setae or setulae anterior to them ..... *A. seticauda* Ebejer, 1998
43. Setulae or setae on frons all more or less of uniform size; male tergite 4 large and modified into caudally directed lobes (Fig. 56) ..... *A. melitense* Ebejer, 1993
- A pair of longer setulae present on the frons in front of the anterior ocellus; male without modification of tergite 4 ..... 44
44. Yellow and brown coloured species with 3 fronto-orbitals; eye 2 × as long as high; anepisternum yellow; brown bands on abdominal tergites more or less microtomentose and merge diffusely into paler hind margins (Ebejer 2021a: 4, fig. 5) ..... *A. cypriense* Ebejer,
- Dark grey species with 2 fronto-orbitals; eye at most 1.5 × as long as high; anepisternum always with distinct grey or black mark; abdomen black, weakly microtomentose, appearing subshining with contrasting pale margins clearly defined (Fig. 22A) ..... *A. daedalum* sp. nov.

45. 3+8 dorsocentral setae (only rarely 2+7), all quite short except for the hindmost seta; a pair of longer setae on frons in front of the anterior ocellus usually present, but often difficult to see because of the very pale colour; body colouration very variable, but usually with greyish brown vittae and dull yellow scutellum ..... 46
  - 2+5 dorsocentral setae (rarely 2+7), short but distinct, only hindmost seta well-developed; species with a distinct pair of stronger setae in front of anterior ocellus, sometimes not easily seen; body colour variable, but generally presents a variegated pattern of contrasting pale and dark areas with more distinct dark scutal vittae, scutellum and a large area anterior to it clear yellow; sometimes scutum and scutellum uniformly grey and grey pollinose ..... 49
46. Frons with only 2 pairs of very pale setae placed one anterior to the other in front of anterior ocellus (Fig. 31A); no other setae on mesofrons; a species of variable colouration often showing a dark aedeagus and 3 pale appendages in the hypopygium: a narrow almost straight postgonite, surstylus, and rounded pregonite (Fig. 31B–C) ..... *A. fissum* Collin, 1949
  - Several very short setae on frons, sometimes including a longer pair in front of anterior ocellus; hypopygium and appendages of different structure ..... 47
47. Male abdomen viewed from behind with large, black, flat shiny patch on each side of tergite 6 (Fig. 68B); female with small shiny patch dorso-laterally on tergite 7; both sexes with 8–10 dorsocentral setae and head longer than high ..... *A. oculicauda* Collin, 1949
  - Male abdomen without distinctive shiny black patch on tergite 6, but with long broad, yellow to brown surstylus, often easily visible; female without shiny patch on tergite 7; dorsocentral setae various, within the range of 8–12 ..... 48
48. Male with surstylus very broad and longer than height of epandrium (Fig. 50C); 10–12 dorsocentral setae; head about as long as high ..... *A. lamellatum* Collin, 1949
  - Male with surstylus shorter than height of epandrium (Fig. 71B); 8–10 dorsocentral setae; head a little longer than high ..... *A. platystylus* Ebejer,
49. Scutum of yellowish brown colour with the scutal vittae usually represented only by a confluent dark postsutural patch in the middle and adjacent short lateral vittae (Fig. 88); male with large, completely black hypopygium (Ebejer 2008: 691, pl. 1) with prominent, broad-based, thick, black, curved postgonite ..... *A. yitii* Ebejer, 1996
  - Scutum vittate or uniformly grey; male hypopygium never so large or completely black ..... 50
50. Scutum completely grey, only postpronotal lobe and narrow strip on notopleuron yellow; scutellum grey or brownish ..... 51
  - Scutum vittate, though usually with confluent light or dark grey area anterior to transverse suture with vittae appearing more posteriorly, scutellum and area anterior to it usually of the same clear yellow colouration (only in *A. scutellare* scutum sometimes completely grey while scutellum clear yellow) ..... 59
51. Scutum and scutellum pale grey; abdomen also pale greyish brown with yellow apical margins; male hypopygium pale yellowish brown with small shiny brown spot on dorsal part of epandrium ..... 52
  - Scutum and scutellum dark grey; abdomen dark brown to black with yellow apical margins; male hypopygium, various ..... 53
52. Pleura mostly pale yellow; both sexes with small shiny brown spot on last tergite; male without modified setae on lower lateral margins of tergite 6; postgonite narrow, more or less pointed; pregenital sternite triangular with apex directed apically (Ebejer 2009: 408, fig. 52) ..... *A. suboculicauda* Frey, 1958
  - Pleura with variable grey marks on sclerites; both sexes without small shiny brown spot on last tergite; male with three broad pale setae on each side of lower lateral margin of tergite 6; postgonite narrow, curved at apex; pregenital sternite more complex in structure (Ebejer 1998: 226, fig. 78) ...  
..... *A. trisetum* Ebejer, 1998

53. Males .....	54
– Females .....	57
54. Viewed from behind, epandrium barely visible and not divided into large globular halves; surstylus large, visible as a broad yellow structure sharply curved apically (Fig. 70B); a dark species with abdomen mostly subshining black (Fig. 69A); the species appears variegated because dark and pale areas are more clearly demarcated than usual in this genus .....	<i>A. palestinense</i> sp. nov.
– Viewed from behind, epandrium divided dorsally and each with its dorsal half appearing, in situ, as a globular sclerite (Figs 67B, 75B); surstylus small and narrow; species appearing less variegated in colour pattern .....	55
55. Posterior 2 fronto-orbital setae longer and stronger than setae/setulae anterior to them; postgonite narrow and curved at apex; about as long as globular part of epandrium; aedeagus dark .....	<i>A. scutellare</i> Ebejer, 1998
( <i>A. notatum</i> Collin, 1949 may key out here if further material should be of a dark form)	
– Posterior 2 fronto-orbital setae similar to setae anterior to them, all more or less gradually becoming shorter from back to front without a distinct gradation between the posterior two setae and those anterior to them; postgonite narrow and longer than half height of epandrium; aedeagus variable ...	56
56. Postgonite rather straight and pointed; pregenital sternite more or less oval, large, about half length of abdomen and with a long process on each posterior side directed antero-ventrally (Ebejer 1996: 293, figs 10–11) .....	<i>A. gallagheri</i> Ebejer, 1996
– Postgonite curved apically and blunt; pregenital sternite small, about a quarter of length of abdomen, divided into two sclerotized rectangular halves each with a short lateral process directed postero-ventrally (Ebejer 1998: 220, figs 62–64) .....	<i>A. proximum</i> Ebejer, 1998
57. Basal flagellomere dark brown .....	58
– Basal flagellomere yellow; frons always yellow .....	<i>A. gallagheri</i> Ebejer, 1996 <i>A. proximum</i> Ebejer, 1998 <i>A. scutellare</i> Ebejer, 1998
58. Frons with well-demarcated dark brown transverse band across the middle (Fig. 69C); abdominal tergites subshining with sparse microtomentum; sternites 2, 6–7 with well-sclerotized dark middle part .....	<i>A. palestinense</i> sp. nov.
– Frons, pale but if darkened this is irregular with diffuse margins; abdomen more densely microtomentose leaving very little shine; only sternite 7 with small sclerotized dark central area ...	<i>A. scutellare</i> Ebejer, 1998
59. Pleura and sides of apical 2–3 tergites mostly bright yellow (Figs 1A, 6A) .....	60
– Pleura and sides of apical 2–3 tergites dark with narrow yellow borders (Figs 37A, 67A) .....	61
60. Scutum with dark grey to black vittae; male tergite 4 with short obtuse angled postero-lateral projection (Fig. 1B) and tergite 5 with long acute process at postero-lateral margin on each side (Fig. 3C) .....	<i>A. acitergum</i> sp. nov.
– Scutum with brown to pale brown vittae; male tergite 4 with short acute angled antero-ventral margin on each side (Fig. 8A) and tergite 5 without any special development .....	<i>A. angulitergum</i> sp. nov.
61. Scutum with well-demarcated black vittae contrasting with the pale yellow areas even when scutum densely microtomentose .....	62
– Scutum brown or grey vittate with margins not usually well-demarcated and anteriorly vittae most often confluent to form a broad dark area over most of the scutum anterior to the transverse suture .....	63

62. Anepisternum and anepimeron mostly black; male epandrium with globular dorsal parts on each side (Fig. 67B); male postgonite short, narrow, pale brown and curved at apex; female unknown ... *A. notatum* Collin, 1949
- Anepisternum and anepimeron mostly yellow; male epandrium not appearing globular on each side; postgonite broad, dark brown and rounded at apex (Fig. 80); female similar to male except for hypopygial characters ... *A. sodalis* Collin, 1949
63. Males ..... 64
- Females ..... 69
64. Tergite 6 with 3 distinct, broad, pale setae at ventral margin on each side (Fig. 82C) ..... *A. trisetum* Ebejer, 1998
- Tergite 6 without such distinctive setae ..... 65
65. Tergite 6, laterally on each side with postero-medially directed projection ..... 66
- Tergite 6, laterally on each side without projection ..... 67
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- Posterior projection at lower lateral margin of tergite 6 long, narrow, and slightly sinuous (Ebejer 1995: 204, fig. 1) ..... *A. brevivittatum* Ebejer, 1995 (females of *A. approximatum* and *A. brevivittatum* cannot be reliably separated, and both species are very variable in colouration and pattern.)
67. Posterior 2 fronto-orbital setae longer and stronger than setae/setulae anterior to them; postgonite narrow and curved at apex; about as long as globular part of epandrium; pregenital sternite more or less hexagonal; aedeagus dark (Ebejer 1998: 222, figs 68–70) ..... *A. scutellare* Ebejer, 1998 (*A. notatum* Collin, 1949 may key out here if further material should be of a dark form)
- Posterior 2 fronto-orbital setae similar to setae anterior to them, all more or less gradually becoming shorter from back to front without a distinct gradation between the posterior two setae and those anterior to them ..... 68
68. Postgonite rather straight and pointed; pregenital sternite more or less oval, large, U-shaped and about half length of abdomen and with a long process on each posterior side directed antero-ventrally (Ebejer 2009: 401, fig. 46a–b) ..... *A. gallagheri* Ebejer, 1996
- Postgonite curved apically, less pointed; pregenital sternite small, about a quarter of length of abdomen, sclerotized into two rectangular halves each with a short lateral process directed postero-ventrally (Ebejer 1998: 220, fig. 64) ..... *A. proximum* Ebejer, 1998
69. Frons and basal flagellomere always yellow; setae and setulae on frons most often short and very pale, sometimes white; often difficult to see ..... *A. trisetum* Ebejer, 1998
- Frons and basal flagellomere various; setae and setulae on frons usually brown, longer; more distinctly visible ..... 70
- 70 Basal flagellomere dark brown ..... 71
- Basal flagellomere yellow; frons always yellow ..... *A. gallagheri* Ebejer, 1996  
..... *A. proximum* Ebejer, 1998  
..... *A. scutellare* Ebejer, 1998
71. Frons with demarcated dark brown transverse band across the middle; sternites 2, 6–7 broadly dark brown to black sclerotized at middle ..... *A. palestinense* sp. nov.
- Frons, if darkened, this is irregular with more diffuse margins; only sternite 7 with small, narrow, sclerotized area at middle ..... *A. scutellare* Ebejer, 1998

## List of species

### Notes on the descriptions

- All species have a row of very short fine setulae along the anterior margin of the frons immediately above the lunule, commonly four in number. These are sometimes folded ventrally with the shrinkage of the frons and may not be clearly visible. For this reason, they are not mentioned in the descriptions nor counted with the setulae scattered across the frons, since they carry no taxonomic value.
- The proepimeral seta/setula is present in all species of *Aphaniosoma*, but it is not mentioned in the descriptions because so often it is difficult to see, being hidden behind the margin of the occiput or a folded foreleg.
- All species have proclinate and diverging ocellar setae and all have yellow mouthparts. These characters are omitted from the descriptions.
- An approximate ratio of the gena to the eye is given with the eye viewed in profile with its long axis horizontal and the genal height taken below the middle of the eye.
- Scutal vittae show remarkable intraspecific variability in many species. The intensity of their colour can vary, e.g., from pale brown to almost black or from being only a deeper tint of yellow than the rest of the scutum to distinctly brown or grey. There are always three pairs of vittae (e.g., Fig. 4B) though not all necessarily darkened to the same extent, e.g., compare the middle vittae in Fig. 21 with those of the same species illustrated in the original description (Ebejer 2021a: 4, fig. 7). The middle pair is sometimes confluent especially anteriorly and may sometimes extend along the midline to the hind margin (e.g., Fig. 10) or even be separated only by a very narrow pale line (e.g., Fig. 38A). The usually longer vitta lateral to these is often confluent, anterior to the transverse scutal suture, with the vitta lateral to it and which runs along the supra-alar line, except for a short break at the suture (e.g., Figs 31A, 68A). In many species with a tendency for all vittae to coalesce anteriorly, the vittae that appear posteriorly vary in extent and can be short (e.g., Fig 22B). It is the commonest pattern for each species that is given in the key. Measurements of specimen length are based on the holotype in its dry state and taken from the anterior margin of the head to the wing base and added to that taken from the wing base to the tip of the abdomen, thus correcting for the flexion of the abdomen relative to the thorax. It is impossible to correct for any shrinkage as it is equally impossible to correct for expansion if specimens in alcohol were to be used for measurement. There is also variation of as much as about 20% between specimens of many species and so the size given here is meant only as a guide.
- Some specimens in alcohol are excluded from the type series where several dry paratypes are available. Some dry specimens are excluded if their condition is unsatisfactory; others, if only a few specimens originate from an area distant to that of the type series and are housed in other institutions.
- The descriptions are based on the holotype with supplementary description of the hypopygium in most cases from dissected paratypes.

## Taxonomy

Class Insecta Linnaeus, 1758  
Order Diptera Linnaeus, 1758  
Suborder Brachycera Schiner, 1862  
Superfamily Sphaeroceroidea J.F. McAlpine 1989  
Family Chyromyidae Hendel, 1916  
  
Genus *Aphaniosoma* Becker, 1903

*Aphaniosoma* Becker, 1903: 186

## Type species

*Aphaniosoma approximatum* Becker, 1903 (original designation).

*Aphaniosoma acitergum* sp. nov.

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Figs 1–3

## Diagnosis

A yellow species with black longitudinal scutal vittae obscured by pale yellowish white microtomentum (Fig. 2); 2 well-developed fronto-orbital setae. Male with the ventral margin of the 5<sup>th</sup> tergite produced into an acutely pointed projection; a narrow yellow surstylus and similar pregonite almost parallel to each other lying along the large black basiphallus. In many respects, the new species is very similar to *A. angulitergum* sp. nov., but in that species the main modification of the tergites is in tergite 6, whereas in *A. angulitergum* sp. nov. it is in tergite 5. The pregenital sternites are also distinctly different in shape, e.g., compare sternite 6 in Fig. 3D with sternite 6 in Fig. 8C. The species is also somewhat similar to *A. palestinense* sp. nov. particularly in the male hypopygium. It differs from it in its paler colouration and in the shape of tergites 4–6, which are unmodified in *A. palestinense*, in the modification of the pregenital sternites (compare Fig. 3D with Fig. 70C) and in details of the hypopygium, mainly in the shapes of the surstylus and gonites. Females of *A. acitergum* sp. nov. and *A. angulitergum* sp. nov. are difficult to separate from each other, but females of *A. palestinense* have a dark band across the frons.

## Etymology

The species epithet is a combination of the Latin ‘*acies*’ (‘point’) and ‘*tergum*’ and refers to the acutely pointed postero-ventral angle of tergite 5.

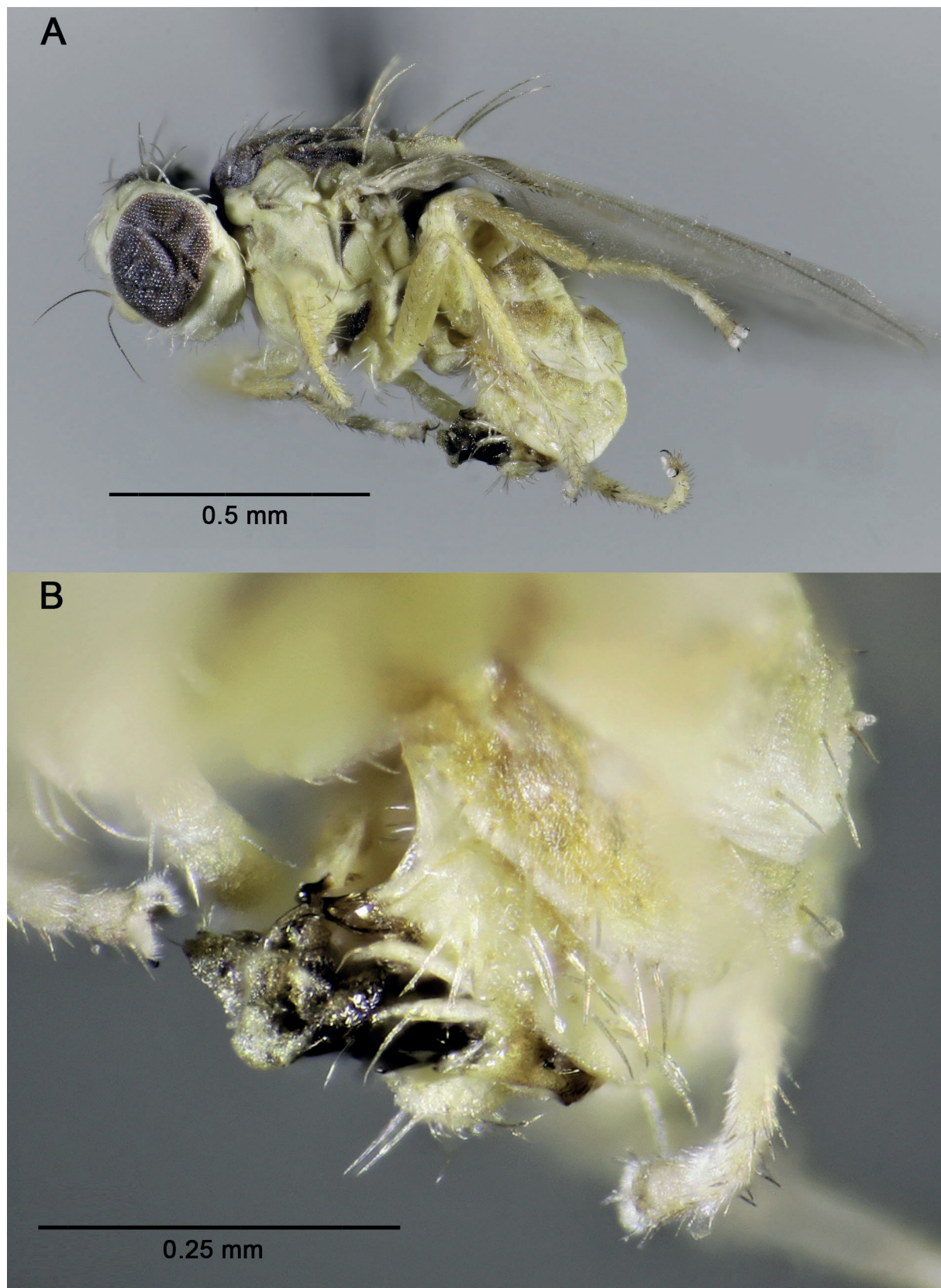
## Material examined

### Holotype

ISRAEL • ♂; En Zin; 13 May 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHNTAU 405818.

### Paratypes

ISRAEL • 1 ♀; same collection data as for holotype; SMNHNTAU • 1 ♀; same collection data as for preceding; on *T. parviflora*; SMNHNTAU • 1 ♀; same collection data as for preceding; 9 Mar. 1999; SMNHNTAU • 2 ♂♂, 2 ♀♀; ‘Enot Zuqim; 19 Mar. 1995; A. Freidberg leg.; SMNHNTAU • 2 ♀♀; ‘Iddan; 20 Jun. 1995; I. Yarom leg.; SMNHNTAU • 1 ♂; Rivivim; 1 May 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHNTAU • 4 ♂♂, 3 ♀♀; ‘Enot Zuqim; 3 Mar. 1998, on *Tamarix* sp.; N. Meltzer and V. Kravchenko



**Fig. 1.** *Aphaniosoma acitergum* sp. nov., ♂, holotype (SMNHNTAU 405818). **A.** Habitus, lateral view. **B.** Hypopygium in situ, lateral view.

leg.; SMNHTAU • 1 ♂; 'En Mor; 16 Mar. 1995; B. Merz leg.; MHNG • 5 ♂♂; Dead Sea, 'Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE.

### Description

MEASUREMENTS. Body length: male 1.2 mm, female 1.2 mm. Wing length: male 1.3 mm, female 1.3 mm.

#### Male (holotype)

HEAD. Yellow, ocellar triangle and occiput black but for a narrow postocular margin and small patch behind ocellar triangle; gena about half height of eye at middle and with scattered pale yellow setulae; a pair of vibrissal setae on each side; frons narrow at anterior margin about  $0.5 \times$  as wide as at level of anterior ocellus; ocellar setae about as long as anterior fronto-orbital, 2 well-developed fronto-orbital setae and 3 short setae anterior to these; about 6 setae on frons rather long and a distinctly longer pair in front of the anterior ocellus widely spaced and parallel; 1 inner and 1 outer vertical well-developed; paravertic setae short and convergent, postocular setae strong and in one row; face short, poorly sclerotized and depressed; median carina poorly developed; antenna yellow, pedicel paler than basal flagellomere and with distinct short seta dorsally; basal flagellomere with fine pubescence along anterior margin; basal  $\frac{1}{4}$  of arista yellow contrasting with black distal  $\frac{3}{4}$ .

THORAX. Yellow; scutum with black longitudinal vittae separated by narrow yellow lines and covered with thin yellow microtomentum; scutellum yellow with black spot on lateral margin at base; pleura yellow with black triangular patch on katepisternum; meron and mediotergite black; chaetotaxy: 1 postpronotal, 1 presutural, 1 incurved intra-postpronotal, 2 notopleurals, 0+3 intra-alars, the posterior one quite strong, 1 postalar, 4+5 dorsocentrals, 2+5 acrostichals with no prescutellar setae, 4 scutellars, 1 anepisternal, 1 katepisternal at upper posterior corner.

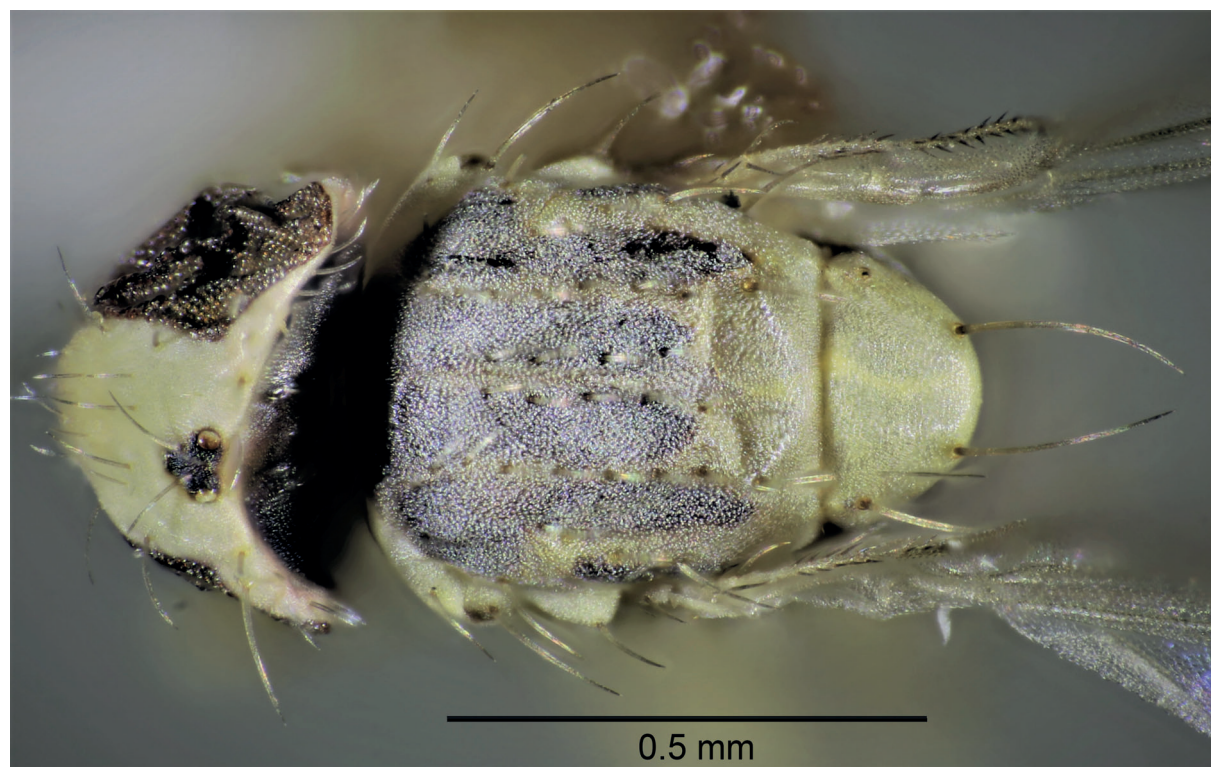
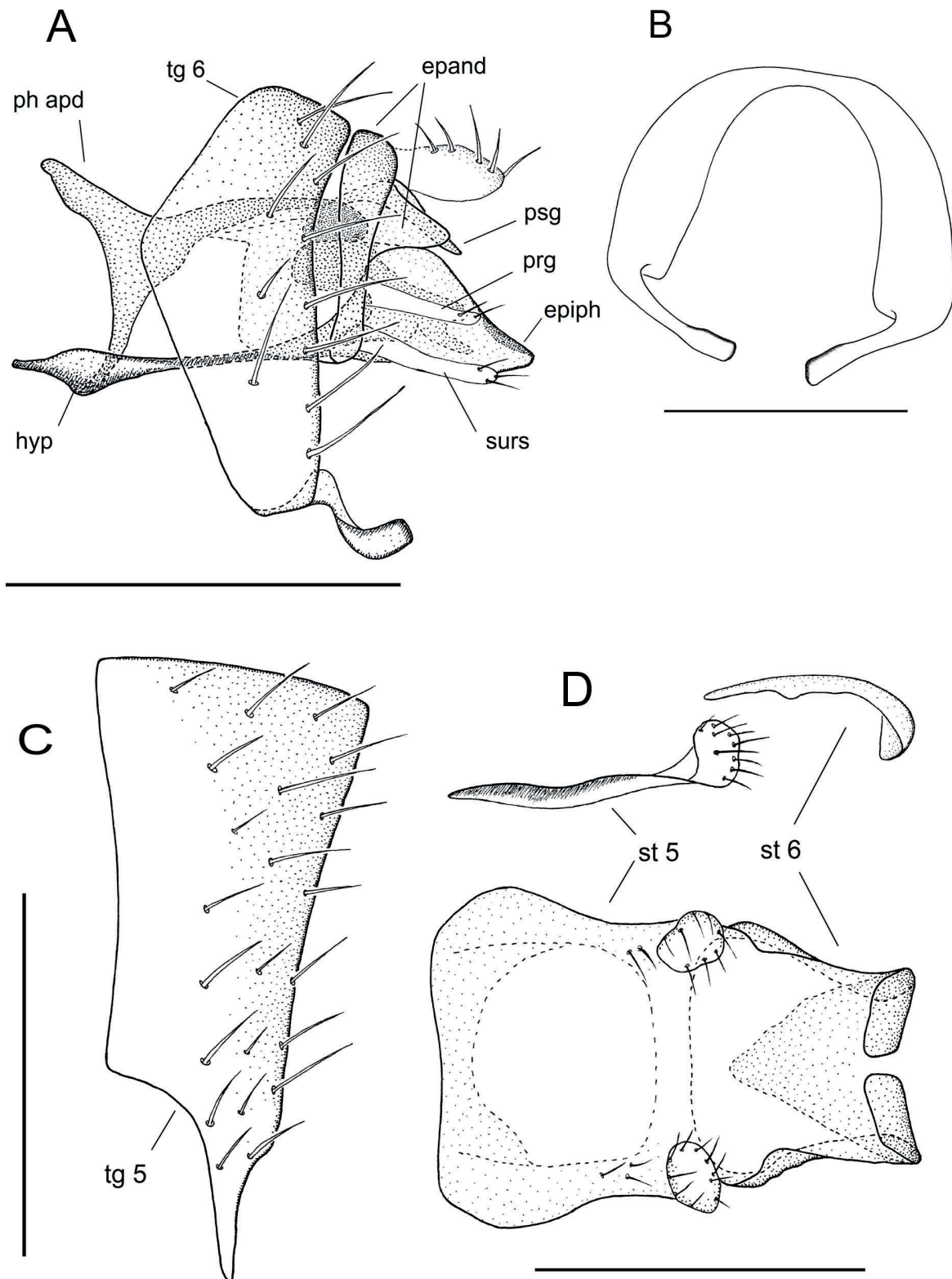


Fig. 2. *Aphaniosoma acitergum* sp. nov. ♂, paratype (SMNHTAU), thorax, dorsal view.



**Fig. 3.** *Aphaniosoma acitergum* sp. nov., ♂, paratype (SMNHTAU). **A.** Hypopygium, lateral view. **B.** Tergite 6, postero-ventral view. **C.** Tergite 5, lateral view. **D.** Pregenital sternites, top, lateral view, bottom, ventral view. Abbreviations: See Material and methods. Scale bars = 0.15 mm.

WING. Veins all pale yellow; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.5 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about  $1.4 \times$  as long as posterior crossvein, which is about  $0.3 \times$  as long as apical section of  $M_4$ . Haltere pale yellow.

LEGS. Fore femur with long setulae on posterior aspect; numerous pale yellow setulae scattered on all legs; apico-ventral seta on mid tibia present; claws black and pulvilli normal; tarsi yellow; hind trochanter not modified.

ABDOMEN (Fig. 1A). Basal tergites brown dorsally, becoming paler laterally; tergites 4–6 mostly yellow; tergite 5 (Fig. 3C) with acutely pointed projection at postero-ventral margin; tergite 6 (Fig. 3B), from ventral margin bearing a long narrow medially directed process that ends in a rectangular black margined lobe; tergites with fine pale setulae; sternites 5 and 6 modified (Fig. 3D).

HYPOPYGIUM (Figs 1B, 3A). Epandrium small and brown dorsally, bearing a narrow surstylus, setulose at tip; pregonite similar and visible externally without dissection in most specimens; aedeagus black with basiphallus/epiphallus shining black; cercus fused with the opposite side, pale yellow and with a pair of long subapical setae.

#### **Female**

As in male, but without secondary sexual characters; abdomen tending to be darker on posterior tergites.

#### **Variation**

The amount of darkening on pleura and the extent of pallor laterally on the tergites are variable in both sexes but more so in the female.

#### *Aphaniosoma aegyptium* sp. nov.

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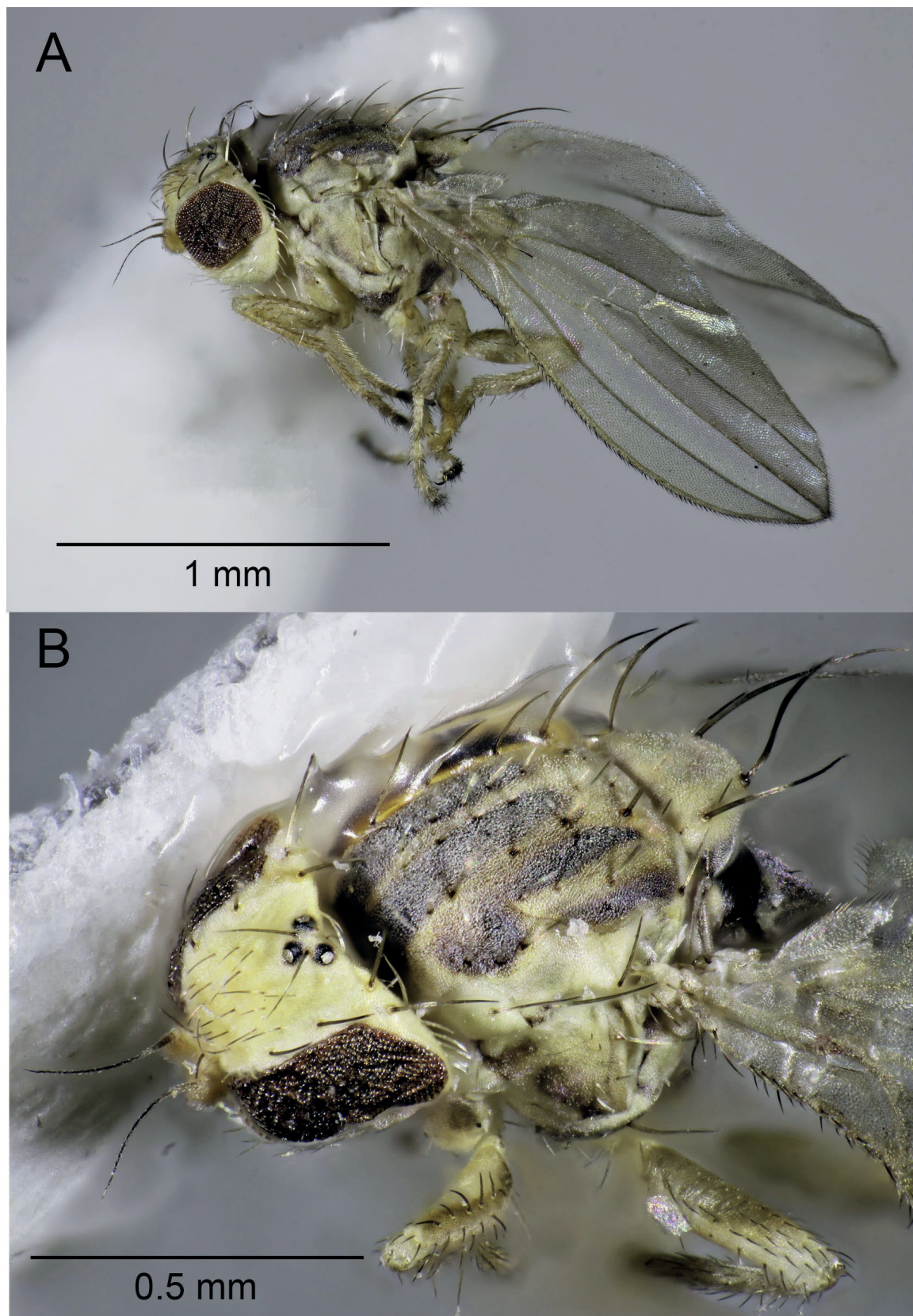
Figs 4–5

#### **Diagnosis**

A yellow species with black longitudinal scutal vittae (Fig. 4B) and strong prealar and dorsocentral setae, but no presutural intra-alar. Male with a long narrow surstylus curved postero-medially at apex and easily visible without dissection (Fig. 5B); male also with a short narrow projection on hind trochanter (Fig. 5A). Similar species: *A. hackmani* Lyneborg, 1973 and *A. harteni* Ebejer, 1996 have a similar hind trochanter in the male, but neither of these has a strong presutural intra-alar seta and they have differently shaped structures in the hypopygium, although the surstylus looks very similar. *A. verecundum* Ebejer, 1998 is similar to the new species in that it shares the same chaetotaxy and the appearance of the male 5<sup>th</sup> tergite, which is shorter dorsally compared to laterally, but there is no projection on the male hind trochanter. The hypopygial differences between the three species are subtle with regard to the surstylus (thickening at base and apical curvature), shape of tergite 6 and epandrium, but more clearly apparent in the shapes of sternites 5 and 6 (compare *A. aegyptium* Fig. 5B–C with *A. hackmani* Fig. 34B–C and Ebejer 2016: fig. 15a–b for *A. harteni*).

#### **Etymology**

The species epithet is the Latin '*aegyptium*', for 'Egyptian', and refers to the type locality.



**Fig. 4.** *Aphaniosoma aegyptium* sp. nov., ♂, holotype (CUSLP). **A.** Habitus, lateral view. **B.** Head and thorax, dorsal oblique view.

## Material examined

### Holotype

EGYPT • ♂; Kafr Elsheikh; 30.48° N, 31.14° E; 28 Mar. 1996; M. Barták leg.; garden vegetation; CUSLP.

### Paratypes

EGYPT • 3 ♀♀; same collection data as for holotype; CUSLP.

## Description

MEASUREMENTS. Body length: male 1.5 mm, female 1.6 mm. Wing length: male 1.7 mm, female 1.8 mm.

### Male, holotype

HEAD. Yellow except for black ringed ocelli (Fig. 4B); almost spherical; frons narrowed anteriorly: at level of antennae about  $0.7 \times$  as wide as at level of anterior ocellus; gena: narrow in front, deeper behind; viewed in profile, below middle of eye, about equal to height of eye and with numerous yellow setulae; occiput in profile narrowly visible behind eye; long postocular setulae in one row; 3 long white vibrissal setulae; face short, poorly sclerotized and depressed; median carina poorly developed; antenna yellow, pedicel paler than basal flagellomere and with distinct short seta dorsally; basal flagellomere with fine but distinct pubescence along anterior margin, as long as diameter of first segment of arista; first segment of arista yellow, second brown on basal  $\frac{1}{4}$ , black on apical  $\frac{3}{4}$ , with fine pubescence; chaetotaxy: 2 strong fronto-orbitals, paravericals short and crossed; 1 inner and 1 outer vertical, both strong; ocellars about as long as anterior fronto-orbital; about 16 short brown setulae across middle of frons all more or less of same size.

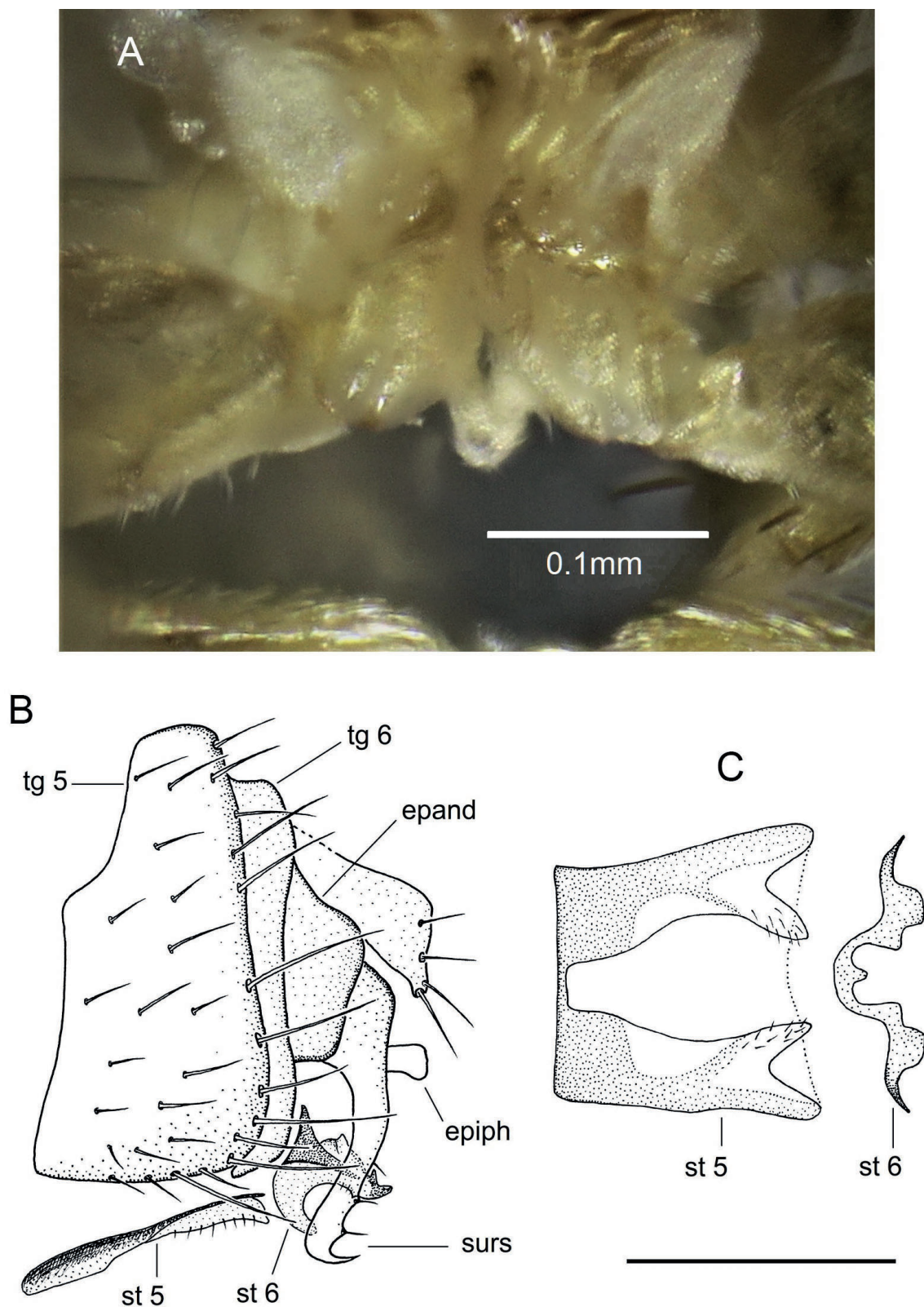
THORAX (Fig. 4B). Yellow; scutum with black longitudinal vittae and thin yellow microtomentum; vittae run between rows of setae; scutellum yellow with lateral dark brown spot along margin at base; mediotergite dark brown; pleura yellow with darker yellow on middle of katepisternum and meron; chaetotaxy: 1 postpronotal, 1 incurved intra-postpronotal, 1 long presutural, 2 notopleurals, 0+3 intralalars, 1 postalar, 1+3 dorsocentrals, 1+6 acrostichals with prescutellar setae, 4 scutellars, 1 anepisternal with 2 shorter setae below it, 1 katepisternal at upper posterior corner.

WING. Veins all pale yellowish brown; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.5 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about  $1.3 \times$  as long as posterior crossvein, which is oblique and is about  $0.5 \times$  as long as apical section of  $M_4$ . Haltere pale yellow.

LEGS. Fore femur with long setae on postero-dorsal aspect; numerous pale brown setulae scattered on all legs; apico-ventral seta on mid tibia present; claws black in apical half and pulvilli normal; 5<sup>th</sup> tarsomere of all legs black and 4<sup>th</sup> brown; hind trochanter modified with a posteromedial process that is narrow, short, blunt and bearing a few minute setulae at apex (Fig. 5A).

ABDOMEN. Tergites brown dorsally, becoming paler laterally and then darkening again along ventral margin; tergite 5 medially on dorsum narrower than on lateral margin; tergite 6 narrow; tergites with fine pale brown setulae; sternites sclerotized in middle third and pigmented brown; sternite 5 large, almost square, and with pigmented sclerotized lateral parts that fold ventrally and medially; sternite 6 small and of complicated structure (Fig. 5C).

HYPOPYGIUM (Fig. 5B). Epandrium small and pale, bearing long surstylus that is curved postero-medially at apex and bearing 3 fine setulae; hypandrium with narrow lateral arms at base (anterior), each broadening caudally and curving ventrally fusing with triangular sclerotized pregonite; postgonite long, narrow and pale and when viewed from posterior aspect it runs close and parallel to basiphallus



**Fig. 5.** *Aphaniosoma aegyptium* sp. nov., ♂, holotype (CUSLP). **A.** Hind trochanters, posterior view. **B.** Hypopygium, lateral view. **C.** Pregenital sternites, ventral view. Abbreviations: See Material and methods. Scale bars: B–C = 0.15 mm.

ending just short of posterior border of epandrium, hence not visible in lateral view; epiphallus clearly separated from distal part of membranous and largely translucent basiphallus; distiphallus pale, mostly membranous and irregularly cylindrical; cercus large and yellow.

### Female

As in male, but without secondary sexual characters and in two specimens the scutal vittae are pale brown.

### Variation

Other than minor chromatic variation, no significant variation noted in this short series of specimens.

### *Aphaniosoma angulitergum* sp. nov.

urn:lsid:zoobank.org:act:81FD092F-808C-4659-9774-EAF8DBF26413

Figs 6–8

### Diagnosis

Similar to *A. acitergum* sp. nov.; a yellow species with brown to pale brown longitudinal scutal vittae; 2 well-developed fronto-orbital setae. Male with the ventral margin of tergite 4 produced into an acute angled projection (similar to the foregoing species but shorter and broader) (Fig. 6A); a short narrow yellow surstylus subapically bifid and setulose on both branches; pregonite a little larger curved and apically with small black tip; large black sharply pointed epiphallus. *A. acitergum* sp. nov. and *A. palestinense* sp. nov. are the most similar species to *A. angulitergum* sp. nov. in this geographical area. They are much the same size with a similar colour pattern, although darker in *A. palestinense* sp. nov.; all three have a shiny black epiphallus usually clearly visible. They differ in the shapes of the surstylus and gonites. Other differences are outlined under *A. acitergum* sp. nov.

### Etymology

The species epithet is a combination of the Latin ‘*angulus*’ (‘angle’) and ‘*tergum*’ and refers to the angular extension of tergite 4.

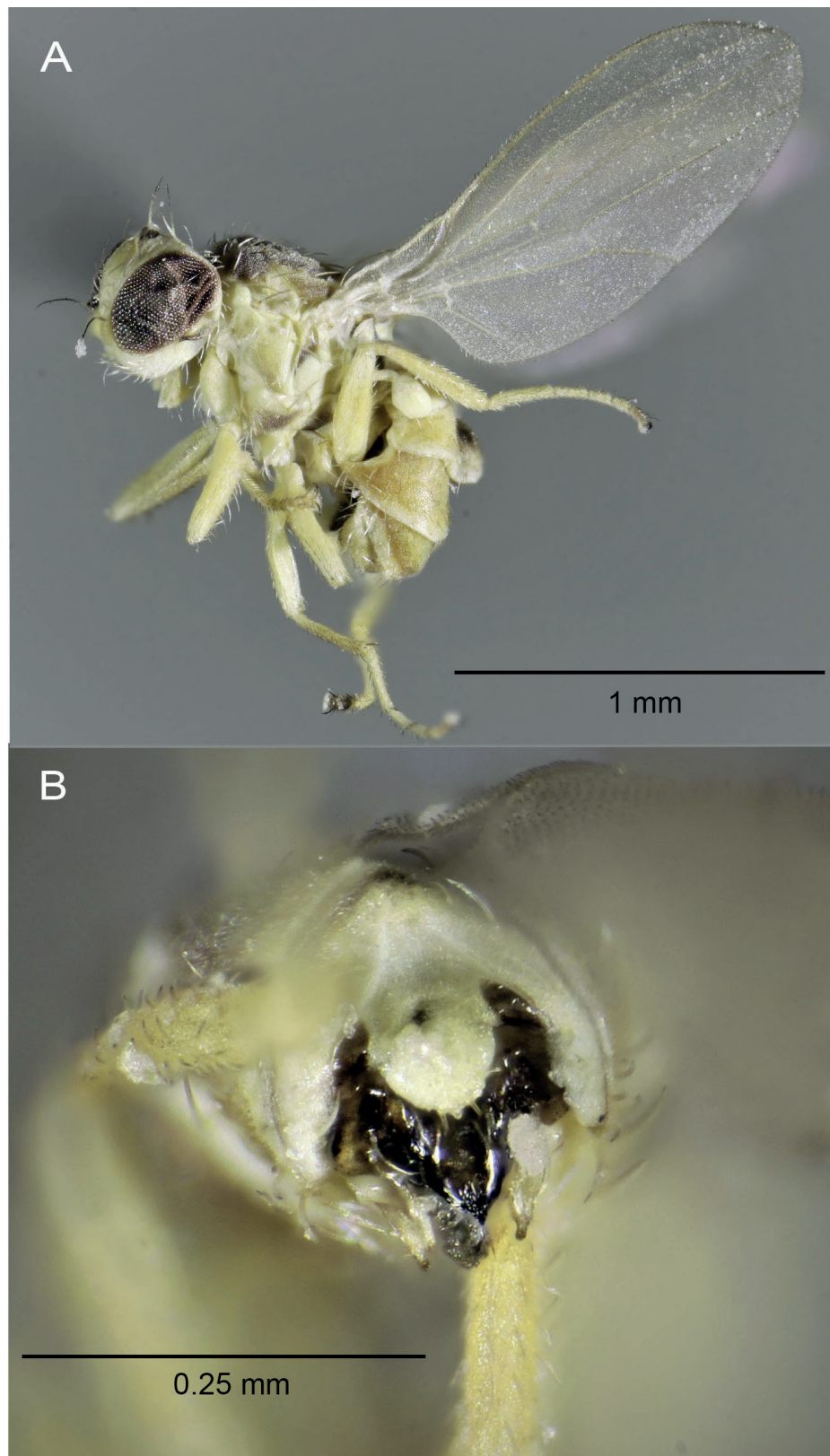
### Material examined

#### Holotype

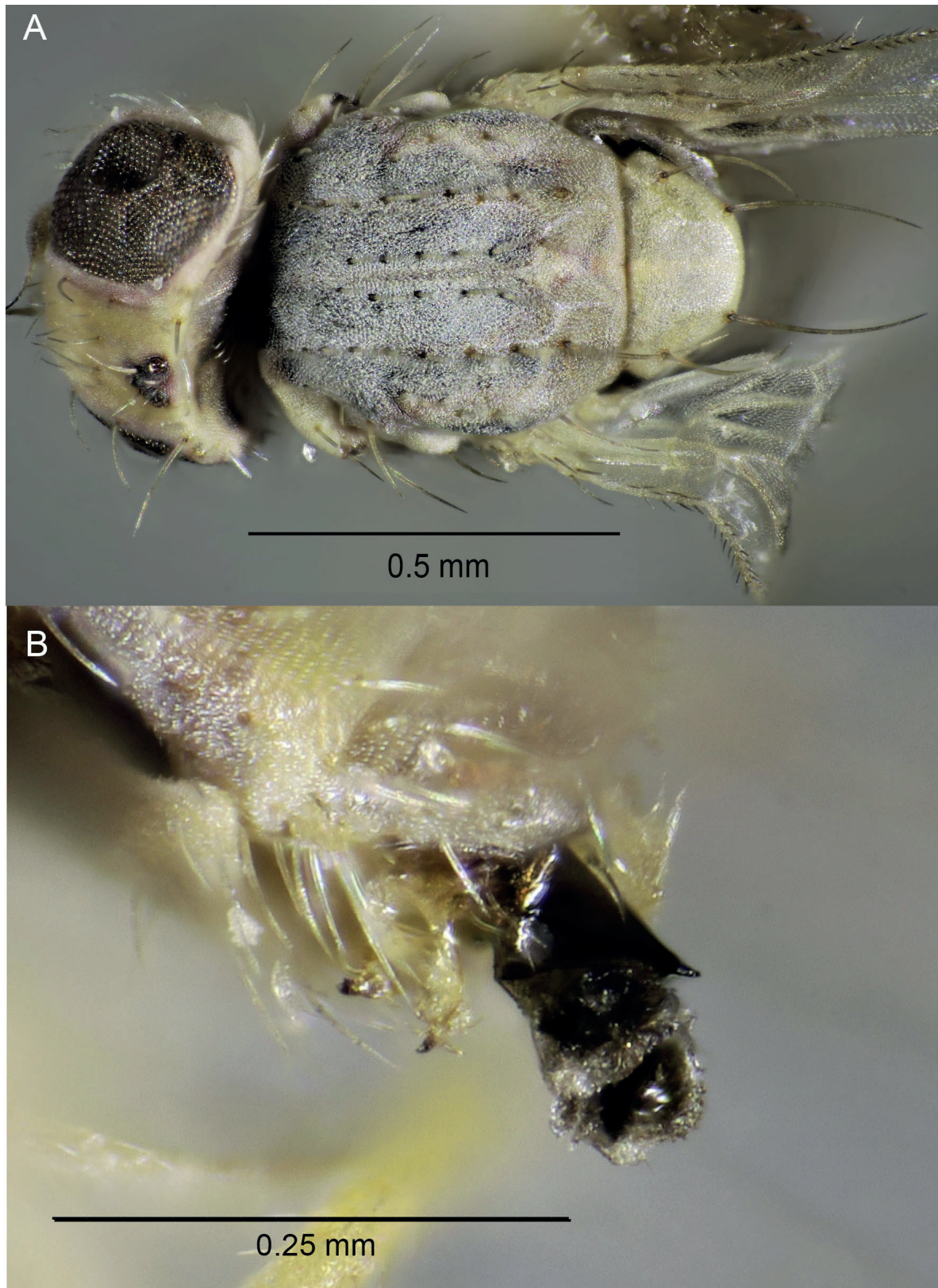
ISRAEL • ♂; ‘En Zin; 13 Nov. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHNTAU 405819.

#### Paratypes

ISRAEL • 3 ♂♂, 3 ♀♀; same collection data as for holotype; 13 Nov. 1999; SMNHNTAU • 1 ♂; ‘Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHNTAU • 1 ♂; ‘Enot Zuqim; 25 Aug. 1995; A. Freidberg leg.; SMNHNTAU • 3 ♂♂, 2 ♀♀; ‘Enot Zuqim; 3 Mar. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHNTAU • 1 ♂; ‘Enot Zuqim; 1 Feb. 1999; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHNTAU • 2 ♀♀; same collection data as for preceding; 3 Mar. 1999; SMNHNTAU • 4 ♀♀; same collection data as for preceding; 30 Mar. 1999; SMNHNTAU • 3 ♀♀; same collection data as for preceding; 28 Apr. 1999; SMNHNTAU • 1 ♂, 2 ♀♀; same collection data as for preceding; 24 Nov. 1999; SMNHNTAU • 2 ♂♂, 2 ♀♀; same collection data as for preceding; 12 Apr. 2000; SMNHNTAU • 2 ♀♀; same collection data as for preceding; on *Tamarix jordanis*; SMNHNTAU • 2 ♂♂, 1 ♀; ‘En Zin; 9 Feb. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHNTAU • 7 ♂♂, 1 ♀; same collection data as for preceding; 13 May 1999; SMNHNTAU • 3 ♂♂, 1 ♀; same collection data as for preceding; 13 Sep. 1999; SMNHNTAU • 1 ♂; ‘En Yahav; 24 Jul. 1995; A. Freidberg leg.; SMNHNTAU • 4 ♀♀; ‘En Zin; 15 Dec. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHNTAU



**Fig. 6.** *Aphaniosoma angulitergum* sp. nov., ♂, holotype (SMNHTAU 405819). **A.** Habitus, lateral view. **B.** Hypopygium in situ, posterior view.



**Fig. 7.** *Aphaniosoma angulitergum* sp. nov., ♂, paratype (SMNHTAU). **A.** Thorax, dorsal view. **B.** Hypopygium in situ, lateral view.

• 4 ♂♂, 4 ♀♀; same collection data as for preceding; 19 Oct. 1999; SMNHTAU • 1 ♀; same collection data as for preceding; 18 Jan. 2000; on *Tamarix parviflora*; SMNHTAU • 1 ♂, 1 ♀; same collection data as for preceding; 12 Apr. 1999; SMNHTAU • 3 ♀♀; same collection data as for preceding; on *Tamarix negevensis*; SMNHTAU • 2 ♂♂, 1 ♀; same collection data as for preceding; 14 Jan. 1999; SMNHTAU • 1 ♂, 1 ♀; same collection data as for preceding; on *Tamarix parviflora*; SMNHTAU • 1 ♂; Nahal Neqarot, N of Sappir; 6 Apr. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix parviflora* var. *sodomensis*; SMNHTAU • 1 ♀; same collection data as for preceding; 10 May 1998; on *Tamarix* sp.; SMNHTAU • 1 ♀; same collection data as for preceding; 8 Mar. 1999; SMNHTAU • 4 ♂♂, 2 ♀♀; same collection data as for preceding; 17 Oct. 1999; on *Tamarix nilotica*; SMNHTAU • 1 ♀; same collection data as for preceding; on *Tamarix parviflora*; SMNHTAU • 1 ♂; Nahal Zin; 2 Mar. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 1 ♀; same collection data as for preceding; 6 Apr. 1998; on *T. negevensis*; SMNHTAU • 1 ♂, 2 ♀♀; same collection data as for preceding; on *Tamarix* sp.; SMNHTAU • 1 ♀; same collection data as for preceding; 8 Jun. 1998; SMNHTAU • 2 ♂♂; Ne'ot haKikkar; 29 Mar. 1996; A. Freidberg leg.; SMNHTAU • 1 ♂; Ne'ot haKikkar; 3 Feb. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix deserti*; SMNHTAU • 8 ♂♂, 1 ♀; 'Iddan; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 6 ♀♀; 'Iddan; 20 Jun. 1995; I. Yarom leg.; SMNHTAU • 12 ♂♂, 2 ♀♀; Qalya; 2 Jan. 1997; A. Freidberg leg.; SMNHTAU • 7 ♂♂, 4 ♀♀; same collection data as for preceding; S. Paz leg.; SMNHTAU • 4 ♂♂, 1 ♀; 'En Mor; 11 Oct. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 10 ♂♂; Zomet Zohar; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂, 2 ♀♀; Sappir pond; 9 Jul. 1996; A. Freidberg leg.; SMNHTAU • 1 ♀; Nahal Qumeran; 3 Feb. 1999; N. Meltzer and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂; Elot; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♀; Ma'agan Mikha'el; 19 Apr. 2000; N. Meltzer and V. Kravchenko leg.; on *Tamarix tetragyna*; SMNHTAU • 1 ♀; same collection data as for preceding; 23 Apr. 1998; on *Tamarix* sp.; SMNHTAU • 1 ♂; Iddan spring; 19 Mar. 1995; B. Merz leg.; MHNG • 1 ♀; same collection data as for preceding; MHNG • 1 ♂; Western Negev, Nahal Lavan; 30°58' N, 34°24' E; 24 Mar. 2000; M.J. Ebejer leg.; shrubs on sand; MJE • 7 ♂♂, 1 ♀; N. Arava valley; 30°46' N, 35°14' E; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* and chenopods; MJE • 2 ♂♂, 7 ♀♀; Dead Sea, Zomet Zohar; 31°08' N, 35°21' E; alt. -338 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE • 5 ♂♂, 4 ♀♀; Dead Sea, 'Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE.

#### Other material

ISRAEL • 1 ♂, preserved in alcohol; Arava valley, Qetura [Ketura]; 50 km north of Eilat; 29°58'07" N, 35°03'38" E; alt. 126 m; 3–8 May 2013; Z.A. Yefremova leg.; Malaise trap; coll. code 140907; ZSM • 1 ♂; N. Arava valley; 30°46' N, 35°14' E; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* and chenopods; MJE.

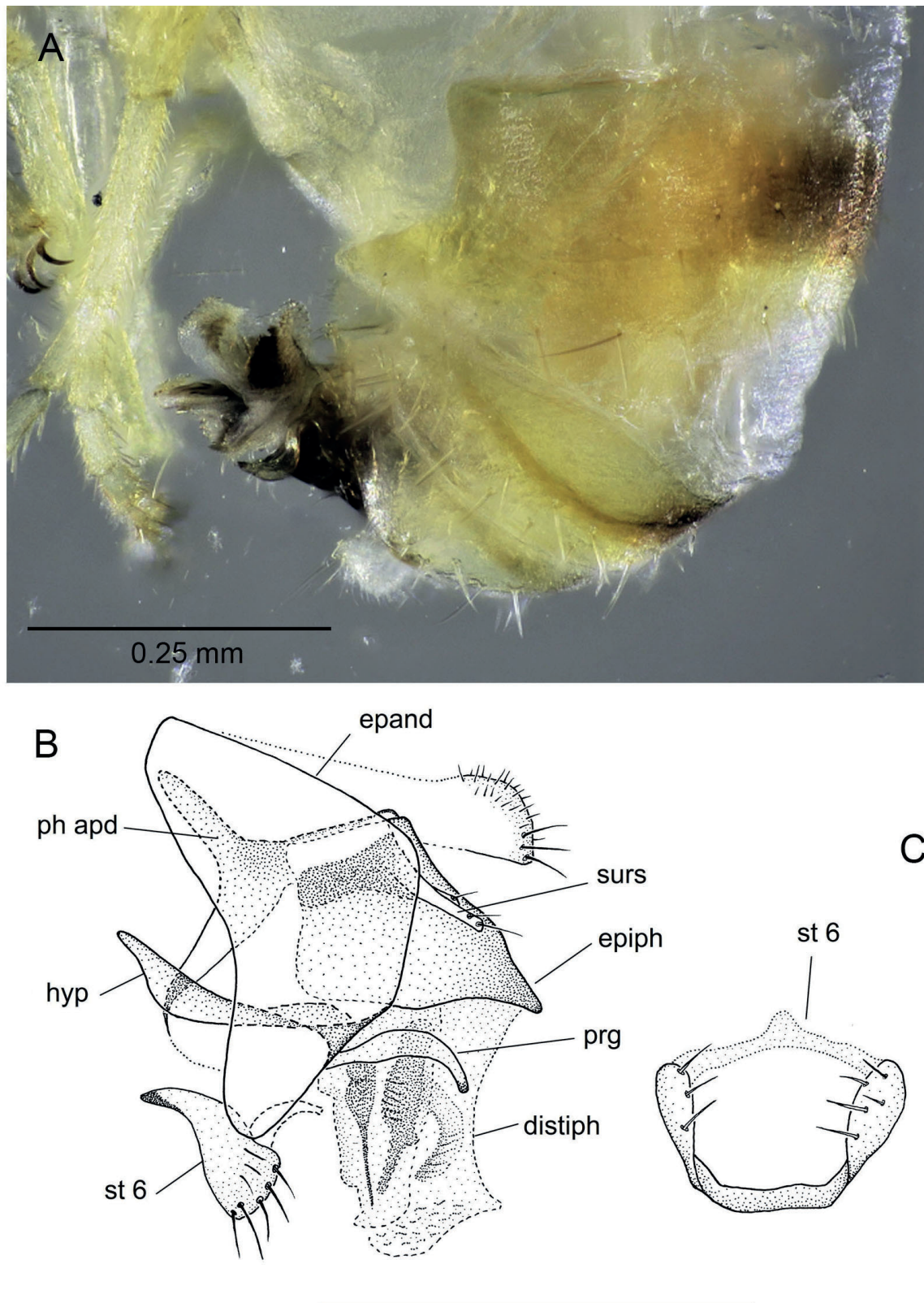
UNITED ARAB EMIRATES • 1 ♂, 1 ♀; Abu Dhabi, Al Dhafra, Houbara protected area; 28 Feb. 2017; A. Saji and A. van Harten leg.; Malaise trap; NMWC.

#### Description

MEASUREMENTS. Body length: male 1.2 mm, female 1.3 mm. Wing length: male 1.4 mm, female 1.4 mm.

#### Male (holotype)

HEAD. Yellow, including ocellar triangle and occiput, ocelli ringed in black; gena about  $\frac{2}{5} \times$  as high as eye at middle and with scattered pale yellow setulae; 2 vibrissal setae; frons narrow at anterior margin about  $0.5 \times$  as wide as at level of anterior ocellus; ocellar setae, weaker than anterior fronto-orbital, 2 well-developed fronto-orbital setae and 3 short setae anterior to these; about 10 very pale short setae on frons and a distinctly longer pair in front of the anterior ocellus narrowly spaced from each other; 1 inner and 1 outer vertical well-developed; paraverticlar setae short and convergent; postocular setae strong and in one row; face short, poorly sclerotized and depressed; median carina poorly developed;



**Fig. 8.** *Aphaniosoma angulitergum* sp. nov., ♂, paratype (MJE). **A.** Hypopygium in situ, extended in alcohol, lateral view. **B–C.** ♂, paratype (SMNHTAU). **B.** Hypopygium, lateral view. **C.** Sternite 6, ventral view. Abbreviations: See Material and methods. Scale bar: B–C = 0.15 mm.

antenna yellow, pedicel a little paler than basal flagellomere and with distinct short seta dorsally; basal flagellomere with fine pubescence along anterior margin; basal  $\frac{1}{4}$  of arista yellow contrasting with black distal  $\frac{3}{4}$ .

THORAX (Fig. 7A). Yellow; scutum with brown longitudinal vittae separated by narrow yellow lines and covered with pale yellow microtomentum; scutellum entirely yellow; pleura yellow with black triangular patch on katepisternum; meron and mediotergite black; chaetotaxy: 1 postpronotal, 1 presutural, 1 incurved intra-postpronotal, 2 notopleurals, 0+3 intra-alars, 1 postalar, 4+5 dorsocentrals, 1+4 acrostichals with no prescutellar setae, 4 scutellars, 1 anepisternal, 1 katepisternal at upper posterior corner.

WING. Veins all pale yellow; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.4 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about  $1.3 \times$  as long as posterior crossvein, which is about  $0.25 \times$  as long as apical section of  $M_4$ . Haltere pale yellow.

LEGS. Fore femur with long setulae on posterior aspect; numerous pale yellow setulae scattered on all legs; apico-ventral seta on mid tibia present; claws black, pulvilli normal; tarsi yellow; hind trochanter not modified.

ABDOMEN. Basal tergites brown dorsally, becoming paler laterally; tergites 4–6 mostly yellow; tergite 4 (Fig. 8A) with triangular projection at postero-ventral margin; tergites 5 and 6 unremarkable; tergites with fine pale setulae; sternite 6 modified (Fig. 8C).

HYPOPYGIUM (Figs 7B, 8). Epandrium large, bearing a small narrow surstylus that is bifid subapically with both branches setulose; pregonite larger, sickle-shaped and black tipped, often visible externally without dissection in most specimens; postgonite not identified and may be absent; aedeagus black with epiphallus shining black and apically acutely pointed; cercus pale yellow, fused with the opposite side.

### Female

As in male, but without secondary sexual characters.

### Variation

Chromatic variation in this species is significant with some specimens having darker scutal vittae and others having only a pale brown mark on the katepisternum; abdominal tergites can be almost entirely yellow or mostly brown. In all cases, however, the brown bands on the tergites tend to become paler laterally on the posterior tergites of the abdomen. The curvature and thickness of the pregonite is also a little variable.

### Distribution

Israel, United Arab Emirates.

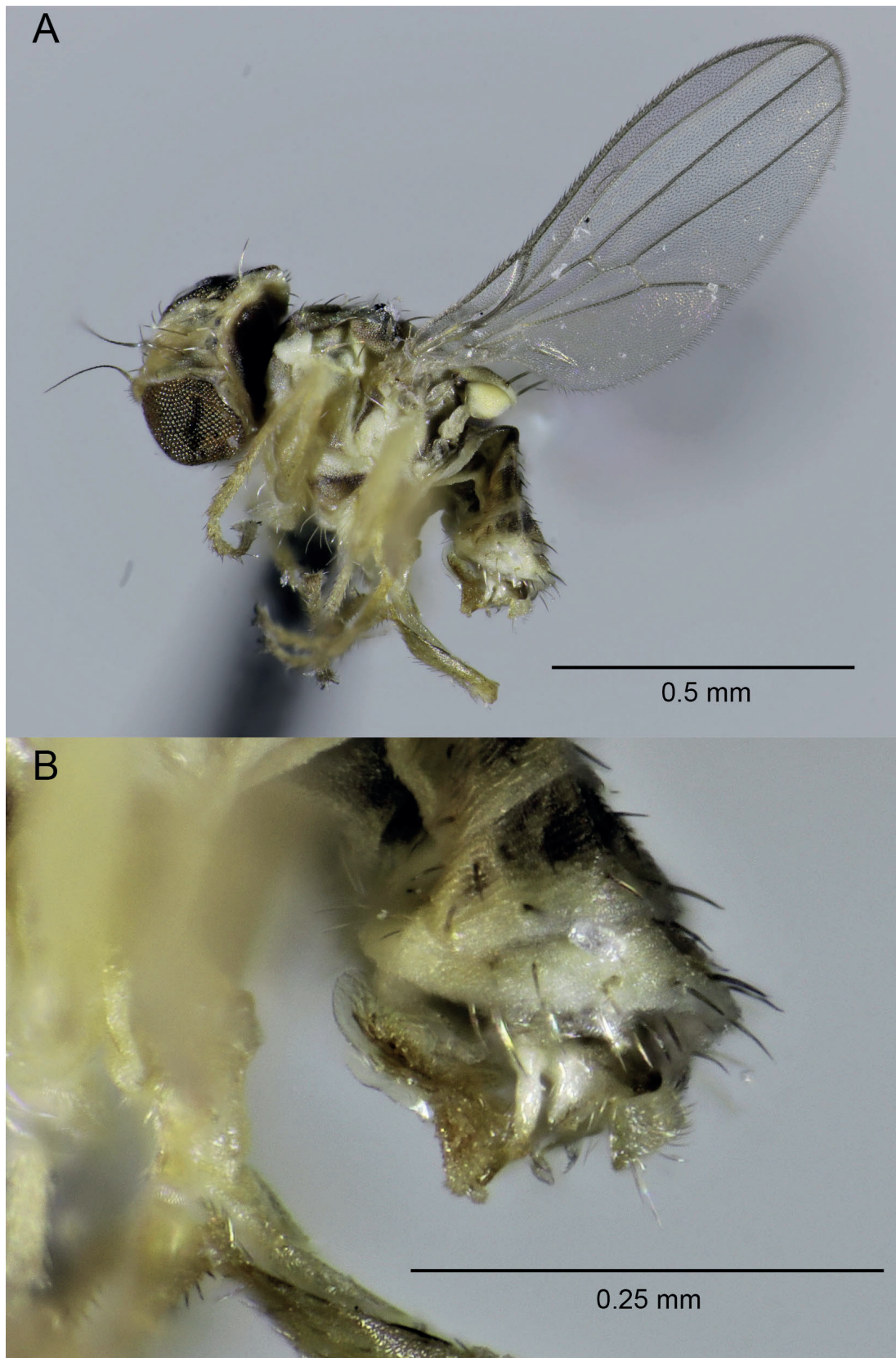
### *Aphaniosoma approximatum* Becker, 1903

Figs 9–10

*Aphaniosoma arabicum* Ebejer, 1996: 287, figs 3b, 4. Synonymized by Ebejer 2008: 683.

### Material examined

EGYPT • 1 ♂, 2 ♀♀; Cairo, Golo Island, along Nile river; 29.58° N, 31.15° E; 21 Mar. 1996; M. Barták leg.; CULSP • 1 ♂, 1 ♀; same collection data as for preceding; MJE • 3 ♂♂, 6 ♀♀; Cairo, El-Marg; 30.16° N, 31.23° E; 29 Mar. 1996; M. Barták leg.; margin of field; CULSP • 1 ♀; Cairo, 20 km S;



**Fig. 9.** *Aphaniosoma approximatum* Becker, 1903, ♂ (MJE). **A.** Habitus, lateral view. **B.** Hypopygium in situ, lateral view.

29.52° N, 31.15° E; 31 Mar. 1996; M. Barták leg.; riverbank; CULSP • 2 ♂♂, 1 ♀, preserved in alcohol; Alexandria, Abu Kir; 20 Oct. 2003; P. Gatt leg.; beach, wrack; MJE • 3 ♂♂, 2 ♀♀, preserved in alcohol; Alexandria, Ras Rashid; 21 Oct. 2003; P. Gatt leg.; beach; MJE.

ISRAEL • 3 ♂♂; Ne'ot haKikkar; 25 Jul. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂; 'En Gedi/N. Arugot; 31 May 2000; B. Merz leg.; MHNG.

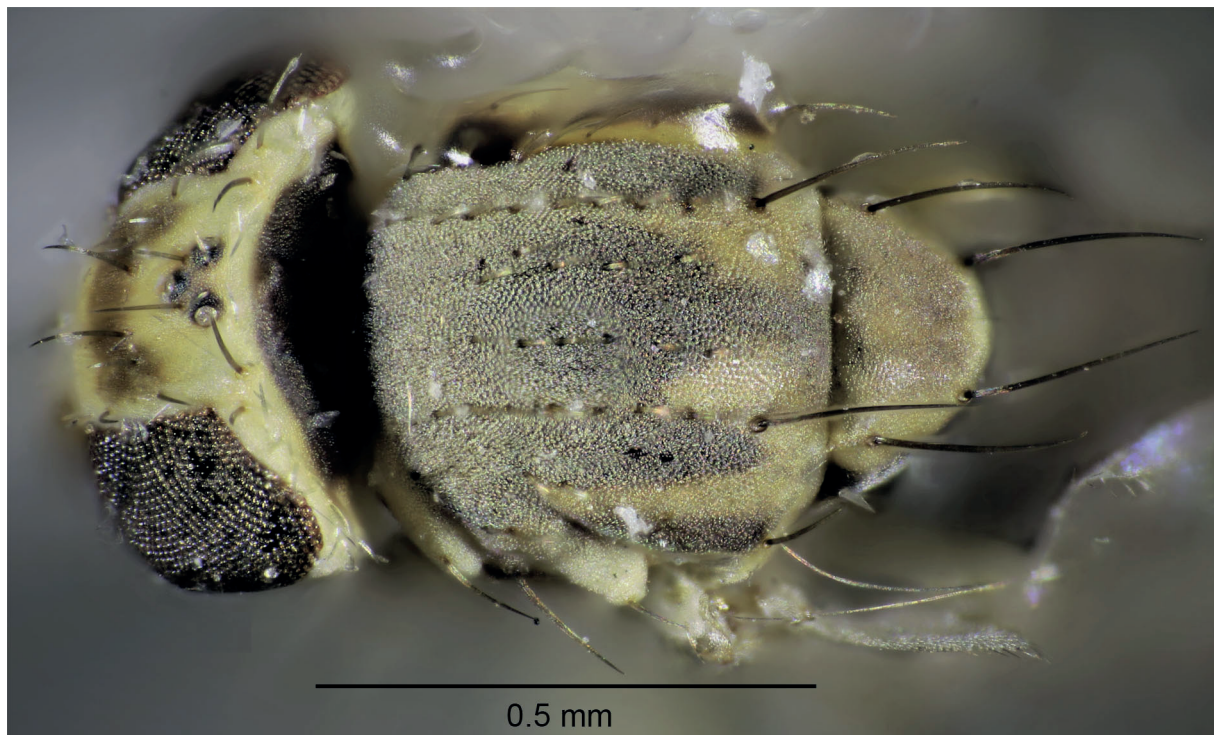
JORDAN • 1 ♂, 1 ♀, preserved in alcohol; Wadi Rum, Seitental [side valley]; 29°34.29' N, 35°24.75' E; 14 Oct. 2010; J.-H. Stuke leg.; J-HS.

SAUDI ARABIA • 13 ♂♂, 48 ♀♀, preserved in alcohol; Jazan, Farasan Island, Aziz Yousef village; 16°40' N, 42°50' E; 6 Mar. 2017; Malaise trap; H.A. Dawah leg.; NMWC.

YEMEN • 9 ♂♂, 5 ♀♀; Ta'Izz; 5 Jan.–2 Feb. 1998; A. van Harten and M. Mahyoub leg.; light trap; NMWC • 4 ♂♂, 10 ♀♀; Ta'Izz; Aug. 1999; A. van Harten and A. Awad leg.; light trap; NMWC.

### Remarks

*A. approximatum* Becker, 1949 was re-described (Ebejer 2008) with illustrations supplementary to those of Collin (1949) and Ebejer (1998). As with many similar species, it is quite variable in the intensity of darkening of the scutal vittae, which in some specimens coalesce anterior to the scutal suture. The lateral aspect of the abdominal tergites show a variable extent of yellow merging with the brown dorsally. It is a species with a distinct pair of setae in front of the anterior ocellus clearly longer than other setae on the frons. Although not easy to identify, the overall pallor of the male hypopygium, with pale brown, narrow, curved postgonites, a pointed epiphallus and a mostly translucent bilobed distiphallus, should suggest this species. Similar species are: *A. brevivittatum* Ebejer, 1995, which has a much longer ventro-lateral projection on tergite 6 twisted along its axis and a longer pregonite (Ebejer 1995: 204,



**Fig. 10.** *Aphanosoma approximatum* Becker, 1903, ♀ (MJE), head and thorax, dorsal view.

fig. 1); *A. claridgei* Ebejer, 1995, which has a blunt slightly upcurved apex of the epiphallus, black postgonite and aedeagus, and very different pregenital sternites (Ebejer 1995: 204, figs 2–3; 1998: 204, figs 16–17); *A. proximum* Ebejer, 1998, which has a pointed epiphallus, dark postgonite, smaller and darker distiphallus and a different pregenital sternite (Ebejer 1998: 220, figs 63–64); *A. suboculicauda* Frey, 1958, which has a longer more pointed ventro-lateral projection of sternite 6, pale structures of the hypopygium including the aedeagus, and a triangular sternite 6 (Ebejer 2009: 408, fig. 52a–c); and *A. trisetum* Ebejer, 1988, which has as its most distinct character the 3 long, broad, white setae at the ventral margin of tergite 6 (Fig. 82C). Fig. 10 shows a specimen very similar to the type and Fig. 9 B shows the extruded aedeagus, which matches the figures of the holotype given previously by the author (Ebejer 1998: 200, figs 5–6). Few specimens have been collected in Israel. This might be due to the species having a greater affinity for date palm groves than for *Tamarix* trees (Baba Aissa 2017).

### Distribution

Algeria, Cape Verde Islands, Egypt, Ethiopia, Morocco, Niger, Oman, Saudi Arabia, Turkey, United Arab Emirates (Becker 1903; Ebejer 1996, 2008, 2009, 2018; Baba Aissa *et al.* 2017; Ebejer & Barták 2019). New records for Israel, Jordan and Yemen.

### *Aphaniosoma brevivittatum* Ebejer, 1995

### Remarks

A species that typically inhabits low-growing vegetation in saltmarsh or brackish water habitats. Described from Greece and later recorded from Turkey (Ebejer & Barták 2019) and from Cyprus with photographs of the adult (Ebejer 2021a). The name '*brevivittatum*' was chosen for the type series where the specimens had short scutal vittae. However, this pattern is not consistent and many specimens seen subsequently have an almost uniformly grey scutum. For similar species see under *A. approximatum* above.

### Distribution

Cyprus, Greece, Turkey (Ebejer 1995; Ebejer & Bartak 2019; Ebejer 2021a).

### *Aphaniosoma brunnipes* Ebejer, 1996

Fig. 11

### Material examined

#### Paratype

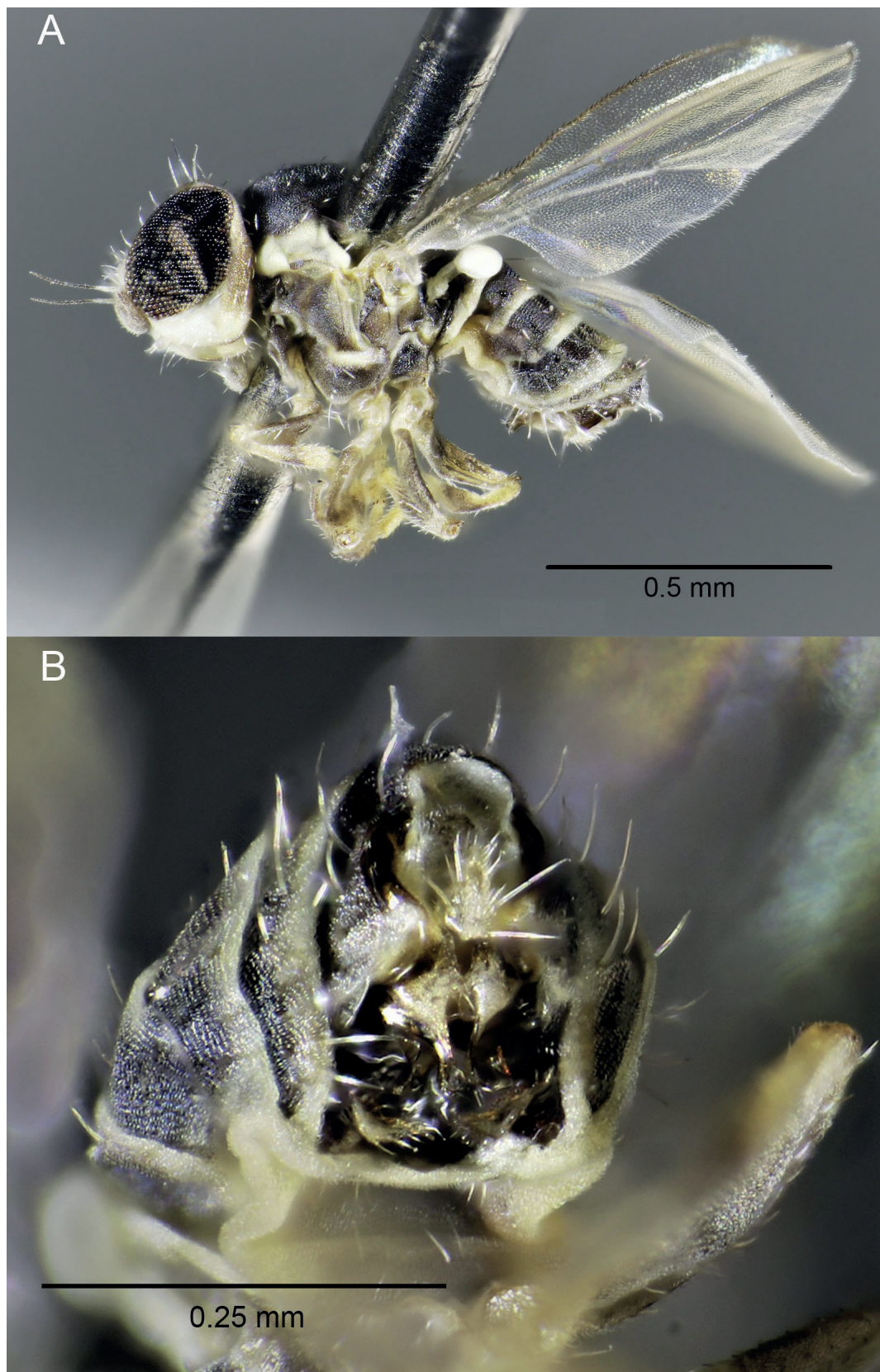
OMAN • 1 ♂; Muscat, Azaiba; 9 Feb. 1989; M.J. Ebejer leg.; NMWC.

### Remarks

This is one of a very few species with extensively darkened legs (Fig. 11A). It is known only from the type series. Both sexes have a dark band across the frons, dark brown basal flagellomere and brown palpus. The similar species *A. nigripes* Ebejer, 2016 from Morocco has a yellow palpus, yellow basal flagellomere in the male, a slender postgonite and a differently shaped sternite 6 (Ebejer 2016: 226, figs 4–6). *Aphaniosoma captiosum* sp. nov. has the ventro-lateral margin of tergite 6 similar to that in *A. nigripes*; it differs from both species in the postgonite, which is thicker and ends in a white seta-like tip (Fig. 13A), and in the shape of sternites 5 and 6 (Fig. 14C).

### Distribution

Oman (Ebejer 1996).



**Fig. 11.** *Aphaniosoma brunnipes* Ebejer, 1996., ♂, paratype (NMWC). **A.** Habitus, lateal view. **B.** Hypopygium, postero-ventral view.

*Aphaniosoma captiosum* sp. nov

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Figs 12–14

**Diagnosis**

A very dark, almost black species with greyish microtomentum (Fig. 12A–B); basal flagellomere yellow in male and brown in female; femora and usually tibiae brown; 3 distinct but not strong fronto-orbital setae. Male with large shining black hypopygium and a thick set postgonite ending in a white seta-like tip. Females usually with dark transverse band across middle of frons and apical 2–3 tarsomeres also dark. *Aphaniosoma brunnipes* from Oman and the Moroccan *A. nigripes* Ebejer, 2016 are very similar to the new species externally and in the in situ appearance of the hypopygium, but differ in details of the hypopygium and the pregenital sternites (see note under *A. brunnipes* above).

**Etymology**

The species epithet is derived from the Latin ‘*captiosus*’ meaning ‘deceptive’, and refers to the great similarity of this species to *A. brunnipes* Ebejer, 1996 described from Oman.

**Material examined**

**Holotype**

ISRAEL • ♂; ‘Enot Zuqim; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU 405820.

**Paratypes**

ISRAEL • 7 ♂♂, 4 ♀♀; ‘Enot Zuqim; 25 Jul. 1995; I. Yarom leg.; SMNHTAU • 1 ♀; ‘Enot Zuqim; 3 Mar. 1999; N. Meltzer and V. Kravchenko leg.; on *Tamarix jordanis*; SMNHTAU • 1 ♂; same collection data as for preceding; 22 Apr. 1998; SMNHTAU • 1 ♀; same collection data as for preceding; on *Tamarix nilotica*; SMNHTAU • 1 ♂; same collection data as for preceding; 12 Apr. 2000; SMNHTAU • 1 ♂; Nahal Neqarot; 17 Oct. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂; ‘En Zin; 13 Nov. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHTAU • 1 ♀; same collection data as for preceding; 19 Oct. 1999; SMNHTAU • 1 ♀; Nahal Zin; 5 May 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 3 ♂♂; Sappir pond; 9 Jul. 1996; A. Freidberg leg.; SMNHTAU • 1 ♂; 19 Mar. 1995; B. Merz leg.; MHNG • 1 ♀; N. Arava valley; 30°46' N, 35°14' E; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* and chenopods; MJE • 3 ♂♂; Dead Sea, ‘Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE • 1 ♂; Dead Sea, Zomet Zohar; 31°08' N, 35°21' E; alt. -338 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE.

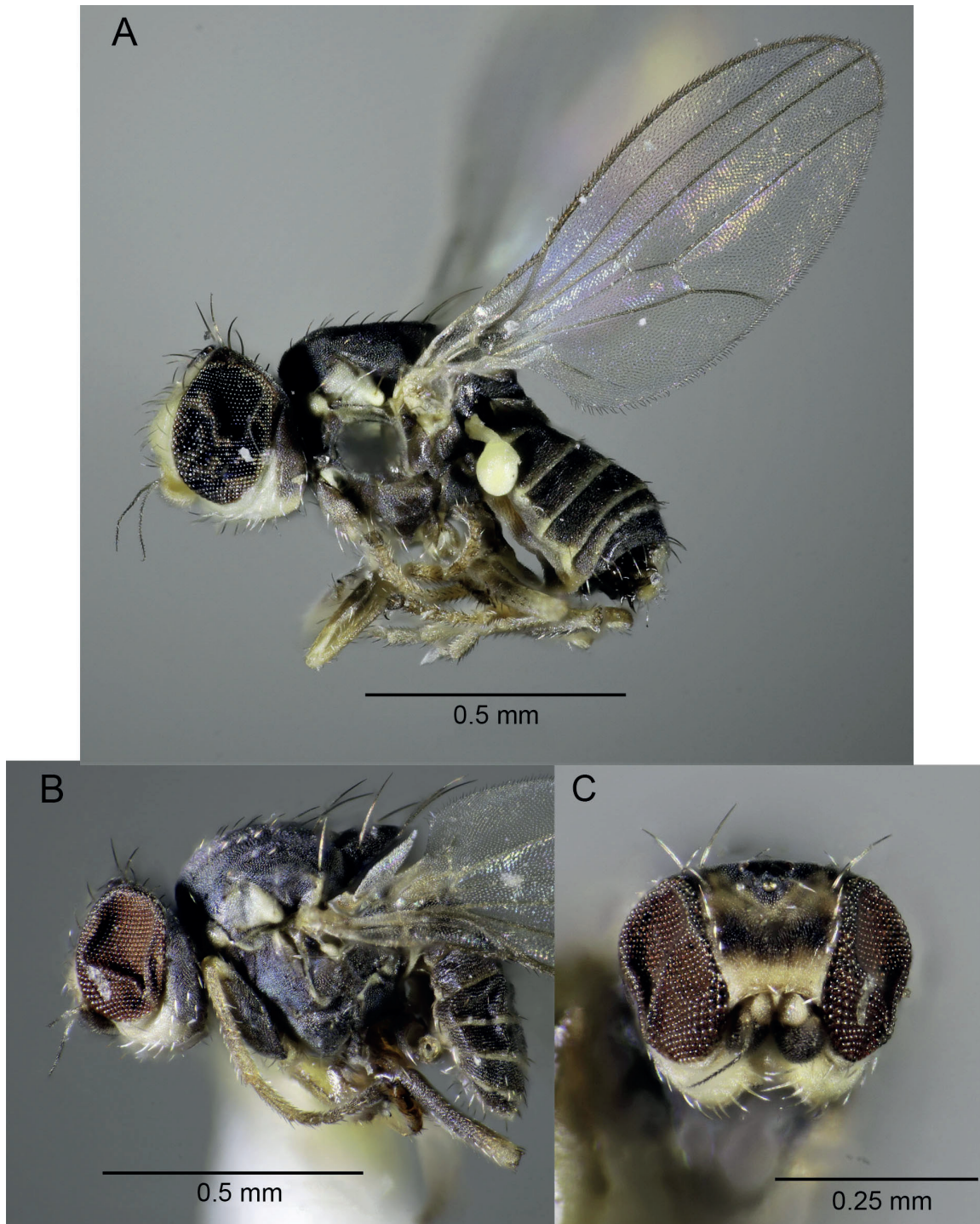
**Description**

MEASUREMENTS. Body length: male 1.2 mm, female 1.3 mm. Wing length: male 1.4 mm, female 1.5 mm.

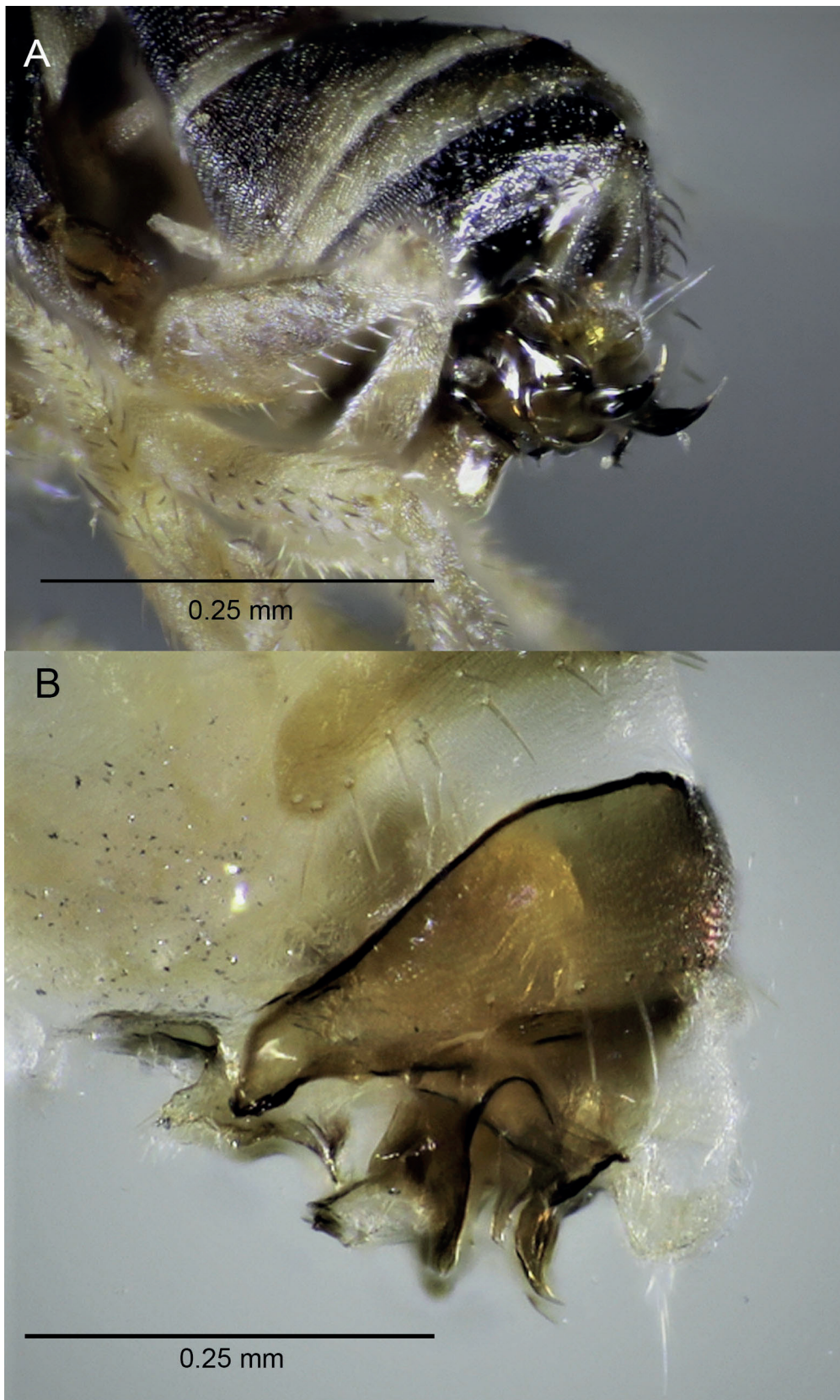
**Male (holotype)**

HEAD. Yellow on frons and anterior part of gena, otherwise, ocellar triangle, occiput and posterior 1/3 of gena black; gena about 1/3 height of eye at middle and with scattered pale yellow setulae; 2 vibrissal setae on each side not much longer than other setae along buccal margin; frons narrow at anterior margin, about 0.7 × as wide as at level of anterior ocellus; ocellar setae weaker than posterior fronto-orbital, 3 distinct but not especially strong fronto-orbital setae and 2 short setulae anterior to these; about 16 pale short setulae on frons without a distinctly longer pair in front of the anterior ocellus; 1 inner and 1 outer vertical well-developed; paraverticlar setae short and convergent; postocular setae short and in one row; face short, poorly sclerotized and depressed; median carina distinct to clypeus; antenna yellow, pedicel a little paler than basal flagellomere and with distinct short seta dorsally; basal flagellomere with fine pubescence along anterior margin; basal 1/5 of arista yellow contrasting with black distal portion.

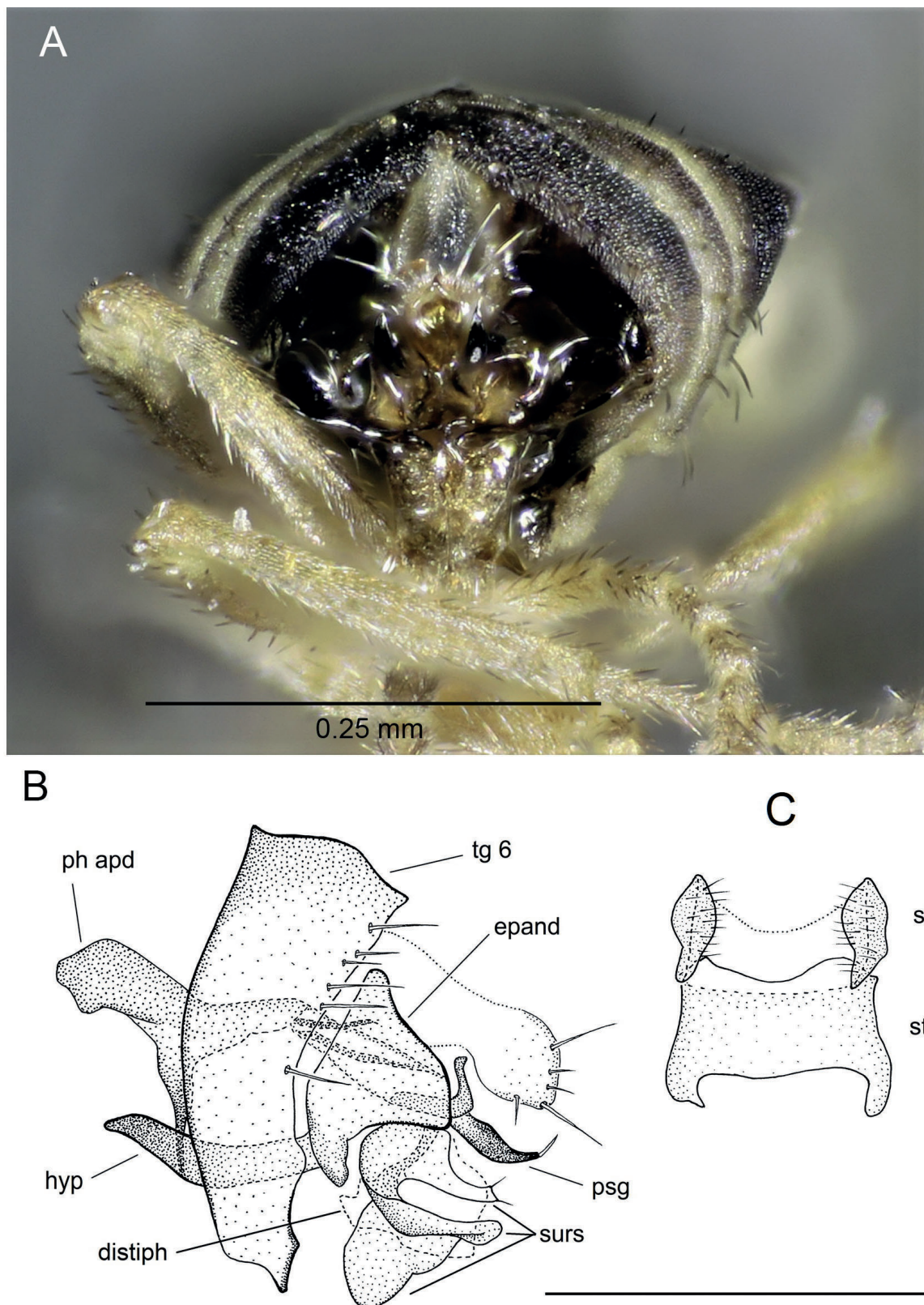
THORAX (Fig. 12A–B). Black and almost uniformly greyish micotomentose; postpronotal lobe with yellow spot and notopleuron yellow, scutellum black; pleura black with very narrow yellow margins to sclerites; chaetotaxy: 1 postpronotal, 1 presutural, 1 very short and indistinct incurved intra-postpronotal, 2 notopleurals, 0+3 intra-alars, 1 postalar, 1+6 dorsocentrals with only the posterior one strong, 1+3 acrostichals with no prescutellars, 4 scutellars, 1 anepisternal, 1 katepisternal at upper posterior corner.



**Fig. 12.** *Aphaniosoma captiosum* sp. nov. A. ♂, holotype (SMNHTAU 405820), habitus, lateral view. B–C. ♀, paratype (SMNHTAU). B. Habitus, lateral view. C. Head, frontal view.



**Fig. 13.** *Aphaniosoma captiosum* sp. nov., hypopygium in situ. **A.** ♂, holotype (SMNHTAU 405820), lateral view. **B.** ♂, paratype (MJE), extended in alcohol, lateral view.



**Fig. 14.** *Aphanosoma captiosum* sp. nov., ♂, paratype (SMNH-TAU). **A.** Hypopygium in situ, posterior view. **B.** Hypopygium, lateral view. **C.** Pregenital sternites, ventral view. Abbreviations: See Material and methods. Scale bar: B–C = 0.15 mm.

WING. Veins all brown; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.6 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about  $1.2 \times$  as long posterior crossvein, which is about  $0.5 \times$  as long as apical section of  $M_4$ . Haltere pale yellow.

LEGS. Femora dark greyish brown over most of their length, tibiae variably darkened at middle; fore femur with long setulae on posterior aspect; numerous pale setulae scattered on all legs; apico-ventral seta on mid tibia present; claws black, pulvilli normal; tarsomeres yellow; hind trochanter not modified.

ABDOMEN (Fig. 12A). Tergites black with narrow yellow hind margins, bearing very short pale setulae almost exclusively on the hind margins; sternites 5 and 6 modified.

HYPOPYGIUM (Figs 13, 14A–B). Epandrium rather trapezoidal in shape (seen laterally), bearing a large multilobed surstylus; pregonite small, dark and curved dorsally; postgonite black with a white tip; aedeagus difficult to define; cercus pale yellow, fused with the opposite side.

#### Female

Similar to male, but generally more extensively dark on legs, including the apical 2 to 3 tarsomeres, and across the middle of the frons; basal flagellomere dark brown to black (Fig. 12C).

#### Variation

There is some chromatic variation in this species particularly on the frons and tibiae with regard to the extent of darkening. Also, the pale hind margins of the abdominal tergites vary a little in width.

#### Distribution

Israel.

#### *Aphaniosoma claridgei* Ebejer, 1998

#### Remarks

A species widespread in coastal localities around the Mediterranean that is difficult to identify without examination of the male hypopygium as there are several species almost identical to it in the same geographical area that are often collected with it. Some comparative details are given under *A. approximatum* above. A photograph of the habitus is given in Ebejer (2021a).

#### Distribution

Cyprus, France, Greece, Italy (including Sardinia and Sicily), Malta, Morocco, Spain (Balearic Islands), Tunisia, Turkey (Ebejer 1995, 1998, 2005, 2016, 2021a; Ebejer & Deeming 1997).

#### *Aphaniosoma creperum* Collin, 1949

Figs 15–16

#### Material examined

##### Lectotype (here designated)

EGYPT • ♂; Siwa Oasis; 24 Apr. 1935; J. Omer-Cooper leg., Armstrong College Expedition; NHMUK, B.M. 1935–354, bar code 013435827.

##### Paralectotypes

EGYPT • 1 ♂, 2 ♀♀; same collection data as for lectotype; NHMUK, B.M. 1935–354, bar code 013435829–31 • 2 ♂♂, parts of abdomens and hypopygia only, in Euparal; same collection data as

for lectotype; NHMUK, B.M. 1935–354, bar code 013435828 • 1 ♂, 1 ♀; same collection data as for lectotype; 18–19 Apr. 1935; NHMUK, B.M. 1935–354, bar code 01343582–33 • 1 ♀; same collection data as for lectotype; 29 Apr. 1935; evening sweeping; NHMUK, B.M. 1935–354, bar code 013435837 • 1 ♂, 2 ♀♀; same collection data as for lectotype; 3–5 May 1935; NHMUK, B.M. 1935–354, bar code 013435834–36 • 1 ♂; same collection data as for lectotype; Zegawa; 5 May 1935; NHMUK, B.M. 1935–354, bar code 013435838 • 4 ♂♂; same collection data as for lectotype; Zegawa; 8 May 1935; Plant No. 9 Tabsanit; NHMUK, B.M. 1935–354, bar code 013435839–42 • 1 ♀; same collection data as for lectotype; 21–22 May 1935; NHMUK, B.M. 1935–354, bar code 013435843 • 1 ♂; same collection data as for lectotype; 31 May–1 Jun. 1935; NHMUK, B.M. 1935–354, bar code 013435844 • 1 ♀; same collection data as for lectotype; 3 Jun. 1935; NHMUK, B.M. 1935–354, bar code 013435845 • 1 ♀; Fayoum, Lake Karun; 2–23 Sep. 1945; R.L. Coe leg.; NHMUK, B.M. 1946–39, bar code 014594087.

#### Other material

EGYPT • 1 ♂, 1 ♀; Cairo, El-Marg; 30.16° N, 31.23° E; 21 Mar. 1996; M. Barták leg.; margin of field; CULSP • 1 ♀; Cairo, El-Marg; same collection data as for preceding; 22 Mar. 1996; orange orchard; CULSP • 1 ♀; same collection data as for preceding; MJE; • 2 ♂♂, 1 ♀; Cairo, Golo Island, along Nile river; 29.58° N, 31.15° E; 21 Mar. 1996; M. Barták leg.; CULSP • 2 ♂♂; same collection data as for preceding; MJE • 1 ♂, 1 ♀; Tanta, 12 km SE; 30.41° N, 31.02° E; 27–28 Mar. 1996; M. Barták leg.; orchard; CULSP • 1 ♂; Cairo, 20 km S; 29.52° N, 31.15° E; 31 Mar. 1996; M. Barták leg.; riverbank; CULSP • 1 ♀; same collection data as for preceding; semi desert; CULSP • 1 ♂, 6 ♀♀, preserved in alcohol; Alexandria, Lake Etku; 20 Oct. 2003; P. Gatt; leg.; MJE • 2 ♂♂, 4 ♀♀; Alexandria, Abu Kir; 20 Oct. 2003; P. Gatt leg.; beach, wrack; PG • 1 ♀; Alexandria, Lake Etku; 20 Oct. 2003; P. Gatt leg.; PG.

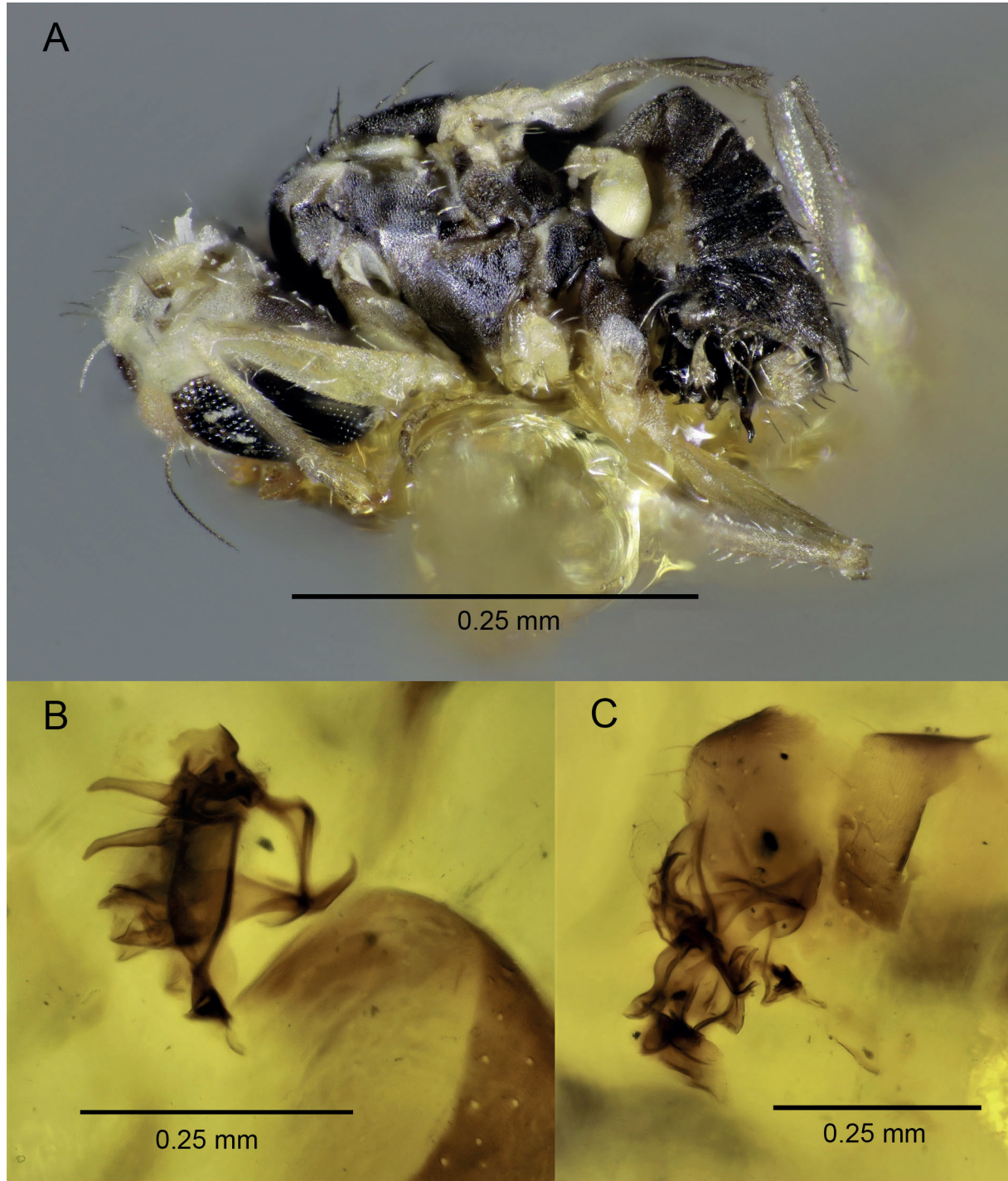
ISRAEL • 1 ♂; Iddan spring; 19 Mar. 1995; B. Merz leg.; MHNG • 6 ♂♂, 6 ♀♀; same collection data as for preceding; A. Freidberg leg.; SMNHTAU.

JORDAN • 1 ♂, preserved in alcohol; Azraq, Wildlife Resort; 31°49'97" N, 36°49'27" E; 20 Oct. 2011; J.-H. Stuke leg.; 1584; J-HS.

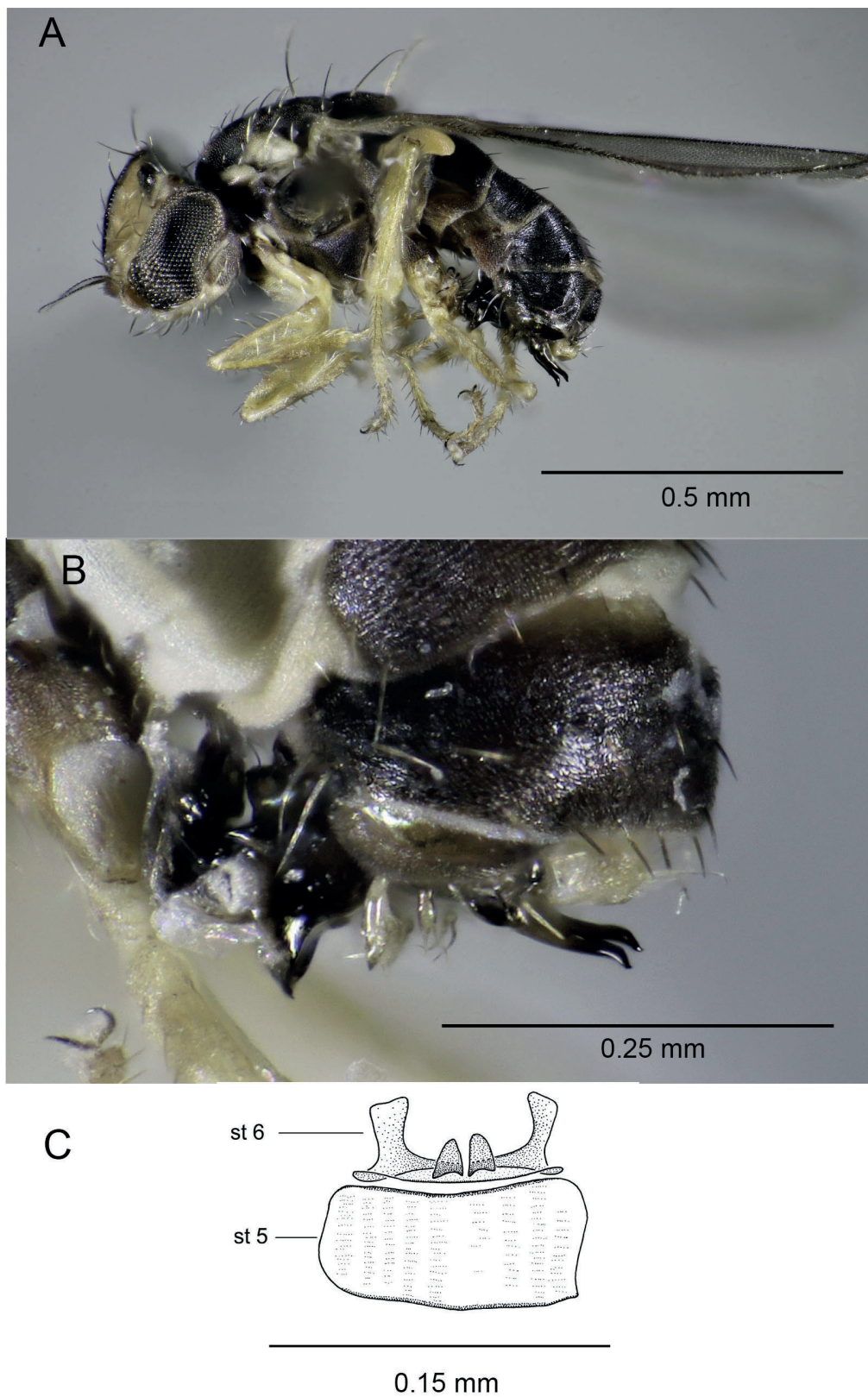
#### Remarks

*Aphaniosoma creperum* belongs to a difficult and complex group of species several of which have sympatric distributions. Collin (1949) described *A. creperum* from several male specimens, but he did not designate a holotype or place identification labels on any of the specimens. The two specimens that he dissected (Fig. 15B–C) and upon which he may have based his very limited illustration are mounted separately in Euparal on plastic and together on the same pin with one data label (dated: “24 iv 1935”). However, these are not associated with the remainder of their individual specimen parts, which were probably badly destroyed when the abdomen was removed for maceration and dissection. He illustrated only the basiphallus/epiphallus and the distiphallus possibly of one of these (Collin 1949: 135). Later, the present author (Ebejer 1998: 205, figs 21–22) illustrated the hypopygium of the other specimen along with a new drawing of the aedeagus from a slightly altered angle to that of Collin’s figure. Pont (1995: 54) listed 10 males and 10 females but conceded that he found it difficult to recognize the sexes owing to the very poor condition of most of the specimens. Eleven males and 9 females are listed in the Material examined section above. From the available material it is not possible to be certain that one species is involved and for this reason a lectotype is here designated. A specimen, rather badly glued to a plastic point, fits Collin’s description, including that of the male hypopygium, where most of the characteristic structures can be clearly seen. This specimen (Fig. 15A) is here designated as lectotype. Only those specimens with visible male terminalia that fit those of the lectotype, and females associated with them are designated as paralectotypes, leaving 1 male, 6 females and an indeterminate specimen all in very poor condition as ‘probable paralectotypes’.

The female from Lake Karoun, which Collin (1949) stated as belonging to this species, bears a red circled 'Type' label. However, it was collected 10 years later at Lake Karoun, which is at least 445 km east of Siwa, and it belongs to a group of species where this sex is identical in all of them. There is no male from that site with which it could be associated, and so it may not belong to *A. creperum*.



**Fig. 15.** *Aphaniosoma creperum* Collin, 1949. **A.** ♂, lectotype (NHMUK B.M. 1935–354, bar code 013435827), habitus, lateral view. **B** ♂, paralectotype 1 (NHMUK), hypopygium in Euparal, lateral view. **C.** ♂, paralectotype 2 (NHMUK), hypopygium in Euparal, lateral view.



**Fig. 16.** *Aphanosoma creperum* Collin, 1949. **A–B.** ♂, specimen from Cairo, Egypt (MJE). **A.** Habitus, lateral view. **B.** Hypopygium in situ, lateral view. **C.** ♂, specimen from Israel, pregonital sternites, ventral view. Abbreviations: See Material and methods.

Furthermore, Collin did not describe any features of this specimen and he did not provide it with an identification label. It is left as ‘paralectotype’.

*Aphaniosoma creperum* is typically a dark greyish brown to black species. The females of three closely related species: *A. nigricauda* Ebejer, 1998, *A. nigrum* Ebejer, 1998, and *A. spiniventre* Ebejer, 1998 usually have a dark brown basal flagellomere, as does the female of *A. creperum*, and they can only be identified by association with males. Males can be identified by examination of the hypopygium, where the shape of the pregenital sternites, the postgonite and the apex of the bilobed distiphallus are the simplest characters that help to differentiate *A. creperum* from closely related species, the most difficult of which to tell apart is *A. nigricauda*. The latter does not have the ventral extension to tergite 6; sternites 5 and 6, although similar, are not identical, and the distiphallus is with rather longer and clearly more pointed lobes. These differences may represent geographical variation of one species, but so far the indication is that *A. nigricauda* is a species in North Africa extending westwards from Tunisia and *A. creperum* a North African species extending eastwards from Egypt to Israel, Jordan and Oman.

### Distribution

Egypt, Oman (Becker 1903; Ebejer 1996). New records for Israel and Jordan.

### *Aphaniosoma cristatum* sp. nov.

urn:lsid:zoobank.org:act:AF2ED06E-2846-4E11-84BD-036B38ACA722

Figs 17–18

### Diagnosis

A yellow species of the *collini* group, with brown longitudinal scutal vittae and strong presutural, prealar and dorsocentral setae. Male with a flattened crest on the hind trochanter and a small tubercle at the extreme base of the hind femur (Fig. 17B). Among others of the *collini* group with pale tarsi and a presutural intra-alar seta, the new species is most similar to *A. hackmani* Lyneborg, 1973; males are easily separated on the basis of different hind trochanter modifications, but it is likely that the unknown females of *A. cristatum* are more difficult to differentiate.

### Etymology

The species epithet is derived from the Latin ‘*crista*’ meaning ‘crest’ and refers to shape of the modified hind trochanter in the male.

### Material examined

#### Holotype

ISRAEL • ♂; Dead Sea, ‘Enot Zuqim; 31°43’ N, 35°27’ E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; OUMNH DIPT0800-01.

#### Paratype

ISRAEL • 1 ♂; same collection data as for holotype; OUMNH DIPT0800-02.

### Description

MEASUREMENTS. Body length: male 1.9 mm. Wing length 1.9 mm.

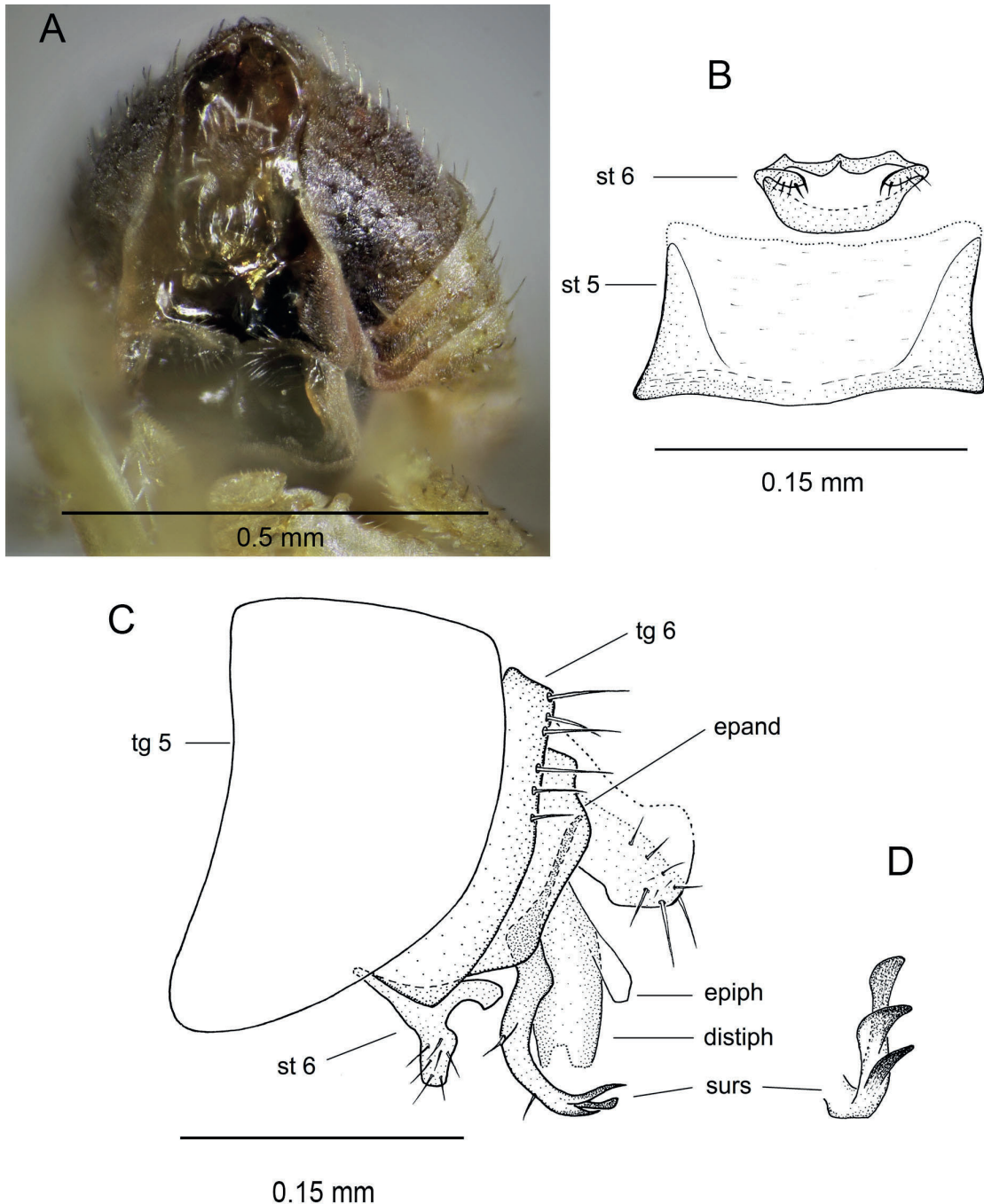
#### Male (holotype)

HEAD. Slightly higher than long and entirely yellow except for the black-ringed ocelli; frons narrowed anteriorly: at level of antennae about  $0.7 \times$  as wide as at level of anterior ocellus; gena narrow in front, much deeper behind, about  $0.7 \times$  as high as eye below middle of eye, with numerous pale setulae;



**Fig. 17.** *Aphanosoma cristatum* sp. nov. A. ♂, holotype (OUMNH DIPT0800-01), habitus, lateral view. B. ♂, paratype (OUMNH DIPT0800-02), hind trochanter and hypopygium in situ, ventro-lateral view.

occiput in profile narrowly visible behind eye; long postocular setulae in one row; 2 long pale vibrissal setulae; face short, poorly sclerotized and depressed; median carina visible to clypeus; antenna yellow, pedicel paler than basal flagellomere and with distinct dark seta dorsally; basal flagellomere with fine and dense pubescence along anterior margin, shorter than diameter of first segment of arista; arista dark on apical  $\frac{3}{4}$  and finely pilose; chaetotaxy: 2 strong fronto-orbitals with three very short setulae interior



**Fig. 18.** *Aphaniosoma cristatum* sp. nov., ♂, paratype (OUMNH). **A.** Hypopygium in situ, postero-ventral view. **B.** Pregenital sternites, ventral view. **C.** Hypopygium, lateral view. **D.** Apex of surstylus, ventral view, enlarged. Abbreviations: See Material and methods.

to them, paravericals short and convergent; 1 inner and 1 outer vertical, both strong; ocellars as long as anterior fronto-orbital; about 20 pale setulae across frons all more or less of uniform size.

THORAX. Yellow; scutum covered with dense pale microtomentum, with broad brown longitudinal vittae leaving only narrow yellow lines between them; scutellum yellow; mediotergite dark brown; pleura yellow with light brown mark on middle of anepisternum and katepisternum, meron with black mark; chaetotaxy: 1 postpronotal with weaker seta adjacent, 1 incurved intra-postpronotal, 1 long presutural, 2 notopleurals, 1+3 intra-alar, 1 postalar, 2+4 dorsocentrals, 1+4 acrostichals with prescutellars, 4 scutellars, 1 anepisternal with 2 shorter and thinner setae below, 1 katepisternal at upper posterior corner with 6 short thin setae down middle.

WING. Veins yellowish brown; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.5 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about  $1.6 \times$  as long as posterior crossvein, which is about  $0.4 \times$  as long as apical section of vein  $M_4$  and lies oblique, forming an angle of about  $60^\circ$  with  $M_4$ . Haltere pale yellow.

LEGS. Fore femur with long setulae on posterior aspect; numerous pale setulae scattered on all legs; apico-ventral seta on mid tibia present; claws black and pulvilli normal; tarsomeres of all legs yellow; hind trochanter modified with narrow crescent shaped process, pilose over most of its crest; hind femur at extreme base of ventral surface with a distinct small tubercle.

ABDOMEN (Fig. 17). Tergites brown dorsally over basal half; tergite 5 longer laterally than at middle and about  $2.5 \times$  as long as tergite 4; tergite 6 very short and small in comparison and mostly hidden by tergite 5 (Fig. 18C); setulae on tergites numerous, short and pale brown; sternite 6 transverse oval with a short ventral setulose lobe on each side (Fig. 18B).

HYPOPYGIUM (Fig. 18C). Yellow; epandrium narrow, bearing long pale surstylus curved into almost a semicircle in distal half and ending in three black and broad, flattened spines (Fig. 18D); hypandrium with narrow lateral arms ending caudally at lower edge of epandrium; pregonite not visible if present; postgonites short, narrow and translucent, not visible in lateral view; epiphallus pale, with rounded apex and separate from apex of basiphallus; distiphallus pale, cylindrical and uncomplicated, weakly sclerotized; cercus pale yellow with shorter setae compared to those of congeners.

### Female

Unknown.

### Variation

Paratype a little paler than holotype.

### Distribution

Israel.

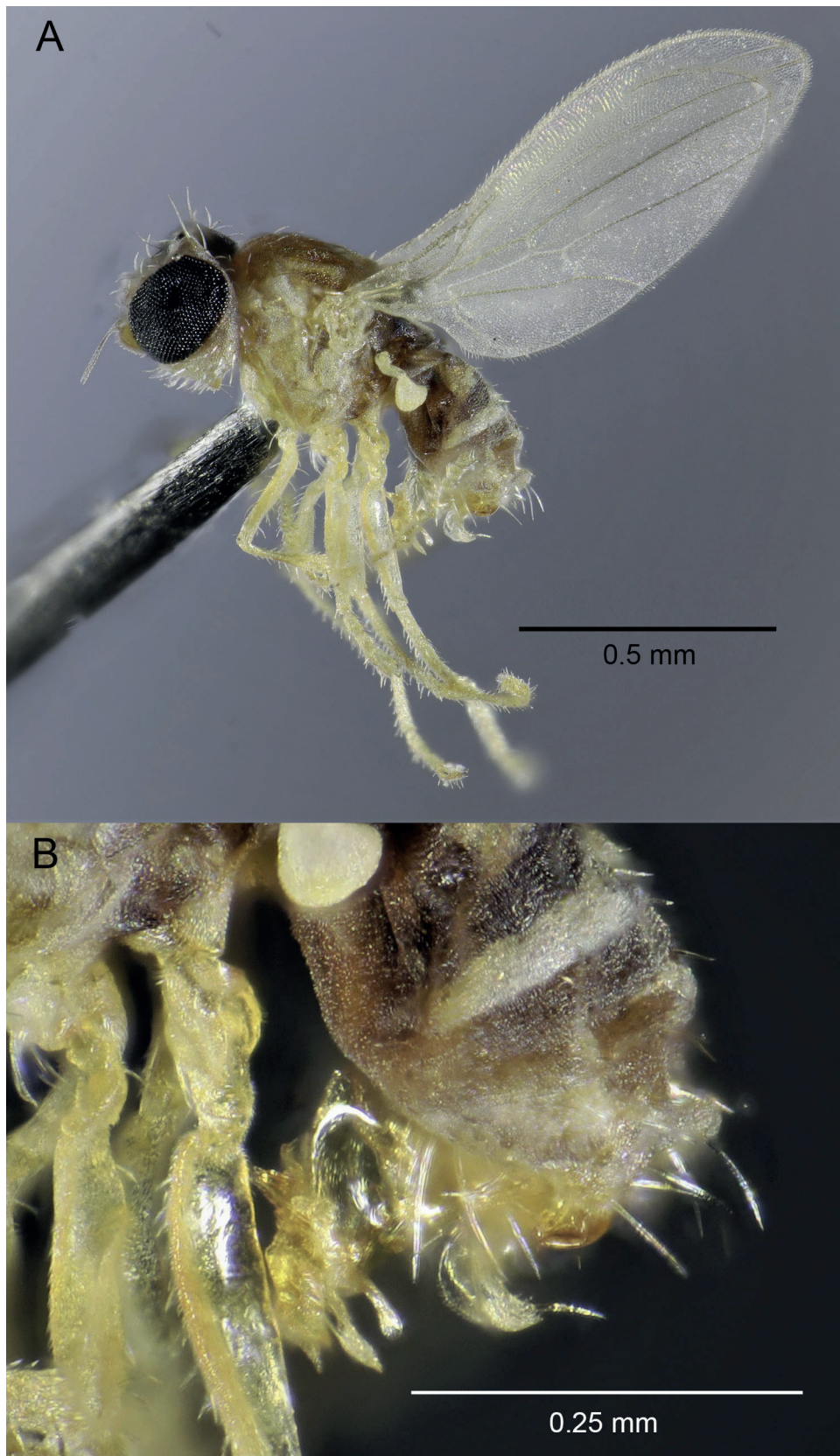
### *Aphaniosoma curvistylus* sp. nov.

urn:lsid:zoobank.org:act:9CF6D443-9441-43CA-BAF5-371A9F3440D5

Figs 19–20, 89

### Diagnosis

A pale yellow species with pale brown vittae on scutum; pale yellow shiny epandrium and entirely pale aedeagus; the curved postgonite clearly visible in most male specimens; 4 short fronto-orbital setulae and no long frontal setae in front of the ocellar triangle. Similar species: in the Middle East *A. curvistylus* sp. nov. shares with *A. meltseri* sp. nov. (see below) a pale mediotergite and an absence



**Fig. 19.** *Aphaniosoma curvistylus* sp. nov., ♂, holotype (SMNHTAU 405821). **A.** Habitus, lateral view. **B.** Hypopygium in situ, lateral view.

of longer setae in front of the anterior ocellus, but the hypopygium differs in structure. *A. nudum* Ebejer, 2007 from Mongolia is similar to *A. curvistylus* in the appearance of the mediotergite and the pattern of setulae on the frons, but the structure of the hypopygium also differs.

### Etymology

The species epithet is a combination of the Latin ‘*curvus*’ and ‘*stylus*’, and refers to the postgonite.

### Material examined

#### Holotype

ISRAEL • ♂; ‘En Zin; 15 Dec. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHTAU 405821.

#### Paratypes

ISRAEL • 1 ♂; ‘Enot Zuqim; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂; same collection data as for preceding; 25 Aug. 1995; SMNHTAU • 4 ♂♂, 9 ♀♀; ‘Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂; ‘Enot Zuqim; 25 Jul. 1995; I. Yarom leg.; SMNHTAU • 1 ♂; ‘Enot Zuqim; 11 Oct. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 1 ♂; Nahal Zin; 6 Apr. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHTAU • 1 ♂; Ne’ot haKikkar; 29 Mar. 1996; A. Freidberg leg.; SMNHTAU • 3 ♂♂, 1 ♀; Dead Sea, ‘Enot Zuqim; 31°43’ N, 35°27’ E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE.

### Description

MEASUREMENTS. Body length: male 0.9 mm, female 1.3 mm. Wing length: male 1 mm, female 1 mm.

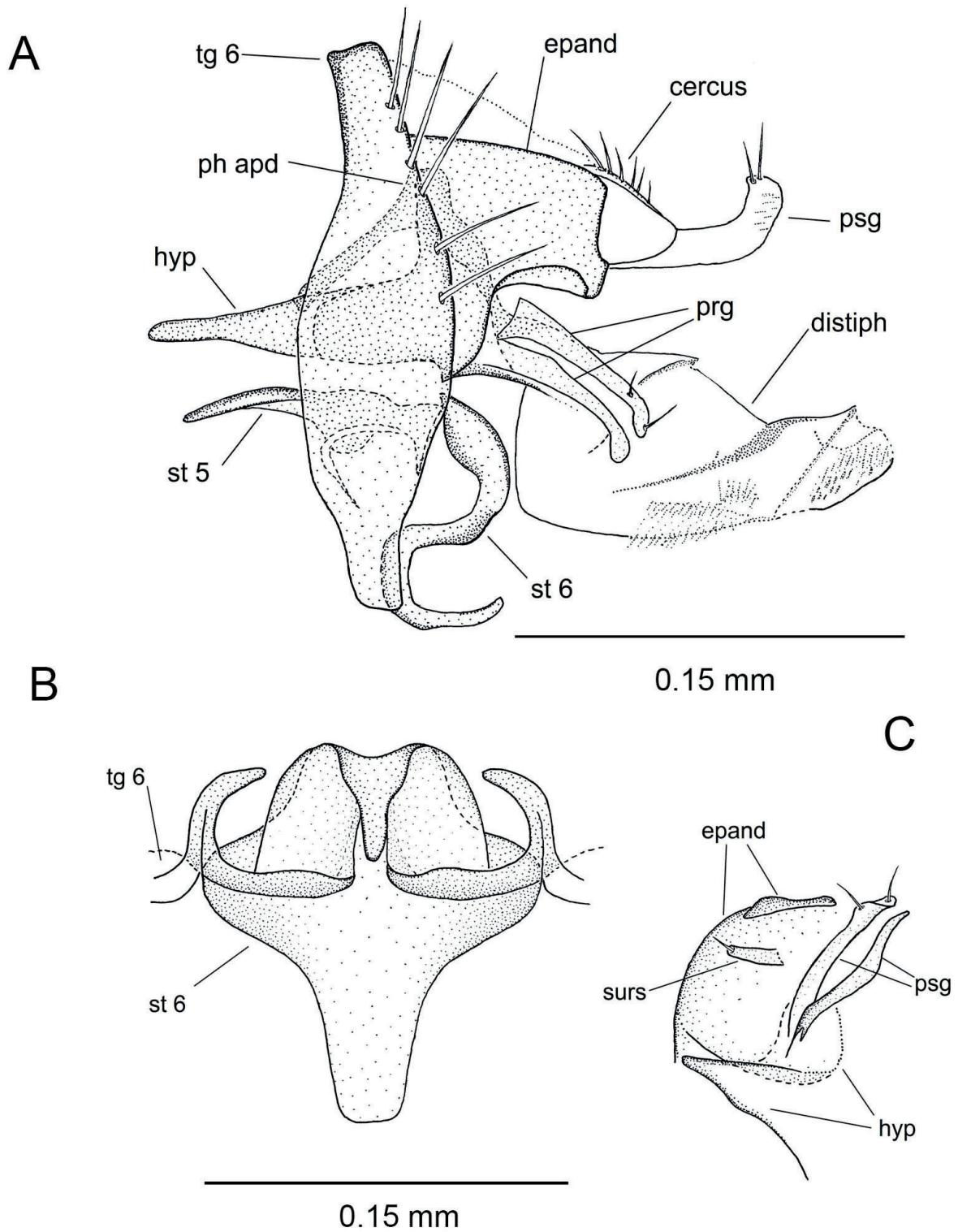
#### Male (holotype)

HEAD. Yellow including ocellar triangle and entire occiput; at vertex, frons narrowed anteriorly, at level of antennae about  $0.5 \times$  as wide as at level of anterior ocellus; gena narrow in front, deeper behind, below middle of eye, about  $0.5 \times$  as high as short oval eye, with numerous white setulae; occiput in profile narrowly visible behind eye, with pale postocular setulae in one row; 3 vibrissal setae differentiated from buccal row of setulae; face short and narrow, depressed and poorly sclerotized; median carina not seen; antenna yellow, pedicel with short seta dorsally; basal flagellomere with very fine short and dense pubescence along anterior margin, shorter than diameter of basal segment of arista; basal  $\frac{1}{3}$  of arista pale, with fine pubescence; chaetotaxy: 4 short fronto-orbitals, posterior 2 a little longer; ocellars short, paraverticals short and convergent; 1 inner and 1 outer vertical; frons with about 14 scattered silvery white setae and no longer pair in front of anterior ocellus.

THORAX. Yellow with yellow microtomentum; scutum with pale brown vittae; chaetotaxy: 1 postpronotal, 1 short inconspicuous intra-postpronotal setula, 1 presutural, 2 notopleurals, 0+3 intralargals, 1 postalar, 2+5 dorsocentrals, only hindmost seta strong, 0+4 acrostichals with prescutellars not developed, 4 scutellars, 1 anepisternal at upper posterior margin and 2 weaker setae at middle of sclerite, 1 katepisternal at upper posterior corner and 2 weaker setae at middle of sclerite.

WING. Veins yellow; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.4 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between cross veins about  $1.2 \times$  as long as posterior crossvein, which lies slightly oblique and is about  $0.5 \times$  as long as apical section of  $M_4$ . Haltere creamy white.

LEGS. Yellow with numerous pale setulae scattered on all legs, with setulae on fore femur longer; apico-ventral seta on mid tibia present; claws black in apical half, pulvilli normal; hind trochanter not modified.



**Fig. 20.** *Aphaniosoma curvistylus* sp. nov., ♂, paratype (SMNHHTAU). **A.** Hypopygium, lateral view. **B.** Sternite 6, ventral view. **C.** Left half of hypopygium, ventral view. Abbreviations: See Material and methods.

ABDOMEN. Tergites yellow with pale brown bands on basal  $\frac{1}{3}$  of tergites; sparsely setulose with marginal setae of tergites 5 and 6 distinct and long; sternite 6 strongly modified (Fig. 20B).

HYPOPYGIUM (Figs 19B, 20A). Epandrium small, pale shiny yellow, bearing narrow curved surstylus; pregonite long and narrow; postgonite translucent, strongly curved; aedeagus pale yellow and mostly translucent; distiphallus with multiple lobes; cercus pale with short fine setulae.

#### Female

Similar to male but without the secondary sexual characters.

#### Variation

Some specimens have no pale brownish vittae on scutum.

#### Distribution

Israel.

#### *Aphaniosoma cypriense* Ebejer, 2021

Fig. 21

#### Material examined

##### Paratype

CYPRUS • 1 ♂; Mazotos beach; 34°46'32" N 33°28'12" E; 26 Apr. 2002; M.J. Ebejer leg.; on *Atriplex* L. and *Chrysanthemum* L.; MJE.

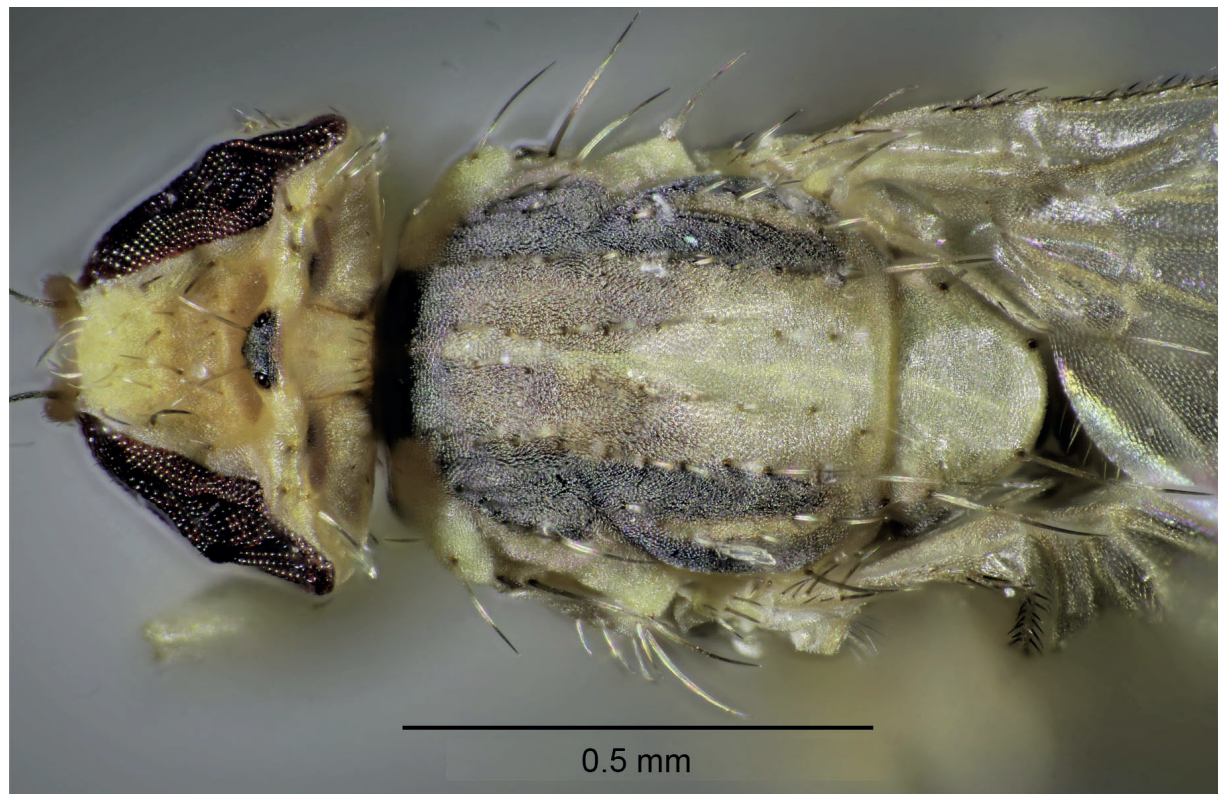


Fig. 21. *Aphaniosoma cypriense* Ebejer, 2021, ♂, paratype (MJE), head and thorax, dorsal view.

## Remarks

A rather elongate species that most resembles *A. melitense* Ebejer, 1993 in having strong fronto-orbitals, uniform frontal setulae on a frons that is longer than wide, and long rows of short dorsocentral and acrostichal setae including a prescutellar pair. Unlike *A. melitense*, *A. cypriense* does not have any modification of abdominal tergite 4. The original description includes photographs of both sexes.

## Distribution

Cyprus (Ebejer 2021a).

### *Aphaniosoma daedalum* sp. nov.

urn:lsid:zoobank.org:act:5B7ABB09-34CA-4B74-AC56-86DB62F5493F

Figs 22–24

## Diagnosis

A species strongly marked with black and pale yellow, giving it a variegated appearance, and with unusually long, strong setae (Fig. 22A). Frons with a pair of long setae in front of anterior ocellus. Frons, scutellum and large parts of pleura always yellow. Male with large shiny black hypopygium and long pale yellow bifid surstylus, both easily viewed externally in most specimens; tergite 6 with a long, black, narrow extension of its ventral margin directed postero-medially. The new species differs from *A. cypriense* by not being unusually elongate and by having a dark subshining abdomen. In *A. cypriense*, tergite 6 has a short and broad anterior lobe at the ventro-lateral margin and no extension postero-medially. The hypopygium is also markedly different with *A. cypriense* having a proportionately much larger phallapodeme, a dark blade-like postgonite (a structure possibly absent in *A. daedalum*), and a simple tubular aedeagus. With *A. palestinense* sp. nov., it shares an almost identical habitus except for longer scutal setae and shinier tergites. Males are also easily separated on the appearance of the hypopygium, even in situ. Females of *A. palestinense* have a dark band across the frons, whereas in females of *A. daedalum* and *A. cypriense*, the frons is always clear yellow. *A. palestinense* does not have the prescutellar acrostichals.

## Etymology

The species epithet is derived from the Latin '*daedalus*' meaning 'variegated'.

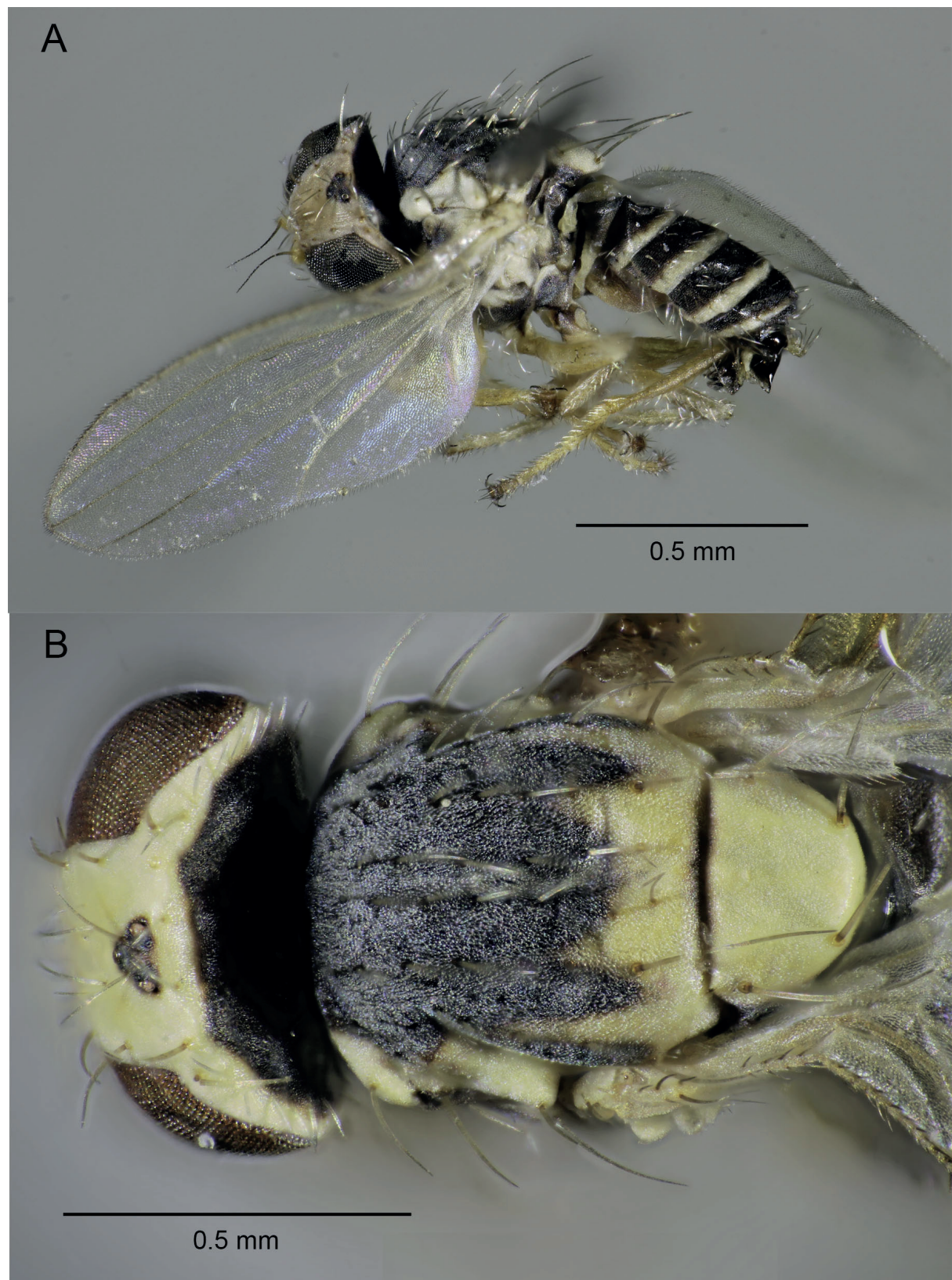
## Material examined

### Holotype

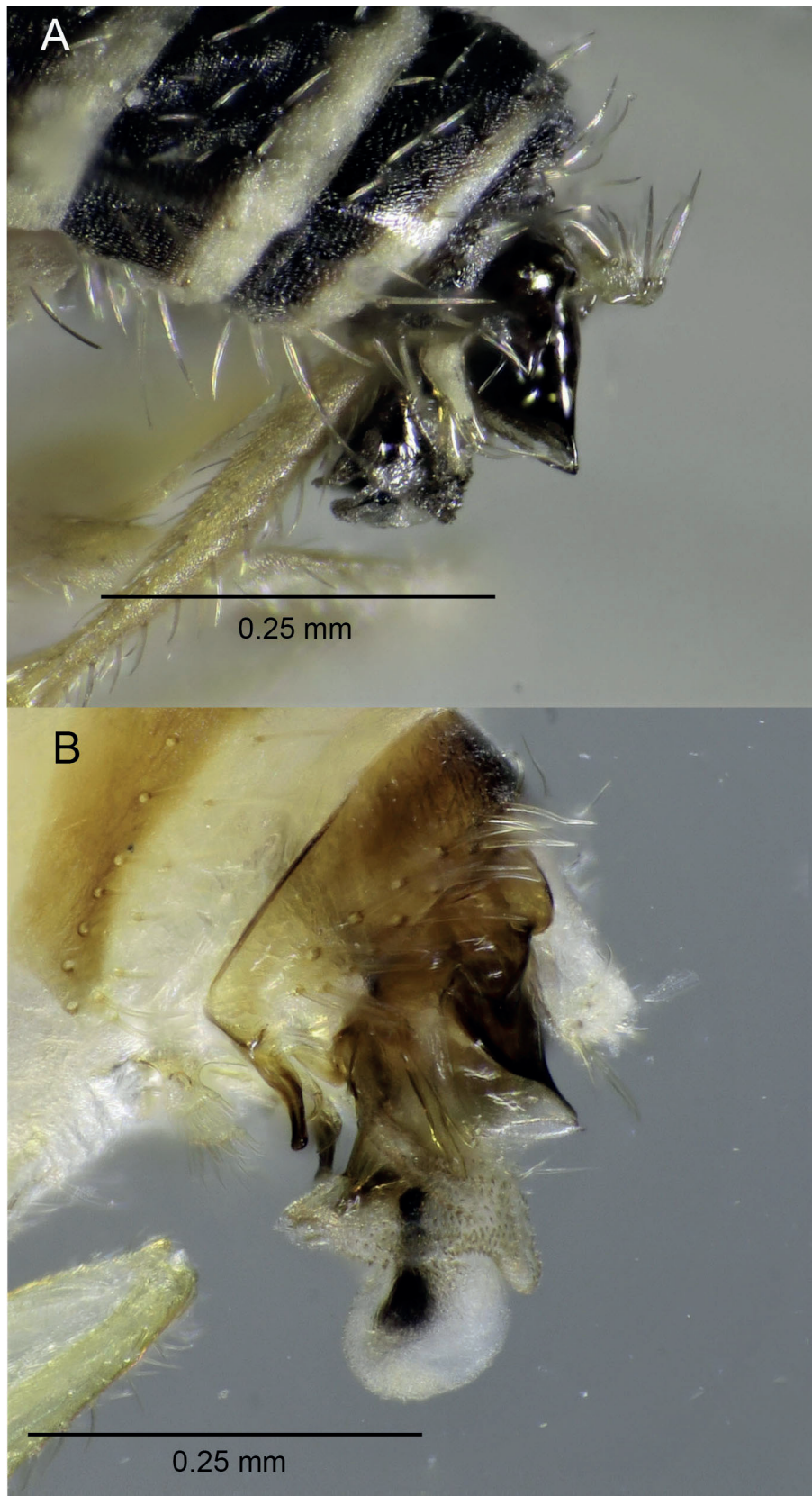
ISRAEL • ♂; Ne'ot haKikkar; 29 Mar. 1996; A. Freidberg leg.; SMNHTAU 405822.

### Paratypes

ISRAEL • 4 ♂♂; Ne'ot haKikkar; 29 Mar. 1996; A. Freidberg leg.; SMNHTAU • 26 ♂♂, 4 ♀♀ (one ♀ with *Stigmatomyces*); Zomet Zohar; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 5 ♂♂, 2 ♀♀; Qalya; 2 Jan. 1997; A. Freidberg leg.; SMNHTAU • 3 ♂♂; same collection data as for preceding; S. Paz leg.; SMNHTAU • 1 ♀; 'En Gedi; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂, 4 ♀♀; 'Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 1 ♀; 'Enot Zuqim; 3 Mar. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 8 ♂♂, 7 ♀♀; 'Enot Zuqim; 12 Apr. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♀; 'En Zin; 9 Feb. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix parviflora*; SMNHTAU • 1 ♀; same collection data as for preceding; on *T. negevensis*; SMNHTAU • 1 ♂, 4 ♀♀; Newe Zohar; 19 Mar. 1995; B. Merz leg.; MHNG • 18 ♂♂, 5 ♀♀; Dead Sea, Zomet Zohar; 31°08' N, 35°21' E; alt. -338 m; 25 Mar. 2000; M.J. Ebejer leg.;



**Fig. 22.** *Aphaniosoma daedalum* sp. nov., ♂, holotype (SMNHTAU 405822). A. Habitus, lateral view. B. Head and thorax, dorsal view.



**Fig. 23.** *Aphaniosoma daedalum* sp. nov. **A.** ♂, holotype (SMNHTAU 405822), hypopygium in situ, lateral view. **B.** ♂, paratype (MJE), hypopygium in situ, extended in alcohol, ventro-lateral view.

on *Tamarix* sp.; MJE • 7 ♂♂, 3 ♀♀; Dead Sea, 'Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE.

## Description

MEASUREMENTS. Body length: male 1.4 mm, female 1.4 mm. Wing length: male 1.5 mm, female 1.5 mm.

### Male (holotype)

HEAD (Fig. 22B). Yellow, ocellar triangle and occiput black, latter with narrow yellow postocular margin; gena about  $\frac{2}{5}$  × as high as eye at middle and with scattered yellowish white setulae; a pair of vibrissal setae on each side; frons narrow at anterior margin about 0.6 × as wide as at level of anterior ocellus; ocellar setae as strong as anterior fronto-orbital, 2 well-developed fronto-orbital setae and 2 short setulae anterior to these; about 12 very pale short setae on frons and a distinctly longer pair in front of the anterior ocellus; 1 inner and 1 outer vertical well-developed; paravertic setae short and convergent, postocular setae strong and in one row, face short, poorly sclerotized and depressed; median carina sharp and low, but reaching clypeus; antenna yellow, pedicel a little paler than basal flagellomere and with distinct short seta dorsally; basal flagellomere with fine pubescence along anterior margin; basal  $\frac{1}{3}$  of arista yellow contrasting the black distal  $\frac{2}{3}$ .

THORAX (Fig. 22). Variegated with black and yellow; scutum black anteriorly with vittae appearing for a short distance at level of wing base and leaving an area anterior to scutellum completely yellow; postpronotal lobe and notopleuron all yellow; scutellum yellow but at base of lateral margin with black spot; scutum covered with yellow microtomentum; pleura with black sclerites broadly outlined in yellow; mediotergite black; chaetotaxy: 1 postpronotal, 1 presutural, 1 strong incurved intra-postpronotal, 2 presuturals anterior with seta shorter than very strong posterior seta, 2 notopleurals, 0+3 intra-alars, 1 postalar, 3+4 dorsocentrals, 1+4 acrostichals including a prescutellar pair, 4 scutellars, anepisternal not visible in holotype (damaged by pin, but present in paratypes), 1 katepisternal at upper posterior corner and with two fine setae at middle of sclerite.

WING. Veins all pale yellow; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about 0.4 × that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about 1.6 × as long as posterior crossvein, which is about 0.4 × as long as apical section of  $M_4$ . Haltere pale yellow.

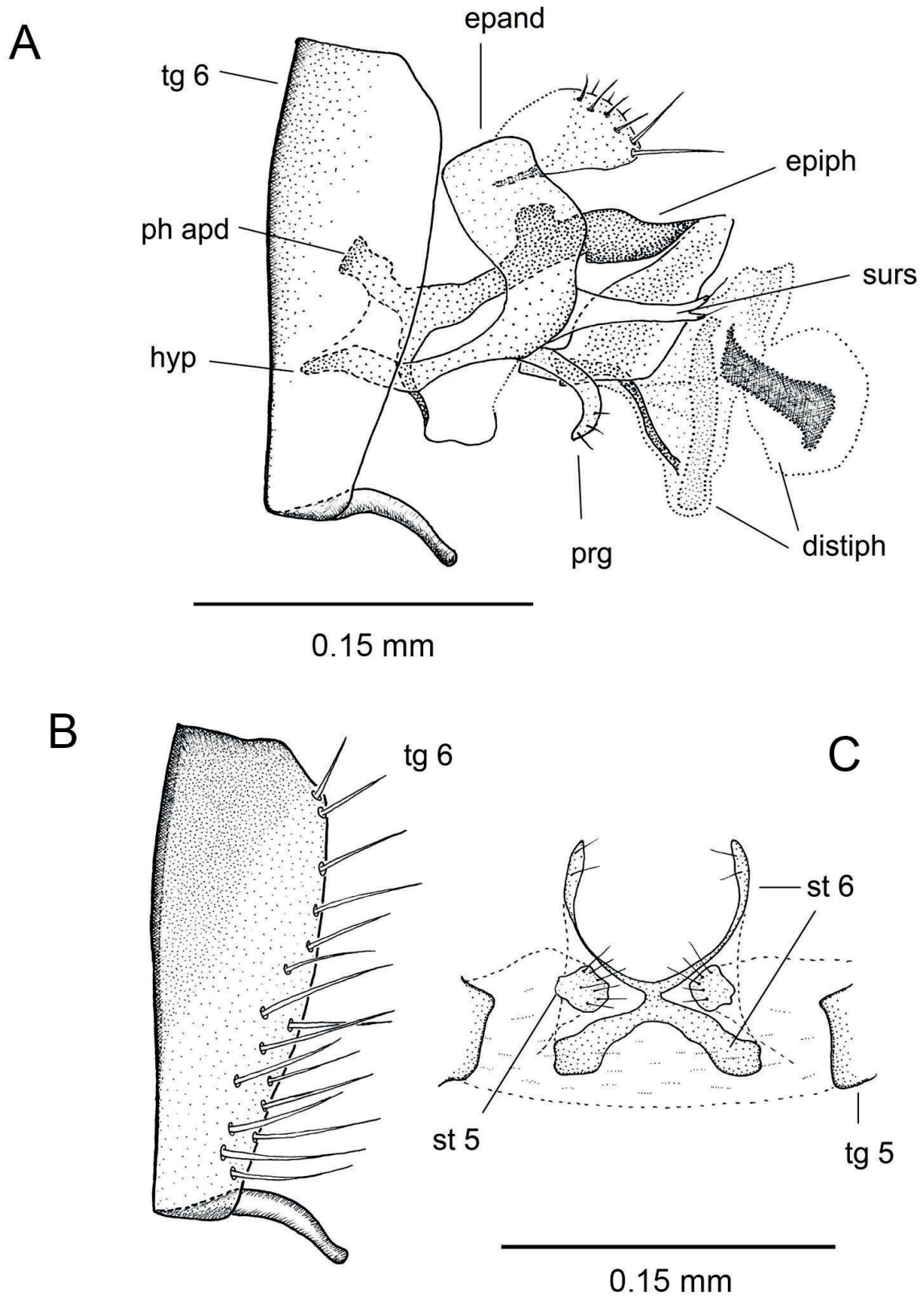
LEGS. Fore femur with long setulae on posterior aspect; numerous pale yellow setulae scattered on all legs; apico-ventral seta on mid tibia present; claws black on apical half, pulvilli normal; tarsomeres 4 and 5 brown; hind trochanter not modified.

ABDOMEN (Figs 22A, 23A). Tergites black with rather sparse microtomentum, thus leaving them subshining; posterior margins pale yellow and all tergites with scattered numerous setulae, becoming paler laterally; tergite 6 at ventral margin with long narrow black extension directed postero-medially (Fig. 24B); sternite 6 modified into an X-shaped sclerite with apparently sternite 5 represented by a small setulose sclerite laterally between the anterior and posterior arms of sternite 6 on each side (Fig. 24C).

HYPOPYGIUM (Figs 23, 24A). Epandrium shining black, bearing a pale, narrow, slightly curved surstylus that is bifid apically with one apical setula on each branch; pregonite curved, narrow and with several minute setulae; epiphallus large, completely shining black and apically pointed; distiphallus mostly black and short bilobed apically; postgonite not identified and may be absent; cercus pale yellow, fused with the opposite side and without exceptionally long setae at apex.

### Female

As in male, but without secondary sexual characters.



**Fig. 24.** *Aphaniosoma daedalum* sp. nov., ♂, paratype (SMNH-TAU). A. Hypopygium, lateral view. B. Tergite 6, lateral view. C. Pregenital sternites, ventral view. Abbreviations: See Material and methods.

### Variation

None observed.

### Distribution

Israel.

### *Aphaniosoma denticulosum* sp. nov.

urn:lsid:zoobank.org:act:D795AC1F-1487-41A3-8C01-8194514D4A1B

Figs 25–26

### Diagnosis

A yellow species with well-developed scutal setae (Fig. 25A). Scutum, anteriorly with confluent pale brownish yellow vittae, and abdomen with transverse brown bands on basal tergites; a pair of long frontal setulae in front of ocellar triangle; male tergite 5 strongly enlarged, appearing inflated and with distinct black spinules along ventral margins (Fig. 25B–C). There is an undescribed species from the western Mediterranean known to the author that has similar modifications to tergite 5, but it differs in other details of the hypopygium.

### Etymology

The species epithet refers to the row of minute tubercles bearing spinules along the inferior margin of the sixth tergite of the male.

### Material examined

#### Holotype

EGYPT • ♂; Kafr Elsheikh; 30.48° N, 31.14° E; 28 Mar. 1996; M. Barták leg.; garden vegetation; CULSP.

#### Paratype

EGYPT • 1 ♂; same collection data as for holotype; CULSP.

ISRAEL • 1 ♂, 1 ♀; ‘Enot Zuqim; 12 Apr. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHTAU • 2 ♂♂, one with *Stigmatomyces*; ‘Enot Zuqim; 3 Mar. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂; same collection data as for preceding; on *Tamarix* sp.; SMNHTAU • 1 ♂; Nahal Zin; 6 Apr. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂; ‘Enot Zuqim; 19 Mar. 1995; A. Friedberg leg.; SMNHTAU • 1 ♀; ‘En Zin; 12 Apr. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHTAU • 1 ♂; Western Negev, Nahal Lavan; 30°58' N, 34°24' E; 24 Mar. 2000; M.J. Ebejer leg.; shrubs on sand; MJE.

### Description

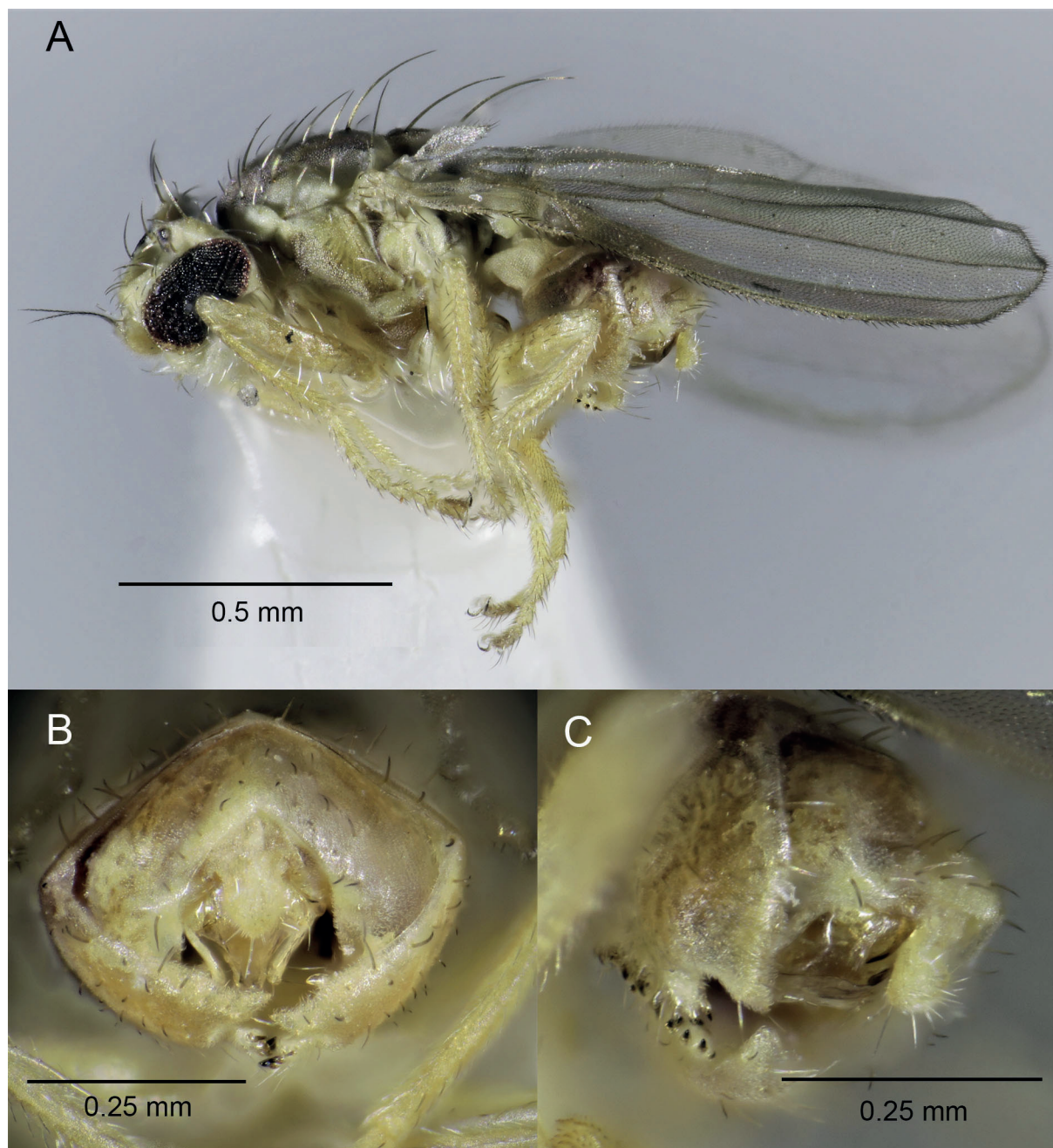
MEASUREMENTS. Body length: male 1.5 mm, female 1.6 mm. Wing length: male 1.6 mm, female 1.7 mm.

#### Male (holotype)

HEAD. Yellow except for black-ringed ocelli; almost twice as broad as long; frons strongly narrowed anteriorly: at level of antennae  $0.5 \times$  as wide as at level of anterior ocellus; gena narrow in front, deeper behind, about equal to height of eye below middle of eye, with numerous yellow setulae; occiput in profile barely visible behind eye, with postocular setulae in one irregular row; 2 vibrissal setulae moderately developed, with longest about equal to fronto-orbital seta; face short, poorly sclerotized and depressed; median carina not developed; antenna yellow, pedicel paler than basal flagellomere and with

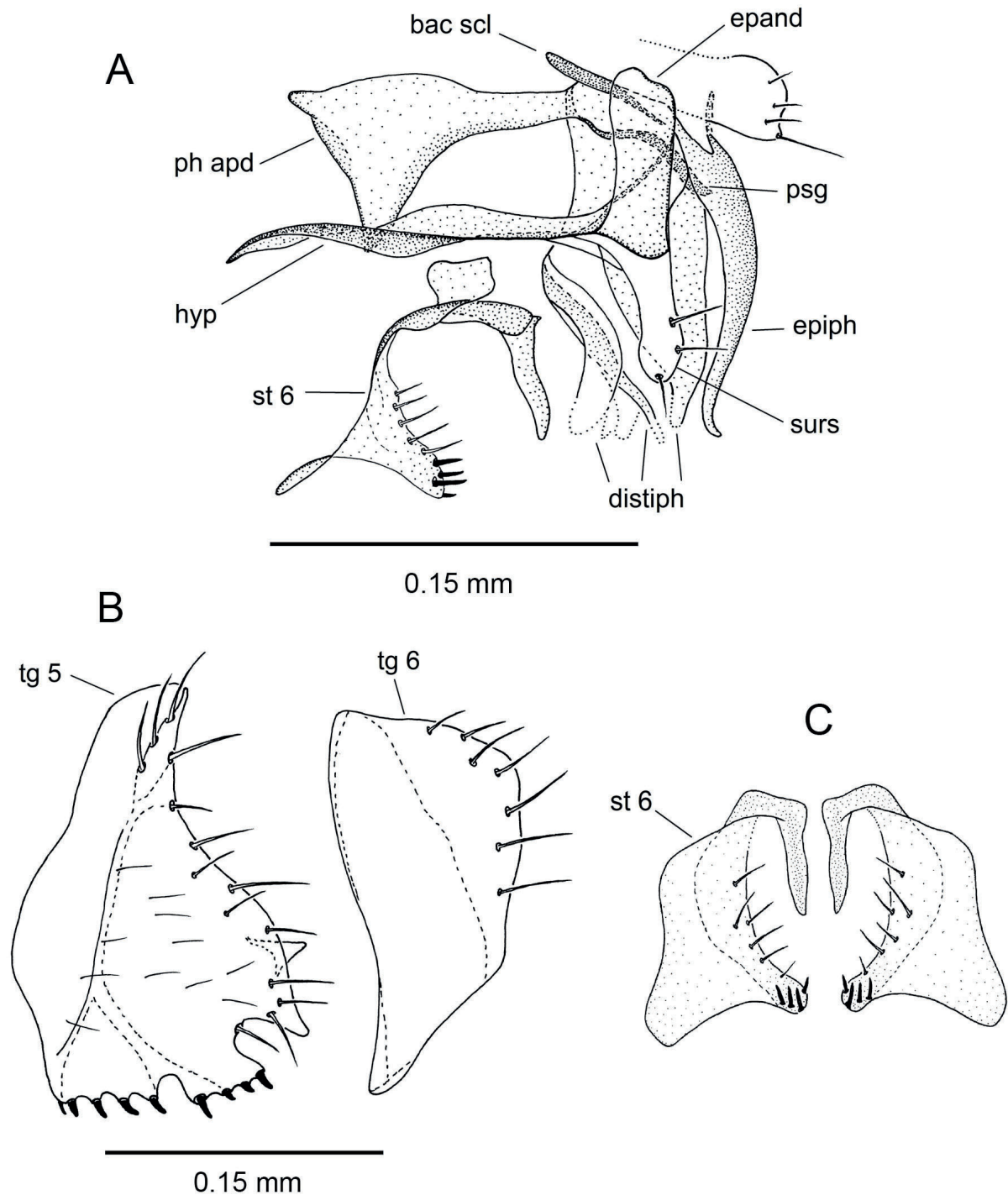
distinct short seta dorsally; basal flagellomere with fine but distinct pubescence along anterior margin, longer than diameter of basal segment of arista; basal segment of arista yellow, the rest brown, with fine pubescence; chaetotaxy: 2 strong fronto-orbitals, with 3 short setulae in front; paraveritics short and crossed; 1 inner and 1 outer vertical, both strong; ocellars long; about 12 short setulae across middle of frons with another pair much longer than these situated in front of ocellar triangle.

THORAX. Yellow; scutum with indistinct pale brownish yellow vittae that are confluent anteriorly, only separating well behind transverse suture; vitta along intra-alar line more distinct, darker brown and almost



**Fig. 25.** *Aphaniosoma denticulosum* sp. nov., ♂, holotype (CUSLP). A. Habitus, lateral view. B–C. Hypopygium in situ. B. Posterior view. C. Ventro-lateral view.

joining lateral dark brown spot on margin of scutellum; mediotergite dark brown; pleura yellow, darker yellow on middle of most pleural sclerites; chaetotaxy: 1 postpronotal, 1 incurved intra-postpronotal, 1 very long presutural, 2 notopleurals, 1+3 intra-alars, 1 postalar, 1+3 dorsocentrals, presutural longer



**Fig. 26.** *Aphaniosoma denticulosum* sp. nov., ♂, paratype (CUSLP). A. Hypopygium, lateral view. B. Tergites 5 and 6, lateral view. C. Sternite 6, ventral view. Abberviations: See Material and methods.

than first postsutural, 5 acrostichals including prescutellars, 4 scutellars, 1 anepisternal with 2 setulae below it, 1 katepisternal at upper posterior corner with 4 setulae vertically down middle of sclerite.

WING. Veins all pale yellow; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.5 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about  $1.2 \times$  as long as posterior crossvein, which lies oblique and is about  $0.4 \times$  as long as apical section of  $M_4$ . Haltere pale yellow.

LEGS. Not modified except for slightly thicker femora; numerous pale setulae scattered on all legs, with longer setulae on fore femur; apico-ventral seta on mid tibia present; claws black in apical half and pulvilli normal; tarsomere 5 of all legs pale brown; hind trochanter not modified.

ABDOMEN. Tergites yellow with pale brown transverse bands dorsally; tergite 5 strongly enlarged laterally, appearing inflated and bearing a row of black spinules on minute tubercles along the irregular ventral margins (Figs 25B–C, 26B); tergites with relatively few fine pale setulae, especially along posterior margins; sternite 6 divided into two sclerites each with a long, posteroventrally curved, narrow process and with a ventro-medial lobe anteriorly having a few short spinose setae (Fig. 26).

HYPOPYGIUM. (Figs 25B–C, 26A). Epandrium small and pale, bearing large surstylus; cercus small and pale; hypandrium bearing a setulose pregonite posteriorly; phallapodeme triangular; postgonites short and brown; distiphallus pale, mostly membranous.

#### Female

Similar to male except for secondary sexual characters.

#### Variation

The scutal vittae vary from pale brown to yellow, almost concolourous with the the rest of the scutum. The prescutellar acrostichal setae are sometimes absent (three male paratypes) or placed slightly anterior to the level of the hindmost dorsocentral seta.

#### Distribution

Egypt, Israel.

### *Aphaniosoma dhofaricum* Ebejer, 1996 Figs 27–28

#### Material examined

##### Paratypes

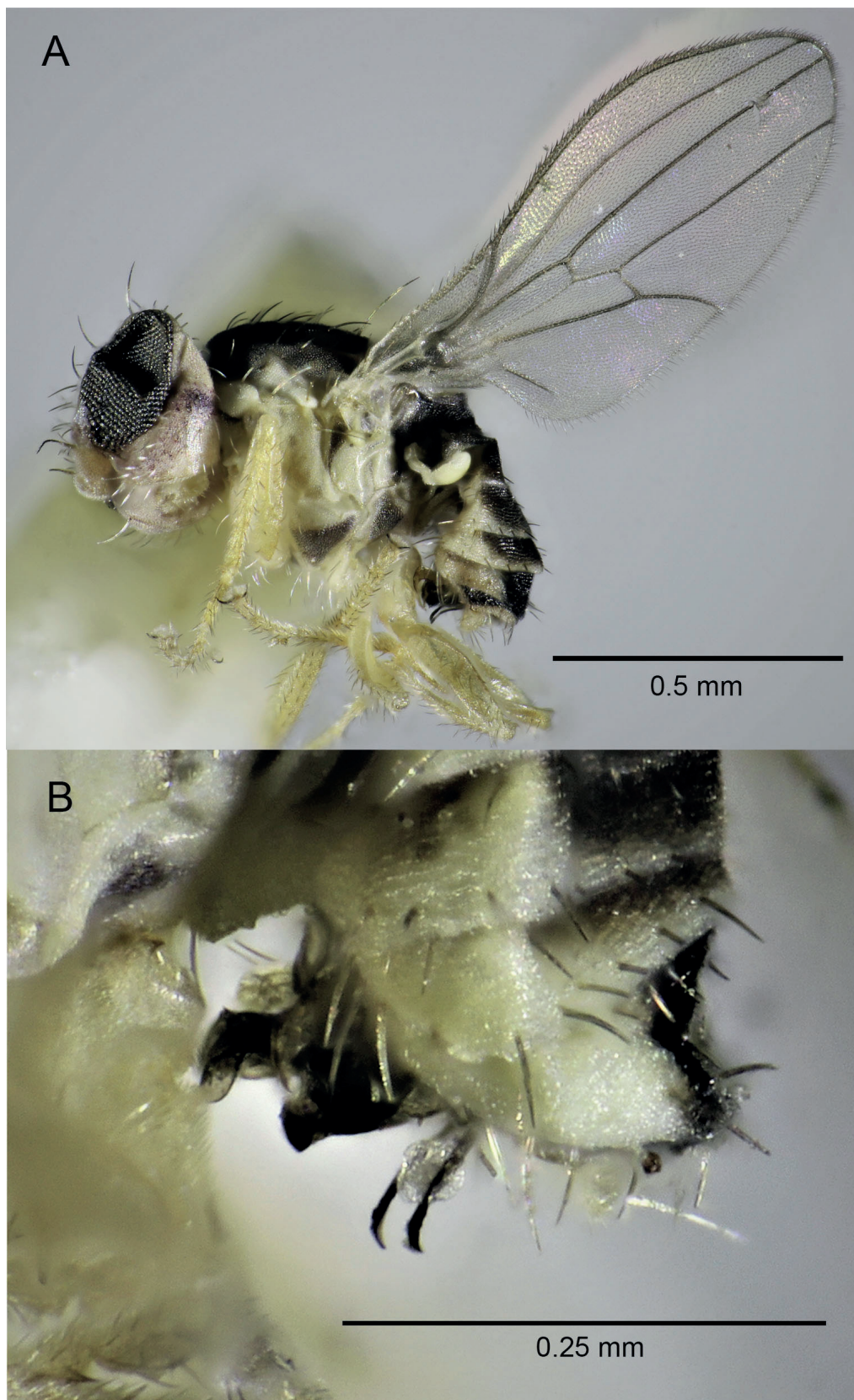
OMAN • 2 ♂♂; Dhofar, Khor Taqah; 12 Nov. 1992; J.C. Deeming leg.; on carpet grazed *Sporobolus virginicus* (L.) Kunth; NMWC.

##### Other material

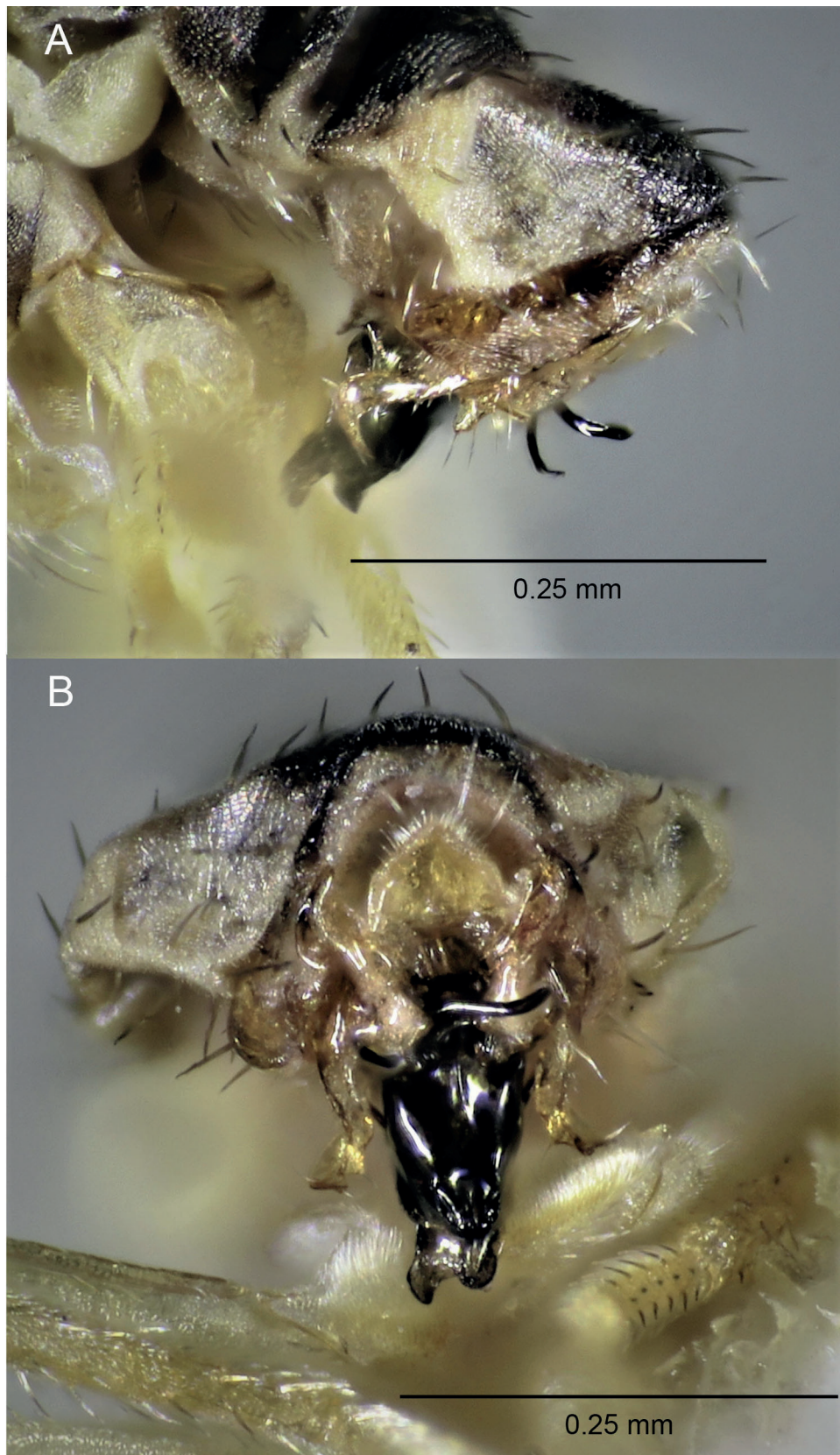
OMAN • 1 ♂; Sahil Al Jazir, Khor Dhirif; 26 Nov. 1999; M.D. Gallagher leg.; MJE.

#### Remarks

Although only known from the southern region of Oman, it appears to be a locally abundant species. It has a dark scutum tending to develop vittae posteriorly; dark abdominal tergites with broad yellow posterolateral margins on tergites 3–6 (Fig. 27B). The male hypopygium is mostly brown with distinctive postgonites, these being somewhat club-shaped, viewed from certain angles (Fig. 28A).



**Fig. 27.** *Aphaniosoma dhofaricum* Ebejer, 1996. **A.** ♂ (MJE), habitus, lateral view. **B.** ♂, paratype (NMWC), hypopygium in situ, lateral view.



**Fig. 28.** *Aphaniosoma dhofaricum* Ebejer, 1996, ♂ (MJE), hypopygium in situ. **A.** Lateral view. **B.** Posterior view.

### Distribution

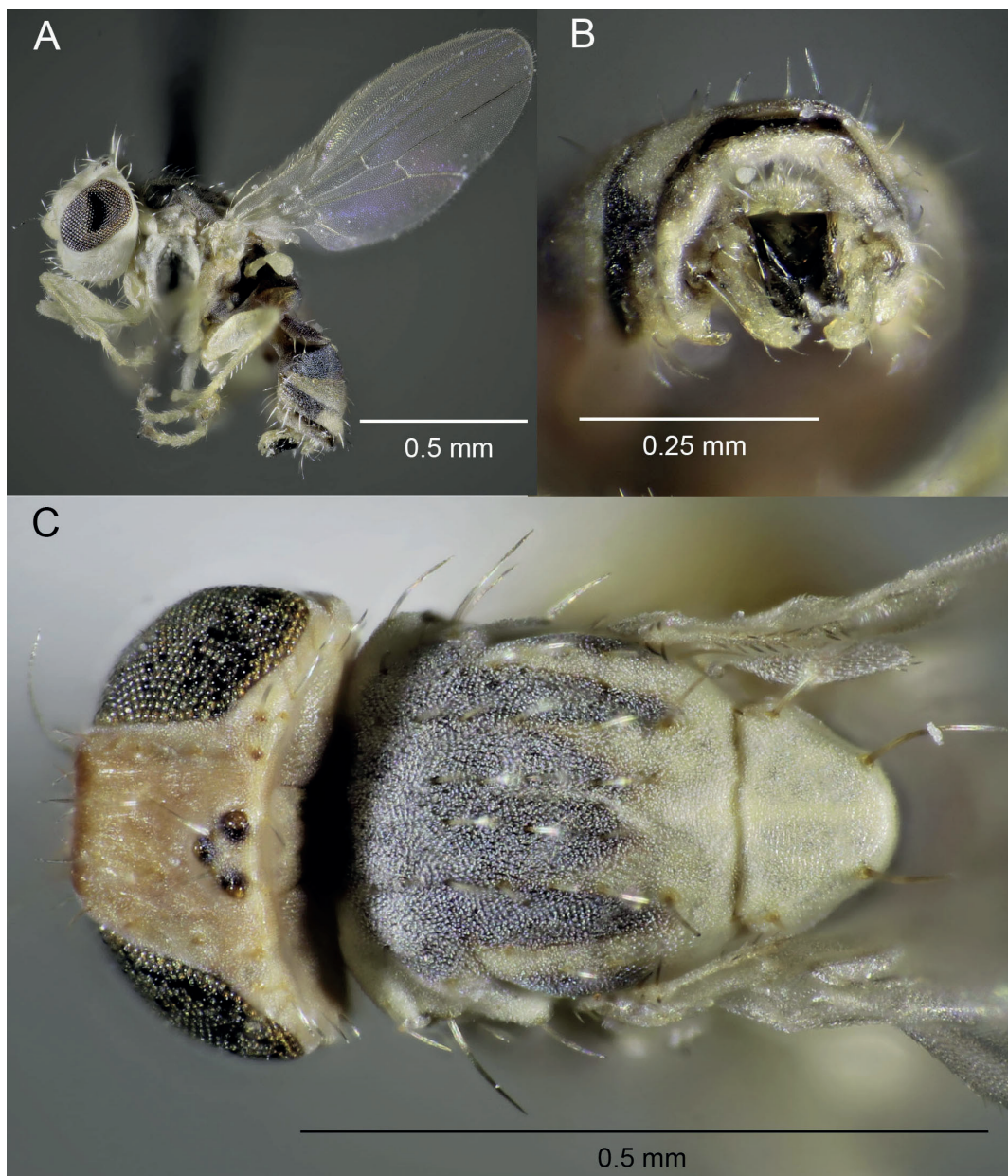
Oman (Ebejer 1996). Listed in error as present on Cape Verde Islands (Ebejer 2009).

### *Aphaniosoma egregium* Ebejer, 1998

Fig. 29

### Material examined

ISRAEL • 19 ♂♂, 17 ♀♀; Mikhmoret; 21 Sep. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU  
• 10 ♂♂, 7 ♀♀; same collection data as for preceding; Hofit leg.; SMNHTAU • 1 ♂; ‘Enot Zuqim;



**Fig. 29.** *Aphaniosoma egregium* Ebejer, 1998, ♂ (MJE). **A.** Habitus, lateral view. **B.** Hypopygium, posterior view. **C.** Head and thorax, dorsal view.

19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♀; Nizzanim; 23 Mar. 1995; A. Freidberg leg.; SMNHTAU • 30 ♂♂, 8 ♀♀; 'Atlit; 28 Apr. 1996; A. Freidberg leg.; SMNHTAU.

### Remarks

This small-bodied species is robust and relatively short winged. The head is proportionately large and broad compared to that of most congeners. The scutum (Fig. 29C) has black vittae appearing grey being obscured by yellow microtomentum. Many specimens have brown transverse bands only on the middle tergites. The large male hypopygium with distinctive yellow surstyli contrasting with the black shiny phallic complex is characteristic (Fig. 25B).

### Distribution

Cyprus, Italy (including Sicily), Tunisia (Ebejer 1998, 2005, 2021a). New record for Israel.

### *Aphaniosoma falciferum* Ebejer, 1998

Fig. 30

### Material examined

ISRAEL • 1 ♂; Park Caesarea; 29 Mar. 1999; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂; Park Caesarea; 15 May 2000; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 2 ♂♂; Park Caesarea; 24 Apr. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂; Park Caesarea; 27 Apr. 1999; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂; 'En Zin; 13 May. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂; 'En Zin; 13 Nov. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix parviflora*; SMNHTAU • 2 ♂♂; Nahal Neqarot, N of Sappir; 6 Apr. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂; same collection data as for preceding; on *Tamarix parviflora sodomensis*; SMNHTAU • 2 ♂♂; 'Enot Zuqim; 19 Mar. 1995; A. Freidberg leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂; 'Enot Zuqim; 3 Mar. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂; 'Enot Zuqim; 30 Mar. 1999; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂; 'Enot Zuqim; 12 Apr. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix parviflora*; SMNHTAU • 1 ♂, 2 ♀♀; Mizpe Ramon, 25 km NW; 2 May 1995; I. Yarom leg.; SMNHTAU • 8 ♂♂; 'Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 14 ♂♂; Revivim; 1 May 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂; Nahal Neqarot; 3 May 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 5 ♂♂; Metar; 4 May 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 3 ♂♂; Western Negev, Nahal Lavan; 30°58' N, 34°24' E; 24 Mar. 2000; M.J. Ebejer leg.; shrubs on sand; MJE.

### Remarks

This is pale yellowish grey species very similar to *A. yaromi* sp. nov. The main differences are found in the males and are given under that species. The male hypopygium of *A. falciferum* is illustrated in the original description (Ebejer 1998: 207, figs 25–27). The appearance of the hypopygium in situ is shown in Fig. 30B–C. Females of *A. falciferum* and *A. yaromi* (see below) are indistinguishable. Only those females collected with males in the absence of the other species are listed above. The remainder are listed separately under both names following the material examined section for *A. yaromi*.

The only two previously known specimens originated from margins of a pool in steppe in central Iraq's fertile plain, fed by the river Euphrates. The habitats of this species in Israel share some similarities in that they were collected at small water bodies with sparse surrounding vegetation in hot arid areas.

### Distribution

Iraq (Ebejer 1998). New record for Israel.

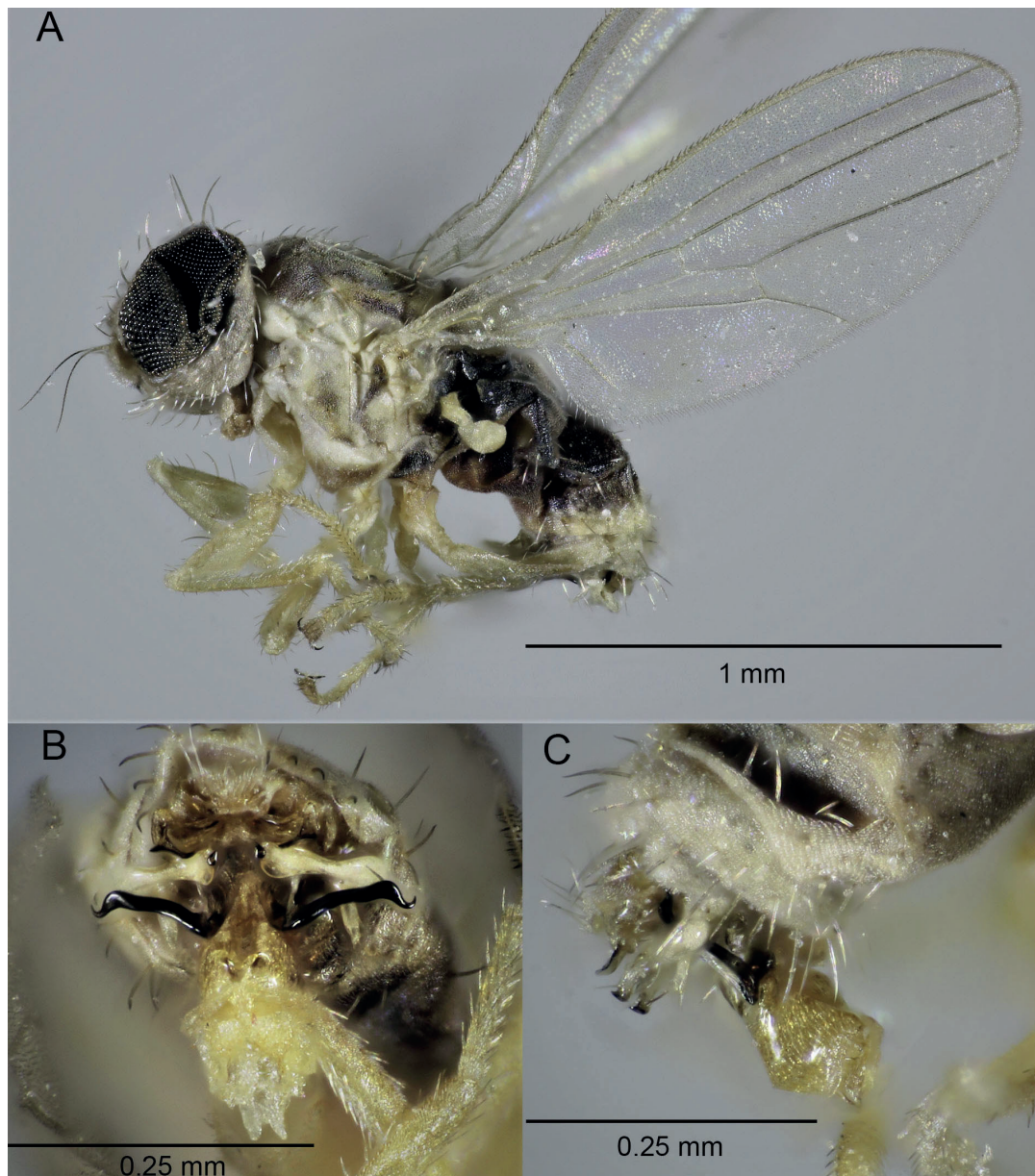
*Aphaniosoma fissum* Collin, 1949

Fig. 31

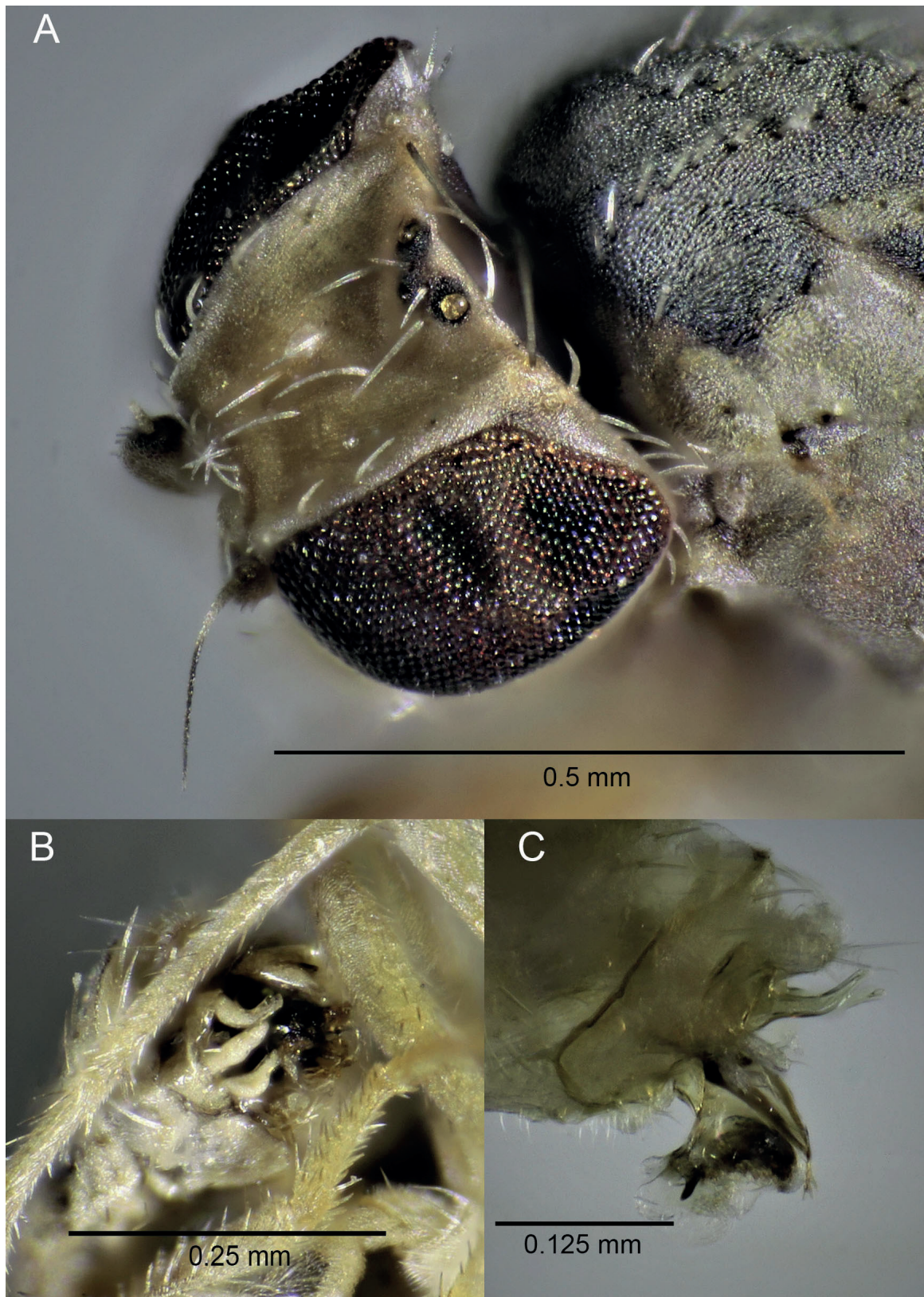
### Material examined

**Lectotype** (here designated)

EGYPT • ♂, head and all legs missing; Fayoum, Lake Karun; 2–23 Sep. 1945; R.L. Coe leg.; NHMUK, B.M. 1946–39, bar code 013435850.



**Fig. 30.** *Aphaniosoma falciferum* Ebejer, 1998, ♂ (SMNH-TAU). **A.** Habitus, lateral view. **B.** Hypopygium, postero-ventral view. **C.** Hypopygium, lateral view.



**Fig. 31.** *Aphaniosoma fissum* Collin, 1949. **A–B.**(MJE). **A.** Head and thorax, antero-dorsal view, head showing the two pairs of setae on middle of frons. **B.** Hypopygium, ventro-lateral oblique view. **C.** Different specimen, (MJE) with extended hypopygium in alcohol, lateral view.

### Paralectotypes

EGYPT • 3 ♂♂, 3 ♀♀, one ♂ and all ♀♀ headless; same collection data as for lectotype; NHMUK, bar codes 013435851–56 • 1 ♂; Siwa Oasis; 24 Apr. 1935; J. Omer-Cooper leg., Armstrong College Expedition; NHMUK, B.M. 1935–354, bar code 013435857.

### Other material

EGYPT • 1 ♂, 5 ♀♀; Cairo, 20 km S; 29.52° N, 31.17° E; 31 Mar. 1996; M. Barták leg.; semi desert; CULSP • 3 ♂♂; Cairo, 20 km S; 29.52° N, 31.15° E; 31 Mar. 1996; M. Barták leg.; riverbank; CULSP • 2 ♂♂; Cairo, El-Marg; 30.16° N, 31.23° E; 29 Mar. 1996; M. Barták leg.; margin of field; CULSP • 1 ♂; Tanta, 12 km SE; 30.41° N, 31.02° E; 27–28 Mar. 1996; M. Barták leg.; orchard; CULSP • 4 ♂♂, 3 ♀♀; Cairo, Golo Island, along Nile river; 29.58° N, 31.15° E; 21 Mar. 1996; M. Barták leg.; CULSP • 1 ♀; Kafr Elsheikh; 30.48° N, 31.14° E; 28 Mar. 1996; M. Barták leg.; garden vegetation; CULSP • 3 ♂♂, 4 ♀♀; Alexandria, Abu Kir; 20 Oct. 2003; P. Gatt leg.; beach, wrack; PG • 2 ♂♂, 1 ♀; same collection data as for preceding; MJE • 1 ♂, 2 ♀♀; Alexandria, Ras Rashid; 21 Oct. 2003; P. Gatt leg.; beach; PG • 1 ♂, 5 ♀♀; Sinai, Taba, 10 km S; 1 May 1996; I. Yarom leg.; SMNHTAU • 1 ♂; same collection data as for preceding; A. Freidberg leg.; SMNHTAU • 2 ♂♂; Sinai, Ras Umm; 1 May 1996; I. Yarom leg.; SMNHTAU • 10 ♂♂, 2 ♀♀; Sinai, El Ma‘agan; 1 May 1996; A. Freidberg leg.; SMNHTAU • 1 ♂, 3 ♀♀; same collection data as for preceding; I. Yarom leg.; SMNHTAU.

ISRAEL • 4 ♀♀; Elot; 18 Mar. 1995; B. Merz leg.; MHNG • 1 ♀; Iddan spring; 19 Mar. 1995; B. Merz leg.; MHNG • 2 ♂♂, 3 ♀♀; ‘En Gedi/N. Arugot; 31 May 2000; B. Merz leg.; MHNG • 1 ♂; ‘En Mor; 11 Oct. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 1 ♂; Elot; 18 Mar. 1995; A. Freidberg leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂; Elot; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂; ‘Enot Zuqim; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂; ‘En Gedi, 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂; Zomet Zohar; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂, 2 ♀♀; ‘Iddan; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂; ‘En ‘Iddan; 20 Jun. 1995; A. Freidberg leg.; SMNHTAU • 4 ♂♂, 3 ♀♀; Qalya; 28 Sep. 1995; I. Yarom leg.; SMNHTAU • 7 ♂♂; Qalya; 2 Jan. 1997; A. Freidberg leg.; SMNHTAU • 2 ♂♂; Ne‘ot Semadar; 21 Jun. 1995; I. Yarom leg.; SMNHTAU • 1 ♂; ‘Enot Zuqim; 11 Oct. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 6 ♂♂, 13 ♀♀; ‘Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 2 ♂♂, 2 ♀♀; Sappir pond; 9 Jul. 1996; A. Freidberg leg.; SMNHTAU • 3 ♂♂; Ne‘ot Semadar; 13 Oct. 1996; A. Freidberg leg.; SMNHTAU • 2 ♂♂, 1 ♀; ‘Enot Zuqim; 22 Apr. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 2 ♂♂; Ma‘agan, Mikha‘el; 30 May 2000; N. Meltzer and V. Kravchenko leg.; on *Tamarix tetragyna*; SMNHTAU • 1 ♀; Nahal, Neqarot; 3 May 1995; I. Yarom leg.; SMNHTAU • 9 ♂♂, 3 ♀♀; Dead Sea, ‘Enot Zuqim; 31°43'N, 35°27'E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE • 10 ♂♂, 15 ♀♀; N. Arava valley; 30°46' N, 35°14' E; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* and chenopods; MJE • 3 ♂♂, preserved in alcohol; same collection data as for preceding • 1 ♀; Dead Sea, Zomet Zohar; 31°08' N, 35°21' E; alt. -338 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE • 1 ♀; Western Negev, Ezuz; 30°46' N, 34°29' E; 24 Mar. 2000; M.J. Ebejer leg.; on grazed grass and dung; MJE.

SAUDI ARABIA • 1 ♂, preserved in glycerine tube; Aseer, Maraba; 1–30 May 2004, H.A. Dawah leg.; Malaise trap; MJE • 1 ♂, 1 ♀; Najran, Hay Alshurfa; 17°31' N, 44°15' E; 7–28 May 2014; H.A. Dawah leg.; Malaise trap; NMWC • 9 ♂♂, 23 ♀♀, preserved in alcohol; Jazan, Farasan Island, Aziz Yousef village; 16°40'N, 42°50'E; 6 Mar. 2017, H.A. Dawah leg.; Malaise trap; NMWC.

YEMEN • 3 ♂♂; Ta‘Izz; Aug. 1999; A. van Harten and A. Awad leg.; light trap; NMWC • 2 ♂♂; Mukalla; Jun. 2003; A. van Harten and M. Hubaishan leg.; light trap; MJE.

**Remarks**

*Aphaniosoma fissum* appears to have a primarily Afrotropical distribution reaching the Middle East and North Africa. Although both sexes are very variable in their general body colour and size, it is the only species known so far that has only two pairs of short, fine, white setulae in front of the anterior ocellus, one pair anterior to the other (Fig. 31A) and no other setae on the frons; these setulae are sometimes long, but never as long as is usual of the single dark pair typical of *A. approximatum* and *A. creperum* Collin, 1949, which are always darker and accompanied by several other short setulae scattered on the frons. The appearance of the male hypopygium, when visible in situ, is characteristic (Fig. 31B–C).

Pont (1995: 72) listed 5 males and 4 females as syntypes. Among the syntypes is a female specimen that has several setulae scattered on the frons and so it belongs to another species. This specimen is not included in the paralectotype series. The wide distribution and variability of this species raise the possibility of a species complex where minor morphological differences may yet be found to define them. There may also be cryptic species. For these reasons, a lectotype to secure the concept of *A. fissum* is necessary. The specimen, which best matches the figure given by Collin, is here designated lectotype in spite of it being headless, but it is otherwise in good condition.

**Distribution**

Algeria, Egypt, Kenya, Namibia, Oman, South Africa, United Arab Emirates (Collin 1949; Ebejer 1996, 2008, 2009; Baba Aissa 2017). New records for Israel and Yemen.

*Aphaniosoma flavipyga* sp. nov.

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Figs 32–34

**Diagnosis**

A pale-yellow species with scutum having deeper yellow to pale brown vittae; epandrium shiny, pale yellow; aedeagus brown; 2 fronto-orbitals and a pair of longer frontal setae in front of the ocellar triangle. Similar species: *A. freidbergi* sp. nov. has a longer head, narrower eyes and a long and strong pair of setae in the middle of the frons. *Aphaniosoma aldabrense* Ebejer, 2009, *A. kirkspriigsi* Ebejer, 2009 and *A. micropygum* Ebejer, 2009, all from the Afrotropical Region, look similar and have the long pair of setae on the frons and a dark mediotergite.

**Etymology**

The species epithet is a combination of the Latin for yellow '*flavus*' and for buttocks '*pyga*' and refers to the large round yellow epandrial halves on each side.

**Material examined****Holotype**

ISRAEL • ♂; Zomet Zohar; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU 405823.

**Paratypes**

ISRAEL • 16 ♂♂, 3 ♀♀; same collection data as for holotype; SMNHTAU • 2 ♂♂; same collection data as for holotype; MJE • 1 ♂; Holon; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU.

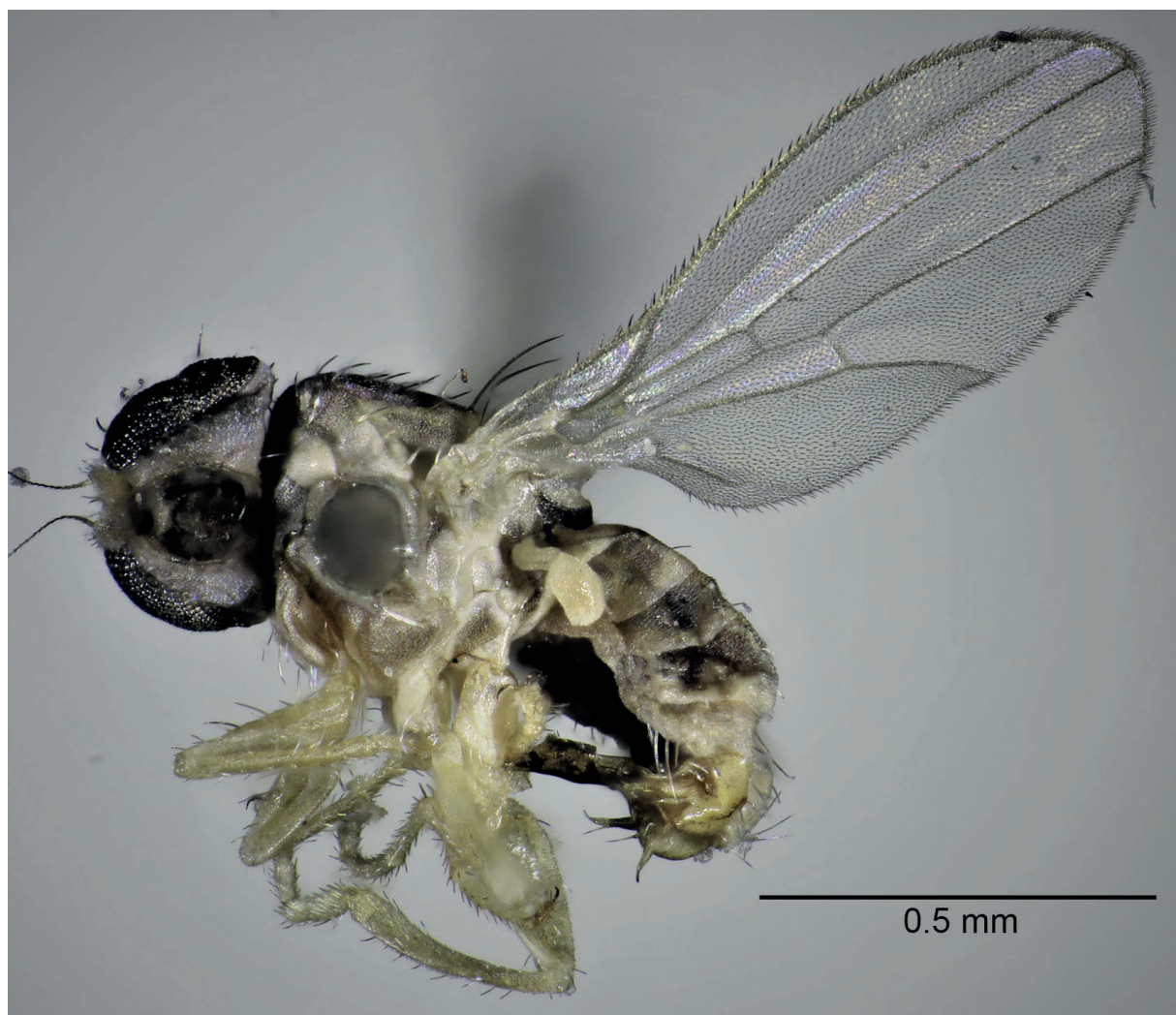
**Description**

MEASUREMENTS. Body length: male 1 mm, female 1.1 mm. Wing length: male 1 mm, female 1.1 mm.

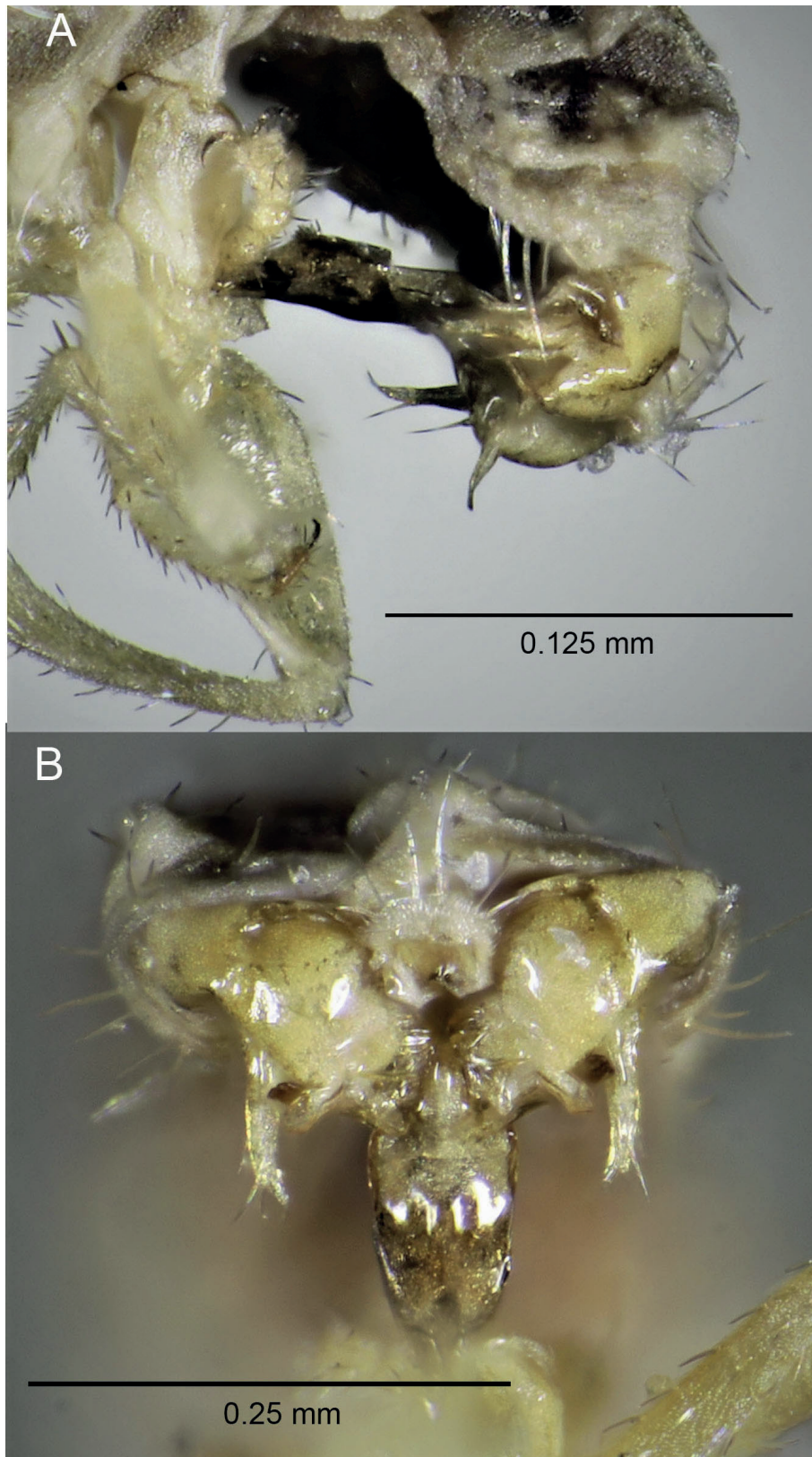
### Male

**HEAD.** Yellow including ocellar triangle and entire occiput, ocelli ringed black; at vertex, frons twice as broad as eye, narrowed anteriorly, at level of antennae about  $0.5 \times$  as wide as at level of anterior ocellus; gena narrow in front, deeper behind, in profile, below middle of eye, about  $0.5 \times$  as high as short oval eye, with numerous white setulae; occiput in profile not visible behind eye, with pale postocular setulae in one row; 2 vibrissal setae well differentiated from buccal row of setulae; face short and narrow, depressed and poorly sclerotized; median carina narrow and short; antenna yellow, pedicel with short seta dorsally; basal flagellomere with very fine short and dense pubescence along anterior margin shorter than diameter of basal segment of arista; basal  $\frac{1}{5}$  of arista pale, with fine pubescence; chaetotaxy: 2 posterior moderately developed fronto-orbitals with 2 very short setulae anterior to them; ocellars short; paravericals short and convergent; 1 inner and 1 outer vertical; frons with about 10 scattered setae apart from longer pair in front of anterior ocellus.

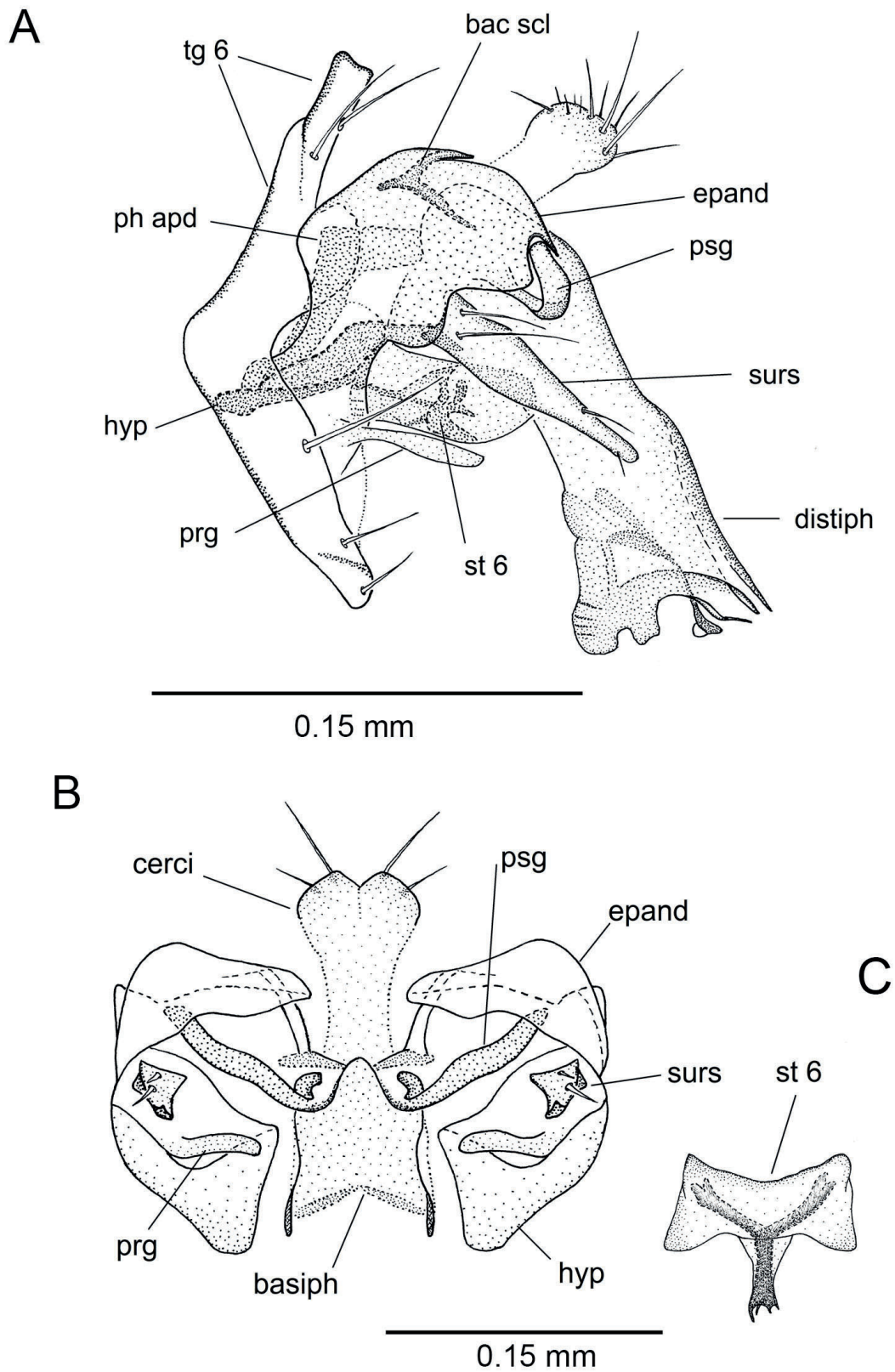
**THORAX.** Yellow with pale golden yellow microtomentum; scutum with deeper yellow to pale brown vittae; mediotergite yellow; chaetotaxy: 1 postpronotal, 1 short inconspicuous intra-postpronotal setula, 1 presutural, 2 notopleurals, 0+3 intra-alars, 1 postalar, 2+4 dorsocentrals, only prescutellar strong, 1+4



**Fig. 32.** *Aphaniosoma flavipyga* sp. nov., ♂, holotype (SMNHTAU 405823), habitus, lateral view.



**Fig. 33.** *Aphaniosoma flavipyga* sp. nov., ♂, paratype (SMNHTAU), hypopygium in situ. **A.** Lateral view. **B.** Posterior view.



**Fig. 34.** *Aphaniosoma flavipyga* sp. nov., ♂, paratype (SMNH-TAU). **A.** Hypopygium, lateral view. **B.** Hypopygium, ventral view. **C.** Sternite 6, ventral view. Abbreviations: See Material and methods.

acrostichals with prescutellars not developed, 4 scutellars, anepisternal and katepisternal setae not seen in holotype, damaged by pin (present in paratypes).

WING. Veins yellow; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.4 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between cross veins about  $1.3 \times$  as long as posterior crossvein, which lies slightly oblique and is about  $0.3 \times$  as long as apical section of  $M_4$ . Haltere creamy white.

LEGS. Yellow, with numerous pale setulae, longer setulae present on fore femur; apico-ventral seta on mid tibia present; claws black in apical half, pulvilli normal; hind trochanter not modified.

ABDOMEN. Tergites yellow with pale brown bands on basal  $\frac{2}{3}$ ; tergites sparsely setulose, with setulae more distinct on margins of tergites 5 and 6; tergite 6 narrow; sternite 6 with a heavily sclerotized central section directed anteriorly (Fig. 30 C).

HYPOPYGIUM (Figs 33–34). Epandrium large, pale shiny yellow, bearing elongate, conical surstylus, cercus very pale and long setulose; pregonite narrow and pale; postgonites pale brown pigmented, curved laterally; basiphallus pale brown; epiphallus notched at apex; distiphallus large and brown pigmented apically.

#### **Female**

Similar to male but without the secondary sexual characters.

#### **Variation**

Some specimens have pale brownish vittae along the dorsocentral and intra-alar lines, the former reaching the scutellum.

#### **Distribution**

Israel.

#### *Aphaniosoma freidbergi* sp. nov.

urn:lsid:zoobank.org:act:8B8A9A7B-7999-43A3-B76C-E801C07D6DF6

Figs 35–36

#### **Diagnosis**

A pale yellow species with a rather elongated head and eyes; only the aedeagus is dark brown and with a globular distiphallus; in contrast to similar species, it has a broad, pale shiny epandrium appearing more or less round in posterior view. The pair of long frontal setae in front of the ocellar triangle are set far forward and 2 strong posterior fronto-orbital setae are present. Similar species: *A. flavipyga* sp. nov. shares a pale mediotergite and an elongate head and eyes. The afore mentioned species *A. aldabrense*, *A. kirkspriggsi* and *A. micropygum* have a long pair of setae on the frons, but all have a dark mediotergite. Furthermore, all these species differ from each other in the structure of the male hypopygium.

#### **Etymology**

The species is named in honour of the late Amnon Freidberg, and his contribution to the study of Diptera including his interest in this family and his unwavering support to students and colleagues.

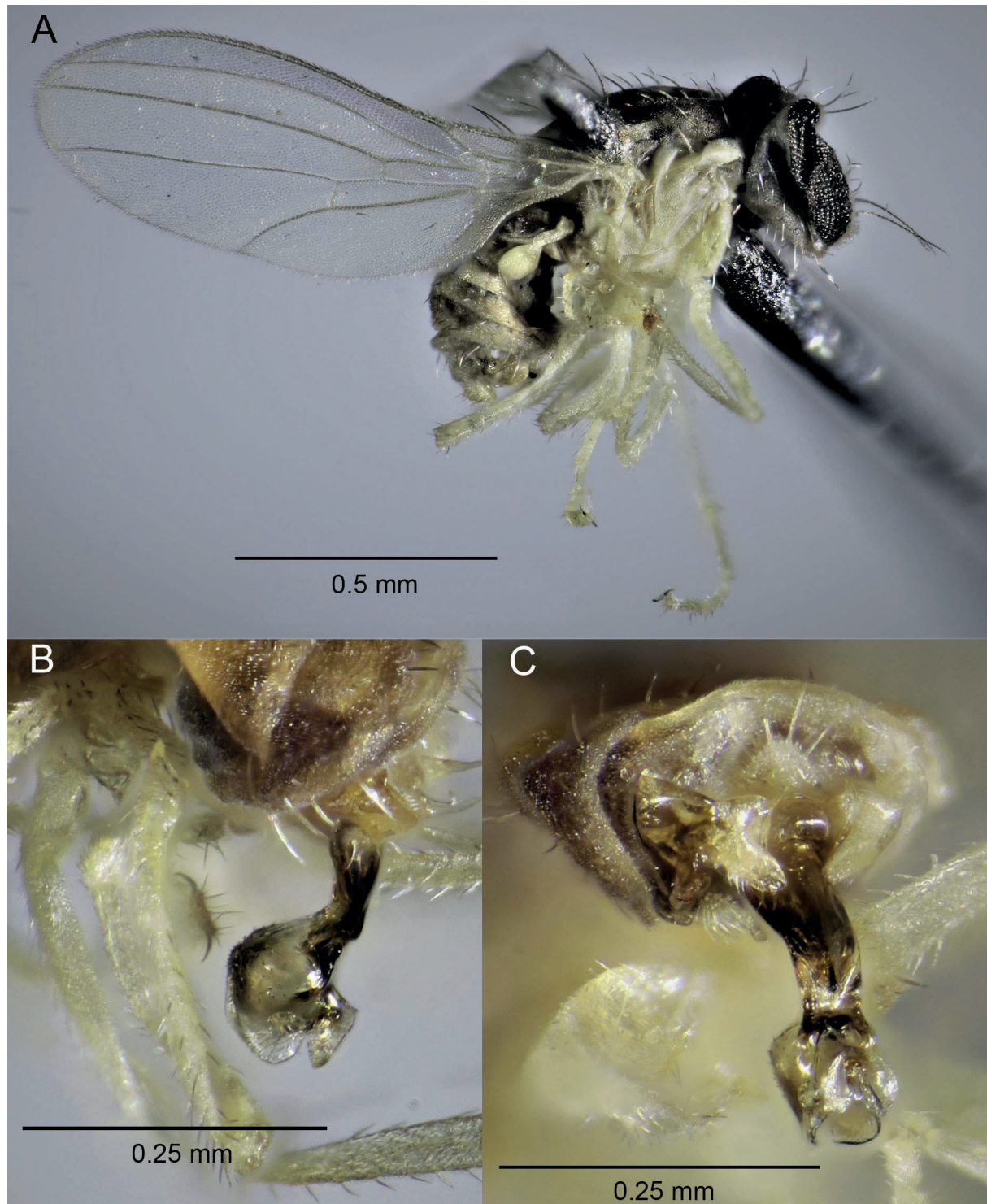
#### **Material examined**

##### **Holotype**

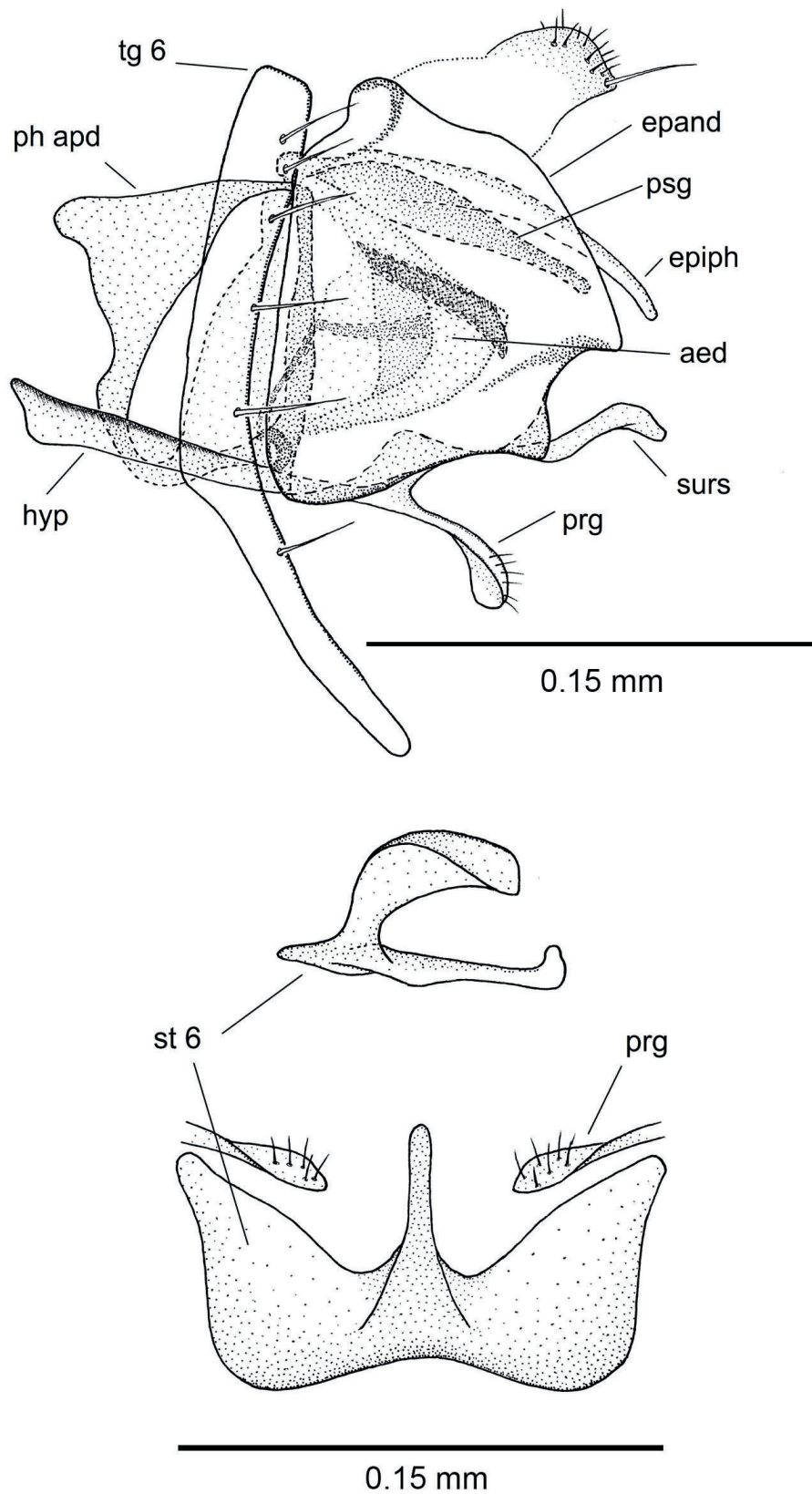
ISRAEL • ♂; 'Enot Zuqim; 7 Jun. 1996; A. Freidberg leg.; SMNHTAU 405824.

### Paratypes

ISRAEL • 6 ♂♂, 7 ♀♀; same collection data as for holotype; SMNHTAU • 2 ♂♂, 2 ♀♀; same collection data as for holotype; MJE • 2 ♂♂, 1 ♀; ‘Enot Zuqim; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 2 ♀♀; ‘Iddan; 20 Jun. 1995; I. Yarom leg.; SMNHTAU • 2 ♂♂, 1 ♀; ‘En Yahav; 24 Jul. 1995;



**Fig. 35.** *Aphaniosoma freidbergi* sp. nov., ♂, holotype (SMNHTAU 405824). A. Habitus, lateral view. B. Hypopygium in situ, lateral view. C. Hypopygium in situ, posterior view.



**Fig. 36.** *Aphaniosoma freidbergi* sp. nov., ♂, paratype (SMNHTAU). **A.** Hypopygium, lateral view. **B.** Sternite 6, top, lateral view, bottom, ventral view. Abbreviations: See Material and methods.

A. Freidberg leg.; SMNHTAU • 3 ♂♂; 'Enot Zuqim; 25 Aug. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂; 'En Gedi/N. Arugot; 31 May 2000; B. Merz leg.; MHNG.

### Description

MEASUREMENTS. Body length: male 1 mm, female 1.1 mm. Wing length: male 1 mm, female 1.1 mm.

#### Male (holotype)

HEAD. Yellow including ocellar triangle and entire occiput; frons longer than broad, narrowed anteriorly, at level of antennae about  $0.4 \times$  as wide as at level of anterior ocellus; gena narrow in front, deeper behind, about  $0.6 \times$  as high as long oval eye below middle of eye, with numerous white setulae; occiput in profile narrowly visible behind eye, with pale postocular setulae in one row; 2 vibrissal setae well differentiated from buccal row of setulae; face short and narrow, depressed and poorly sclerotized; median carina not visible; antenna yellow, pedicel with short seta dorsally; basal flagellomere with fine pubescence along anterior margin that is shorter than diameter of basal segment of arista; basal  $\frac{1}{3}$  of arista pale, with fine pubescence; chaetotaxy: 2 posterior moderately developed fronto-orbitals with 2 very short setulae anterior to them; ocellars short; paravericals short and convergent; 1 inner and 1 outer vertical; frons apparently bare except for pair of setae in front of anterior ocellus set forward beyond the middle of frons.

THORAX (Fig. 35A). Entirely yellow, covered with pale golden yellow microtomentum especially on scutum; chaetotaxy: 1 postpronotal, 1 short inconspicuous intra-postpronotal setula, 1 presutural, 2 notopleurals, 0+3 intra-alars, 1 postalar, 2+5 dorsocentrals, only hindmost strong, 6 acrostichals with prescutellars not developed, 4 scutellars, 1 anepisternal with 2 short setulae below, 1 katepisternal at upper posterior corner.

WING. Veins yellow; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.4 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between cross veins about  $1.6 \times$  as long as posterior crossvein, which lies slightly oblique and is about  $0.3 \times$  as long as apical section of  $M_4$ . Haltere creamy white.

LEGS. Yellow; with numerous pale setulae, including longer setulae on fore femur; apico-ventral seta on mid tibia present; claws black in apical half, short, about  $\frac{1}{2} \times$  as long as tarsomere, pulvilli normal; hind trochanter not modified.

ABDOMEN. Tergites yellow and sparsely setulose but setulae more distinct on margins of tergites 5 and 6; tergite 6, in lateral view, exceptionally narrow and dorso-ventrally long (Fig. 36A); sternite 6 of distinctive shape with a midline, posteriorly directed narrow lobe (Fig. 36B).

HYPOPYGIUM (Figs 35B–C, 36A). Epandrium large, pale, bearing short broad surstylus, cercus very pale and long setulose; pregonite setulose at apex and postgonites translucent, not easily seen; basiphallus brown and as narrow as proximal part of distiphallus, which is broader, almost globular at apex.

#### Female

Similar to male but without the secondary sexual characters.

### Variation

Some specimens have pale brownish vittae along the dorsocentral and intra-alar lines, the former reaching the scutellum.

### Distribution

Israel.

*Aphaniosoma gallagheri* Ebejer, 1996  
Fig. 37

**Material examined**

BAHRAIN • 1 ♂; Ahari, pool area; 4 Jun. 2000; C. Turner leg.; irrigated farms and ditches; NMWC.

EGYPT • 8 ♂♂, 1 ♀; Alexandria, Abu Kir; 20 Oct. 2003; P. Gatt leg.; beach, wrack; PG • 6 ♂♂, 1 ♀; same collection data as for preceding; MJE • 3 ♂♂; same collection data as for preceding; CULSP • 7 ♂♂, 2 ♀♀, preserved in alcohol; same collection data as for preceding; MJE • 1 ♂; Sinai, Taba; 1 May 1996; A. Freidberg leg.; SMNHTAU.

ISRAEL • 1 ♂, 1 ♀; 'Enot Zuqim; 11 Oct. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 10 ♂♂, 2 ♀♀; 'En Yahav; 24 Jul. 1995; A. Freidberg leg.; SMNHTAU • 5 ♂♂, 5 ♀♀; 'En Gedi; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 6 ♂♂; Ne'ot haKikkar; 29 Mar. 1996; A. Freidberg leg.; SMNHTAU • 2 ♂♂, 1 ♀; 'En 'Iddan; 20 Jun. 1995; A. Freidberg leg.; SMNHTAU • 5 ♂♂, 1 ♀; 'Iddan; 20 Jun. 1995; I. Yarom leg.; SMNHTAU • 7 ♂♂, 1 ♀; Sappir pond; 9 Jul. 1996; A. Freidberg leg.; SMNHTAU • 2 ♂♂, 3 ♀♀; 'Enot Zuqim; 25 Aug. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂; Elot; 18 Mar. 1995; A. Freidberg leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂; 'Enot Zuqim; 7 Jun. 1996; A. Freidberg leg.; SMNHTAU • 3 ♂♂, 2 ♀♀; Dead Sea, 'Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE • 2 ♂♂, 2 ♀♀; Dead Sea, Zomet Zohar; 31°08' N, 35°21' E; alt. -338 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE.

JORDAN • 1 ♂; NW Amman, Zarka River; 12 Oct. 2000; W. Rossi leg.; NMWC • 4 ♂♂, 1 ♀; preserved in alcohol; Azraq Reserve; 8 Oct. 2000; W. Rossi leg.; NMWC • 5 ♂♂, 2 ♀♀; preserved in alcohol; Azraq, Wildlife Resort; 31°49'97" N, 36°49'27" E; 20 Oct. 2011; J.-H. Stuke leg.; 1584; J-HS.

QATAR • 7 ♂♂, 4 ♀♀; Al Khor, nr Al-Khor community; 25°42'21.95" N, 51°33'17.84" E; 25 Apr. 2014; D. Whitmore leg.; BMNH(E) 2015-94; NHMUK.

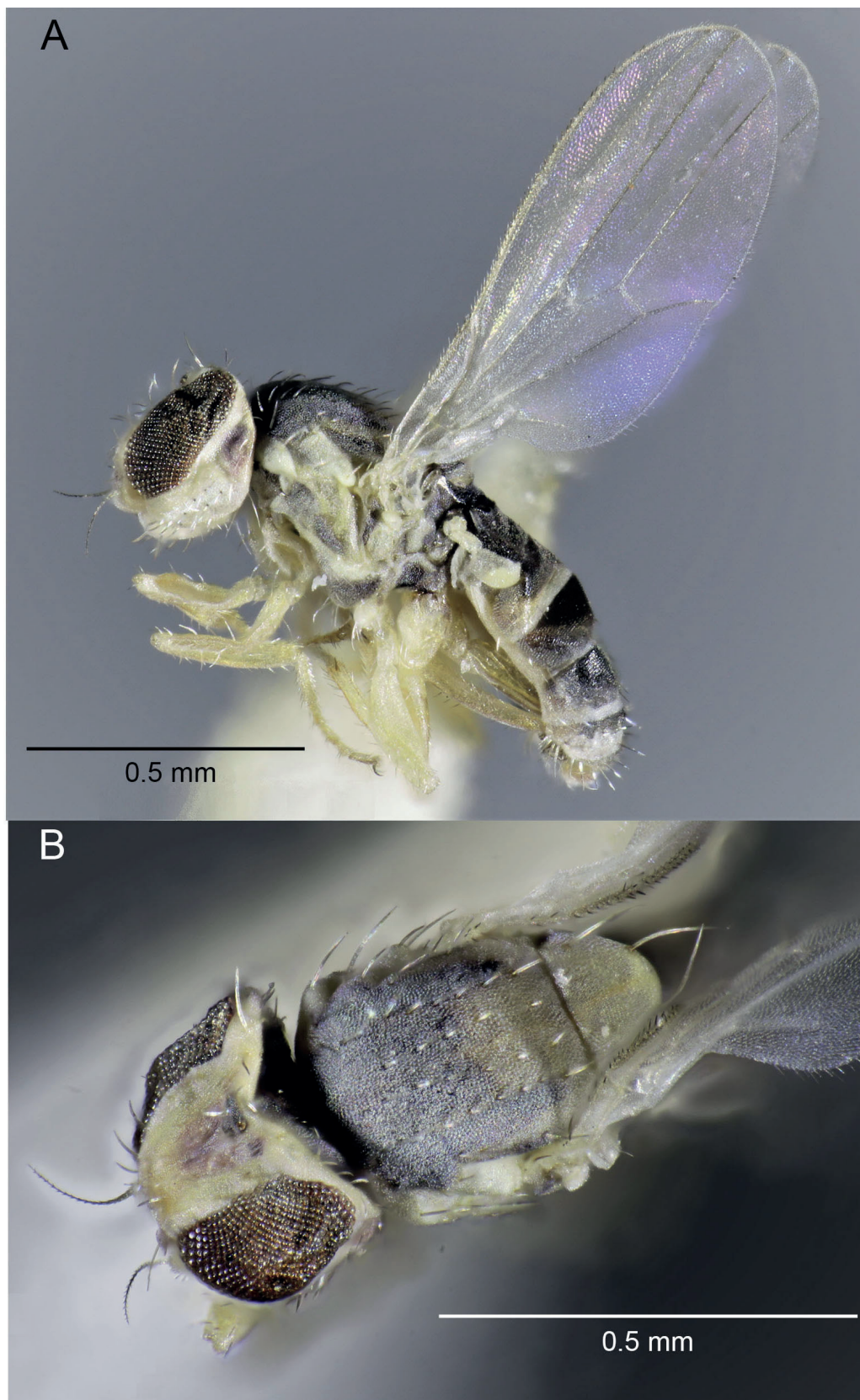
UNITED ARAB EMIRATES • 1 ♂; Al-Ajban; 1–10 Oct. 2005; A. van Harten leg.; NMWC • 2 ♂♂; Al-Ajban; 9–16 Nov. 2005; A. van Harten leg.; MJE • 1 ♂; Sharja Desert Park; 6–13 Dec. 2006; A. van Harten leg.; pitfall trap; NMWC • 4 ♂♂; Wadi Shawkah; 31 Oct.–27 Nov. 2006; A. van Harten leg.; water trap; NMWC.

**Remarks**

This species belongs to the *approximatum* group. The ground colour of the scutum is dark grey anteriorly but appears pale grey because of the dense pale microtomentum; setae and setulae are predominantly white (Fig. 37). The male has a large U-shaped pregenital sternite (Ebejer 1996: 293, fig. 11; 2009: 401, fig. 46a–b) that allows for easy identification when the abdomen is dissected, although occasionally it is also visible without dissection if the abdomen is not shrunken and flexed. The long ventrally projecting lobes on each side at the caudal end of the sternite may also be visible.

**Distribution**

Cape Verde Islands, Oman, The Gambia (Ebejer 1996, 2009). New records for Bahrain, Egypt, Israel, Jordan, Qatar, United Arab Emirates.



**Fig. 37.** *Aphaniosoma gallgheri* Ebejer, 1996, ♂ (MJE). **A.** Habitus, lateral view. **B.** Head and thorax, dorsal view.

*Aphaniosoma hackmani* Lyneborg, 1973

Fig. 38

**Material examined**

ISRAEL • 1 ♀; 'En Mor; 16 Mar. 1995; B. Merz leg.; MHNG • 1 ♂; Dead Sea, 'Enot Zuqim; 7 Jun. 1996; B. Merz and A. Freidberg leg.; MHNG • 1 ♂; 'Enot Zuqim; 31 May 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂, 2 ♀♀; 'Enot Zuqim; 3 Mar. 1998; Meltzer and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 4 ♀♀; same collection data as for preceding; on *Tamarix nilotica*; SMNHTAU • 4 ♂♂, 1 ♀; Qesarya; 23 Feb. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 4 ♀♀; same collection data as for preceding; 23 Apr. 1998; SMNHTAU • 1 ♀; Nahal Zin; 4 Apr. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 3 ♀♀; same collection data as for preceding; 6 Apr. 1998; SMNHTAU • 1 ♀; Park Qesarya; 27 Apr. 1999; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂, 1 ♀; 'Enot Zuqim; 24 May 2000; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂; Ma'agan, Mikha'el; 23 Feb. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix tetragyna*; SMNHTAU • 2 ♂♂; same collection data as for preceding; 29 Jan. 1999; SMNHTAU • 2 ♂♂; same collection data as for preceding; 29 Mar. 1999; SMNHTAU • 1 ♀; same collection data as for preceding; 19 Apr. 2000; SMNHTAU • 1 ♂; same collection data as for preceding; on *Tamarix* sp.; SMNHTAU • 2 ♂♂, 3 ♀♀; 'En Gedi; 11 May 1995; I. Yarom leg.; SMNHTAU • 1 ♂; 'En Mor; 11 Oct. 1995; F. Kaplan and A. Freidberg leg.; SMNHTAU • 1 ♂; 'Enot Zuqim; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂; Zomet Zohar; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂, 2 ♀♀; Qalya; 2 Jan. 1997; A. Freidberg leg.; SMNHTAU • 2 ♂♂, 2 ♀♀; same collection data as for preceding; S. Paz leg.; SMNHTAU • 1 ♀; 'Iddan; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 2 ♀♀; 'Atlit; 30 May 1995; A. Freidberg leg.; SMNHTAU • 1 ♀; same collection data as for preceding; 28 Apr. 1996; SMNHTAU • 1 ♀; Nizzanim; 23 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 1 ♀; Akko; 29 Oct. 1994; A. Freidberg leg.; SMNHTAU • 1 ♀; Park ha Yarden; 14 Jun. 1996; A. Freidberg leg.; SMNHTAU • 12 ♂♂, 12 ♀♀; Dead Sea, 'Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE • 1 ♂, 1 ♀; Jericho, route 90; 31°48' N, 35°29' E; 25 Mar. 2000; M.J. Ebejer leg.; on roadside vegetation; MJE.

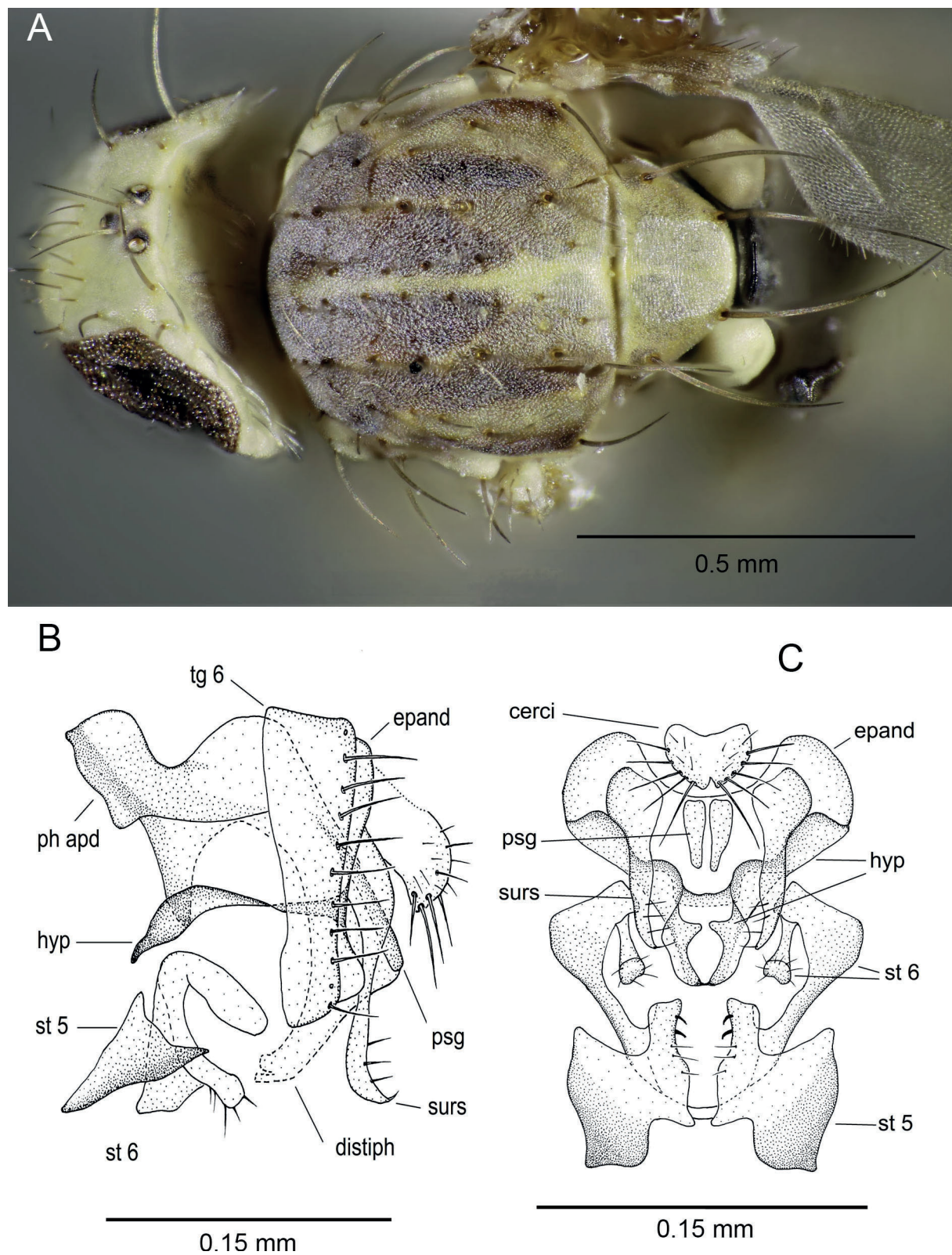
JORDAN • 1 ♂; NW Amman, Zarka River; 12 Oct. 2000; W. Rossi leg.; NMWC.

**Remarks**

A variable species with regard to colouration. Scutal pattern can have the vittae entirely yellow or brown to black as in Fig. 38A, but always covered with pale microtomentum; the dark brown bands on the tergites and brown marks on the pleura equally vary in their extent. There is also some variation in the number of dorsocentral setae and their length (1–2+3–4), but the presutural intra-alar seta is always present and the presutural dorsocentral always obviously strong. The long surstylus with 4–5 setulae directed ventrally (in the natural position) is remarkably constant. Line drawings of the hind trochanter and surstylus are given in Ebejer (1998: 205, figs 19–20), and photographed in situ in Ebejer (2021a: 6, fig. 11). The hypopygium was not previously illustrated. Line drawings are provided here (Fig. 38B–C).

**Distribution**

Cyprus, Spain (including Balearic Islands) (Lyneborg 1973; Ebejer 1998, 2021a). New records for Israel and Jordan.



**Fig. 38.** *Aphaniosoma hackmani* Lyneborg, 1973, ♂ (MJE). **A.** Head and thorax, dorsal, view. **B.** Hypopygium, lateral view. **C.** Hypopygium, ventral view. Abbreviations: See Material and methods.

*Aphaniosoma harteni* Ebejer, 1996  
Figs 39–40

**Material examined**

**Holotype**

YEMEN • ♂; Sana'a; Aug. 1991; A. van Harten leg.; NMWC.

**Other material**

ISRAEL • 1 ♂, 2 ♀♀; Western Negev, Ezuz; 30°46' N, 34°29' E; 24 Mar. 2000; M.J. Ebejer leg.; on grazed grass and dung; MJE.

SAUDI ARABIA • 1 ♂, 1 ♀; Najran, Hay Alshurfa; 17°31' N, 44°15' E; 7–28 May 2014; H.A. Dawah leg.; Malaise trap; NMWC.

**Remarks**

When this species was described the subtle projection on the hind trochanter was missed. The type series was re-examined and further illustrations provided (Ebejer 2016: 231, figs 14b, 15a–b). The record from Tunisia (Ebejer 1998) is now doubtful considering that many similar species have been described since, and a number of additional similar species known to the author are still awaiting description. Photographs of the holotype are provided here (Figs 39A, 40).

**Distribution**

Yemen (Ebejer 1996). New records for Israel, Saudi Arabia.

*Aphaniosoma impeditum* Ebejer, 2008  
Fig. 41

**Material examined**

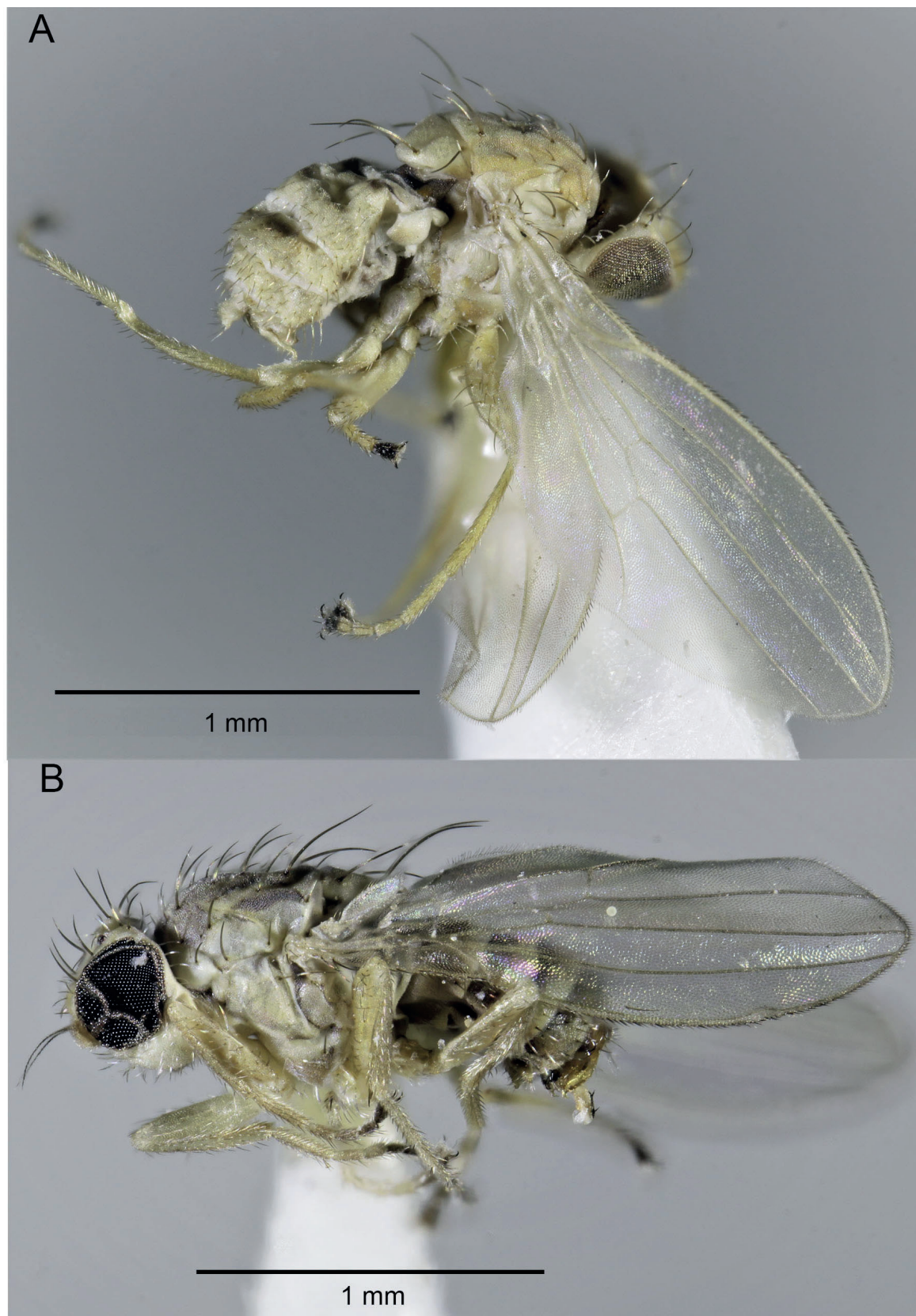
ISRAEL • 1 ♂; 'Enot Zuqim; 25 Aug. 1995; A. Freidberg leg.; SMNHTAU • 3 ♂♂, 2 ♀♀; Dead Sea, 'Enot Zuqim; 7 Jun. 1996; B. Merz and A. Freidberg leg.; MHNG • 3 ♂♂, 5 ♀♀; Nahal Zin; 8 Jun. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂, 1 ♀; same collection data as for preceding; 7 Aug. 1998; SMNHTAU • 21 ♂♂, 4 ♀♀; Dead Sea, Zomet Zohar; 31°08' N, 35°21' E; alt. -338 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE.

**Remarks**

One of several small and predominantly yellow species, four of which were described from the United Arab Emirates. This species has a pair of longer setae in front of the anterior ocellus and a black mediotergite; as with most species of *Aphaniosoma* that have scutal vittae, these vary in the intensity of brown colouration, and in this species the middle pair are sometimes indistinct compared to the lateral vittae – those near the dorsocentral and intra-alar lines (Fig. 41B). Identification of *A. impeditum* requires examination of the dissected male hypopygium, as the appearance of the hypopygium in situ rarely shows distinctive features (Fig. 41C).

**Distribution**

United Arab Emirates (Ebejer 2008). New record for Israel.



**Fig. 39.** *Aphaniosoma harteni* Ebejer, 1996. **A.** ♂, holotype (NMWC), habitus, lateral view. **B.** ♂, (MJE), from Israel, habitus, lateral view.

*Aphaniosoma impudens* Ebejer, 1998  
Figs 42–43

**Material examined**

**Paratype**

TURKEY • 1 ♂; Denizli, Aci Gol marsh; 4 Jul. 1997; M.J. Ebejer leg.; NMWC.

**Remarks**

A species of a predominantly dark brownish-black thorax and abdomen (Fig. 42A, C). The frons has dark frontal setulae uniform length (Fig. 42B). In both sexes of *A. impudens*, the basal flagellomere is usually dark brown. It is an easy species to recognize in the male because of the large, dark and broad surstylus that is always visible without dissection (Fig. 43). This structure is similar to the surstylus of *A. lamellatum* Collin, 1949, which is longer, yellow and has an irregular outline (Fig. 50C), and similar to that of *A. platystylus* Ebejer, 2008, which is also yellow but shorter and broader (Fig. 71B) than that in *A. lamellatum*. The thorax and abdomen of *A. lamellatum* and *A. platystylus* are much less dark, generally having grey or brown scutal vittae and much more yellow on the pleura as well as broader yellow hind margins on the abdominal tergites. Both these species have pale yellowish setae and setulae.

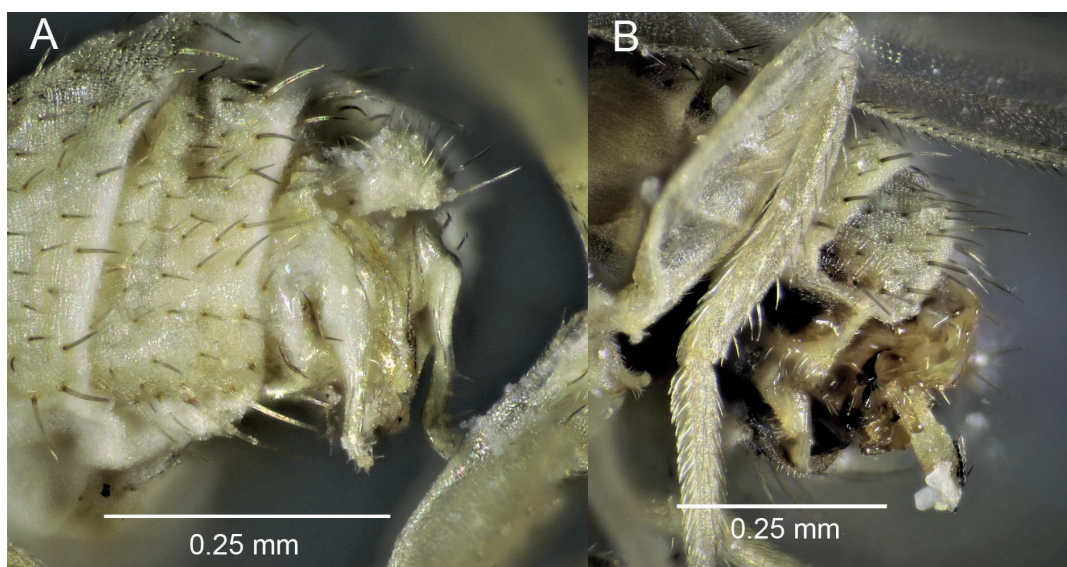
**Distribution**

Turkey (Ebejer 1998). New record for Israel.

*Aphaniosoma incudisternum* Ebejer, 2008  
Figs 44–45

**Material examined**

ISRAEL • 17 ♂♂, 2 ♀♀; Dead Sea, Zomet Zohar; 31°08' N, 35°21' E; alt. -338 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE • 5 ♂♂; same collection data as for preceeding; SMNHTAU • 2 ♂♂,

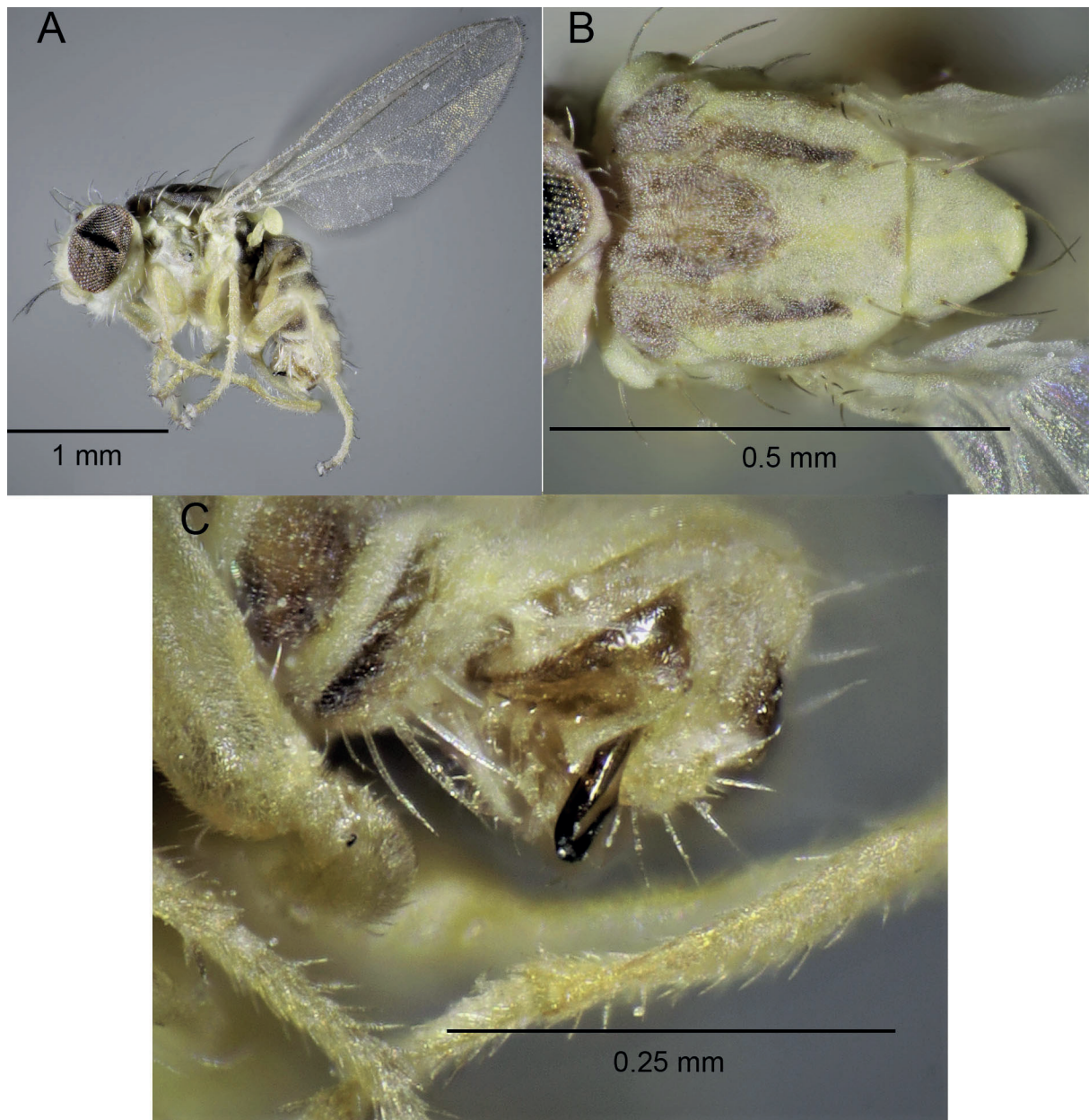


**Fig. 40.** *Aphaniosoma harteni* Ebejer, 1996, ♂, holotype (NMWC), hypopygium in situ. **A.** Lateral view. **B.** Ventro-lateral view.

preserved in glycerine; same collection data as for preceding; MJE • 2 ♂♂; N. Arava valley; 30°46' N, 35°14' E; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* and chenopods; MJE.

### Remarks

A yellow species (Fig. 44) with pale brown scutal vittae and bands on the abdominal tergites; mediotergite dark. The frons has a pair of longer setae in front of the anterior ocellus. It is one of the most difficult species to identify because of the pale structures of the male hypopygium (only the postgonite dark) (Fig. 45), their small size and the ease with which maceration destroys some diagnostic features. It is one of the four species described from the United Arab Emirates. Identification requires examination of the



**Fig. 41.** *Aphaniosoma impeditum* Ebejer, 2008, ♂ (MJE). **A.** Habitus, lateral view. **B.** Thorax, dorsal. **C.** Hypopygium, ventro-lateral oblique view.

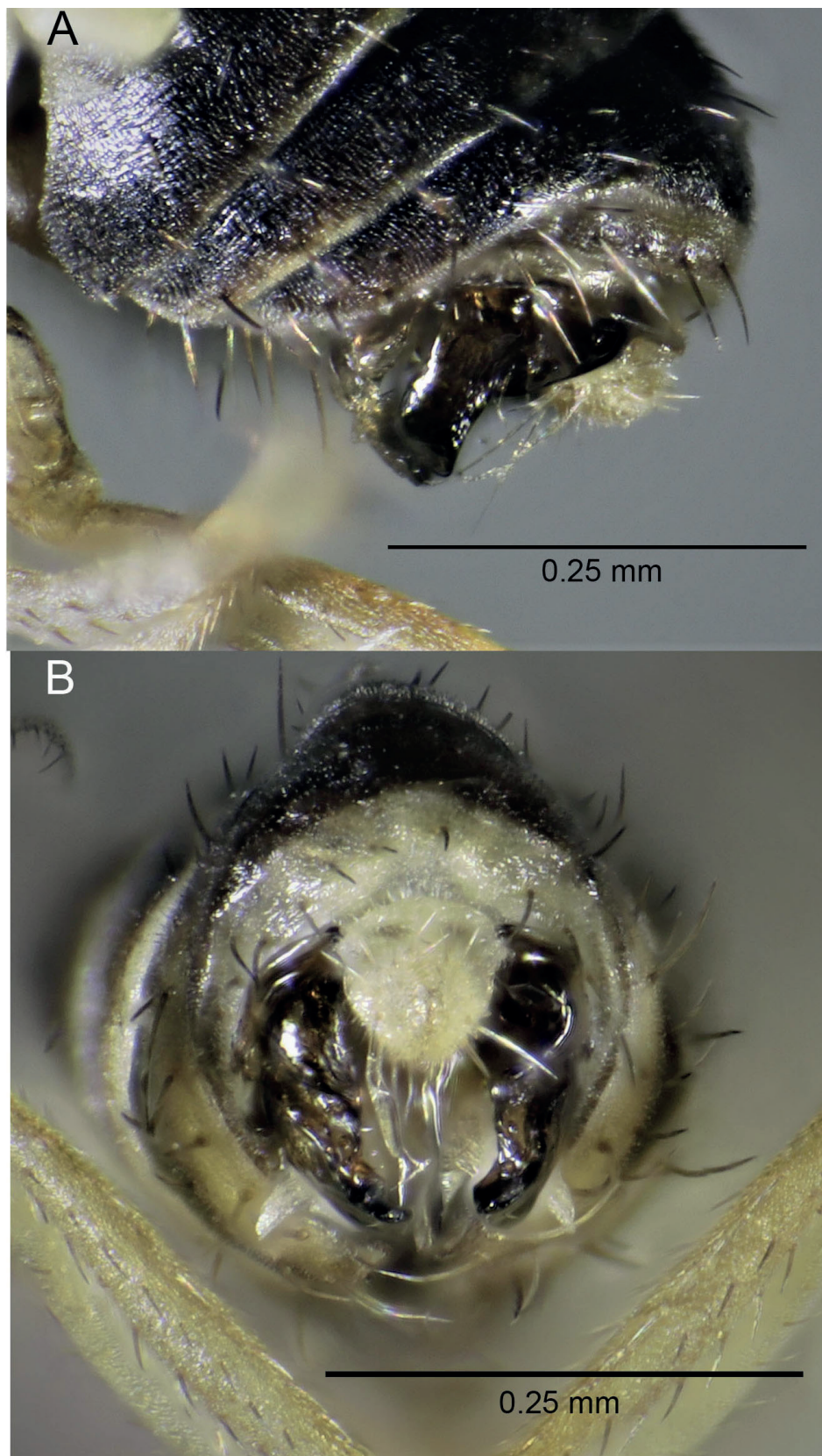
dissected male abdomen where the easiest feature to appreciate is the structure of abdominal sternites 3–5 (Ebejer 2008: 687, fig. 9).

### Distribution

United Arab Emirates (Ebejer 2008). New record for Israel.



**Fig. 42.** *Aphaniosoma impudens* Ebejer, 1998, ♂ (NMWC). **A.** Habitus, lateral view. **B.** Head, frontal view. **C.** Head and thorax, dorsal view.



**Fig. 43.** *Aphaniosoma impudens* Ebejer, 1998, ♂ (NMWC), hypopygium in situ. **A.** Lateral view. **B.** Posterior view.

*Aphaniosoma interispina* sp. nov.

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Figs 46–47

**Diagnosis**

A yellow species with brown longitudinal scutal vittae appearing pale owing to dense yellowish white microtomentum; 2 well-developed fronto-orbital setae and a pair of long setae in front of anterior ocellus. Male with the 6<sup>th</sup> tergite bearing a small black spine on its ventro-medial margin; epandrium small, round at base and shining black; surstylus broad-based, black and triangular. In general appearance and chaetotaxy, this species is similar to *A. falciferum*, but it does not have the long black postgonite of the other species. The three long setae on the ventral margin of tergite 6 are similar to those of *A. trisetum* Ebejer, 1998, but in all other respects it differs from that species.

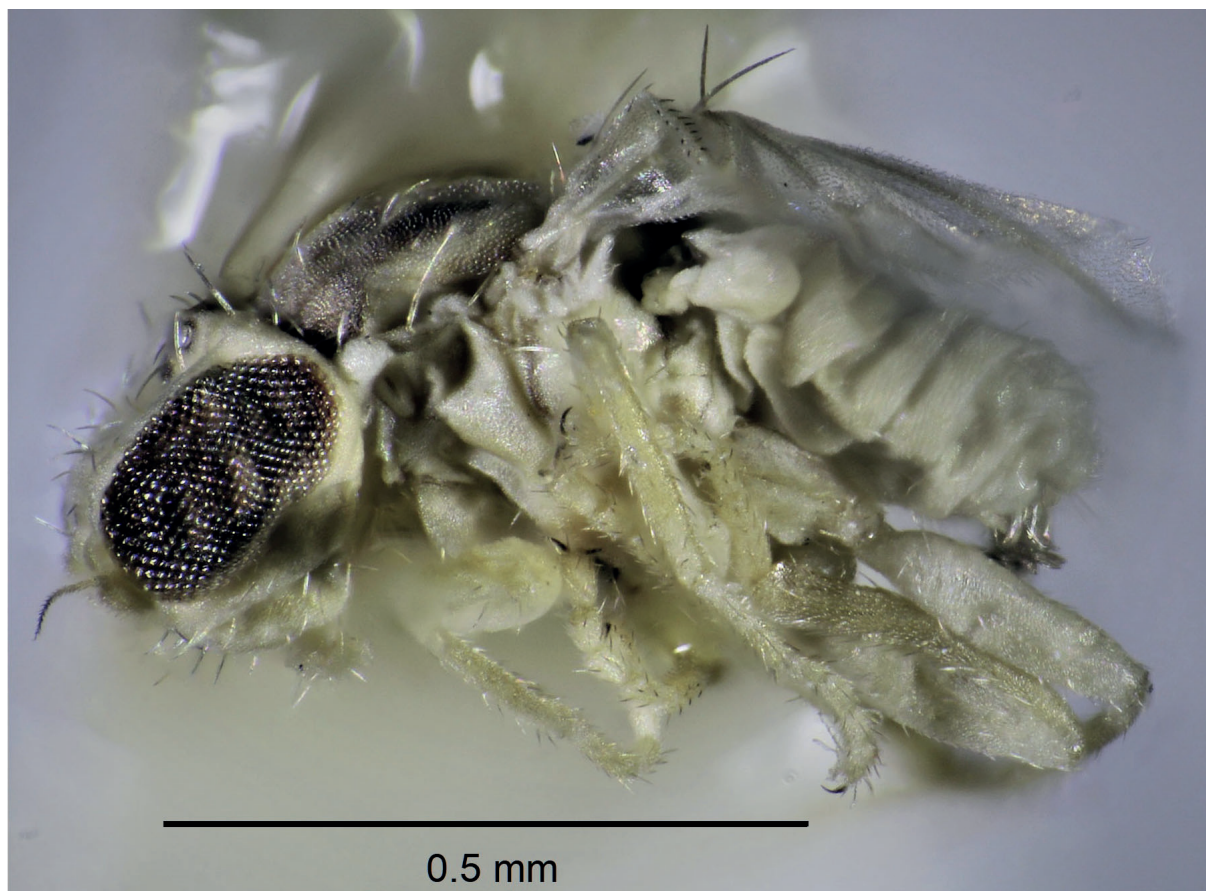
**Etymology**

The species epithet is a combination of the Latin ‘*interior*’ (‘inside’) and ‘*spina*’ (‘spine’) and refers to the spine within the lower margin of tergite 6.

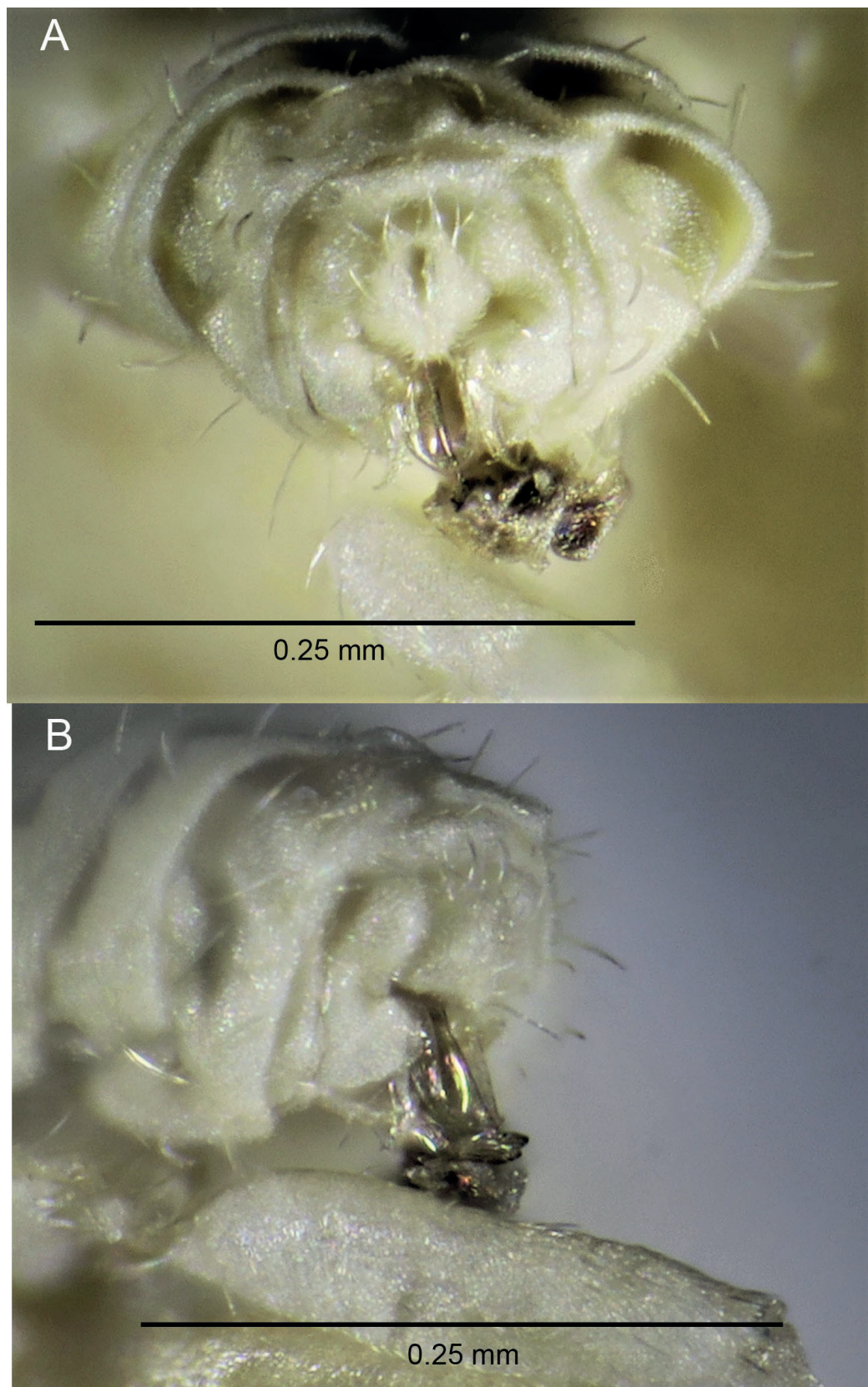
**Material examined**

**Holotype**

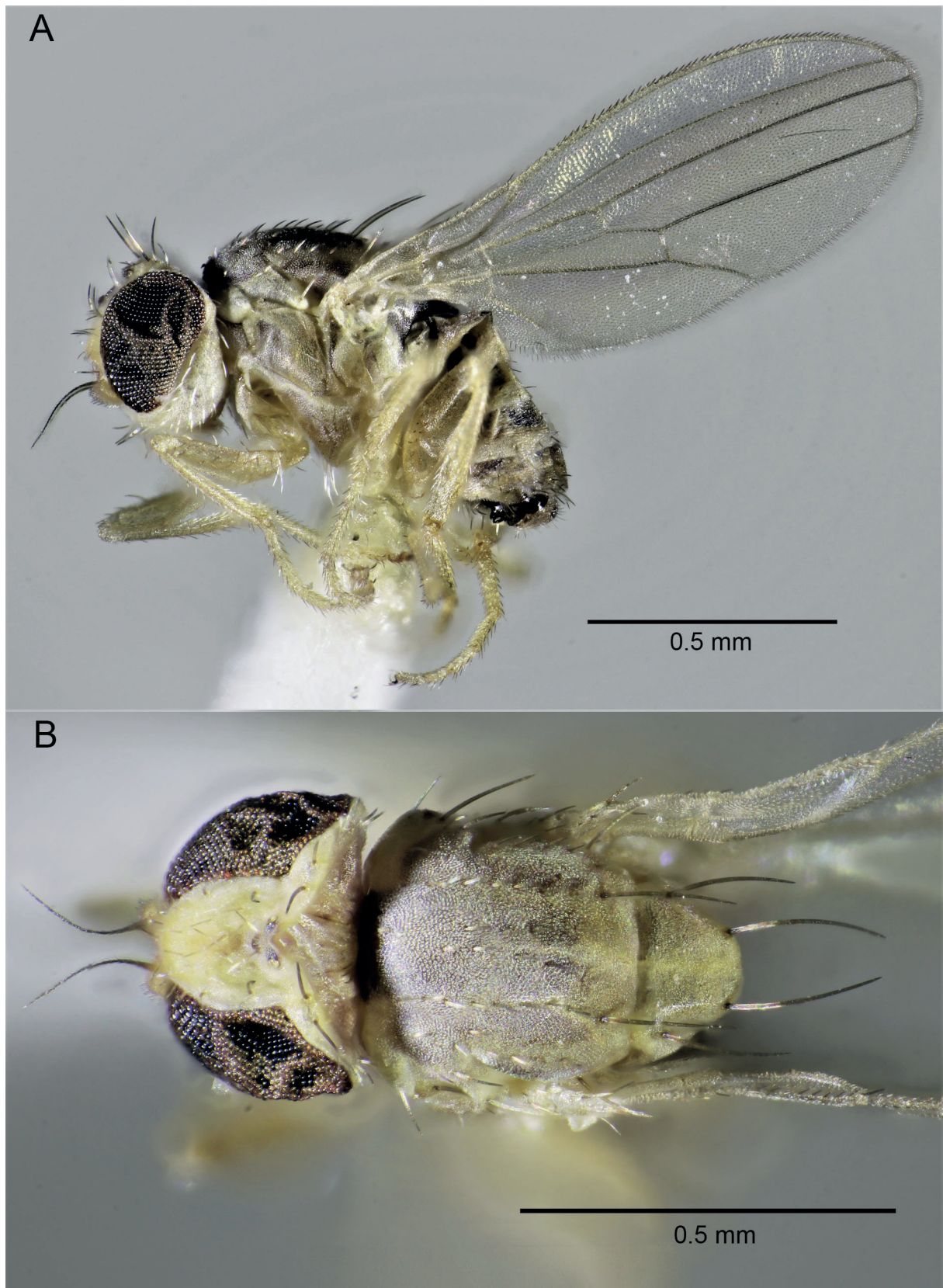
ISRAEL • ♂; Western Negev, Nahal Lavan; 30°58' N, 34°24' E; 24 Mar. 2000; M.J. Ebejer leg.; shrubs on sand; OUMNH DIPTO801.



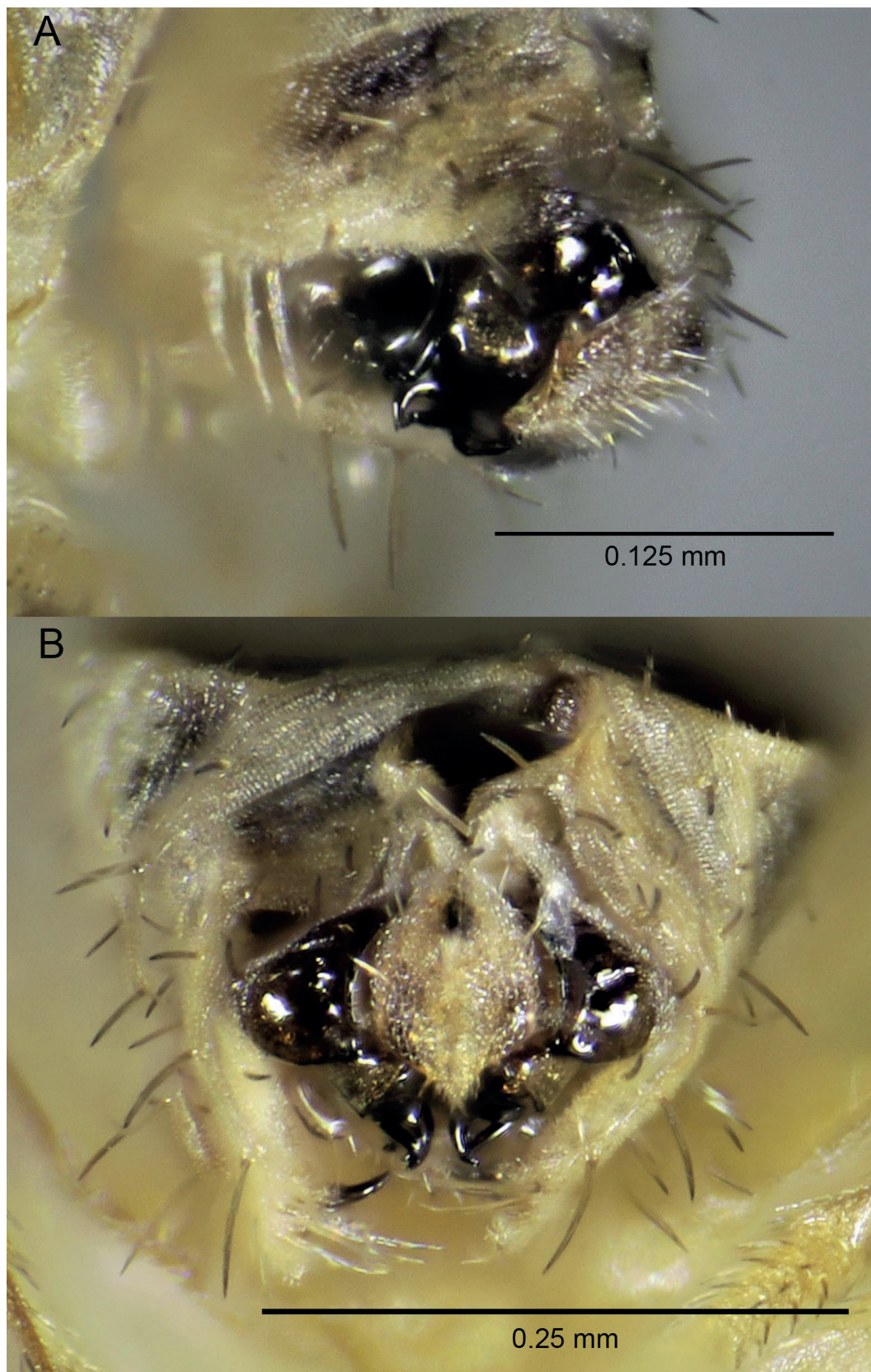
**Fig. 44.** *Aphaniosoma incudisternum* Ebejer, 2008, ♂ (MJE), habitus, lateral view.



**Fig. 45.** *Aphaniosoma incudisternum* Ebejer, 2008, ♂ (MJE), hypopygium in situ **A.** Posterior view. **B.** Postero-lateral view.



**Fig. 46.** *Aphaniosoma interispina* sp. nov., ♂, holotype (OUMNH DIPTO801). **A.** Habitus, lateral view. **B.** Head and thorax, dorsal view.



**Fig. 47.** *Aphaniosoma interispina* sp. nov., ♂, holotype (OUMNH DIPTO801), hypopygium in situ. **A.** Ventro-lateral oblique view. **B.** Posterior view.

## Description

MEASUREMENTS. Body length: male 1.1 mm. Wing length 1.2 mm.

### Male, holotype

HEAD (Fig. 46B). Yellow, ocelli partly ringed with black; gena about half height of eye at middle and with scattered pale yellowish white setulae; a pair of vibrissal setae on each side; frons narrow at anterior margin about  $0.5 \times$  as wide as at level of anterior ocellus; ocellar setae about as long as anterior fronto-orbital, 2 well-developed fronto-orbital setae and 2 very short and inconspicuous setulae anterior to these; about 12 setae on frons and a longer pair in front of the anterior ocellus; 1 inner and 1 outer vertical well-developed; paraverticlar setae short and convergent, postocular setae strong and in one row; face short, poorly sclerotized and depressed; median carina distinct, sharp and low, reaching clypeus; antenna yellow, pedicel paler than basal flagellomere and with distinct short dark seta dorsally; basal flagellomere with fine pubescence along anterior margin a little longer than diameter of base of arista; arista all brown and minutely pilose.

THORAX (Fig. 46). Mostly yellow; scutum with brown longitudinal vittae separated by narrow yellow lines and covered with dense yellowish microtomentum; scutellum yellow and pleura yellow; mediotergite brown; chaetotaxy: 1 postpronotal with fine short seta adjacent, 1 presutural with a short fine seta close and anterior to it, 1 incurved intra-postpronotal, 2 notopleurals, the anterior quite strong; 1+4 intra-alars, 1 postalar, 2+6 dorsocentrals with only posterior seta well-developed, 0+4 acrostichals, no prescutellars, 4 scutellars, anepisternal seta short and inconspicuous short, 1 very strong katapisternal at upper posterior corner and a short fine seta far anterior to it.

WING. Veins all pale; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.4 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about  $1.4 \times$  as long as posterior crossvein, which is about  $0.4 \times$  as long as apical section of  $M_4$ . Haltere pale yellow.

LEGS. Numerous pale-yellow scattered setulae, with longer posterior setulae on fore femur; apico-ventral seta on mid tibia present; claws black and pulvilli normal; tarsi yellow; hind trochanter not modified.

ABDOMEN. Basal tergites brown dorsally, becoming much narrower laterally; tergites 4–6 mostly yellow; tergite 6, laterally on its ventral margin with 3 close set long white setae (Fig. 47A) and on medial aspect of ventral margin (inner surface), bearing a small black spine (Fig. 47B); tergites with relatively few fine pale setulae.

HYPOPYGIUM (Fig. 47). Not dissected as the holotype is the only specimen and it exhibits enough diagnostic features externally; epandrium small, round and shining black, bearing a narrow black and curved surstylus that is bluntly truncated apically; pregonite pale and with apical setulae; postgonite broad-based, shining black, curved and pointed; aedeagus not visible; cercus pale yellow, fused with the opposite side and setulose but without any exceptionally long setae.

### Female

Unknown.

### Distribution

Israel.

*Aphaniosoma kravchenkoi* sp. nov.

urn:lsid:zoobank.org:act:3857614B-5E83-430B-BDB7-80FD7E32ADC4

Figs 48–49

**Diagnosis**

A black species with dense greyish microtomentum giving it an overall grey appearance; with margins of pleural sclerites and hind margins of abdominal tergites yellow (Fig. 48A); apex of scutellum yellow; basal flagellomere yellow in male, dark brown in female; 2 distinct fronto-orbital setae. Male densely microtomentose on tergite 6 and on dorsal part of epandrium, leaving two small shining brown patches dorsally on epandrium (Fig. 48B). There are four species similar to *A. kravchenkoi* sp. nov. in external characters and in the structures of the male hypopygium. *Aphaniosoma bartaki* Ebejer, 1998, described from Uzbekistan, has a broader and bilobed medial extension of the ventro-lateral margin of tergite 6 and a differently shaped pregenital sternite, which is more transverse and has two short and broad posteriorly directed lobes; the surstylus and postgonite are dark sclerotized. *Aphaniosoma hamatum* Ebejer, 2007 and *A. similis* Ebejer, 2007, both described from Mongolia, have a narrower curved ventral lobe to tergite 6, a bilobed pale surstylus and pale pregonite. *Aphaniosoma subtilis* Ebejer, 2007, described from Kyrgyzstan, is most similar to the new species in external features, and hypopygial structures must be examined for differentiation: the postero-ventral lobe of tergite 6 is narrower and longer with the apex broad and round in the new species (Fig. 49A); the surstylus is dark, curved and pointed in *A. subtilis* whereas in *A. kravchenkoi* it is translucent (in macerated specimens) and curved only slightly at the tip; the pregonite is large, broad and strongly curved downwards in *A. kravchenkoi* but narrow and almost straight in *A. subtilis*; the postgonite in both species is translucent, but that of *A. kravchenkoi* is shorter.

**Etymology**

The species is named after V. Kravchenko who collected many specimens of *Aphaniosoma* in Israel.

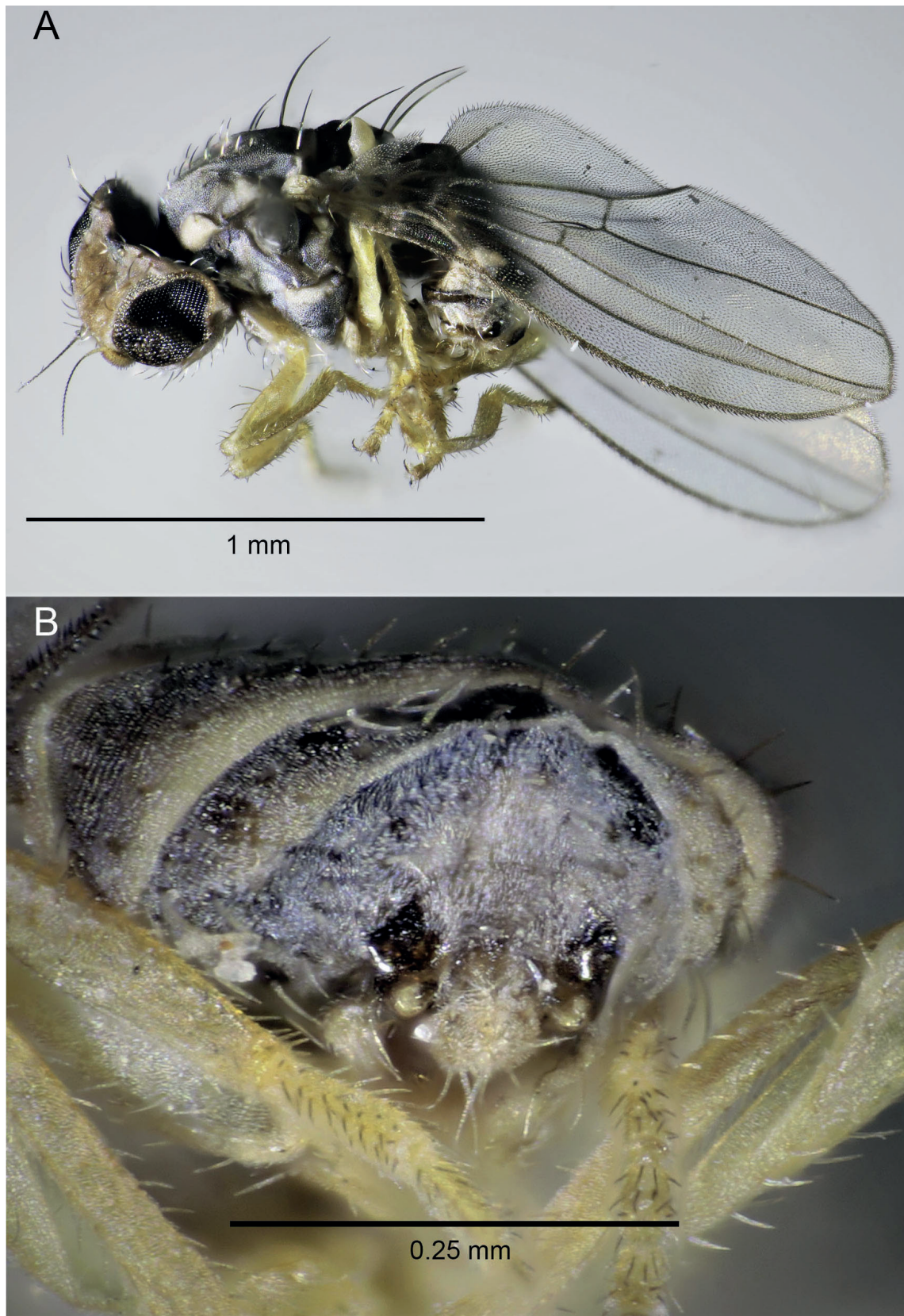
**Material examined**

**Holotype**

ISRAEL • ♂; 'Iddan; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU 405825.

**Paratypes**

ISRAEL • 3 ♂♂, 1 ♀; same collection data as for holotype; SMNHTAU • 3 ♂♂, 1 ♀; 'Enot Zuqim; 11 Oct. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 1 ♂, 1 ♀; 'Enot Zuqim; 30 Mar. 1999; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂, 1 ♀; same collection data as for preceding; 28 Apr. 1999; SMNHTAU • 5 ♀♀; 'Enot Samar; 3 Mar. 1999; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 5 ♂♂; same collection data as for preceding; 30 Mar. 1999; SMNHTAU • 2 ♂♂; same collection data as for preceding; 24 Nov. 1999; SMNHTAU • 2 ♂♂; same collection data as for preceding; 12 Apr. 2000; SMNHTAU • 1 ♂; Ma'agan Mikha 'El; 15 May 2000; N. Meltzer and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂; Nahal Neqarot, N of Sappir; 4 Mar. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂; same collection data as for preceding; *Tamarix* sp.; SMNHTAU • 4 ♂♂; 'Iddan; 20 Jun. 1995; I. Yarom leg.; SMNHTAU • 1 ♂; 'En Iddan; 20 Jun. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂, 1 ♀; 'En Gedi; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 6 ♂♂; 'En Gedi (Nahal David); 5 Jun. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 11 ♂♂, 3 ♀♀; 'En Gedi/N Arugot; 31 May 2000; B. Merz leg.; MHNG • 2 ♂♂, 1 ♀; N. Arava valley; 30°46' N, 35°14' E; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* and chenopods; MJE • 3 ♂♂; Dead Sea, Zomet Zohar; 31°08' N, 35°21' E; alt. -338 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE • 17 ♂♂, 3 ♀♀; Dead Sea, 'Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE • 1 ♀; Jericho, route 90; 31°48' N, 35°29' E; 25 Mar. 2000; M.J. Ebejer leg.; on roadside vegetation; MJE.



**Fig. 48.** *Aphaniosoma kravchenkoi* sp. nov., ♂, holotype (SMNHTAU 405825). **A.** Habitus, lateral view. **B.** Hypopygium in situ, posterior view.

### Other material

ISRAEL • 1 ♂, preserved in alcohol; N. Arava valley; 30°46' N, 35°14' E; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* and chenopods; MJE • 1 ♂, preserved in alcohol; Arava valley, Qetura [Ketura]; 50 km north of Eilat; 29°58'07" N, 35°03'38" E; alt. 126 m; 3–8 May 2013; Z.A. Yefremova leg.; Malaise trap; coll. code 140907; ZSM.

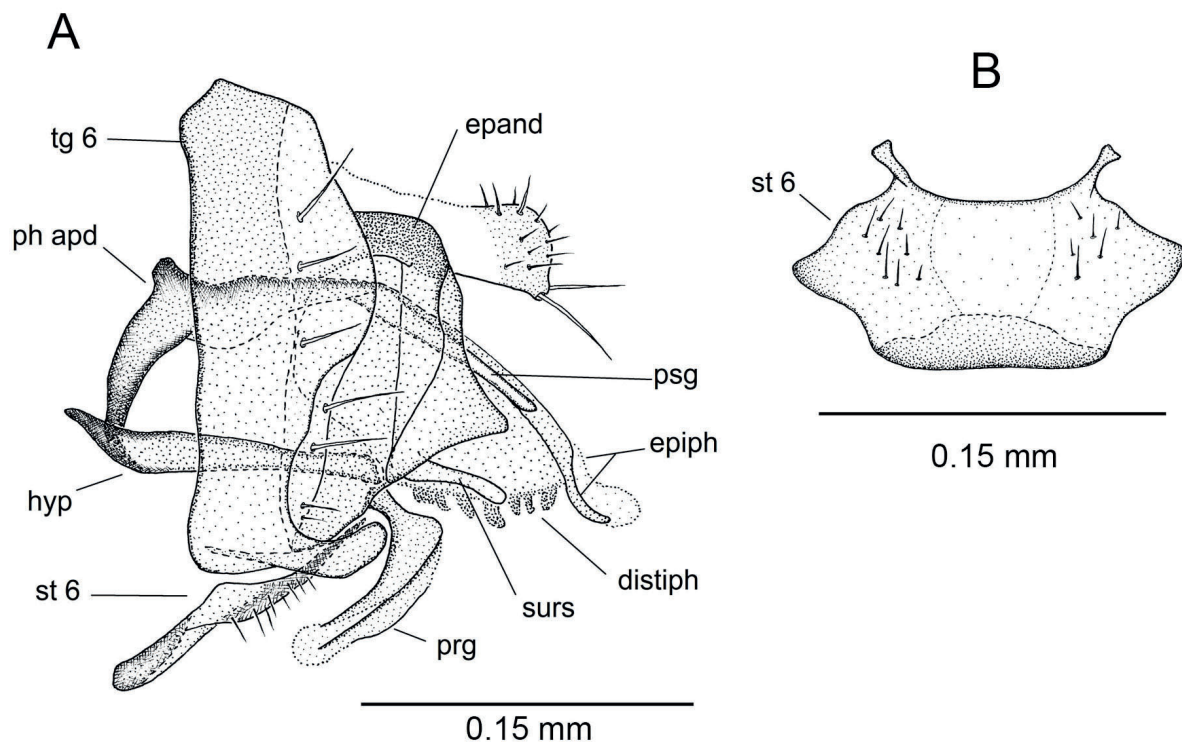
JORDAN • 1 ♂, 1 ♀, preserved in alcohol; Wadi Rum, “Sietental” [valley]; 29°34'29" N, 35°24'25" E; 14 Oct. 2011; J.-H. Stuke leg.; 1580; J-HS.

### Description

MEASUREMENTS. Body length: male 1.1 mm, female 1.3 mm. Wing length: male 1.2 mm, female 1.3 mm.

### Male, holotype

HEAD. Yellow on frons and anterior part of gena, otherwise, ocellar triangle, entire occiput and posterior margin of gena black; gena about  $\frac{1}{2} \times$  as high as eye at middle and with scattered pale yellow setulae; one vibrissal setae but with 2 as strong setae close to it, one on buccal margin and the other on gena lateral to vibrissa; frons narrow at anterior margin about  $0.5 \times$  as wide as at level of anterior ocellus; ocellar setae as strong as posterior fronto-orbital, 2 distinct but not especially strong fronto-orbital setae and 3 short setulae anterior to these; about 8 short setulae on frons with a distinctly longer pair in front of the anterior ocellus; inner and outer vertical well-developed; paraverticlar setae short and convergent, postocular setae short and in one row; face short, poorly sclerotized and depressed; median carina low and not reaching clypeus; antenna yellow, pedicel paler than basal flagellomere and with distinct short seta dorsally; basal flagellomere with fine pubescence along anterior margin; basal  $\frac{1}{5}$  of arista yellow contrasting with black distal portion.



**Fig. 49.** *Aphaniosoma kravchenkoi* sp. nov., ♂, paratype (SMNHTAU). A. Hypopygium, lateral view. B. Sternite 6, ventral view. Abbreviations: See Material and methods.

**THORAX.** Black and almost uniformly greyish microtomentose, leaving only postpronotal lobe and notopleuron bright yellow, postalar calli dusky yellowish; scutellum grey with yellowish apex; pleura grey with narrow yellow margins to sclerites; chaetotaxy: 1 postpronotal, 1 presutural, 1 short incurved intra-postpronotal, 2 notopleurals, 0+4 intra-alars, 1 postalar, 2+6 dorsocentrals with only the posterior one strong, 1+4 acrostichals with no prescutellars, 4 scutellars, anepisternal damaged by pin in holotype, present in paratypes, 1 katepisternal at upper posterior corner and 4 fine setae scattered on disc.

**WING.** Veins all brown; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.7 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about  $1.3 \times$  as long as posterior crossvein, which is about  $0.4 \times$  as long as apical section of  $M_4$ . Haltere pale yellow.

**LEGS.** Yellow; numerous pale setulae scattered on legs, fore femur with additional long setulae on posteriorly; apico-ventral seta on mid tibia present; claws black, pulvilli normal; tarsomeres yellow; hind trochanter not modified.

**ABDOMEN.** Tergites black with yellow hind margins, bearing short pale setulae almost exclusively on the hind margins; tergite 6 densely grey microtomentose (Fig. 48B); sternite 6 modified, having the lateral borders extended into triangular lobes, and the posterior margin bearing two short and narrow projections (Fig. 49B).

**HYPOPYGIUM** (Figs 48B, 49A). Epandrium, on each side, with yellow anterior half and brown posterior half; densely microtomentose dorsally above a small shining brown spot; surstylus narrow elongate; pregonite large and curved; aedeagus brown (not distended and cannot be assessed further); epiphallus shining brown and apically pointed; postgonite pale narrow, rod-like. cerci fused, pale yellow and with long apical setae.

### **Female**

Similar to male, but with basal flagellomere dark brown and a broad dark brown band across the middle of the frons.

### **Variation**

There is some chromatic variation in this species where a few specimens have the grey scutum breaking up into vittae over the posterior half, and the pleural sclerites have broader yellow margins.

### **Distribution**

Israel, Jordan.

### *Aphaniosoma lamellatum* Collin, 1949

Fig. 50

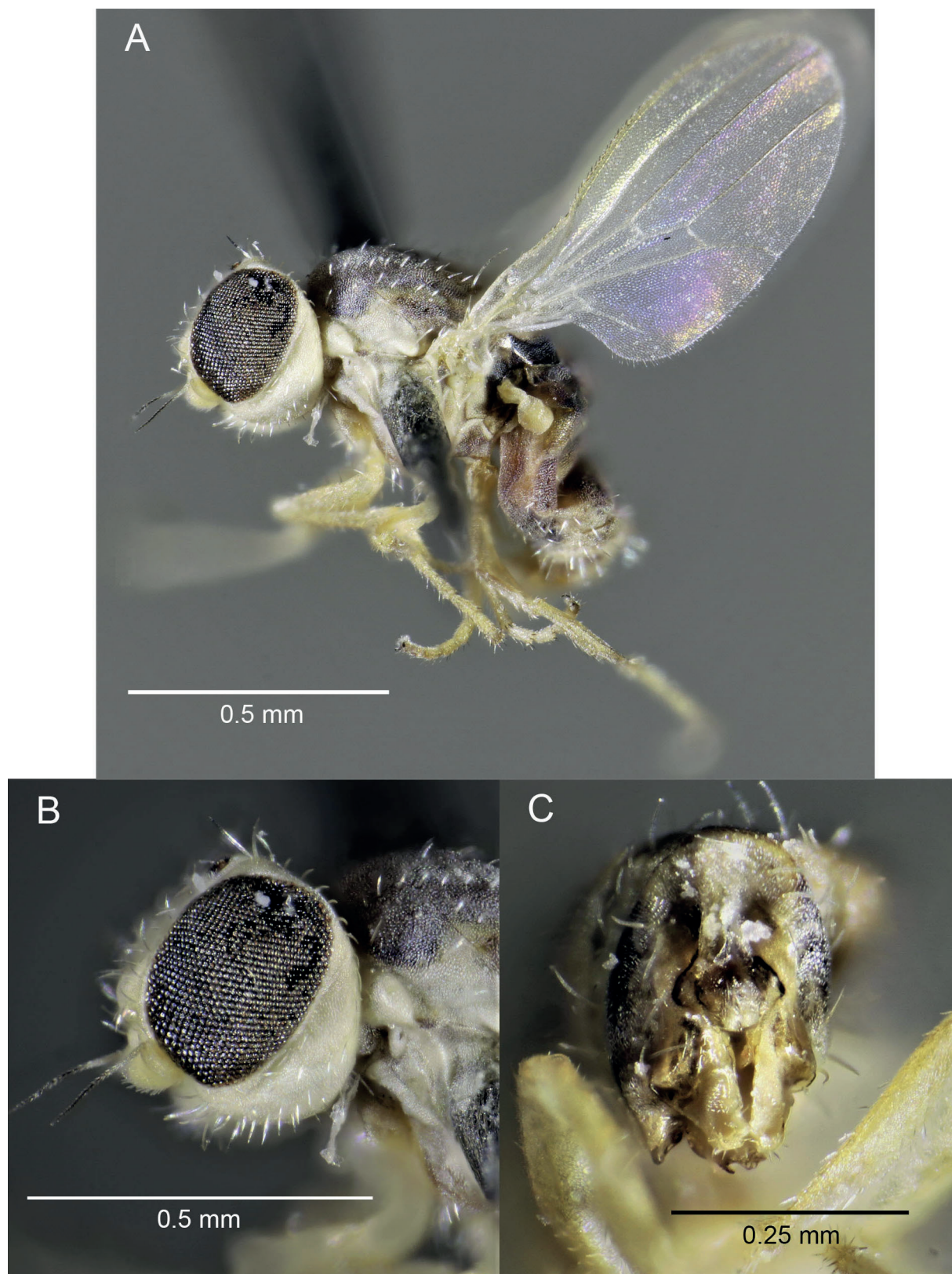
### **Material examined**

#### **Lectotype** (here designated)

EGYPT • ♂, Fayoum, Lake Karun; 2–23 Sep. 1945; R.L. Coe leg.; NHMUK, B.M. 1946–39, bar code 013435858.

#### **Paralectotypes**

EGYPT • 10 ♂♂, 7 ♀♀ (3 ♂♂ headless); same collection data as for lectotype; NHMUK, bar codes 013933279–85 • 1 ♀; Siwa Oasis; 3 Jun. 1935; J. Omer-Cooper leg., Armstrong College Expedition; NHMUK, B.M. 1935–354, bar code 013933286 • 2 ♂♂; same collection data as for preceeding; 13 Aug.



**Fig. 50.** *Aphaniosoma lamellatum* Collin, 1949, ♂ (SMNHTAU). **A.** Habitus, lateral view. **B.** Head, lateral view. **C.** Hypopygium in situ, posterior view.

1935; bar codes 013933287–88 • 1 ♀; same collection data as for preceding; 15 Aug. 1935; NHMUK, bar code 013933289.

### Other material

EGYPT • 2 ♂♂, 2 ♀♀; Sinai, Taba, 10 km S; 1 May 1996; I. Yarom leg.; SMNHTAU • 4 ♂♂, 1 ♀; same collection data as for preceding; A. Freidberg leg.; SMNHTAU • 1 ♂, 3 ♀♀; Alexandria, Ras Rashid; 21 Oct. 2003; P. Gatt leg.; beach; PG • 1 ♂; same collection data as for preceding; MJE • 2 ♀♀; same collection data as for preceding; SMNHTAU.

ISRAEL • 1 ♂; Sappir; 24 Jul. 1995; I. Yarom leg.; SMNHTAU • 1 ♂; 'En mor; 11 Oct. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 1 ♂, 3 ♀♀; Qalya; 28 Sep. 1995; I. Yarom leg.; SMNHTAU • 1 ♀; Dead Sea, Qalya [= Kallia]; 7 Jun 1996; B. Merz and A. Freidberg leg.; MHNG • 5 ♂♂, 1 ♀; Sappir pond; 9 Jul. 1996; A. Freidberg leg.; SMNHTAU • 1 ♂; 'En Zin; 13 Nov. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHTAU.

UNITED ARAB EMIRATES • 1 ♂; SSW of ad-Dhaid; 13–18 Dec. 2005; A. van Harten leg.; NMWC.

### Remarks

Pont (1995: 95) listed 16 male and 7 female syntypes. However, in the present study 11 male and 8 female specimens can be attributed to this species. Among further material that had been left unsorted some specimens belonging to this species could be recognized albeit with difficulty. Two specimens from among those listed as syntypes are in very poor condition, one being also headless and the other consists only of minute unrecognizable fragments of the hypopygium mounted in Euparal. These are left undetermined. Given the difficulties in sorting out these specimens to recognize the species intended by Collin, and to reliably separate it from other very similar species recently described, it is necessary to designate a lectotype. A male in good condition from among the series of both sexes collected at Fayoum, Lake Karun; 2–23 Sep. 1945 is here designated lectotype.

In its habitus (Fig. 50A), this species is almost identical to *A. oculicauda* Collin, 1949, as Collin himself appreciated when he described the two species. Both have very short fronto-orbital and scutal setae (Fig. 50B). The male hypopygium is highly distinctive in both species, even without dissection as long as it is sufficiently exposed (Fig. 50C). Females are very difficult to separate. Although the features used in the key are present in most specimens, they are absent in some, and overlap does occur with other species. When this is the case, identification is more reliable if the specimens are associated with males.

### Distribution

Egypt, Israel, Oman (Collin 1949; Ebejer 1996). New records for Israel and the United Arab Emirates.

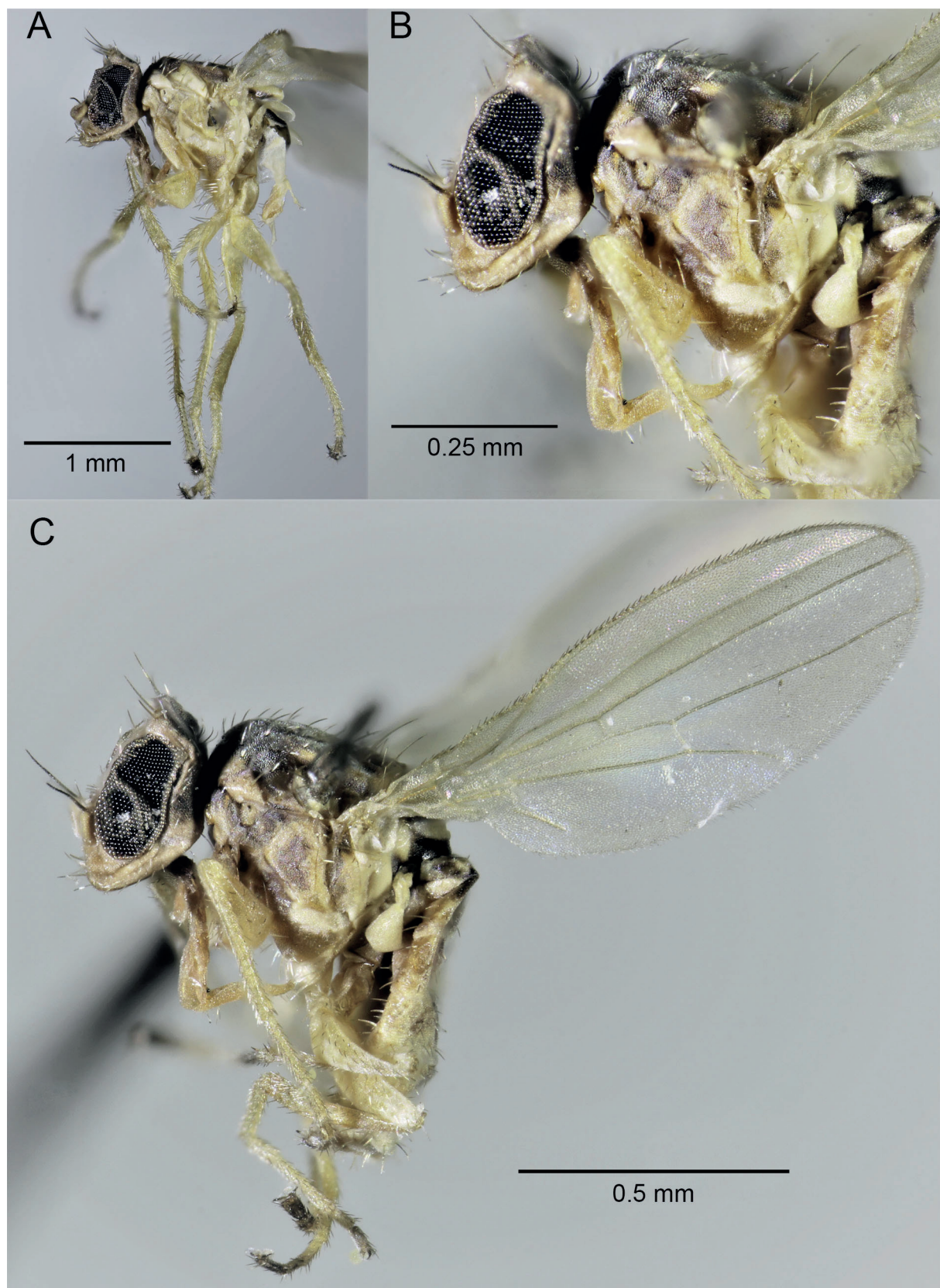
### *Aphaniosoma longilingua* sp. nov.

urn:lsid:zoobank.org:act:1E96F635-7BC1-4EA5-9919-1F93FB3380E5

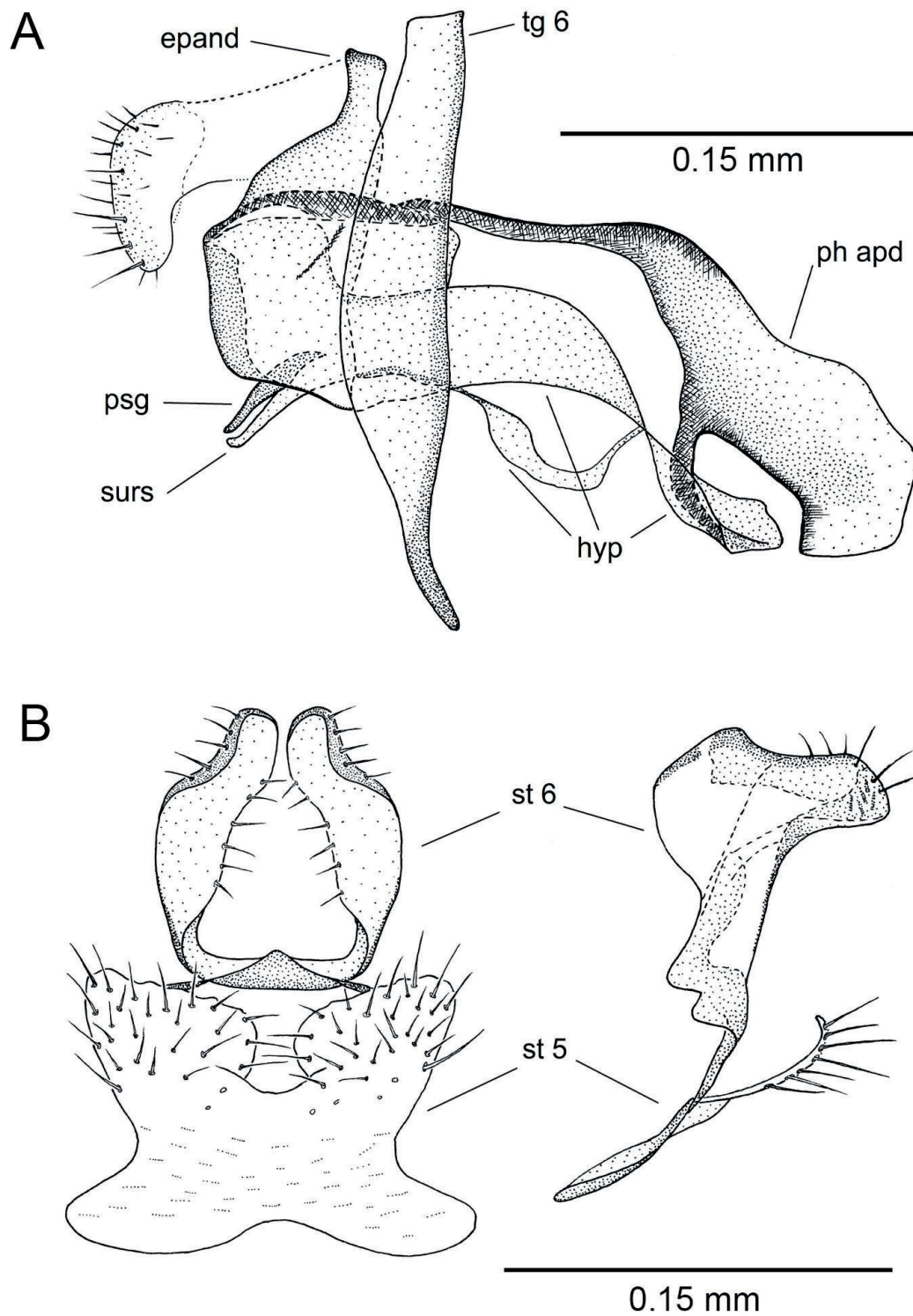
Figs 51–52

### Diagnosis

This is the only species in the family with such an elongated head and a long geniculate proboscis (Fig. 51A–B); scutum yellow with brown longitudinal vittae; 2 well-developed fronto-orbital setae; the phallapodeme particularly large and heavily sclerotized in proportion to the rest of the hypopygial structures.



**Fig. 51.** *Aphaniosoma longilingua* sp. nov. A. ♂, holotype (SMNHTAU 405826), habitus, lateral view. B–C. ♀, paratype (SMNHTAU). B. Head and thorax, lateral view. C. Habitus, lateral view.



**Fig. 52.** *Aphaniosoma longilingua* sp. nov., ♂, holotype (SMNHTAU 405826). **A.** Hypopygium, lateral view. **B.** Pregenital sternites, left, ventral view, right, lateral view.

### Etymology

The species epithet is a combination of the Latin ‘*longus*’ (‘long’) and ‘*lingua*’ (‘tongue’) and refers to the exceptionally long proboscis.

### Material examined

#### Holotype

ISRAEL • ♂; Deir Shaman, 500 m North, near Yarden; 32°02' N, 35°30' E; 15 Mar. 2005; L. Freidman leg.; SMNHATAU 405826.

#### Paratype

ISRAEL • 1 ♀; same collection data as for holotype; SMNHATAU.

### Description

MEASUREMENTS. Body length: male 1.4 mm, female 1.4 mm. Wing length: male 1.4 mm, female 1.4 mm.

#### Male (holotype)

HEAD. Yellow except for ocellar triangle and occiput, apart from small area behind vertex and behind vertical setae; gena about  $\frac{1}{3} \times$  as high as eye at middle and with scattered pale yellowish white setulae; a pair of vibrissal setae on each side; frons narrower than long but too shrunken to assess further; ocellar setae longer than posterior fronto-orbital seta; 2 moderately well-developed fronto-orbital setae and 2 shorter setae anterior to these; about 14 pale setulae on frons that are all more or less uniform in length (frontal setulae seen in female paratype but not in male holotype because of its shrunken frons); inner and outer vertical well-developed; paraverticlar setae short and parallel, postocular setae in one row; proboscis long and geniculate; face very short, poorly sclerotized and depressed; median carina distinct, a little broader between bases of antennae and then sharp and low, reaching clypeus; antenna yellow, pedicel paler than basal flagellomere and with distinct short seta dorsally; basal flagellomere with very short pile along anterior margin; arista brown and minutely pilose.

THORAX. Yellow; scutum with brown longitudinal vittae separated by narrow yellow lines and covered with yellowish microtomentum; middle pair of vittae short; postpronotal lobe and notopleuron yellow; scutellum yellow and pleura yellow with brown marking on katepisternum; mediotergite dark brown; chaetotaxy: 2 postpronotal, 1 presutural with a short fine seta close and anterior to it, 1 incurved intra-postpronotal, 2 notopleurals; 1+5 intra-alars, 1 postalar, 2+4 dorsocentrals with only posterior seta, well-developed, 1+4 acrostichals including prescutellars, 4 scutellars, 1 anepisternal seta with 3 weak setae below it, 1 katepisternal at upper posterior corner and 1 short fine seta far anterior to it and 1 below it.

WING. Veins all pale; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.4 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about  $1.6 \times$  as long as posterior crossvein, which is about  $0.3 \times$  as long as apical section of  $M_4$ . Haltere pale yellow.

LEGS. Fore femur with long setulae on posterior aspect; numerous pale-yellow setulae scattered on all legs; apico-ventral seta on mid tibia present; claws black and pulvilli normal; tarsomeres 4 and 5 dark; hind trochanter not modified.

ABDOMEN (Fig. 51C). Tergites with brown dorsal band not reaching sides; tergite 6 narrow and ventrally tapering almost to a point; tergites pale setulose.

HYPOPYGIUM (Fig. 52 A). Macerated and dissected before being sent to the author; epandrium small and pale, bearing a narrow surstylus; pregonite not identified and may be absent; postgonite short, narrow and a little darker than surstylus; aedeagus not identified (may have been membranous or broken off);

phallapodeme very large and heavily sclerotized; cercus pale yellow, fused with the opposite side and setulose but without any exceptionally long setae.

#### **Female** (Fig. 51B–C)

As for male, but with brown central areas on all pleural sclerites and without secondary sexual characters.

#### **Variation**

Although more material is required to assess this, it may be anticipated that some chromatic and pattern variation will be present, as is the case with all species of *Aphaniosoma*. Some specimens may have less brown markings or conversely more dark markings with the scutal vittae confluent anteriorly.

#### **Distribution**

Israel.

#### *Aphaniosoma lucidum* sp. nov.

urn:lsid:zoobank.org:act:6D2BD028-57FD-4B80-89F7-5C49BCD5568C

Figs 53–55

#### **Diagnosis**

A shiny black species (Fig. 53) with a pearly white scutellum and notopleuron, a pale frons in the male and most often with a dark pattern in the female; no long frontal setae in front of ocellar triangle; antenna yellow in the male, dark brown in females; scutum with a few scattered setulae in between the acrostichals and dorsocentral rows; all legs clear yellow. *A. nitididorsum* Ebejer, 2007 from Mongolia and *A. nitidum* Ebejer, 2018 from Morocco are both almost identical to the new species. There are no consistent reliable external characters to differentiate them. Females of the three species typically have a dark pattern on the frons quite different in shape from any dark frons in other species of *Aphaniosoma*. The three species only consistently differ in the shape of structures of the male hypopygium.

#### **Etymology**

The species epithet is from the Latin ‘*lucidus*’ meaning ‘shining’, and it refers to the lustrous thorax.

#### **Material examined**

##### **Holotype**

ISRAEL • ♂; Nahal Zin; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHTAU 405827.

##### **Paratypes**

ISRAEL • 6 ♀♀; same collection data as for holotype; SMNHTAU • 1 ♂; ‘Enot Zuqim; 11 Oct. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 7 ♂♂, 6 ♀♀; same collection data as for preceding; SMNHTAU • 3 ♂♂, 4 ♀♀; ‘Enot Zuqim; 3 Mar. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 2 ♂♂, 4 ♀♀; same collection data as for preceding; on *Tamarix* sp.; SMNHTAU • 2 ♀♀; same collection data as for preceding; 31 May 1998; on *Tamarix nilotica*; SMNHTAU • 1 ♀; same collection data as for preceding; 1 Feb. 1999; SMNHTAU • 1 ♀; same collection data as for preceding; 30 Mar. 1999; SMNHTAU • 3 ♂♂, 2 ♀♀; same collection data as for preceding; 24 Nov. 1999; SMNHTAU • 1 ♂, 2 ♀♀; same collection data as for preceding; 24 May 2000; SMNHTAU • 2 ♀♀; same collection data as for preceding; 30 Mar. 1999; on *Tamarix jordanis*; SMNHTAU • 3 ♂♂; same collection data as for preceding; 24 Nov. 1999; SMNHTAU • 2 ♀♀; same collection data as for preceding; 24 May 2000; SMNHTAU • 3 ♂♂, 1 ♀; ‘Enot Zuqim; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 2 ♂♂; same collection data as for preceding; 7 Jun. 1996; SMNHTAU • 15 ♂♂, 1 ♀; same collection data as for preceding; 25 Aug. 1995; SMNHTAU • 15 ♂♂, 12 ♀♀; ‘Enot Zuqim; 25 Jul.

1995; I. Yarom leg.; SMNHTAU • 10 ♂♂, 10 ♀♀; Nahal Zin; 6 Apr. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHTAU • 1 ♂, 5 ♀♀; same collection data as for preceding; 8 Jun. 1998; SMNHTAU • 3 ♂♂, 11 ♀♀; same collection data as for preceding; 8 Jun. 1998; on *Tamarix* sp.; SMNHTAU • 1 ♀; same collection data as for preceding; 4 Apr. 1998; SMNHTAU • 1 ♀; 5 May 1998; SMNHTAU • 1 ♀; 7 Aug. 1998; SMNHTAU • 1 ♀; 'Enot Samar; 30 Mar. 1999; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂; same collection data as for preceding; 2 Jun. 1999; SMNHTAU • 1 ♀; same collection data as for preceding; 5 Oct. 1999; SMNHTAU • 1 ♂; same collection data as for preceding; 21 Jul. 1998; on *Tamarix* sp.; SMNHTAU • 1 ♀; 'En Zin; 8 Aug. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 1 ♀; same collection data as for preceding; 12 Apr. 1999; on *Tamarix parviflora*; SMNHTAU • 3 ♂♂, 4 ♀♀; same collection data as for preceding; 13 Jul. 1999; SMNHTAU • 1 ♀; same collection data as for preceding; 14 Jan. 1999; on *Tamarix negevensis*; SMNHTAU • 1 ♀; same collection data as for preceding; 10 May 1999; SMNHTAU • 6 ♂♂, 3 ♀♀; same collection data as for preceding; 13 May 1999; SMNHTAU • 1 ♀; same collection data as for preceding; 19 May 1999; SMNHTAU • 1 ♀; same collection data as for preceding; 19 Jul. 1999; SMNHTAU • 1 ♀; same collection data as for preceding; 6 Sep. 1999; SMNHTAU • 1 ♀; same collection data as for preceding; 13 Nov. 1999; SMNHTAU • 1 ♀; Nahal Neqarot; 10 May 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 2 ♀♀; same collection data as for preceding; 10 May 1999; on *Tamarix* sp.; SMNHTAU • 1 ♂, 3 ♀♀; Akko; 29 Oct. 1994; A. Freidberg leg.; SMNHTAU • 1 ♂, 1 ♀; Ne'ot haKikkar; 29 Mar. 1996; A. Freidberg leg.; SMNHTAU • 1 ♂, 5 ♀♀; 'En Mor; 11 Oct. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 1 ♂, 1 ♀; 'En Gedi; 11 May 1995; I. Yarom leg.; SMNHTAU • 1 ♂; Qalya; 2 Jan. 1997; A. Freidberg leg.; SMNHTAU • 1 ♂, 1 ♀; Qalya; 2 Jan. 1997; S. Paz leg.; SMNHTAU • 2 ♀♀; 'En 'Iddan; 20 Jun. 1995; A. Freidberg leg.; SMNHTAU • 1 ♀; Iddan spring; 19 Mar. 1995; B. Merz leg.; MHNG • 3 ♂♂, 1 ♀; Dead Sea, 'Enot Zuqim; 7 Jun. 1996; B. Merz and A. Freidberg leg.; MHNG • 7 ♂♂, 6 ♀♀; 'En Gedi/N. Arugot; 31 May 2000; B. Merz leg.; MHNG • 5 ♂♂, 10 ♀♀; Dead Sea, 'Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE.

#### Other material

JORDAN • 1 ♂, preserved in alcohol, 1 ♀; Azraq Reserve; 8 Oct. 2000; W. Rossi leg.; NMWC.

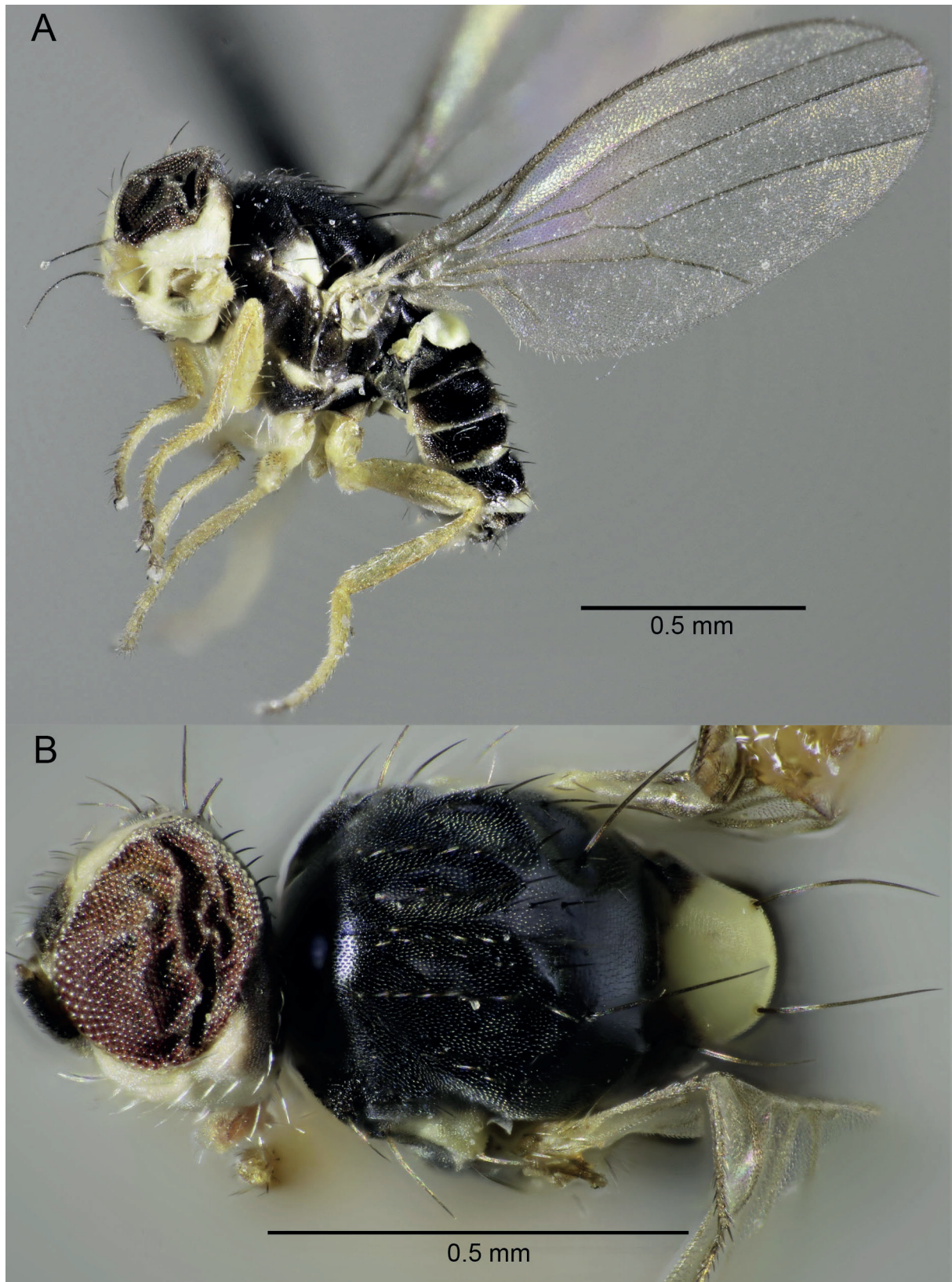
SAUDI ARABIA • 1 ♀; Aseer, Maraba; 1–17 Jun. 2003; H.A. Dawah leg.; Malaise trap in fruit farm; NMWC • 1 ♂; Najran, Alshurfa; 7–28 May 2014; H.A. Dawah leg.; Malaise trap; NMWC.

#### Description

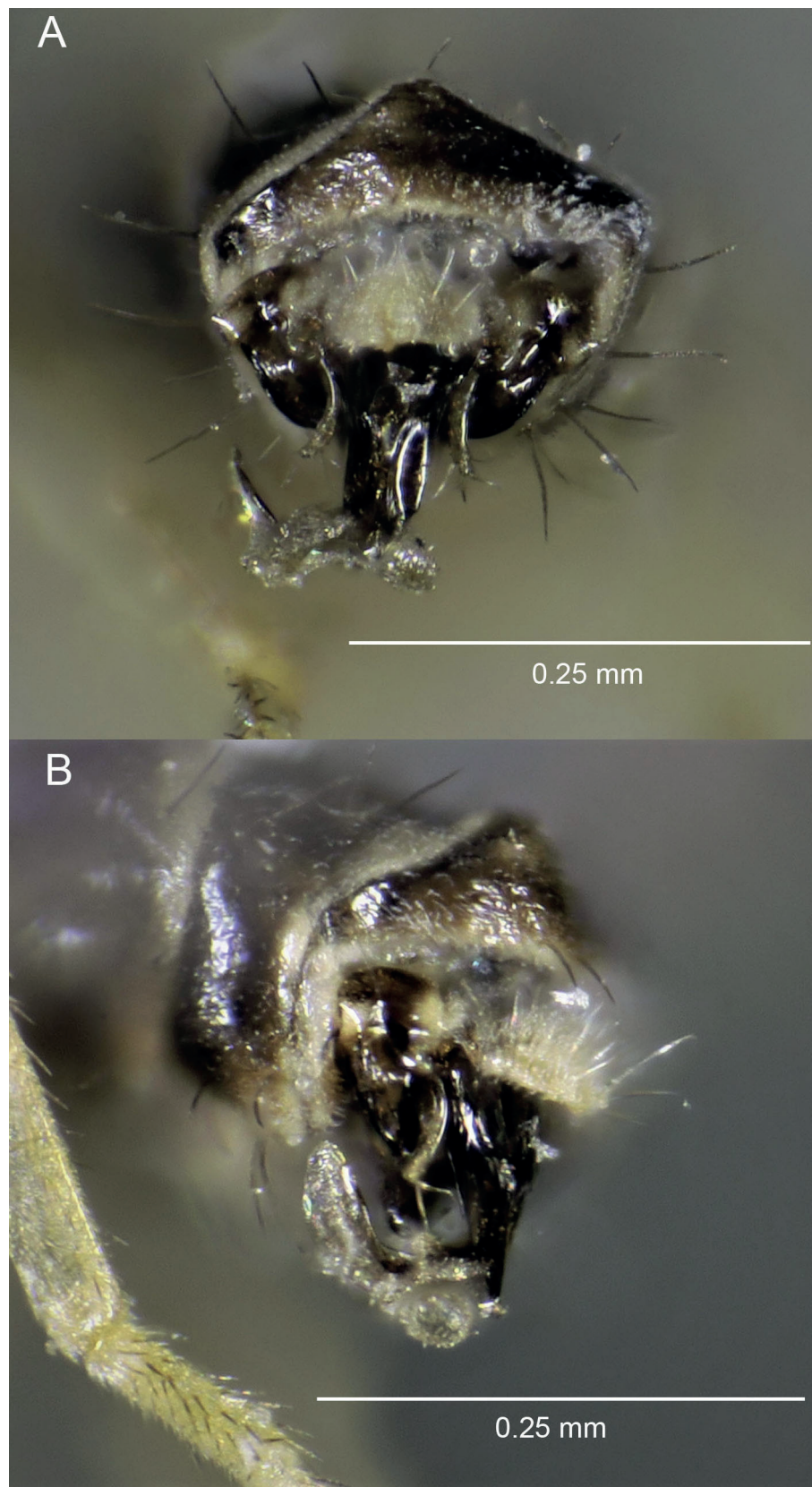
MEASUREMENTS. Body length: male 1.2 mm, female 1.4 mm. Wing length: male 1.3 mm, female 1.5 mm.

#### Male (holotype)

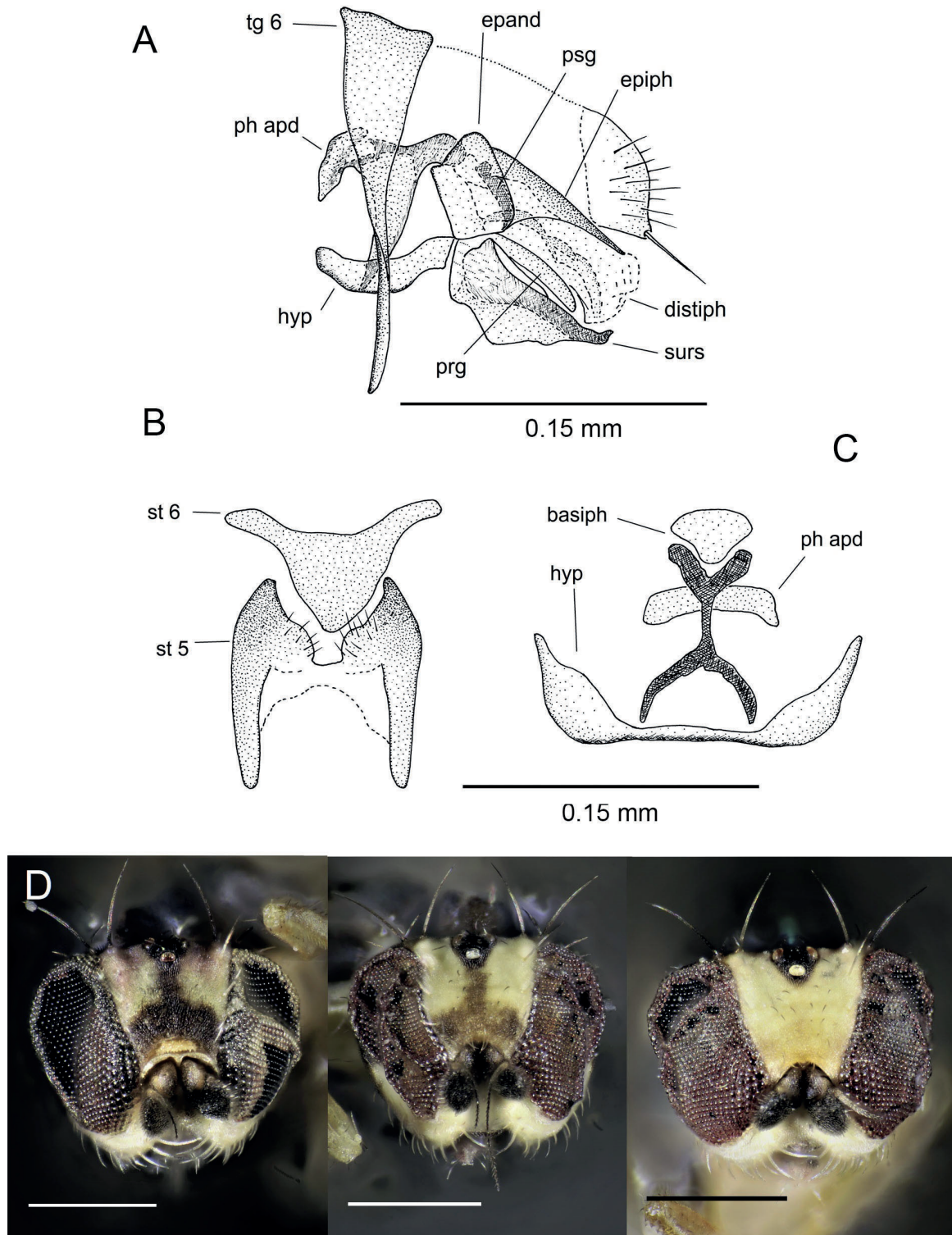
HEAD. Yellow except for black ocellar triangle and entire occiput; frons as broad as long, narrowed anteriorly, at level of antennae about  $0.5 \times$  as wide as at level of anterior ocellus; gena narrow in front, deeper behind, in profile, below middle of eye, about  $0.2 \times$  as high as round eye, with numerous white setulae; occiput in profile narrowly visible behind eye below middle, with postocular setulae irregularly in one row, black dorsally and yellow ventrally; 3 vibrissal setulae well differentiated from buccal row of setulae; face short and narrow, depressed and poorly sclerotized; median carina very narrow, almost reaching clypeus; antenna yellow; pedicel with short seta dorsally; basal flagellomere with fine pubescence along anterior margin shorter than diameter of basal segment of arista; arista black to base, with fine pubescence; chaetotaxy: 2 posterior moderately developed orbitals with 3 very short setulae anterior to them; ocellars short; paravericals short and convergent; 1 medial vertical and 1 lateral vertical; about 14 short brown setulae across middle of frons, all of uniform length.



**Fig. 53.** *Aphaniosoma lucidum* sp. nov. A. ♂, holotype (SMNHTAU 405827), habitus, lateral view. B. ♀, paratype (SMNHTAU), head, lateral view and thorax, dorsal view.



**Fig. 54.** *Aphaniosoma lucidum* sp. nov., ♂, paratype (SMNHTAU), hypopygium in situ. **A.** Posterior view. **B.** Lateral oblique view.



**Fig. 55.** *Aphaniosoma lucidum* sp. nov. **A–C.** ♂, paratype (SMNHTAU). **A.** Hypopygium, lateral view. **B.** Pregenital sternites, ventral view. **C.** Hypopygium, part, ventral view. **D.** ♀♀, paratypes (MJE), heads showing range of pattern on frons, frontal view. Abbreviations: See Material and methods. Scale bar: D = 0.25 mm.

**THORAX** (Fig. 53). Black, appearing lustrous even though there is a thin microscopic greyish microtomentum that is thickest on pleura; postpronotal lobe, notopleuron and scutellum pearly white except at anterior margin and around base of basal scutellar seta, which is broadly black; mediotergite black; pleura black with pale yellow dorsal margin of katepisternum; chaetotaxy: 1 postpronotal, 1 short inconspicuous intra-postpronotal setula, and similar presutural, 2 notopleurals, 0+4 intra-alars, 1 postalar, 2+6 dorsocentrals, only prescutellar strong, 6 acrostichals with prescutellars not developed and several setulae outside each acrostichal row, 4 scutellars, 1 anepisternal, 1 katepisternal at upper posterior corner with short and fine pale setula in front.

**WING.** Veins all brown except at extreme wing base where all root veins are pale yellow; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.7 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between cross veins about  $1.3 \times$  as long as posterior crossvein, which lies only slightly oblique and is about  $0.3 \times$  as long as apical section of  $M_4$ . Haltere creamy white.

**LEGS.** Yellow, not modified except for slightly thicker femora; legs with numerous scattered pale setulae that are darker on femora; longer setulae present on fore femur; apico-ventral seta on mid tibia present; claws black in apical half, short, about  $\frac{2}{3}$  length of tarsomere, pulvilli normal; hind trochanter not modified.

**ABDOMEN** (Fig. 53A). Tergites black with narrow yellow hind margins that are often broader on apical segments; with relatively long black setae on sides of tergites, especially towards apex of abdomen; sternite 5 and 6 modified (Fig. 54B).

**HYPOPYGIUM** (Figs 54, 55A, C). Epandrium small, bicoloured; surstylus large, dark, tri-lobed, with the two dark lobes closely opposed to each other and placed medial to larger paler lobe; hypandrium bearing a translucent curved pregonite apically setulose; phallapodeme of heavy build; postgonites short, not easily seen next to large, shiny, black, pointed epiphallus; distiphallus short and mostly membranous with asymmetrical bilobed apex; cercus very pale with apical seta.

### **Female**

Similar to male but basal flagellomere of antenna all dark brown. Most females have a variable dark pattern on the frons (Fig. 55D).

### **Variation**

The dark triangular lateral borders at the base of the scutellum may join narrowly across the midline of the sclerite (Fig. 53B). The scutal setulae between the acrostichal and dorsocentral rows are sometimes missing. Both sexes sometimes have pale brown basal tergites more or less over the middle dorsal section of each.

### **Distribution**

Israel, Jordan, Saudi Arabia.

### *Aphaniosoma melitense* Ebejer, 1993

Fig. 56

*Aphaniosoma graecum* Ebejer, 1995: 202, figs 4–5. Synonymized by Ebejer 1998: 212.

### Material examined

EGYPT • 2 ♂♂, 3 ♀♀; Alexandria, Abu Kir; 20 Oct. 2003; P. Gatt leg.; beach, wrack; PG • 1 ♂, 1 ♀; same collection data as for preceding; MJE • 17 ♂♂, 7 ♀♀, preserved in alcohol; same collection data as for preceding; MJE • 1 ♀; Alexandria, Lake Elka; 20 Oct. 2003; P. Gatt leg.; PG.

ISRAEL • 13 ♂♂, 10 ♀♀; 'Akko; 29 Oct. 1994; A. Freidberg leg.; SMNHTAU • 2 ♀♀; 'Atlit; 28 Apr. 1996; A. Freidberg leg.; SMNHTAU • 3 ♀♀; same collection data as for preceding; 30 May 1995; SMNHTAU • 2 ♂♂, 2 ♀♀; 'En Afeq; 17 May 1994; A. Freidberg leg.; SMNHTAU • 1 ♂; Hofit; 21 Sep. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 2 ♂♂, 1 ♀; Mikhmoret; 21 Sep. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 1 ♀; 'En Gedi; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 4 ♂♂; Ramat Aviv; 27 May 2000; B. Merz leg.; MHNG • 1 ♀; same collection data as for preceding; Antipatris; MHNG.

### Remarks

The characteristic shape of abdominal tergite 5 of the male, with its broad ventro-lateral margins projecting posteriorly, is easily seen and highly diagnostic (Fig. 56). This species varies greatly in colouration from almost entirely pale orange-yellow with barely noticeable scutal vittae to almost completely grey with entirely confluent scutal vittae. In both sexes, the frontal setulae are brown, short and all of almost equal length. The acrostichals reach beyond the hindmost dorsocentral seta and closely approximate the suture with the scutellum. Apart from the figures accompanying the original description, more figures are given in Ebejer (1998: 212, figs 37–38).



**Fig. 56.** *Aphaniosoma melitense* Ebejer, 1993, ♂ (SMNHTAU), habitus, lateral view.

### Distribution

Bulgaria, Cyprus, Czech Republic, Germany, Great Britain, Greece (Crete), France, Italy (including Sardinia and Sicily), Malta, Morocco, Portugal, Romania, Spain (including Balearic Islands), Tunisia, Turkey (Ebejer 1993, 1998, 2005; Ismay & Clemons 2001; Andrade & Almeida 2010). New records for Egypt and Israel.

### *Aphaniosoma meltseri* sp. nov.

urn:lsid:zoobank.org:act:5BB65B19-3C5F-4E02-97AF-D933BE1A770A

Figs 57–59

### Diagnosis

A pale-yellow species (Fig. 57A), including the mediotergite, and with only slightly elongated head and eyes; in contrast to similar species, it has a small, pale epandrium. The pair of long frontal setae in front of the ocellar triangle are set close to the anterior ocellus; 2 short posterior fronto-orbital setae. The most easily appreciated character of this species is in the shape of the surstylus, which is broad at its base and curved with a setula at its apex. Similar species: *A. nudum* Ebejer, 2007 from Mongolia and *A. curvistylus* sp. nov. from Israel are similar in external characters, but all three species differ in details of the hypopygium (see above under *A. curvistylus*).

### Etymology

The species is named in honour of N. Meltzer, who collected a significant amount of specimens of *Aphaniosoma* from Israel during the Tamarisk trees survey. (His name on the data labels is spelled with a “z”.)

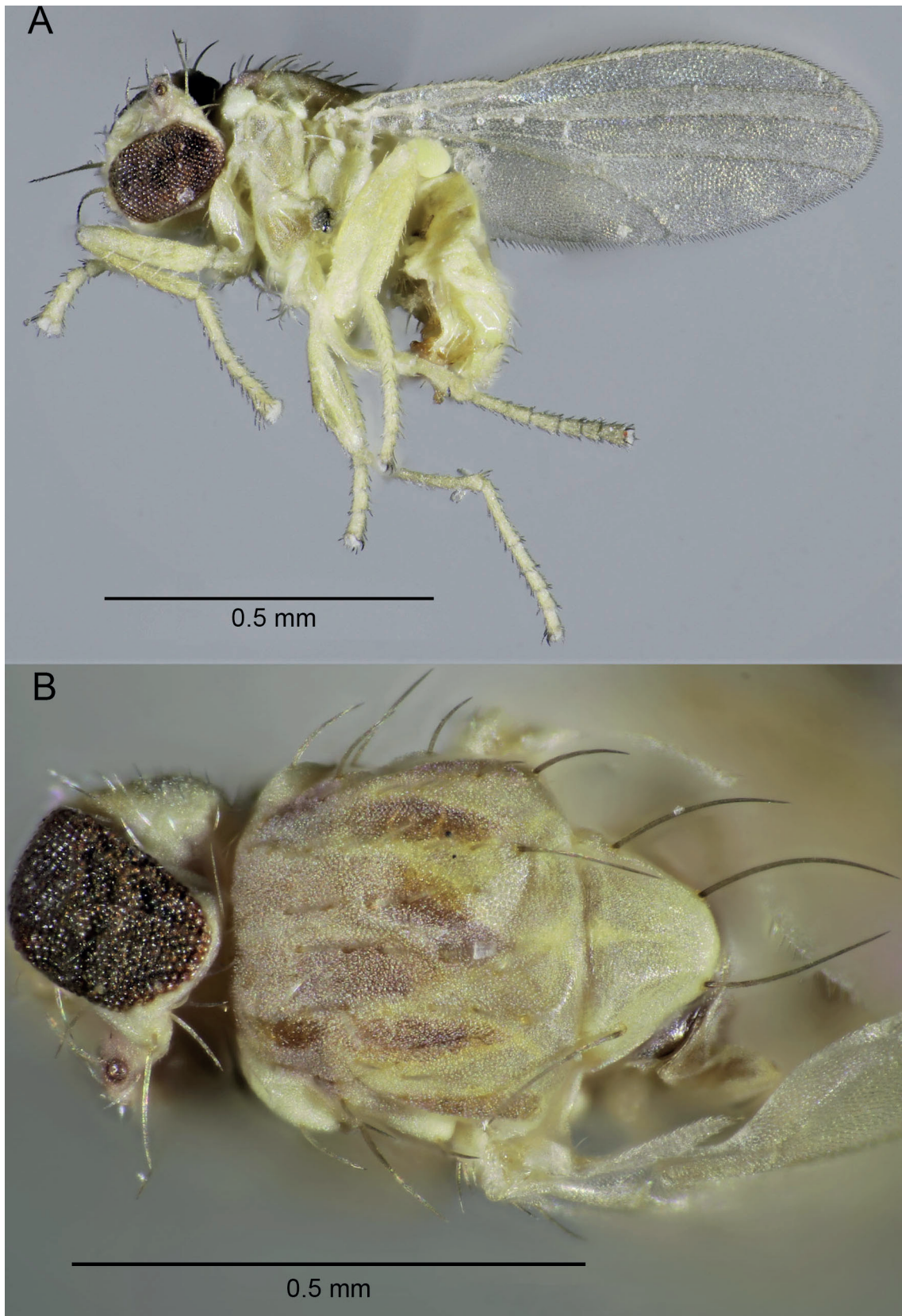
### Material examined

#### Holotype

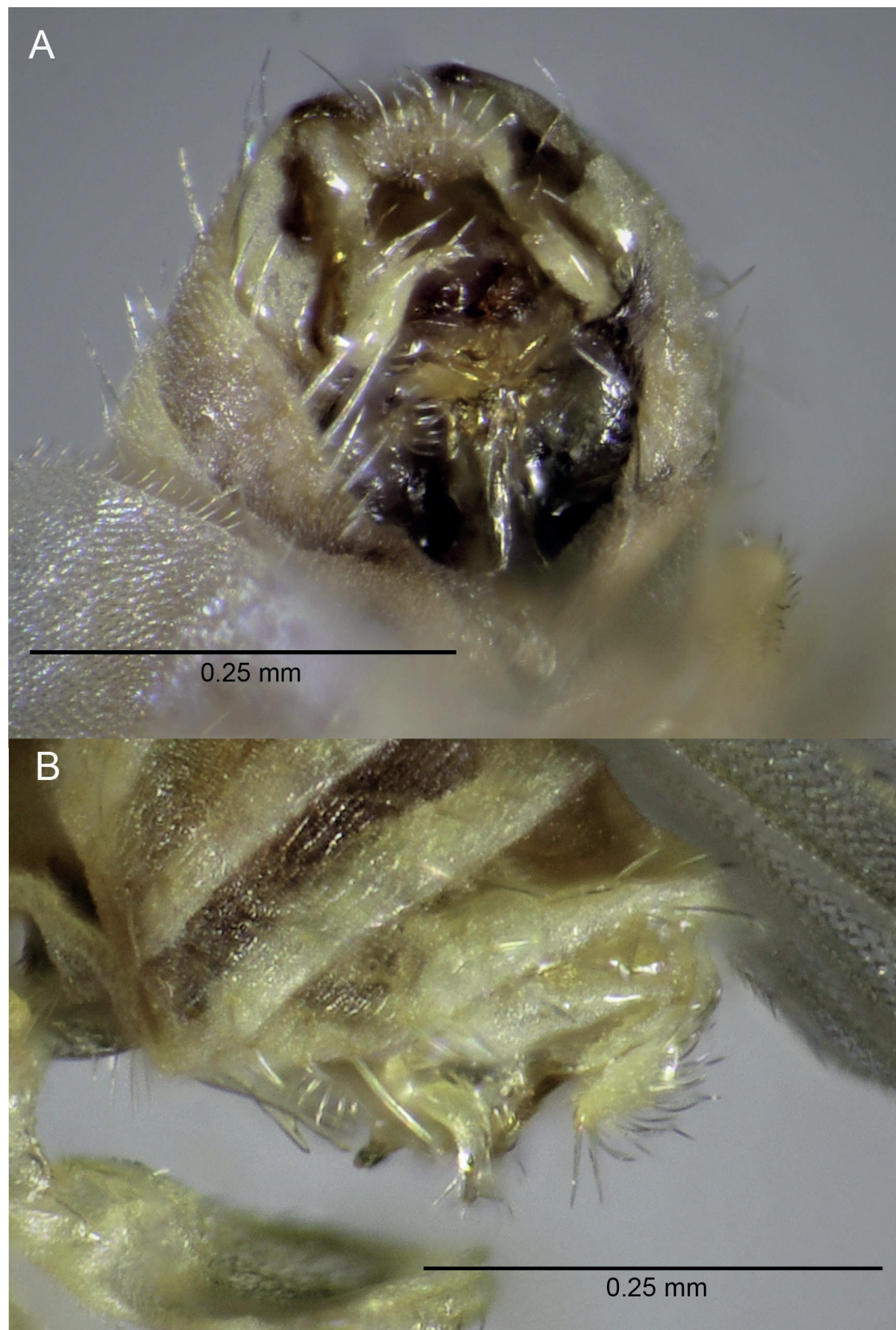
ISRAEL • ♂; ‘En Zin; 13 May 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHTAU 405828.

#### Paratypes

ISRAEL • 5 ♂♂, 6 ♀♀; same collection data as for holotype; SMNHTAU • 2 ♀♀; same collection data as for preceding; on *Tamarix parviflora*; SMNHTAU • 2 ♂♂, 4 ♀♀; same collection data as for preceding; 19 Oct. 1999; on *Tamarix negevensis*; SMNHTAU • 13 ♂♂, 2 ♀♀; ‘Enot Zuqim; 25 Jul. 1995; I. Yarom leg.; SMNHTAU • 7 ♂♂, 1 ♀; ‘Enot Zuqim; 25 Aug. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂; ‘Enot Zuqim; 22 Apr. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 2 ♀♀; same collection data as for preceding; on *Tamarix jordanis*; SMNHTAU • 2 ♂♂, 9 ♀♀; ‘Enot Zuqim; 12 Apr. 2000; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂; ‘Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 3 ♀♀; Ne’ot haKikkar; 25 Jul. 1995; A. Freidberg leg.; SMNHTAU • 3 ♂♂; same collection data as for preceding; 29 Mar. 1996; SMNHTAU • 5 ♂♂; ‘Enot Zuqim; 11 Oct. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 1 ♂; Elot; 18 Mar. 1995; A. Freidberg leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂; Nahal Zin; 6 Apr. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHTAU • 1 ♀; Nahal Zin; 8 Aug. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 2 ♂♂; 5 Oct. 1999; N. Meltzer and V. Kravchenko leg.; on *Tamarix jordanis*; SMNHTAU • 1 ♂; same collection data as for preceding; on *Tamarix nilotica*; SMNHTAU • 2 ♂♂; ‘En Zin; 13 Nov. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix parviflora*; SMNHTAU • 3 ♂♂, 2 ♀♀; Nahal Neqarot; 10 May 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 2 ♀♀; same collection data as for preceding; on *Tamarix parviflora*; SMNHTAU • 1 ♂; Zomet Zohar; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 4 ♂♂, 5 ♀♀; Dead Sea, Zomet Zohar; 31°08' N, 35°21' E; alt. -338 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE • 15 ♂♂,



**Fig. 57.** *Aphaniosoma meltseri* sp. nov. A. ♂, holotype (SMNHTAU 405828), habitus, lateral view. B. ♂, paratype (MJE), head, lateral view and thorax, dorsal view.



**Fig. 58.** *Aphaniosoma meltseri* sp. nov., ♂, paratype (SMNHTAU), hypopygium in situ. **A.** Postero-ventral view. **B.** Lateral view.

5 ♀♀; Dead Sea, 'Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE.

#### Other material

ISRAEL • 1 ♂, preserved in alcohol; Arava valley, Qetura [Ketura]; 50 km north of Eilat; 29°58'07" N, 35°03'38" E; alt. 126 m; 3–8 May 2013; Z.A. Yefremova leg.; Malaise trap; coll. code 140907; ZSM.

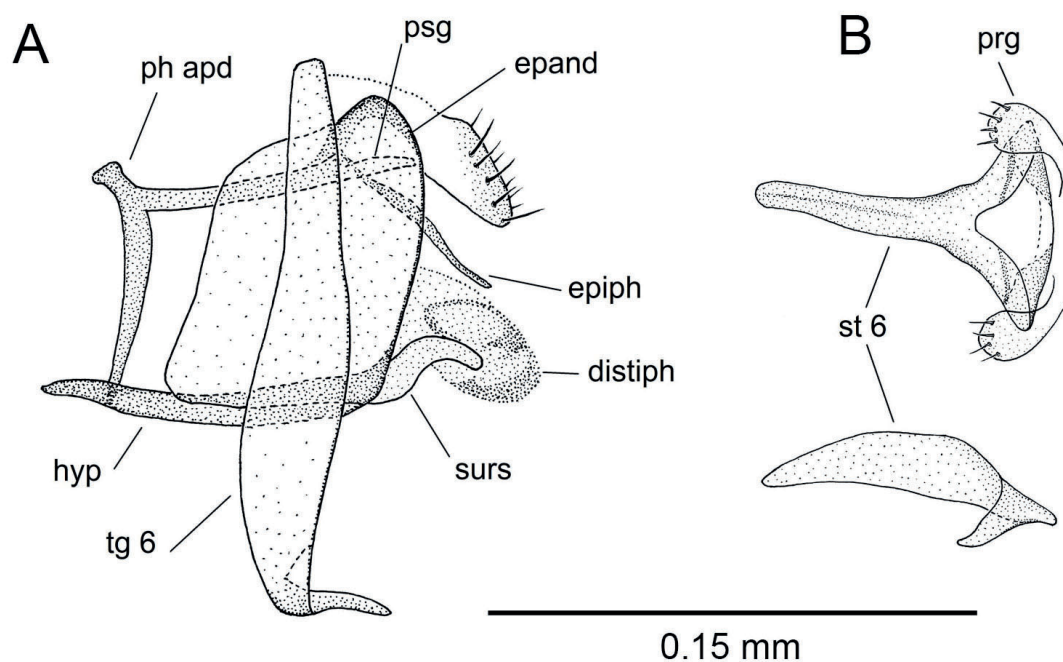
#### Description

MEASUREMENTS. Body length: male 0.8 mm, female 0.9 mm. Wing length: male 0.8 mm, female 0.9 mm.

#### Male (holotype)

HEAD. Yellow including ocellar triangle and entire occiput; frons longer than broad, narrowed anteriorly, at level of antennae about  $0.5 \times$  as wide as at level of anterior ocellus; gena narrow in front, deeper behind, in profile, below middle of eye, about  $0.4 \times$  as high as eye, with numerous white setulae; occiput in profile narrowly visible behind eye, with short, pale postocular setulae in one row; 1 vibrissal seta well differentiated from buccal row of setulae; face short and narrow, depressed and poorly sclerotized; median carina low and short; antenna yellow, pedicel with short seta dorsally; basal flagellomere with fine pubescence along anterior margin shorter than diameter of basal segment of arista; basal  $\frac{1}{3}$  of arista pale, with fine pubescence; chaetotaxy: 2 posterior fronto-orbitals with 3 very short setulae anterior to them; ocellars a little longer than posterior fronto-orbital, paravericals short and convergent; 1 medial vertical and 1 lateral vertical; frons with longer pair of setae in front of anterior ocellus and about 8 short pale setulae scattered across frons.

THORAX. Yellow, covered with pale yellow microtomentum, especially on scutum; chaetotaxy: 1 postpronotal, 1 intra-postpronotal, 1 presutural, 2 notopleurals, 0+4 intra-alars, 1 postalar, 3+6 dorsocentrals, only prescutellars strong, 1+2 acrostichals with prescutellars not developed, 4 scutellars,



**Fig. 59.** *Aphaniosoma meltseri* sp. nov., ♂, paratype (SMNHTAU). A. Hypopygium, lateral view. B. Sternite 6, top, ventral view, bottom, lateral view. Abbreviations: See Material and methods.

1 anepisternal, 1 katapisternal at upper posterior corner and with a vertical row of 3 fine setulae at middle.

WING. Veins yellow; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.6 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between cross veins about  $1.3 \times$  as long as posterior crossvein, which lies slightly oblique and is about  $0.3 \times$  as long as apical section of  $M_4$ . Haltere creamy white.

LEGS. Yellow; numerous pale setulae scattered on all legs with longer setulae on fore femur; apico-ventral seta on mid tibia present; claws black in apical half, short, about  $\frac{1}{2} \times$  as long as tarsomere, pulvilli normal; hind trochanter not modified.

ABDOMEN. Tergites yellow and sparsely setulose basally; setulae longer on margins of tergites 4–6; sternite 6 (Fig. 59B), in ventral view, of triangular shape with long extension anteriorly, seen shining in the midline of lower half of the hypopygium in Fig. 58A.

HYPOPYGIUM (Figs 58, 59A). epandrium small, pale; surstylus, short, broad at base, curved almost through  $90^\circ$ , and setulose at tip; cercus very pale and long setulose; pregonite rounded at apex, with a row of short setulae, and setulose at apex; postgonite short, barely reaching beyond edge of epandrium, translucent and not easily seen; aedeagus all yellow and not properly characterized.

#### **Female**

Similar to male but without the secondary sexual characters.

#### **Variation**

Some specimens have pale brownish vittae along the dorsocentral and intra-alar lines (Fig. 57B) and pale brown bands on the basal half of the tergites.

#### **Distribution**

Israel.

*Aphaniosoma micromacro* Carles-Tolrá, 2001

Fig. 60

#### **Material examined**

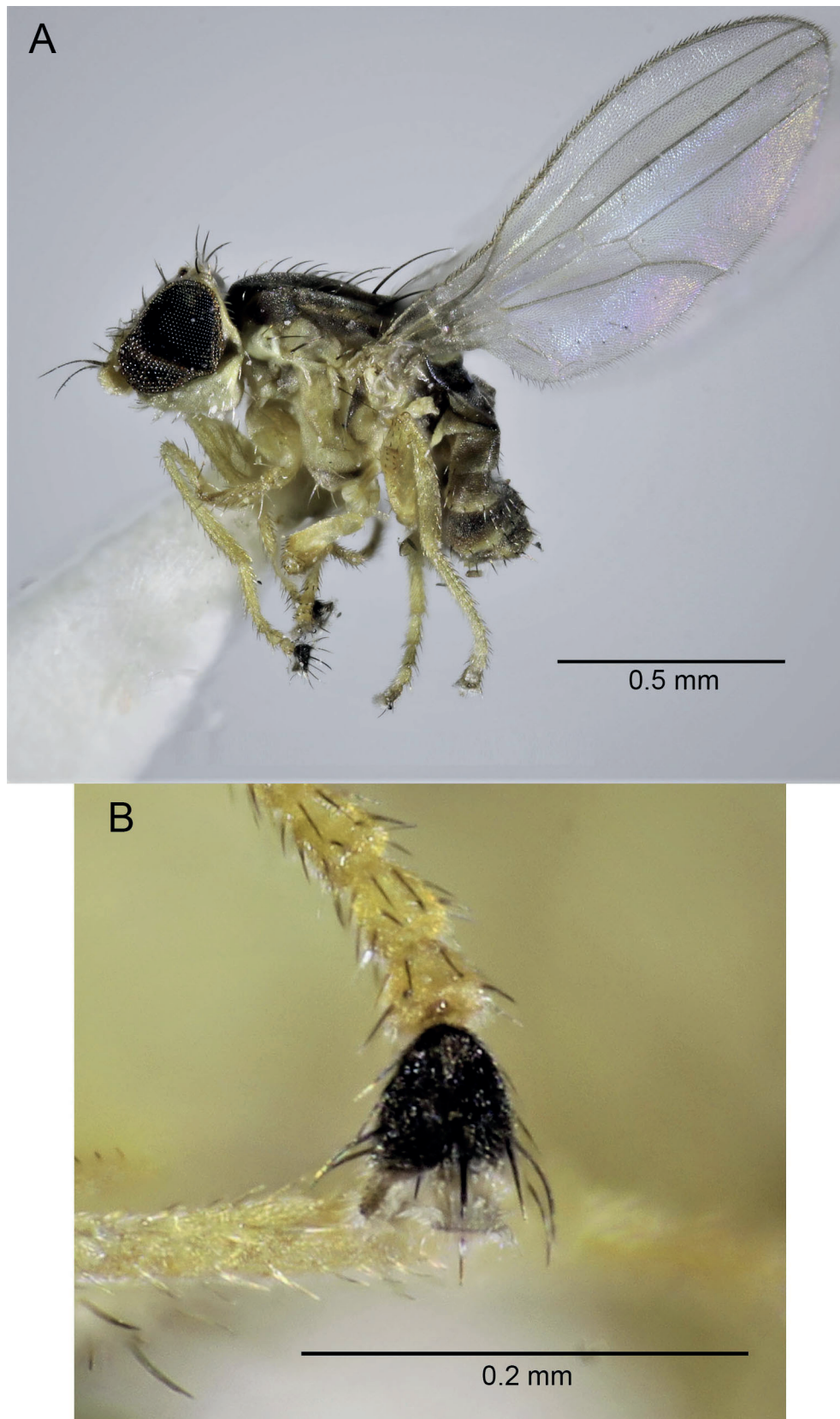
MALTA • 1 ♂; Salina saltmarsh; 7 May 2002; B. Merz leg.; MJE.

#### **Remarks**

This species is similar to *A. melitense* in its overall habitus (Fig. 60A), but differs in the male by having the fifth tarsomere of the foreleg black and enlarged (Fig. 60B); often all fifth tarsomeres are black; abdominal tergite 5 unmodified. In the female, the fifth tarsomere of the foreleg is also slightly enlarged and dark brown to black, but this is not easily appreciated. The pleura of *A. micromacro* is yellow, in contrast to the pleura of *A. melitense* where even in pale specimens the katapisternum always has a large dark marking.

#### **Distribution**

Malta, Spain, Turkey (Carles-Tolrá 2001; Ebejer & Barták 2019; Ebejer 2021a, 2021b).



**Fig. 60.** *Aphaniosoma micromacro* Carles-Tolrá, 2001. **A.** ♂ (MJE), habitus, lateral view. **B.** ♂, fore tarsus, dorsal view.

*Aphaniosoma miricercus* sp. nov.

urn:lsid:zoobank.org:act:6D1FB4C4-1E96-4DE7-9C0C-C72F9AF5C0ED

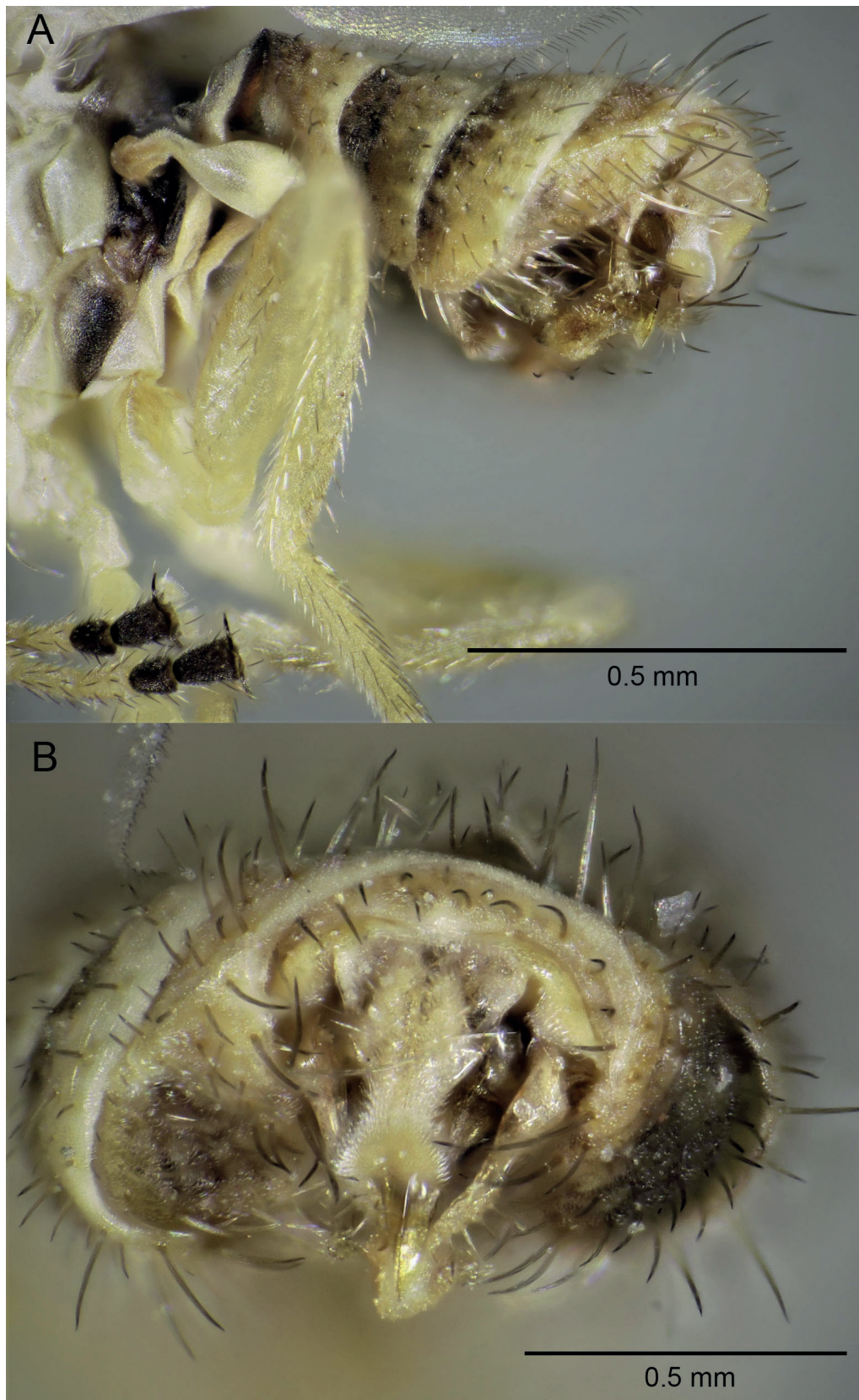
Figs 61–63

**Diagnosis**

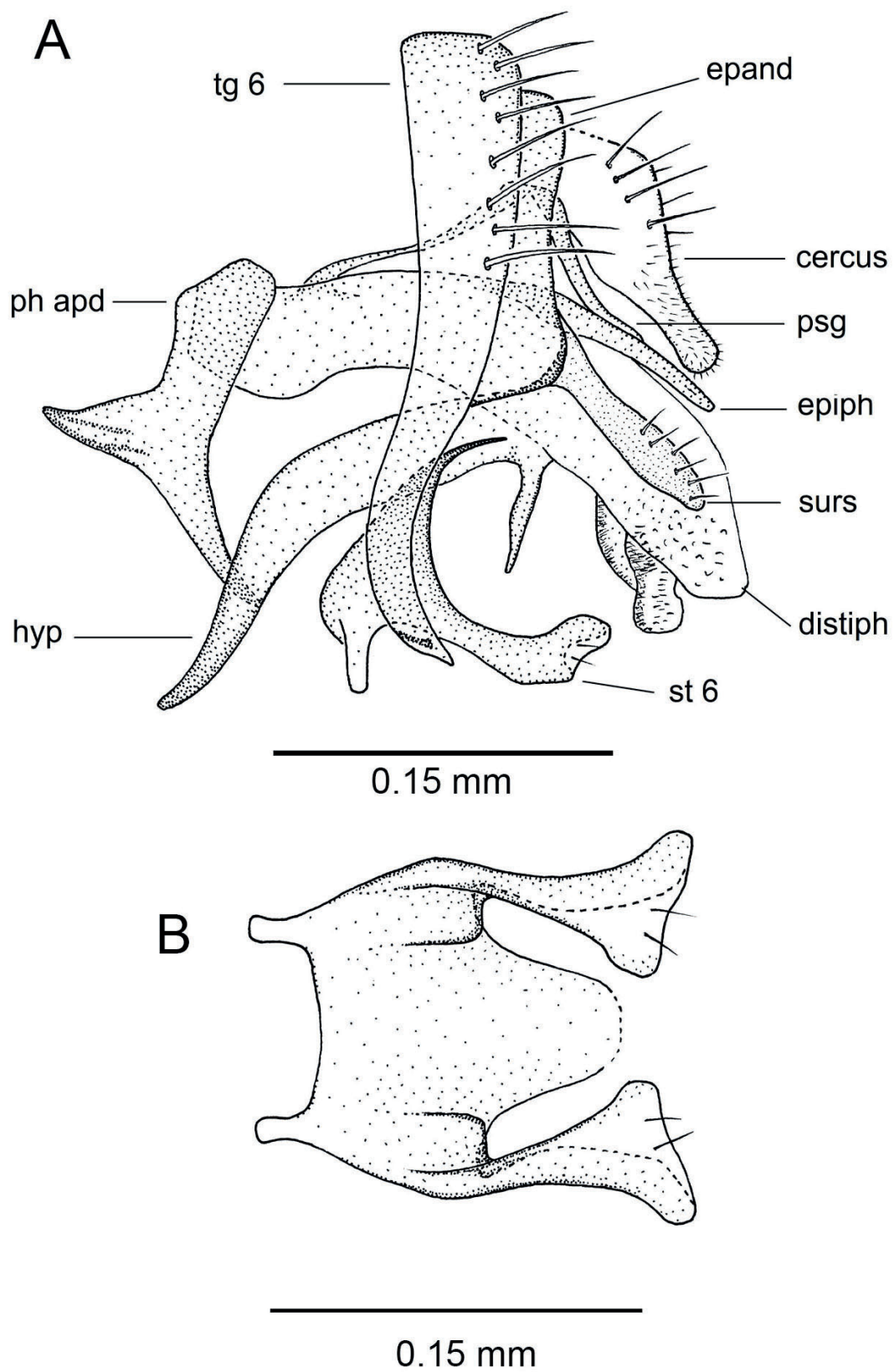
A yellow species with brown longitudinal scutal vittae, black 4<sup>th</sup> and 5<sup>th</sup> tarsomeres in both sexes (Fig. 61), the presutural intra-alar seta is present, and the presutural, prealar and dorsocentral setae are strong. Male without modified hind trochanter. Similar species: among those with strong presutural dorsocentral setae but without a modified hind trochanter in the male, *A. miricercus* sp. nov. is unique in the unusual shape of the cercus. This is unusually long and fused with the opposite side along the basal  $\frac{2}{3}$ . Additionally, the very long setae on the terminal segments of the abdomen are characteristic in the female of this species, shared with the female of *A. setigerum* Collin, 1949 but the latter has no pre-alar seta and all tarsal segments are yellow.



**Fig. 61.** *Aphaniosoma miricercus* sp. nov. ♂, holotype (MHNG-ENTO-00097873), habitus, lateral view.



**Fig. 62.** *Aphaniosoma miricercus* sp. nov., ♂, holotype (MHNG-ENTO-00097873), hypopygium in situ. **A.** Ventro-lateral view. **B.** Posterior view.



**Fig. 63.** *Aphaniosoma mirircercus* sp. nov., ♂, paratype (MHNG). **A.** Hypopygium, lateral view. **B.** Sternite 6, ventral view.

## Etymology

The species epithet is derived from the Latin '*mirus*' meaning 'strange', combined with '*cercus*', and refers to the strange shape of the cercus in this species.

## Material examined

### Holotype

ISRAEL • ♂; Mizpe Ramon observatory; 17 Mar. 1995; B. Merz leg.; MHNG-ENTO-00097873.

### Paratypes

ISRAEL • 1 ♂, 3 ♀♀; 'En Mor; 16 Mar. 1995; B. Merz leg.; MHNG.

## Description

MEASUREMENTS. Body length: male 1.8 mm, female 1.8 mm. Wing length: male 1.8 mm, female 1.8 mm.

### Male (holotype)

HEAD. Yellow, including ocellar triangle, occiput and ocelli; head almost spherical; frons narrowed anteriorly: at level of antennae about  $0.5 \times$  as wide as at level of anterior ocellus; gena: narrow in front, deeper behind, in profile, below middle of eye, about  $0.8 \times$  as high as eye, with numerous pale setulae; occiput in profile narrowly visible posterodorsal to eye, with long postocular setulae in one row; 3 long pale vibrissal setae; face short, poorly sclerotized and depressed; median carina narrow and shallow (not visible in holotype because of facial collapse; antenna yellow, pedicel paler than basal flagellomere and with distinct long black seta dorsally (not visible in holotype because of collapse); basal flagellomere with fine pubescence along anterior margin, shorter than diameter of first segment of arista; arista pale on basal  $\frac{1}{3}$ , with fine pubescence; chaetotaxy: 2 strong fronto-orbitals with two very short setulae interior to them, paraverticals short and convergent; 1 inner and 1 outer vertical vertical, both strong; ocellars as long as posterior fronto-orbital; about 18 dark, subequal setulae across frons.

THORAX. Yellow; scutum covered with dense pale microtomentum, with broad pale brown longitudinal vittae separated by only narrow yellow lines; scutellum yellow; mediotergite dark brown; pleura yellow with black on middle of katapisternum and meron; chaetotaxy: 1 postpronotal with a weak seta adjacent, 1 incurved intra-postpronotal, 1 long presutural, 2 notopleurals, 1+3 intra-alars, 1 postalar, 2+4 dorsocentrals, 1+5 acrostichals with prescutellars, 4 scutellars, 1 anepisternal with 1 shorter and thinner seta below it, 1 katapisternal at upper posterior corner with 2 short thin setae at middle.

WING. Veins yellowish brown; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.4 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about  $1.8 \times$  as long as posterior crossvein, which is about  $0.4 \times$  as long as apical section of vein  $M_4$  and lies oblique, forming an angle of about  $60^\circ$  with  $M_4$ . Haltere pale yellow.

LEGS. Numerous pale setulae scattered on legs and fore femur with long setulae posteriorly; apico-ventral seta on mid tibia present; claws black and pulvilli normal; 4<sup>th</sup> and 5<sup>th</sup> tarsomeres of all legs black; hind trochanter not modified.

ABDOMEN (Fig. 62A). Tergites more or less equal in length except for very short tergite 6, which is markedly elongate ventrally; tergites brown dorsally on basal  $\frac{1}{2}$  but yellow margins wider on segments 4–6; tergites with pale brown to yellow setae and setulae. Sternites 2–4 deeply pigmented, fifth unremarkable, but 6<sup>th</sup> enlarged and of a complex concave shape (Fig. 63B).

HYPOPYGIUM (Figs 62, 63A). Epandrium yellow; surstylus long, pale, very slightly curved and with a few pale setulae posteriorly on apical  $\frac{1}{3}$ ; hypandrium (viewed ventrally) narrow; no pregonite identified and may be absent; postgonites narrow, pale, weakly sclerotized and difficult to see as they run close and

parallel to epiphallus; distiphallus irregularly cylindrical, mostly membranous with some lobes at apex; cercus large and distinctly and unusually elongated, basally fused with the opposite side and with usual long setae basally, but apical  $\frac{1}{3}$  narrow, separated, slightly divergent and bearing a dense array of very short fine white setulae.

#### **Female**

As in male, but without secondary sexual characters; abdominal tergites 5–7 with exceptionally long setae.

#### **Variation**

No significant variation noted in this series of specimens.

#### **Distribution**

Israel.

*Aphaniosoma necopinatum* Ebejer, 1998  
Fig. 64–65

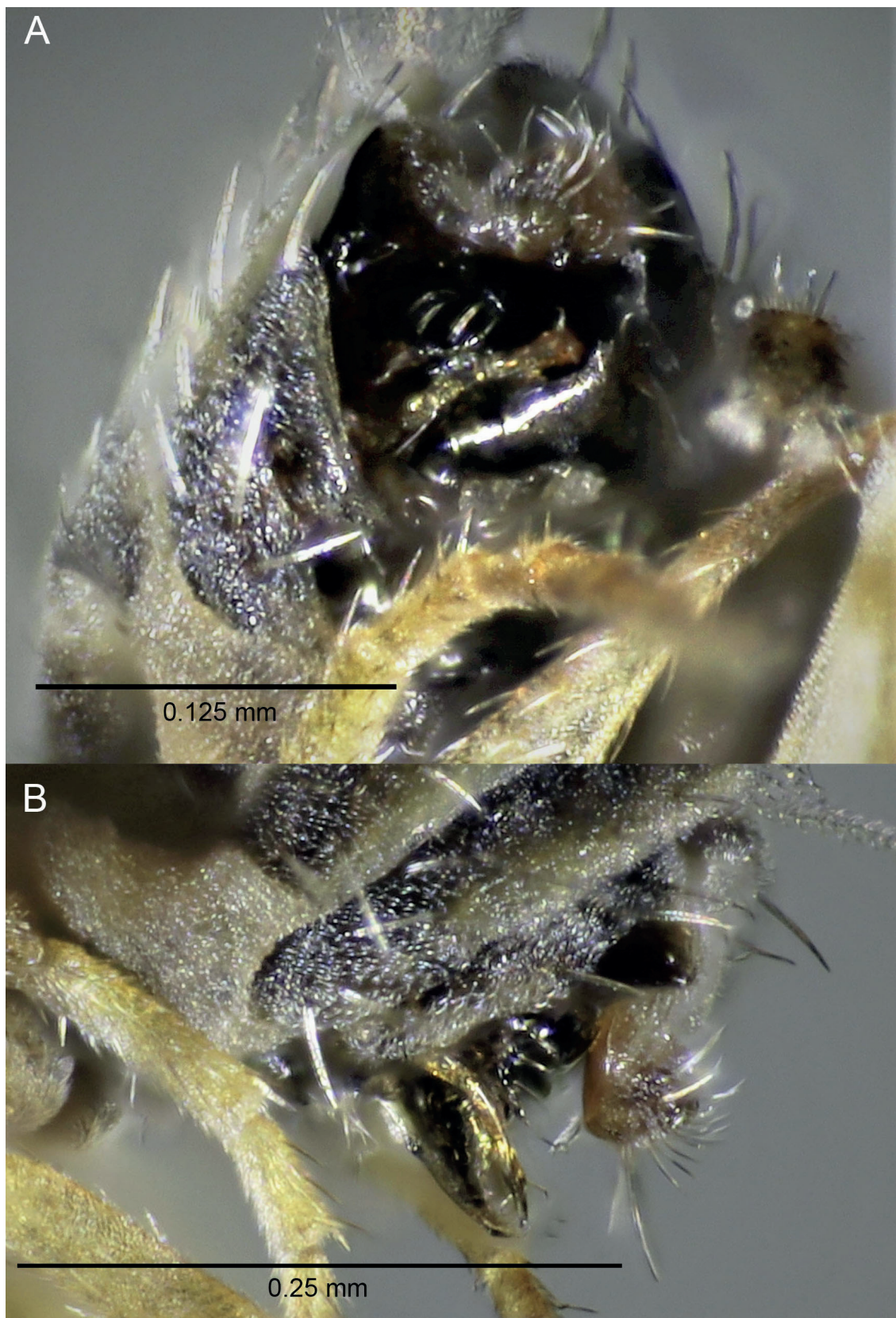
#### **Material examined**

##### **Paratype**

TURKEY • 1 ♂; Denizli, Aci Gol marsh; 4 Jul. 1997; M.J. Ebejer leg.; MJE.



**Fig. 64.** *Aphaniosoma necopinatum* Ebejer, 1998, ♂, paratype (MJE), habitus, lateral view.



**Fig. 65.** *Aphaniosoma necopinatum* Ebejer, 1998, ♂, paratype (MJE), hypopygium in situ. **A.** Postero-ventral view. **B.** Lateral view.

### Remarks

A black species with dark grey microtomentum (Fig. 64) that is known only from the type series. It is similar to several dark species but mostly to *A. claridgei* and *A. creperum*. In the male, it differs in the shape of the pregenital sternite (Ebejer 1998: 213, fig. 40) and in the hypopygium (Ebejer 1998: 213, fig 39) where the pregonite is pale, narrow and elongate, and the apex of the epiphallus is pointed. The species can sometimes be identified in the male if the hypopygium is sufficiently exposed (Fig. 65).

### Distribution

Turkey (Ebejer 1998).

*Aphaniosoma nigricauda* Ebejer, 1998

### Remarks

An almost completely dark brown to black species with greyish microtomentum, and on external characters alone it is indistinguishable from *A. creperum* (Fig. 16). For discussion of similar species, see note above under *A. creperum* and note under *A. nigricauda* below.

### Distribution

Algeria, Cyprus, Morocco, Tunisia (Ebejer 1998, 2016, 2021a; Baba Aissa *et al.* 2016).

*Aphaniosoma nigrum* Ebejer, 1998

Fig. 66

### Material examined

TUNISIA • 1 ♂; Pont de Bizerte ; 17 May 1995; M.J. Ebejer leg.; marsh; MJE.

### Remarks

An almost completely black species with sparse microtomentum (Fig. 66A). It is similar to *A. creperum* and *A. nigricauda*. The male abdominal tergite 5 is clearly longer than tergite 4 when observed dorsally at middle (Fig. 66B), a character not observed in similar species. The twisted and incised lower lateral margin of tergite 6, the shape of the black postgonites and the shape of the pregenital sternite (Ebejer 1998: 216, figs 47–49) are the easiest characters for identification and separation from the similar species.

### Distribution

Cyprus, Malta, Morocco, Tunisia (Ebejer 1998, 2016, 2021a).

*Aphaniosoma notatum* Collin, 1949

Fig. 67

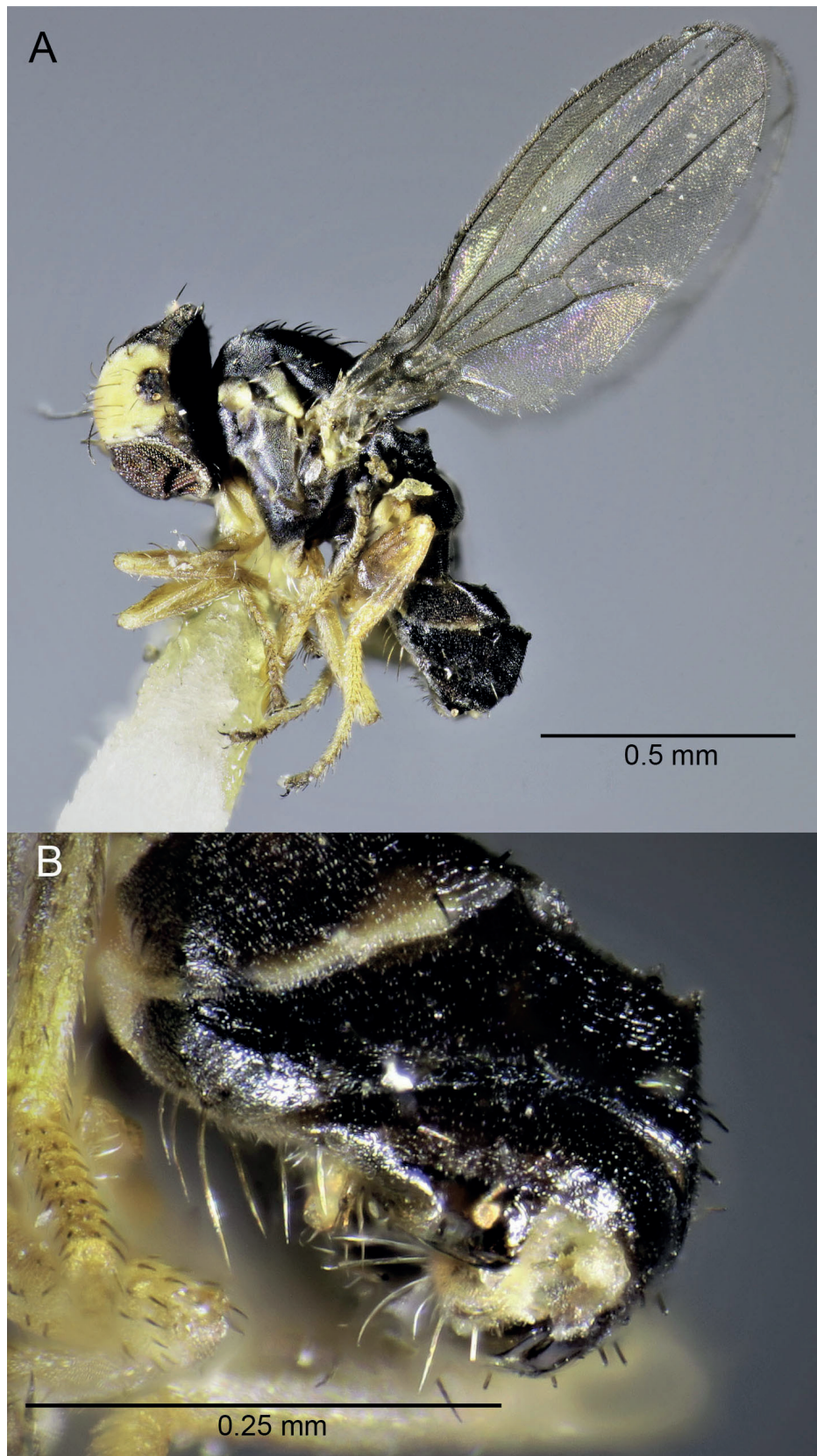
### Material examined

#### Holotype

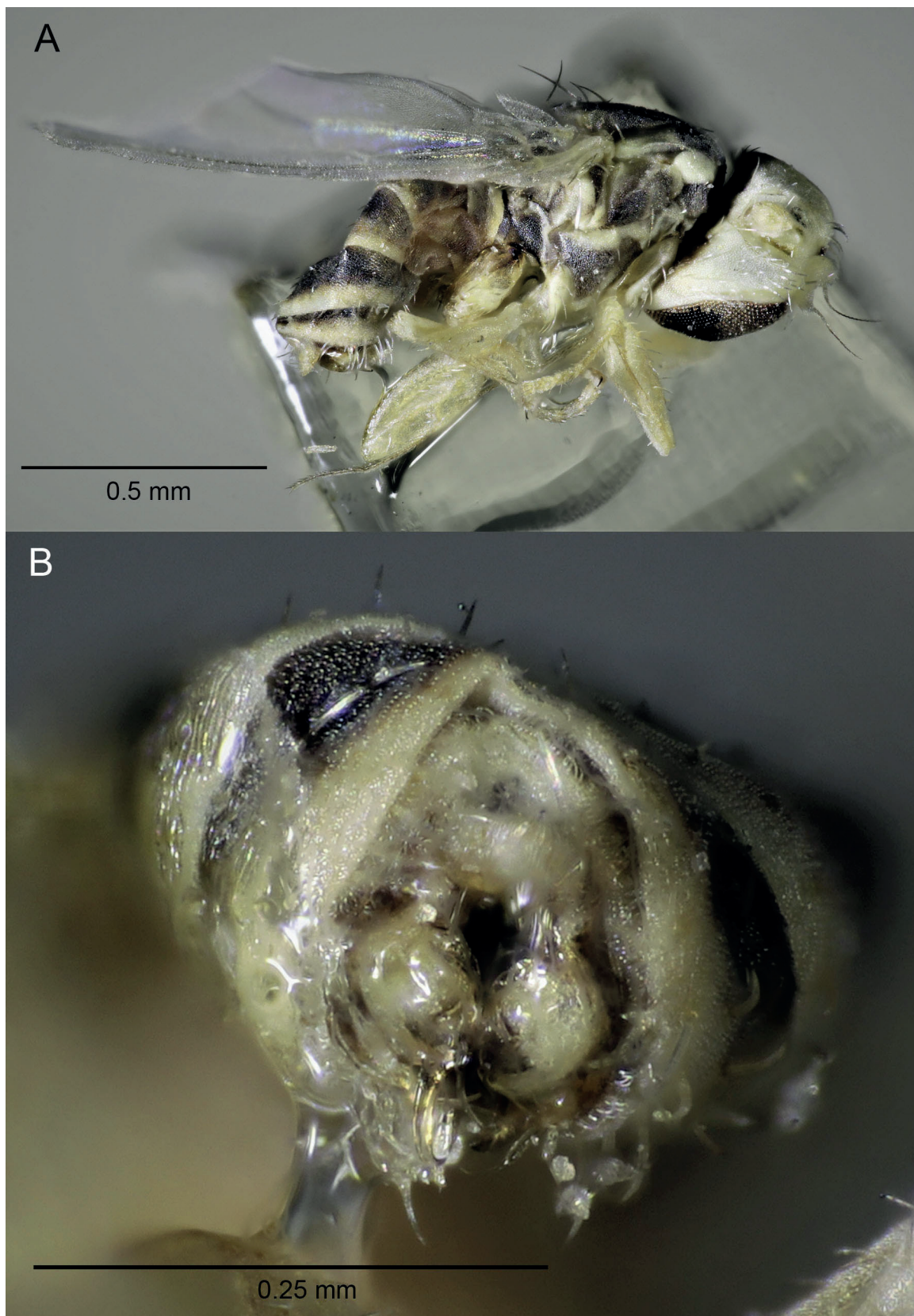
EGYPT • ♂; Siwa Oasis; 18–19 Apr. 1935; J. Omer-Cooper leg., Armstrong College Expedition; NHMUK, B.M. 1935–354, bar code 013435846.

### Remarks

Collin described this species from a single male. The figure given with the description (Collin 1949: 141) readily identifies the relevant specimen as the holotype (Fig. 67A) and this was listed as such in Pont



**Fig. 66.** *Aphaniosoma nigrum* Ebejer, 1998, ♂, paratype (MJE). **A.** Habitus, lateral view. **B.** Hypopygium in situ, ventro-lateral oblique view.



**Fig. 67.** *Aphaniosoma notatum* Collin, 1949, ♂, holotype (NHMUK, B.M. 1935–354, bar code 013435846). **A.** Habitus, lateral view. **B.** Hypopygium in situ, posterior view.

(1995: 118). Although the figure is accurate and Collin implied this species can be easily identified based on the hypopygial appearance, this is no longer the case because a similar appearance is sometimes seen in *A. approximatum*, *A. gallagheri*, *A. proximum* and *A. scutellare* Ebejer, 1998. The “globular yellow processes below the yellow anal cerci” (Fig. 67B) are the dorsal halves of the divided epandrium (right and left) and the degree of their exposure beyond the margin of tergite 6 is variable, depending on the degree of abdominal shrinkage. Thus, they sometimes appear larger, sometimes smaller. Their colour is not reliable. The elongate, narrow, and apically curved postgonite is very similar in *A. notatum* and *A. scutellare*, and these may in fact be conspecific. The former has broader yellow markings on the abdomen, whereas the latter is much darker everywhere and with much narrower yellow outlines to sclerites except on the scutellum, which usually contrasts pale yellow and has broad black lateral margins. However, a completely grey thorax including the scutellum does occur in this species, suggesting a wide degree of variation that lends more support to this species and *A. notatum* being conspecific. *Aphaniosoma scutellare* has a distinctive pregenital sternite (Ebejer 1998: 222, figs 69–70), but the shape of this structure in *A. notatum* is unknown and this could be a most helpful diagnostic character. The holotype being the only specimen representing this species, and since it is rather crudely and extensively glued to a pointed plastic mount, it is inadvisable to dissect it, risking complete destruction. It would be preferable to obtain more material from the type locality for further study of the hypopygium and so until such time, *A. notatum* and *A. scutellare* are considered separate species.

### Distribution

Cyprus (doubtful), Egypt (Collin 1949; Ebejer 2021a).

### *Aphaniosoma oculicauda* Collin, 1949

Fig. 68

### Material examined

#### Syntypes

EGYPT • 40 ♂♂, 14 ♀♀ (7 females headless); Fayoum, Lake Karun; 2–23 Sep. 1945; R.L. Coe leg.; NHMUK, B.M. 1946–39, bar code 013933290–343.

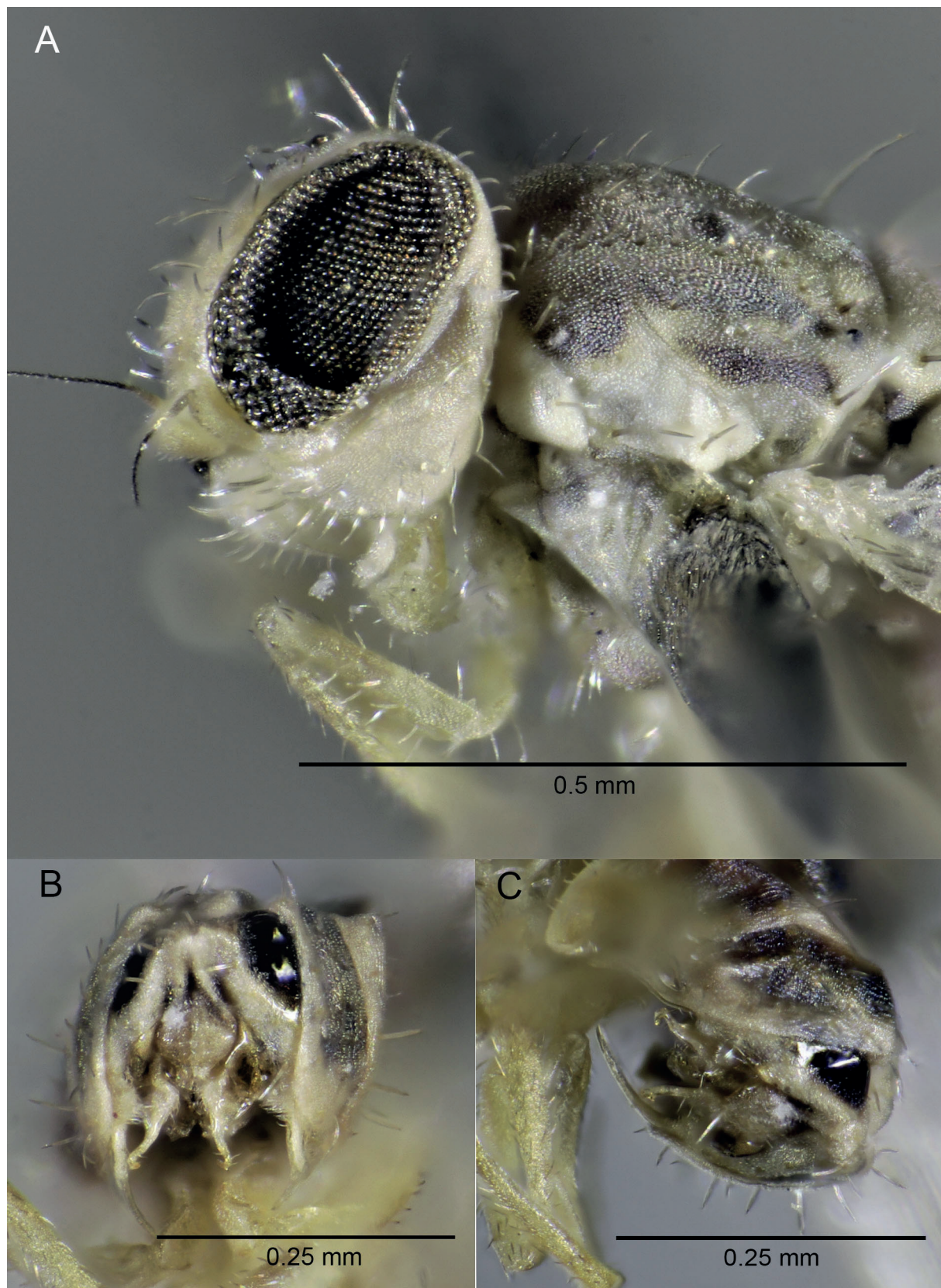
#### Other material

EGYPT • 1 ♂, 1 ♀; Alexandria, Abu Kir; 20 Oct. 2003; P. Gatt leg.; beach, wrack; PG • 2 ♂♂, preserved in alcohol; Alexandria, Ras Rashid; 21 Oct. 2003; P. Gatt leg.; beach; MJE.

ISRAEL • 1 ♀; Elot; 18 Mar. 1995; B. Merz leg.; MHNG • 1 ♂, 1 ♀; ‘Iddan; 19 Mar. 1995; A. Freidberg leg.; SMNHATAU • 9 ♂♂, 9 ♀♀; Qalya; 28 Sep. 1995; I. Yarom leg.; SMNHATAU • 1 ♂; Dead Sea, Nahal Qidron; 7 Jun. 1996; B. Merz and A. Freidberg leg.; MHNG • 1 ♂; Jericho, route 90; 31°48’ N, 35°29’ E; 25 Mar. 2000; M.J. Ebejer leg.; on roadside vegetation; MJE.

### Remarks

Pont (1995: 122) listed 40 male and 18 female syntypes. This species is one of a few where the male hypopygium, when visible in situ, can be highly distinctive even without dissection (Fig. 68B–C). On examining the specimens listed by Pont as syntypes, many males are in good condition and provide easy recognition of the species intended by Collin (33 males bar code 013933290–322 are in good condition; 013933323–329 are headless). Some other specimens are not identifiable, being in very poor condition. Among them (specimen with bar code 013933330), probably a male, is represented only by fragments of the hypopygium in Euparal and 6 specimens are of indeterminate sex, being in such poor condition. The rest of the specimens were not found. As a result, in the present study 40 males and 14 females are recognized as syntypes.



**Fig. 68.** *Aphaniosoma oculicauda* Collin, 1949, ♂, (MJE). **A.** Head, lateral view and thorax, dorsal oblique view. **B–C.** Hypopygium in situ. **B.** Posterior view. **C.** Ventro-lateral oblique view.

## Distribution

Cyprus, Egypt, Oman (Collin 1949; Ebejer 1996, 2021a). New record for Israel.

### *Aphaniosoma palestinense* sp. nov.

urn:lsid:zoobank.org:act:599C3D8D-342F-4C8A-81BE-4BCB534EF692

Figs 69–70

## Diagnosis

A species strongly marked in dark brown to black and pale yellow, giving it a variegated appearance (Fig. 69A); frons with a pair of long setae in front of anterior ocellus that are wide apart and parallel to each other; frons yellow in the male and with broad brown transverse band in the female; scutellum and large parts of pleura always yellow; male with large shiny black hypopygium and broad pale yellow surstylus easily visible in most specimens. The new species is close to *A. acitergum* sp. nov. and *A. angulitergum* sp. nov., but it is darker and differs in details of the hypopygium. In general habitus, it is similar also to *A. daedalum* sp. nov. especially in the appearance of the male hypopygium in situ.

## Etymology

The species is named after the land of origin.

## Material examined

### Holotype

ISRAEL • ♂; 'Iddan; 20 Jun. 1995; I. Yarom leg.; SMNHTAU 405829.

### Paratypes

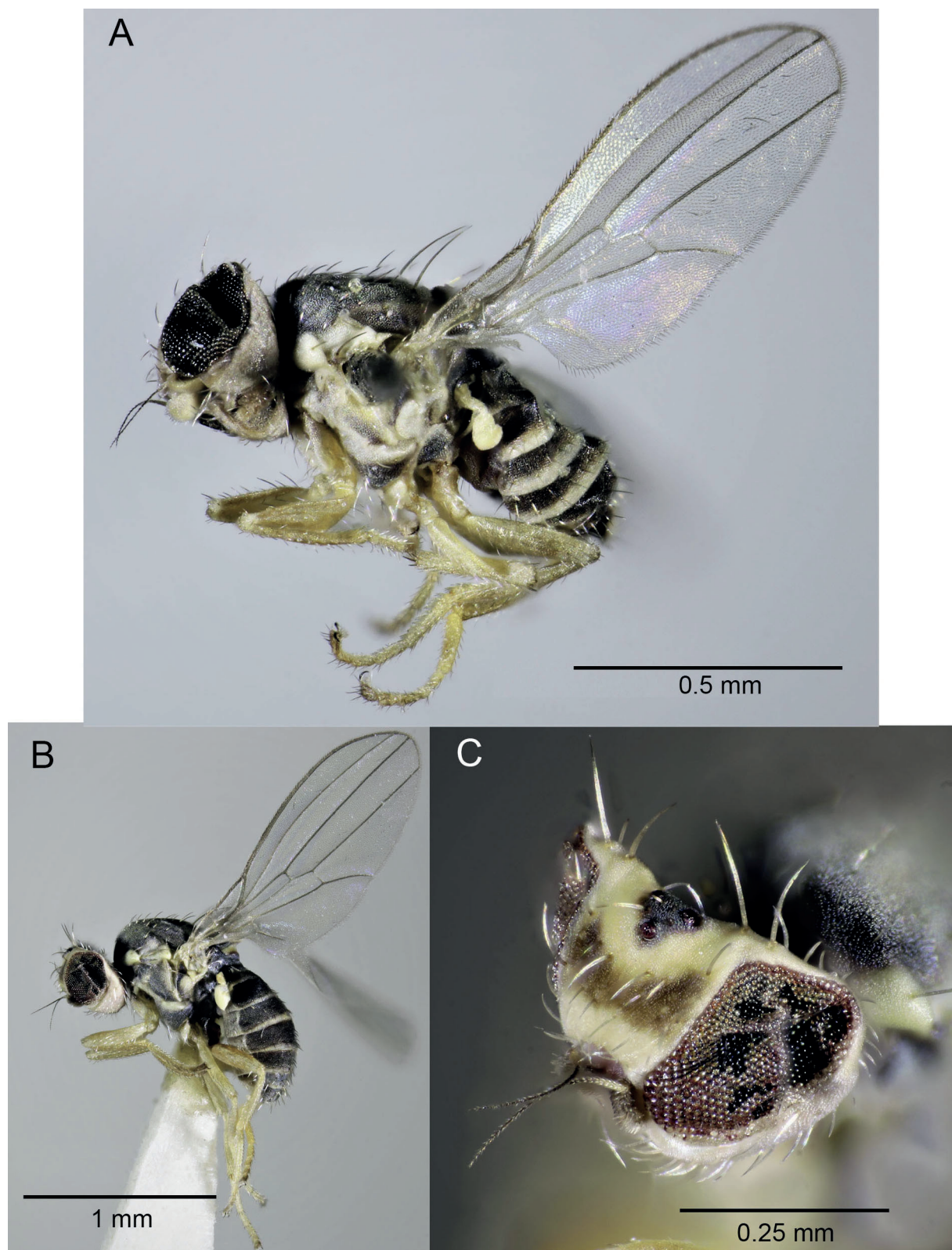
ISRAEL • 5 ♂♂, 6 ♀♀; same collection data as for holotype.; SMNHTAU • 1 ♂; same collection data as for holotype; MJE • 1 ♂; Elot; 18 Mar. 1995; A. Freidberg leg.; on *Tamarix* sp.; SMNHTAU • 4 ♂♂, 2 ♀♀; Elot; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 2 ♂♂, 1 ♀; 'Iddan; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂; 'En Iddan; 20 Jun. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂, 1 ♀; Timna'; 18 Mar. 1995; I Yarom leg.; SMNHTAU • 1 ♂, 1 ♀; same collection data as for preceding; on *Tamarix* sp.; SMNHTAU • 1 ♀; same collection data as for preceding; on *Tamarix* sp.; SMNHTAU • 1 ♀; Sappir pond; 9 Jul. 1996; A. Freidberg leg.; SMNHTAU • 1 ♀; 'En Zin; 9 Mar. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix parviflora*; SMNHTAU • 1 ♀; same collection data as for preceding; 12 Apr. 1999; SMNHTAU • 1 ♀; same collection data as for preceding; 19 Jul. 1999; on *Tamarix negevensis*; SMNHTAU • 1 ♂, 1 ♀; Elot; 16 Mar. 1995; B. Merz leg.; MHNG • 1 ♂, 3 ♀♀; same collection data as for preceding; 18 Mar. 1995; SMNHTAU • 1 ♀; same collection data as for preceding; 19 Mar. 1995; SMNHTAU • 1 ♂, 1 ♀; Jericho, route 90; 31°48' N, 35°29' E; 25 Mar. 2000; M.J. Ebejer leg.; on roadside vegetation; MJE • 7 ♀♀; Dead Sea, 'Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE.

## Description

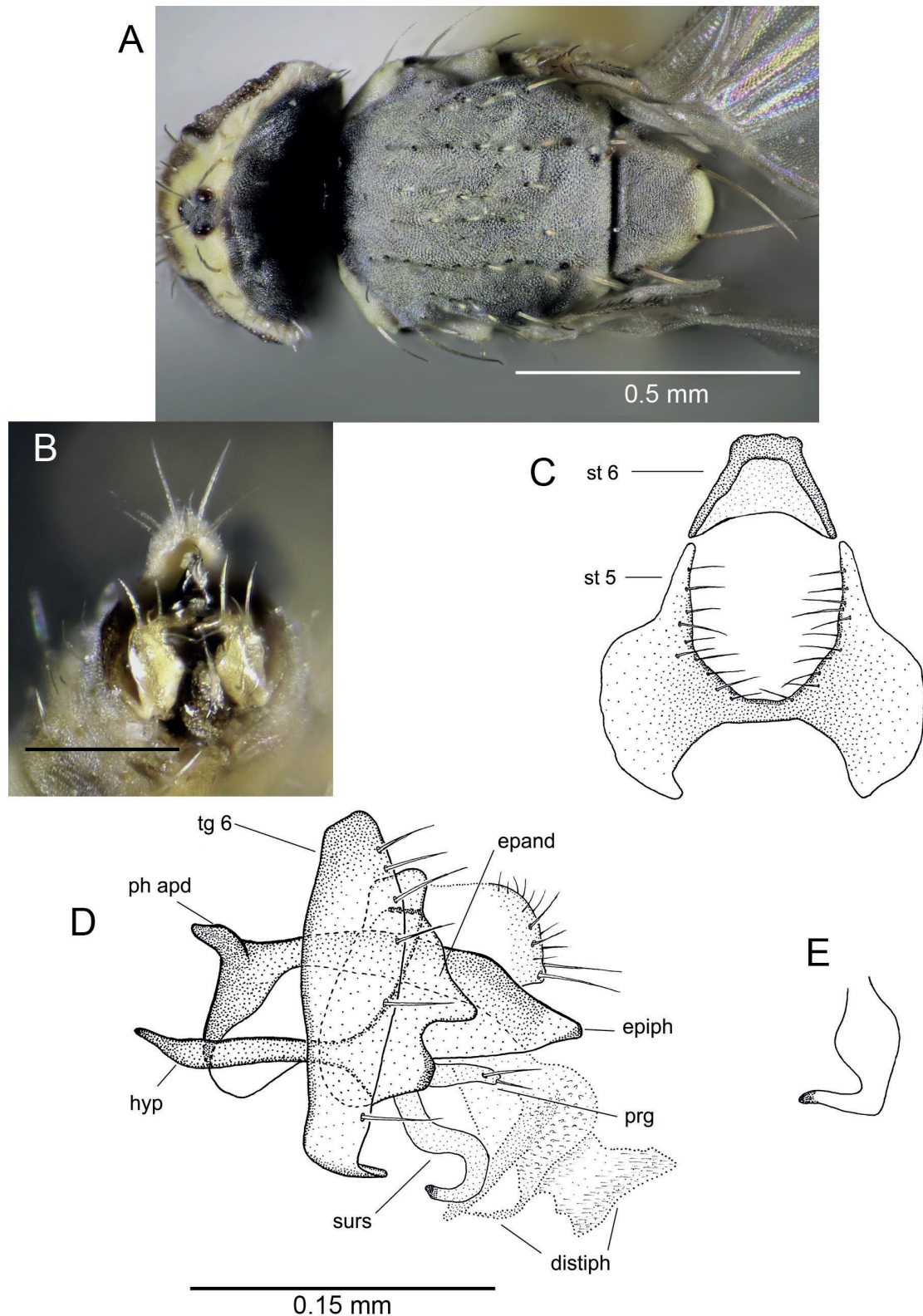
MEASUREMENTS. Body length: male 1.1 mm, female 1.2 mm. Wing length: male 1.1 mm, female 1.2 mm.

### Male (holotype)

HEAD. Yellow, ocelli ringed with black and occiput black with narrow yellow postocular margin; gena about  $\frac{2}{5}$  × as high as eye at middle and with scattered yellowish white setulae; a pair of vibrissal setae on each side; frons narrow at anterior margin, which is about 0.6 × as wide as frons at level of anterior ocellus; ocellar setae as strong as posterior fronto-orbital, 3 fronto-orbital setae not particularly well-developed and 2 very short setulae anterior to these; about 6 short pale setae on frons plus a



**Fig. 69.** *Aphaniosoma palestinense* sp. nov. **A.** ♂, holotype (SMNHTAU 405829). **B–C.** ♀, paratype (SMNHTAU). **B.** Habitus, lateral view. **C.** Head, antero-dorsal oblique view.



**Fig. 70.** *Aphaniosoma palestinense* sp. nov. **A.** ♀, paratype (MJE) head and thorax, dorsal view. **B–E.** ♂, paratype (SMNHTAU). **B.** Hypopygium in situ, postero-ventral view. **C.** Pregenital sternites, ventral view. **D.** Hypopygium, lateral view. **E.** Surstylus enlarged, postero-ventral view. Abbreviations: See Material and methods.

distinctly longer and more widely spaced pair in front of the anterior ocellus; inner and outer vertical well-developed; paraverticlar setae short and convergent; postocular setae short and in one row; face short, poorly sclerotized and depressed; median carina sharp and low, reaches clypeus; antenna yellow, pedicel with distinct short seta dorsally; basal flagellomere with fine pubescence along anterior margin; basal  $\frac{1}{4}$  of arista yellow contrasting with black distal  $\frac{3}{4}$ .

**THORAX** (Fig. 69B). Mostly dark; scutum black anteriorly with vittae appearing for a short distance at level of wing base and leaving an area anterior to scutellum completely yellow; postpronotal lobe and notopleuron yellow; scutellum yellow with black spot at base of lateral margin; scutum covered with yellow microtomentum; pleura with black sclerites broadly outlined in yellow; mediotergite black; chaetotaxy: 1 postpronotal, 1 presutural, 1 incurved intra-postpronotal, 1 presutural, 2 notopleurals, 1+3 intra-alars, 1 postalar, 2+4 dorsocentrals, 1+3 acrostichals, no prescutellars, 4 scutellars, 1 anepisternal, 1 katepisternal at upper posterior corner and two fine setae at lower middle of sclerite.

**WING.** Veins pale brown; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.5 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about  $1.5 \times$  as long as posterior crossvein, which is about  $0.3 \times$  as long as apical section of  $M_4$ . Haltere pale yellow.

**LEGS.** Fore femur with long setulae on posterior aspect; numerous pale-yellow setulae scattered on legs; apico-ventral seta on mid tibia present; claws black, pulvilli normal; tarsomeres all yellow; hind trochanter not modified.

**ABDOMEN** (Fig. 69A). Tergites black along anterior margin, fading slightly to brown on middle third and to yellow on posterior third; all with sparse yellowish grey microtomentum; all tergites with scattered short, pale setulae that become longer laterally on tergites 4–6; sternites 5 and 6 modified.

**HYPOPYGIUM.** (Fig 70B, D) Epandrium shining black, bearing a surstylus that is broad oval on basal  $\frac{2}{3}$  and its apical  $\frac{1}{3}$ ; pregonite narrow and pale with a pair of setulae at apex; postgonite not identified; aedeagus black with epiphallus large, completely shining black and apically pointed; distiphallus mostly black and short bilobed apically; cercus pale yellow, fused with the opposite side and with long apical setae.

#### **Female** (Fig. 69B)

As in male, but with a broad dark band across middle of frons (Fig. 69C) and without secondary sexual characters.

#### **Variation**

Some specimens have an almost entirely grey scutum especially in females (Fig. 70A).

#### **Distribution**

Israel.

*Aphaniosoma perpallidum* Ebejer, 2008

#### **Remarks**

One of several small yellow species similar to *A. egregium*. It bears no unique external characters, but it is one of the palest species. Sternite 5 (Ebejer 2008: 688, fig. 13) is more or less square-shaped with a pair of triangular posterior extensions. Identification requires examination of the dissected male hypopygium where the entirely pale structures and the uncomplicated almost translucent aedeagus are diagnostic (Ebejer 2008: 688, figs 12, 14).

### Distribution

United Arab Emirates (Ebejer 1996).

### *Aphaniosoma platystylus* Ebejer, 2008

Fig. 71

### Material examined

#### Paratypes

UNITED ARAB EMIRATES • 1 ♂; 7km south of Al-Jazirat al-Hamra; 29 Dec. 2004; A. van Harten leg.; white water trap; MJE • 1 ♂; Sharjah Desert Park; 20 Oct.–24 Nov. 2007; A. van Harten leg.; light trap; MJE.

### Remarks

For similar species see note under *A. impudens*, above. The habitus (Fig. 71A) and the appearance of the hypopygium in situ (Fig. 71B) are illustrated here and the characteristic sternite 6 with line drawing of the hypopygium were previously illustrated (Ebejer 2008: 689, figs 15–16).

### Distribution

United Arab Emirates (Ebejer 1996).

### *Aphaniosoma praeditum* sp. nov.

urn:lsid:zoobank.org:act:D13D537C-3D4D-4920-942D-02230AAC3907

Figs 72–73

### Diagnosis

A yellow species with longitudinal scutal vittae and 5<sup>th</sup> tarsomeres black in both sexes (Fig. 72A); strong presutural, prealar and dorsocentral setae. Male with elongate surstylus only slightly curved at its short setulose apex and easily visible without dissection; it has a highly modified hind femur and hind trochanter. Similar species: *A. pteropus* Ebejer, 2021, from Cyprus and *A. cristatum* sp. nov. have a strongly modified hind trochanter and a small tubercle on the hind femur, but quite unlike those in *A. praeditum* sp. nov., where the femur has a quadrate projection and the hind trochanter has a long and narrow process.

### Etymology

The species epithet is derived from the Latin '*praeditus*' meaning 'endowed' and refers to the characteristic modification of the hind leg in the male.

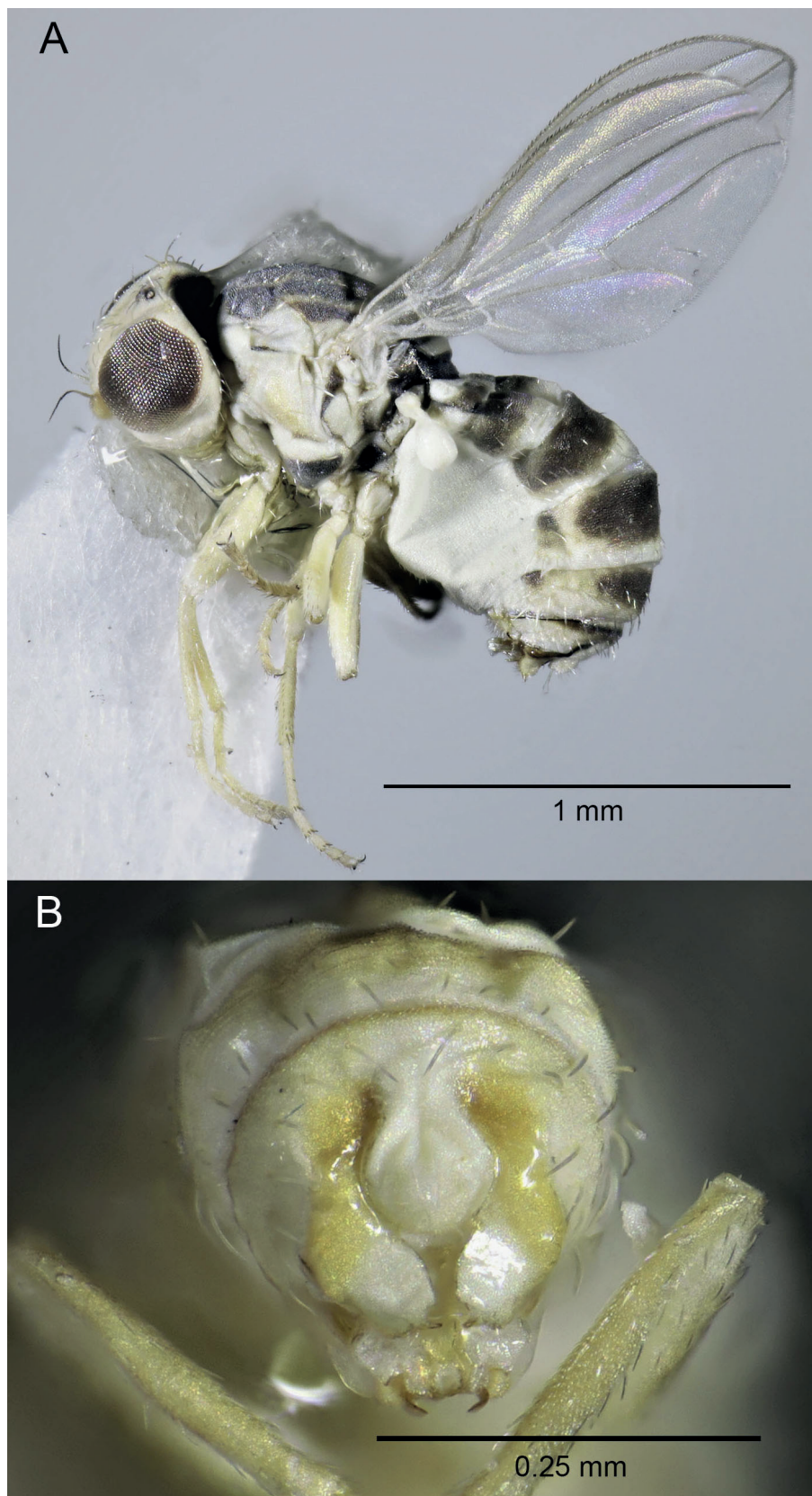
### Material examined

#### Holotype

ISRAEL • ♂; 'En Mor; 16 Mar. 1995; B. Merz leg.; MHNG-ENTO-00097309.

#### Paratypes

ISRAEL • 3 ♂♂, 4 ♀♀; same collection data as for holotype; MHNG • 1 ♂; 'En Gedi; 19 Mar. 1995; A. Freidberg leg.; SMNHNTAU • 1 ♂; Dead Sea, 'Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE.



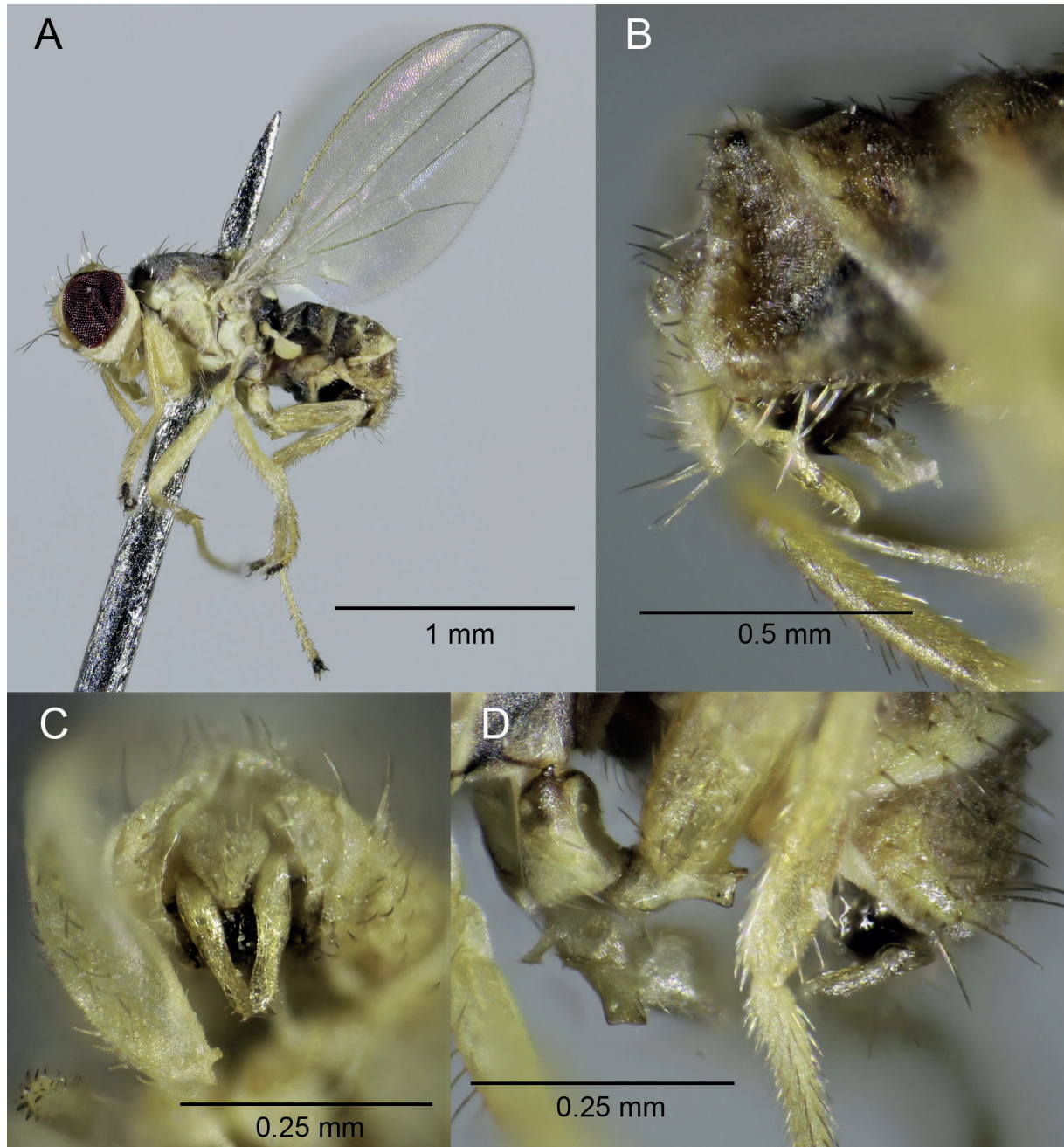
**Fig. 71.** *Aphaniosoma platystylus* Ebejer, 2008, ♂, paratype (MJE). A. Habitus, lateral view. B. Hypopygium in situ, posterior view.

### Description

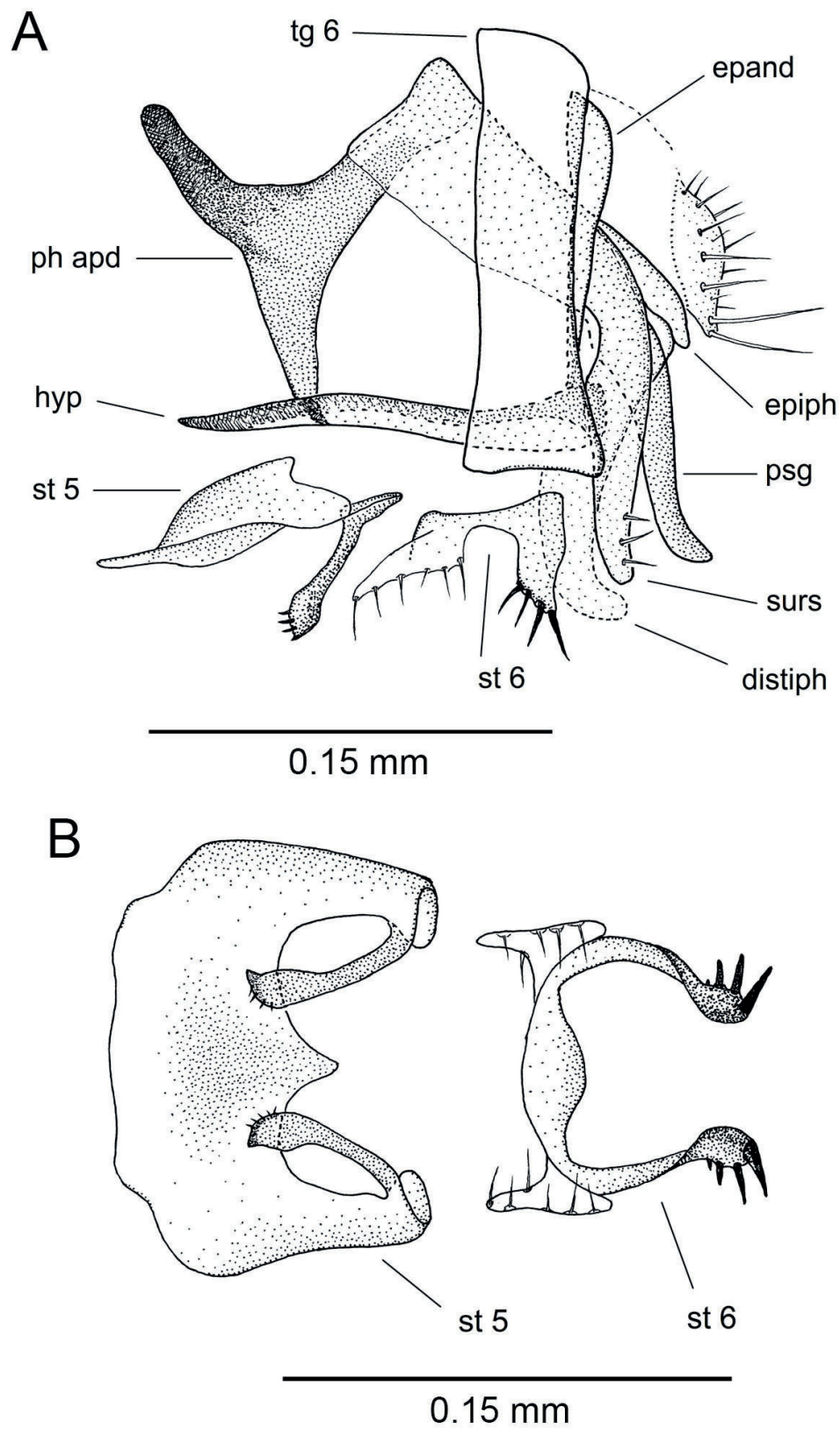
MEASUREMENTS. Body length: male 1.5 mm, female 1.5 mm. Wing length: male 1.6 mm, female 1.6 mm.

#### Male (holotype)

HEAD. Yellow except for black ringed ocelli and two large dark patches on occiput separated by broad yellow vitta from vertex to neck; head almost spherical; frons narrowed anteriorly: at level of antennae about  $0.6 \times$  as wide as at level of anterior ocellus; gena: narrow in front, deeper behind, in profile, below



**Fig. 72.** *Aphaniosoma praeditum* sp. nov., ♂, holotype (MHNG-ENTO-00097309). **A.** Habitus, lateral view. **B–C.** Hypopygium in situ. **B.** Lateral view. **C.** Posterior view. **D.** Hind coxa, trochanter and base of femur, lateral view.



**Fig. 73.** *Aphaniosoma praeditum* sp. nov., ♂, paratype (MHNG). **A.** Hypopygium, lateral view. **B.** Pregenital sternites, ventral view. Abbreviations: See Material and methods.

middle of eye, about half height of eye, with numerous pale setulae; occiput in profile barely visible behind eye above, with long postocular setulae in one row; 2 long pale vibrissal setulae; face short, poorly sclerotized and depressed; median carina not visible; antenna yellow, pedicel paler than basal flagellomere and with distinct short dark seta dorsally; basal flagellomere with fine pubescence along anterior margin, shorter than diameter of first segment of arista; first segment of arista yellow, second black, with fine pubescence; chaetotaxy: 2 strong fronto-orbitals with three very short setulae interior to them, paravericals short and convergent; 1 inner and 1 outer vertical, both strong; ocellars as long as posterior fronto-orbital; about 14 short dark setulae across middle of frons all more or less of uniform size.

**THORAX.** Yellow; scutum covered with dense pale microtomentum, with broad black longitudinal vittae leaving only very narrow yellow lines between them; scutellum yellow; mediotergite dark brown; pleura yellow with black on middle of katepisternum and meron; chaetotaxy: 1 postpronotal, 1 incurved intra-postpronotal, 1 long presutural, 2 notopleurals, 1+2 intra-alars, 1 postalar, 1+3 dorsocentrals, 0+5 acrostichals with prescutellars, 4 scutellars, 1 anepisternal with 2 shorter and thinner setae below it, 1 katepisternal at upper posterior corner with 2 short thin setae anterior.

**WING.** Veins yellowish brown; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.4 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about  $1.3 \times$  as long as posterior crossvein, which is about  $0.4 \times$  as long as apical section of  $M_4$ . Haltere pale yellow.

**LEGS.** Fore femur with long setulae on posterior aspect and middle femur with setulae along anteroventral aspect not much shorter than diameter of femur; numerous pale setulae scattered on legs; apico-ventral seta on mid tibia present; claws black and pulvilli normal; 5<sup>th</sup> tarsomere of all legs black; hind trochanter (Fig. 72D) modified with long narrow process, obliquely truncate at tip where it is covered with several very fine setulae; hind femur at junction with trochanter bearing a quadrate process.

**ABDOMEN.** Tergites brown dorsally over basal  $\frac{2}{3}$ ; tergite 5 narrow dorsally and broader than tergite 4 laterally; tergites with fine pale setulae; sternites 5 and 6 highly modified, each with long posterior lobes directed antero-ventrally in sternite 5 and postero-ventrally in sternite 6; those of sternite 6 bearing distinct black spinose setae (Fig. 73).

**HYPOPYGIUM** (Figs 72B–C, 73A). Epandrium narrow; surstylus long, pale, only slightly curved at tip and on posterior aspect with a few very short fine setulae; hypandrium with narrow lateral arms ending at lower margin of epandrium; pregonite not identified; postgonite narrow and about as long as surstylus, but lying very close to aedeagus; epiphallus shorter; distiphallus pale, mostly membranous and appears irregularly cylindrical; cercus large, fused with the opposite side and pale with apical pair of long setae.

### **Female**

As in male, but without secondary sexual characters.

### **Variation**

No significant variation noted in this series of specimens.

### **Distribution**

Israel.

*Aphaniosoma propinquans* Collin, 1949  
Fig. 74

**Material examined**

SPAIN • 1 ♂; Balearic Islands, Mallorca, S'Albufera, Es Cibollar marsh north; 18 Apr. 2001; M.J. Ebejer leg.; MJE.

TUNISIA • 1 ♀; Bizerte, Menzel Bourgiba; 16 May 1995; M.J. Ebejer leg.; salt-lake; MJE.

**Remarks**

A species with long dorsocentral setae (1–2+3–4) but no projection on the hind trochanter. It usually has the presutural dorsocentral just a little longer than the first postsutural seta whereas in all other species it is the other way round. The male pregenital sternite was illustrated with a line drawing in the original description. What is not apparent from that drawing is the considerable bending of this sternite at its middle to form a broad midline keel that is deeper towards the caudal end with a U-shaped posterior margin (see Fig. 74A). The female has the abdominal tergites 5–7 a little raised in the midline giving it a shallow ridge-like appearance, which lined pale yellow (Fig. 74B). Ebejer (1998, 219) gave more detail for the identification of both sexes.

**Distribution**

Czech Republic, Germany, Great Britain, France, Italy (Sicily), Malta, Spain (including Balearics), Turkey (Collin 1949; Ebejer 1998; Ebejer *et al.* 2001; Bährmann 2006).

*Aphaniosoma proximum* Ebejer, 1998

**Remarks**

This species has much in common with *A. notatum* and *A. scutellare*. Being variable in colour pattern adds to the difficulty of identification of species in this complex. The pregenital sternite of *A. proximum* usually has 2 projecting lobes. The barely noticeable posterior lobes arising from the postero-lateral corners of the sternite just beyond those that project ventrally and arise from the lateral border of the sternite. Basally, the sternite is divided into two more or less rectangular sclerotized parts (Ebejer 1998: 220, fig. 64). In *A. scutellare*, the posterior projections are not much shorter than those proximal to them and the basal part of the sclerite is complete and irregularly hexagonal (Ebejer 1998: 222, figs 69–70). In both species the sternite is much smaller than that in *A. gallagheri*, which has a deep U-shaped apical incision and much longer antero-ventrally directed projections from the lateral margins at its caudal end (Ebejer 2009: 401, fig. 46a–b).

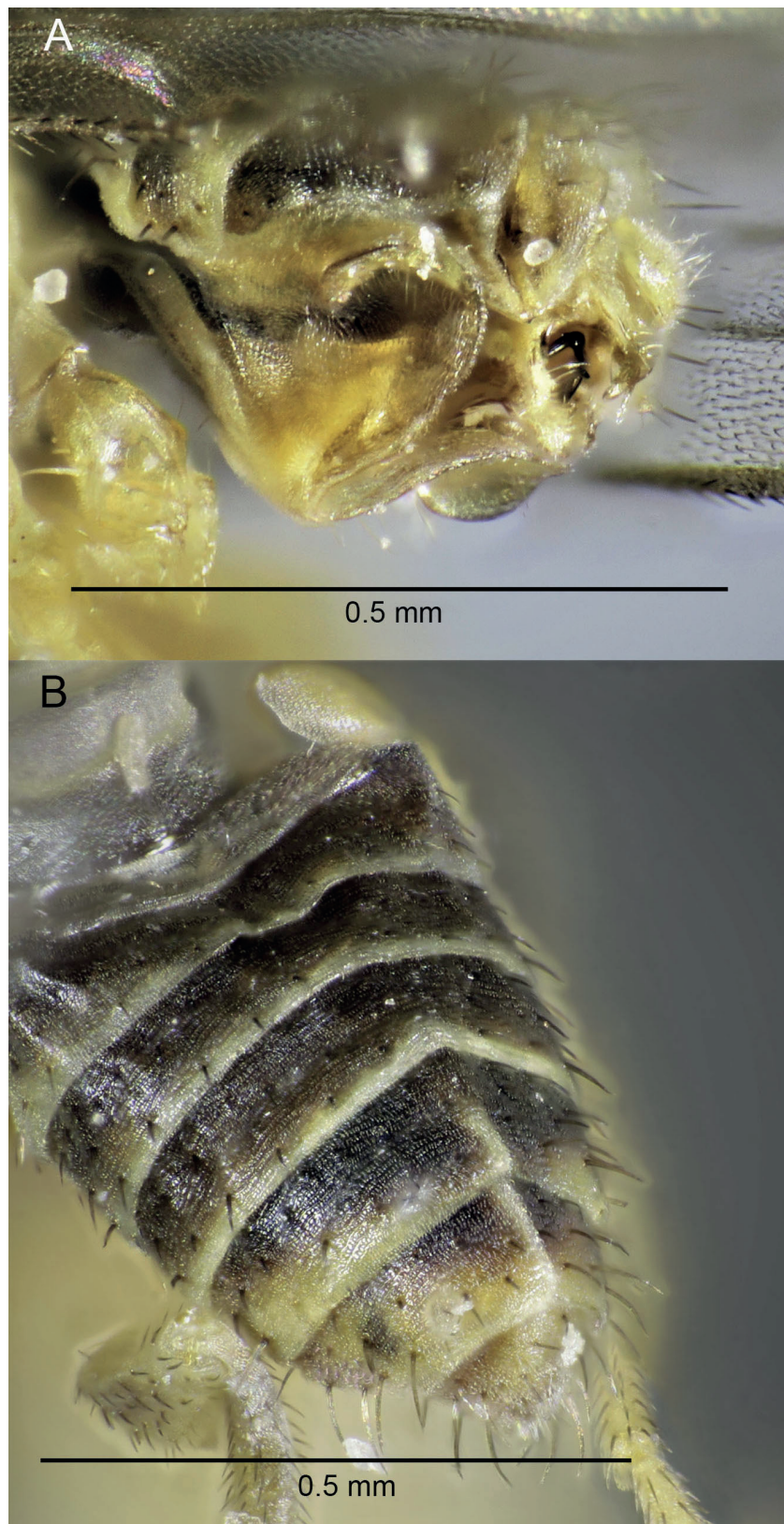
**Distribution**

Italy (Sardinia and Sicily), Malta, Morocco, Romania, Tunisia, Turkey, United Arab Emirates (Ebejer 1998, 2005, 2016; Ebejer & Bartak 2019).

*Aphaniosoma pteropus* Ebejer, 2021

**Remarks**

This species belongs to the *collini* group based on having few dorsocentral setae (2+3) that are relatively strong, and prescutellar acrostichal setae, with the male having the largest and most distinctive development of the hind trochanter known so far. It is about half as long as the hind femur. Photographs of both sexes were included with the original description (Ebejer 2021a: 9, figs 12–14).



**Fig. 74.** *Aphaniosoma propinquans* Collin, 1949. **A.** ♂ (MJE), abdomen showing the large pregenital sternite in situ, ventro-lateral view. **B.** ♀ (MJE), abdomen showing the shallow midline ridge on tergites 5 and 6, dorsal oblique view.

### Distribution

Cyprus (Ebejer 2021a).

### *Aphaniosoma scutellare* Ebejer, 1998

Fig. 75

### Material examined

EGYPT • 2 ♀♀; Alexandria, Abu Kir; 20 Oct. 2003; P. Gatt leg.; beach, wrack; PG • 2 ♂♂, 1 ♀, preserved in alcohol; same collection data as for preceding; MJE.

### Remarks

A species described from Turkey and later reported from Germany. The species is distinctive when the pale scutellum contrasts with the uniformly dark grey scutum and the dark basal flagellomere (Fig. 75A), but completely grey specimens and others with a yellow basal flagellomere do occur (see above under *A. notatum*). It shares characters with the *creperum* group of species on account of its dark colouration, the long pair of setae on the frons and in the male, the shape of the postgonite: a narrow, curved, dark, blunt-ended structure often easily seen without dissection. It also shares the ‘globular’ appearance of the epandrium, as seen in situ (Fig. 76B), with *A. notatum* and *A. proximum* (see above under *A. notatum*). It is identified from the shape of the ventro-lateral margin of tergite 6, which is narrowed at its lower antero-lateral angle, and from the shape of the pregenital sternite, which is irregularly hexagonal in shape bearing a broad ventrally directed lobe from each antero-lateral margin (Ebejer 1998: 222, figs 68–70). It is not a common species.

### Distribution

Cyprus, Germany, Turkey (Ebejer 1998, 2021a; Bährmann 2006). New record for Egypt.

### *Aphaniosoma seticauda* Ebejer, 1998

Fig. 76

### Material examined

#### Other material

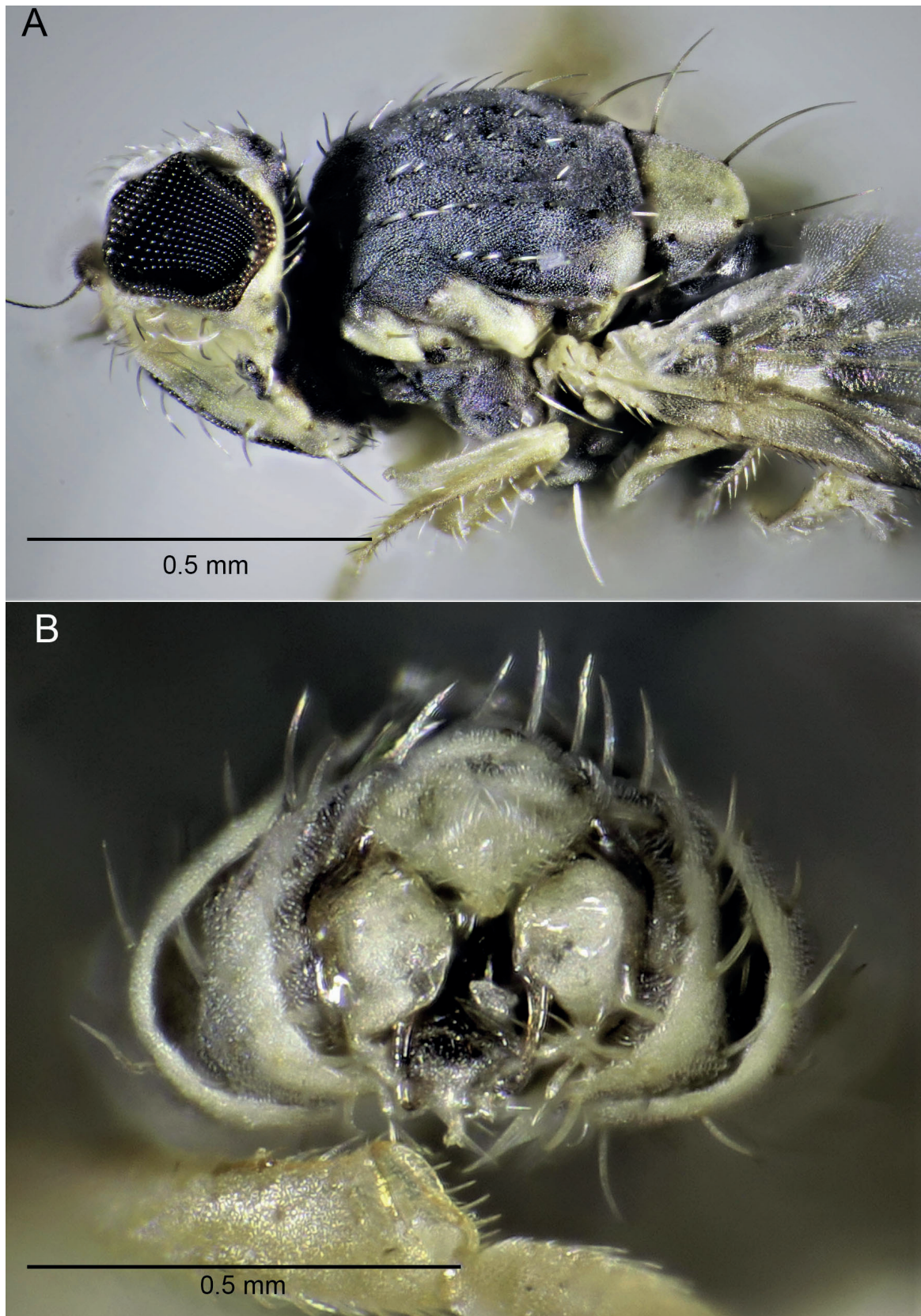
EGYPT • 2 ♂, 3 ♀♀; Alexandria, Ras Rashid, beach; 21 Oct. 2003; P. Gatt leg.; PG • 5 ♂♂, 3 ♀♀, preserved in alcohol; same collection data as for preceding; MJE.

### Remarks

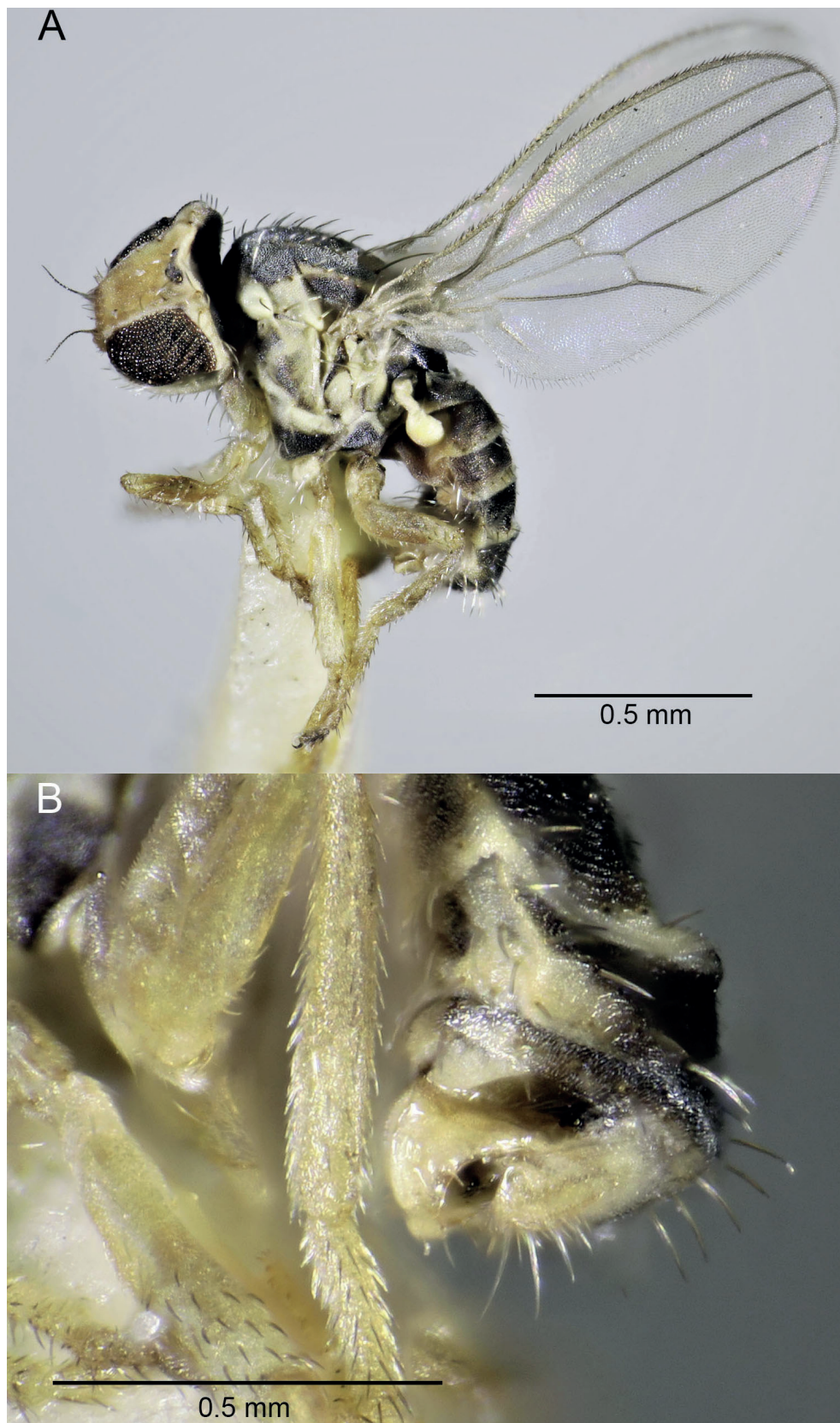
This species (Fig. 76A) is predominantly yellow with broad brownish grey scutal vittae and marks on the pleura, broadly bordered in yellow. All fronto-orbital setae are short. The abdominal tergites have broad brown transverse bands with clear yellow margins, but the border between the two colours is rather diffuse. Apart from the characters given in the key, it is recognized from the hypopygial features of the male, where the pregonite is usually evident without dissection. It is large and pale (Fig. 77B) contrasting with the rest of the darker epandrium and tergite 6. When macerated it shows a deep and narrow posterior incision (Ebejer 1998: 223, fig. 71).

### Distribution

Tunisia (Ebejer 1998). New record for Egypt.



**Fig. 75.** *Aphaniosoma scutellare* Ebejer, 1998, ♂ (MJE). **A.** Head, dorso-lateral oblique view, and thorax, dorsal view. **B.** Hypopygium in situ, posterior view.



**Fig. 76.** *Aphanosoma seticauda* Ebejer, 1998, ♂, paratype (). **A.** Habitus, lateral view. **B.** Hypopygium in situ, postero-lateral view.

*Aphaniosoma setigerum* Collin, 1949  
Figs 77–78

**Material examined**

**Holotype**

EGYPT • ♂; Siwa Oasis; 24 Apr. 1935; J. Omer-Cooper leg., Armstrong College Expedition; NHMUK, B.M. 1935–354, bar code 013435847.

**Other Material**

ISRAEL • 1 ♂, 2 ♀♀; Nahal Zin; 6 Apr. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂ (headless), 1 ♀; same collection data as for preceding; on *Tamarix negevensis*; SMNHTAU • 1 ♂, 1 ♀; ‘Enot Zuqim; 12 Apr. 2000; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 3 ♂♂, 4 ♀♀; Zomet Zohar; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 2 ♀♀; ‘En Zin; 12 Apr. 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix negevensis*; SMNHTAU • 1 ♀; same collection data as for preceding; on *Tamarix parviflora*; SMNHTAU • 2 ♂♂, 1 ♀; Dead Sea, Zomet Zohar; 31°08' N, 35°21' E; alt. -338 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE • 4 ♀♀; Dead Sea, ‘Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE.

**Remarks**

Collin described this species from a single specimen (Collin 1949: 142–143) which he considered as “Almost certainly a male but hypopygium hidden owing to incurved abdomen”. The single specimen is listed as the holotype by Pont (1995: 147–148). It perfectly fits the description of this species bears no name label but bears a round red bordered ‘Type’ label. It is in reasonably good condition (Fig. 77A). A specimen from Israel (Fig. 77C) shows the relative lengths of the male posterior tergites of the abdomen to be identical and which are characteristic of this species. The illustration of the hypopygium provided here (Fig. 78) is based on another specimen from Israel.

**Distribution**

Egypt. New record for Israel.

*Aphaniosoma socium* Collin, 1949

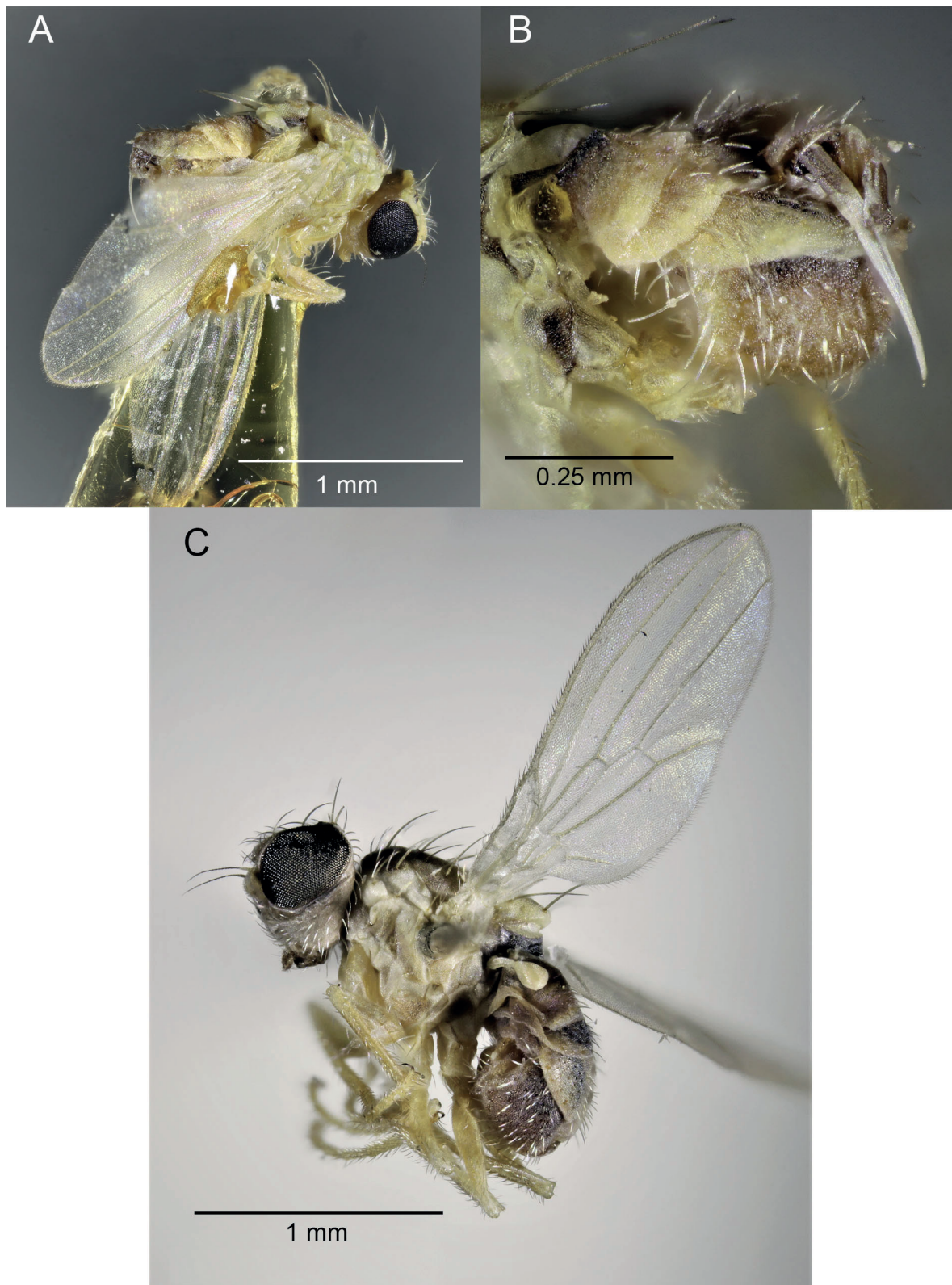
**Remarks**

The listing of *A. socium* Collin, 1949 as present in Egypt (Ebejer 1998) was an error, a lapsus of script – no specimen or literature record is known from Egypt. Given its habitat association and current distribution, it is unlikely to be present along the eastern Mediterranean coast or in the Middle East. It is a dark species with a uniformly grey scutum and scutellum. All setulae on the frons are of equal length and the male has a characteristic semicircular membraneous area dorsally between tergite 5 and 6. The pregenital sternite is square-shaped with two small, also square-shaped projections from the posterior margin as illustrated by Collin (1949: 133, fig. 2).

**Distribution**

Czech Republic, Germany, Great Britain (Collin 1949; Ebejer *et al.* 2001; Bährmann 2006).

*Aphaniosoma sodalis* Collin, 1949  
Figs 79–81



**Fig. 77.** *Aphaniosoma setigerum* Collin, 1949. **A–B.** ♂, holotype (NHMUK, B.M. 1935–354, bar code 013435847). **A.** Habitus, lateral view. **B.** Posterior segments of abdomen showing large tergite 5 (note: artifact dorsally caused by Lepidoptera scale stuck to tergite 3). **C.** ♂ (SMNHTAU) from Israel, habitus, lateral view.

# Material examined

## Lectotype (here designated)

EGYPT • ♂; Siwa Oasis; 29 Apr. 1935; J. Omer-Cooper leg., Armstrong College Expedition; NHMUK, B.M. 1935–354, bar code 013435848.

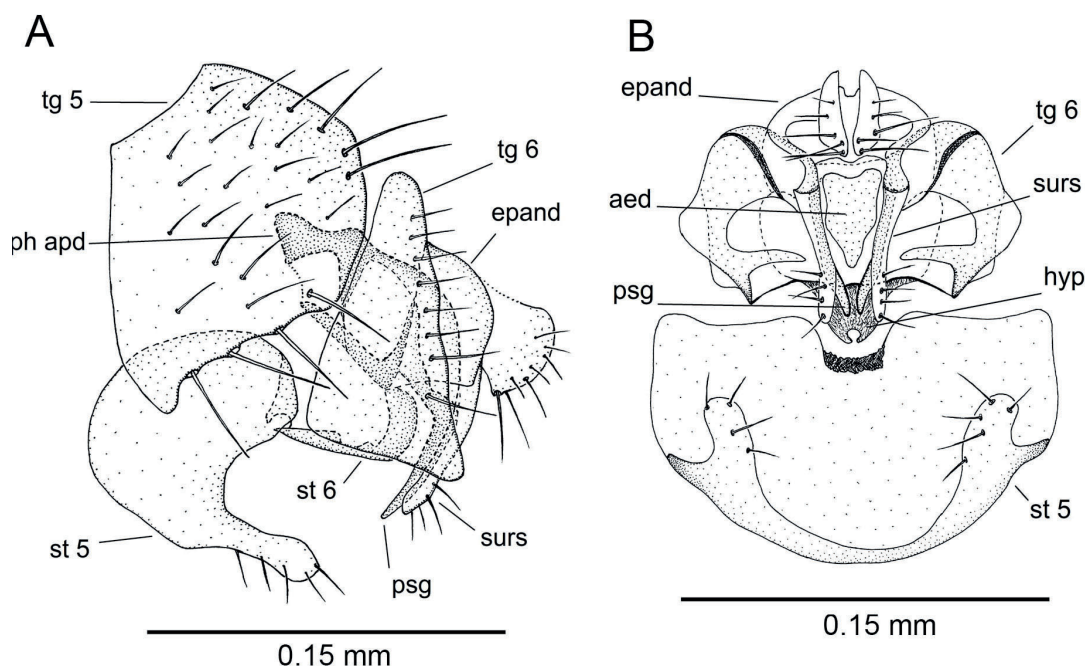
## Paralectotypes

1 ♂; Siwa Oasis; 12 May 1935; J. Omer-Cooper leg., Armstrong College Expedition; NHMUK, B.M. 1935–354, bar code 013435849 • 5 ♀♀; same collection data as for preceding; bar codes 013435869–73.

## Remarks

Although Collin (1949: 140–141) stated that he described the species from 2 males and 8 females, Pont (1995: 151) could not locate one of the females, nor has it been located by the present author for this study. Only one of the males examined for this study can be the species to which Collin gave the name, based on his description and illustration. This is here designated lectotype (Figs. 79–80). The second male (Figs 79–80) (paralectotype), upon critical examination of the hypopygium under high magnification, appears to be a different species and to be closest to *A. angulitergum* sp. nov., although it is not that species. Further topotypic material is desirable (to establish identity by dissection and for description) so as to avoid probable serious damage to this specimen if an attempt is made to dissect it. Of the 7 females found among the syntype series, 2 are in too poor a state to be recognized as any species and are not considered syntypes here. The rest are labelled as paralectotypes although they could belong equally to *A. sodalis* or to the second unidentified species.

The record of *A. sodalis* from Yemen (Ebejer 1996) is incorrect. Higher magnification was used to re-check the specimen for this article and to compare it directly with the type – it is not the same



**Fig. 78.** *Aphaniosoma setigerum* Collin, 1949, ♂ (SMNHTAU) from Israel, hypopygium. **A.** Lateral view. **B.** Ventral view. Abbreviations: See Material and methods.



**Fig. 79.** *Aphaniosoma sodalis* Collin, 1949, ♂, lectotype (NHMUK, B.M. 1935–354, bar code 013435848). **A.** Habitus, lateral view. **B.** Head and thorax, dorsal view.

species. Chromatic pattern and chaetotaxy are now recognized to be far less reliable than earlier authors supposed.

### Distribution

Egypt (Collin 1949).

### *Aphaniosoma spiniventre* Ebejer, 1998

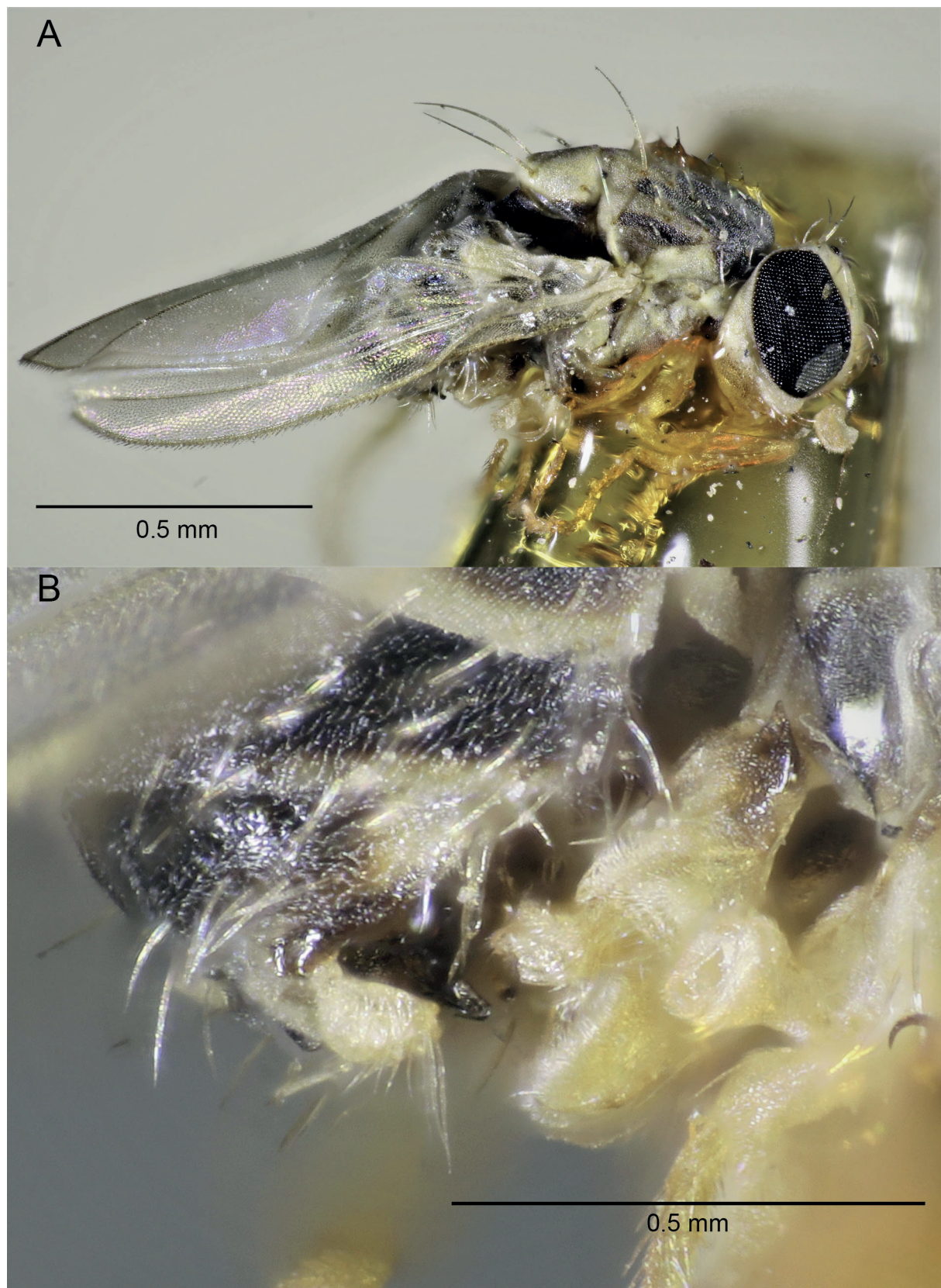
### Material examined

ISRAEL • 1 ♂, 1 ♀; 'En Mor; 11 Oct. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 1 ♀; same collection data as for preceding; Enot Zuqim; SMNHTAU • 6 ♂♂; 'Iddan; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 6 ♂♂, 2 ♀♀; 'En 'Iddan; 20 Jun. 1995; A. Freidberg leg.; SMNHTAU • 2 ♂♂, 11 ♀♀; same collection data as for preceding; I. Yarom leg.; SMNHTAU • 3 ♂♂, 1 ♀; Sappir pond; 9 Jul. 1996; A. Freidberg leg.; SMNHTAU • 1 ♂; N. Arava valley; 30°46' N, 35°14' E; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* and chenopods; MJE.

JORDAN • 1 ♂, preserved in alcohol; Azraq, Wildlife Resort; 31°49'97" N, 36°49'27" E; 20 Oct. 2011; J.-H. Stuke leg.; 1584; J-HS • 7 ♂♂, 3 ♀♀, preserved in alcohol; Jerash, "Flusstal" [river valley]; 32°12'94" N, 35°53'04" E; 21 Oct. 2011; J.-H. Stuke leg.; 1585; J-HS.



**Fig. 80.** *Aphaniosoma sodalis* Collin, 1949, ♂, lectotype (NHMUK, B.M. 1935–354, bar code 013435848), hypopygium in situ, postero-lateral view.



**Fig. 81.** *Aphaniosoma* sp. aff. *sodalis* Collin, 1949, ♂, paralectotype (NHMUK, B.M. 1935–354, bar code 013435848). **A.** Habitus, lateral view. **B.** Hypopygium in situ, lateral view.

**Females of *A. spiniventre* or *A. nigricauda* or *A. creperum***

ISRAEL • 1 ♀; Elot; 18 Mar. 1995; B. Merz leg.; MHNG • 6 ♀♀; ‘Iddan; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU.

**Remarks**

A dark species that often has a yellow apical margin on the scutellum and a small pale area on and/or near the postalar callus. It can be identified in the male without dissection if enough of the hypopygial structures are visible (Ebejer 1998: 225, figs 74–75). The postgonite is particularly narrow and curved at the tip; the apex of the basiphallus is blunt, like that of *A. claridgei*. Upon dissection, the pregenital sternite is very distinctive with its approximately square shape, sclerotized at its lateral and anterior borders and along the midline where, being very heavily sclerotized and narrow, gives this part the appearance of a long spine.

Females of these three species named above are not separable from each other unless associated with males.

**Distribution**

Tunisia, United Arab Emirates (Ebejer 1998, 2008). New records for Israel and Jordan.

*Aphaniosoma suboculicauda* Frey, 1958

**Material examined**

YEMEN • 1 ♂; Ta‘Izz; Aug. 1999; A. van Harten and A. Awad leg.; light trap; NMWC • 1 ♀; same collection data as for preceding; Oct. 1999; NMWC • 1 ♀; same collection data as for preceding; 5 Jan.–2 Feb. 1998; NMWC.

**Remarks**

Frey’s description is accurate, and he likens this species to *A. oculicauda* based on colour pattern, but this is now known to be unreliable. However, the general appearance and the chaetotaxy (fronto-orbitals, pair of setae in front of ocellar triangle and 1 strong dorsocentral) place it in the same group of species as *A. fissum*, *A. lamellatum* and *A. oculicauda*. Frey’s figure of the hypopygium is difficult to interpret. The type series was examined by the present author and the hypopygium illustrated in more detail (Ebejer 2009: 408, fig. 52). Until now this species was thought to be endemic to the Cape Verde Islands. Its presence in Yemen would suggest that it is probably more widespread in the eremic zone between West Africa and Arabia.

**Distribution**

Cape Verde Islands (Frey 1958b). New record for Yemen.

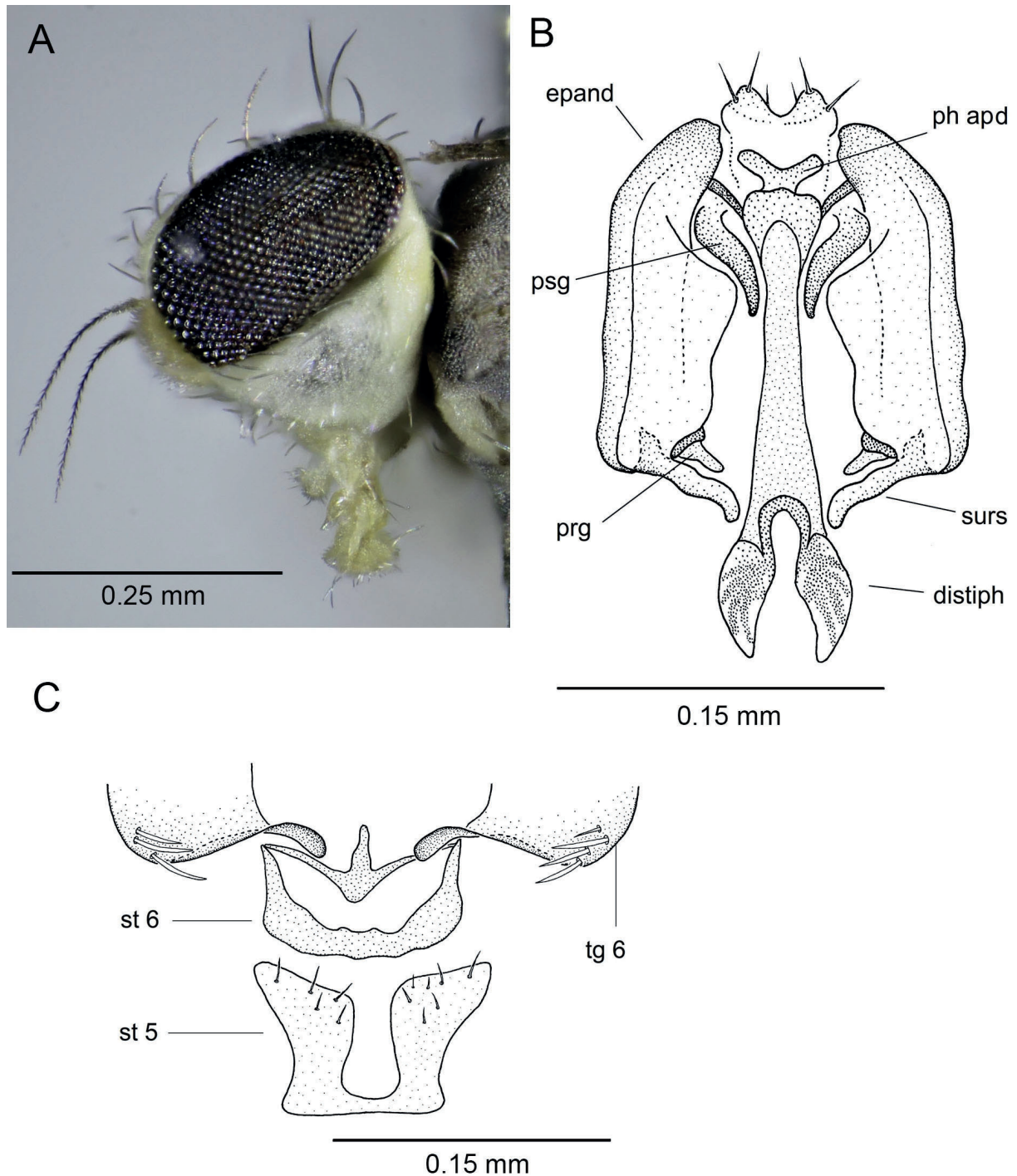
*Aphaniosoma trisetum* Ebejer, 1998

Fig. 82

**Material examined**

ISRAEL • 5 ♂♂; Akko; 29 Oct. 1994; A. Freidberg leg.; SMNHTAU • 3 ♂♂, 2 ♀♀; ‘En Afeq; 17 May 1994; A. Freidberg leg.; SMNHTAU • 8 ♂♂, 3 ♀♀; ‘En Mor; 11 Oct. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 6 ♂♂, 1 ♀; ‘Enot Zuqim; 11 Oct. 1994; F. Kaplan and A. Freidberg leg.; SMNHTAU • 2 ♂♂, 1 ♀; ‘Enot Zuqim; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 4 ♂♂, 3 ♀♀; ‘Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 9 ♂♂, 4 ♀♀; same collection data as for

preceding; 25 Jul. 1995; SMNHTAU • 5 ♂♂; ‘Enot Zuqim; 25 Aug. 1995; A. Freidberg leg.; SMNHTAU • 1 ♀; same collection data as for preceding; 7 Jun. 1996; SMNHTAU • 2 ♂♂, 1 ♀; ‘Enot Zuqim; 3 Mar. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 4 ♀♀; same collection data as for preceding; 22 Apr. 1998; on *Tamarix jordanis*; SMNHTAU • 1 ♂; same collection data as for preceding; 1 Feb. 1999; SMNHTAU • 1 ♂; same collection data as for preceding; 28 Apr. 1999;



**Fig. 82.** *Aphaniosoma trisetum* Ebejer, 1998, ♂ (SMNHTAU). **A.** Head, lateral view. **B.** Hypopygium, posterior view. **C.** Pregenital sternites, ventral view. Abbreviations: See Material and methods.

SMNHTAU • 5 ♂♂, 2 ♀♀; same collection data as for preceding; 5 Oct. 1999; SMNHTAU • 1 ♂, 6 ♀♀; same collection data as for preceding; 24 May 2000; SMNHTAU • 2 ♂♂; same collection data as for preceding; on *Tamarix nilotica*; SMNHTAU • 1 ♀; same collection data as for preceding; 7 Jul. 1998; SMNHTAU • 1 ♂; same collection data as for preceding; 30 Mar. 1999; SMNHTAU • 3 ♂♂, 3 ♀♀; same collection data as for preceding; 30 Mar. 1999; SMNHTAU • 9 ♂♂, 3 ♀♀; same collection data as for preceding; 5 Oct. 1999; SMNHTAU • 7 ♂♂, 5 ♀♀; same collection data as for preceding; 12 Apr. 2000; SMNHTAU • 10 ♂♂, 7 ♀♀; same collection data as for preceding; 24 May 2000; SMNHTAU • 1 ♂, 2 ♀♀; same collection data as for preceding; 24 Nov. 2000; SMNHTAU • 4 ♂♂, 6 ♀♀; 'En Gedi; 11 May 1995; I. Yarom leg.; SMNHTAU • 2 ♂♂; 'Iddan; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 5 ♂♂, 3 ♀♀; 'Iddan; 20 Jun. 1995; I. Yarom leg.; SMNHTAU • 2 ♂♂, 2 ♀♀; En 'Iddan; 20 Jun. 1995; A. Freidberg leg.; SMNHTAU • 4 ♂♂, 1 ♀; Sappir pond; 9 Jul. 1996; A. Freidberg leg.; SMNHTAU • 1 ♂, 1 ♀; 'En Yahav; 24 Jul. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂; 'En Zin; 8 Aug. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 5 ♂♂, 3 ♀♀; same collection data as for preceding; 13 May 1999; on *Tamarix negevensis*; SMNHTAU • 2 ♂♂; same collection data as for preceding; on *T. parviflora*; SMNHTAU • 1 ♂, 4 ♀♀; same collection data as for preceding; 19 Jul. 1999; SMNHTAU • 1 ♀; same collection data as for preceding; 6 Sep. 1999; on *Tamarix negevensis*; SMNHTAU • 1 ♂; Park Caesarea; 7 Sep. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 2 ♂♂; same collection data as for preceding; 7 Nov. 1998; SMNHTAU • 1 ♀; 'Enot Samar; 10 Nov. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 2 ♂♂, 1 ♀; same collection data as for preceding; 3 Mar. 1999; SMNHTAU • 1 ♂; same collection data as for preceding; 30 Mar. 1999; SMNHTAU • 1 ♂; same collection data as for preceding; 28 Apr. 1999; SMNHTAU • 2 ♂♂; same collection data as for preceding; 5 Oct. 1999; SMNHTAU • 2 ♂♂; Nahal Neqarot; 10 May 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix parviflora*; SMNHTAU • 3 ♂♂; same collection data as for preceding; on *Tamarix* sp.; SMNHTAU • 1 ♂♂, 1 ♀; same collection data as for preceding; 17 Oct. 1999; on *Tamarix aphylla*; SMNHTAU • 1 ♂, 1 ♀; same collection data as for preceding; on *Tamarix nilotica*; SMNHTAU • 1 ♂, 1 ♀; Ma'agan Mikha 'el; 30 May 1999; N. Meltzer and V. Kravchenko leg.; on *Tamarix tetragyna*; SMNHTAU • 1 ♂; same collection data as for preceding; 3 Nov. 1999; SMNHTAU • 2 ♂♂; Qalya; 2 Jan. 1997; A. Freidberg leg.; SMNHTAU • 3 ♂♂, 1 ♀; Dead Sea, Zomet Zohar; 31°08' N, 35°21' E; alt. -338 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE • 8 ♂♂, 2 ♀♀; Dead Sea, 'Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE • 1 ♂, 1 ♀; N. Arava valley; 30°46' N, 35°14' E; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* and chenopods; MJE • 3 ♀♀; 'En Gedi/N Arugot; 31 May 2000; B. Merz leg.; MHNG.

JORDAN • 3 ♂♂, 5 ♀♀, preserved in alcohol; Azraq Reserve; 8 Oct. 2000; W. Rossi leg.; NMWC.

SAUDI ARABIA • 1 ♂, 1 ♀; Najran, Hay Alshurfa; 17°31' N, 44°15' E; 7–28 May 2014; H.A. Dawah leg.; Malaise trap; NMWC.

## Remarks

A common and widespread species that may well turn out to be a species complex. It has much in common with *A. approximatum*. The two species are similar in their male hypopygial characters: both have the distally narrowed postgonite that is apically curved, and a largely translucent bilobed distiphallus with each lobe flat, mostly translucent, and rounded apically. *Aphaniosoma approximatum* has one darker more sclerotized 'rib' along the middle of each lobe (Ebejer 1998: 200, figs 5–6), whereas *A. trisetum* has three (Fig. 82B). In *A. trisetum*, the base of the surstylus is variable in thickness and length; and tergite 6, ventrally has a narrow and medially directed lobe below the 3 (rarely 2 or 4) large broad pale setae. *Aphaniosoma approximatum* has a shorter, broader and more curved lobe in outline at the ventral margin of tergite 6 and no such distinctive setae. The pregenital sternites differ. In *A. approximatum* sternite 5 is more or less square and sternite 6 is transversely narrow especially at its middle (Ebejer 2006: 684, fig. 2) and can be partly flexed (Ebejer 1998: 200, fig. 7). In *A. trisetum* this is a more complex

structure appearing as an irregular transverse rectangle broadly concave at the middle posteriorly and on each side with extended arms to a trilobed sclerite (Ebejer 1998: 226, fig. 78). This part of the sternite may appear separated and look different from specimen to specimen if its orientation is not flat relative to the basal part (Fig. 82C). An inconsistent but frequent difference is that the pair of setae on the frons in front of the anterior ocellus are often shorter and less distinct in *A. trisetum* compared to the same in *A. approximatum*. The author has seen specimens of *A. trisetum* that are almost completely yellow and others that are almost completely grey. Photographs of the male hypopygium in situ are given in Ebejer (2021a). The hypopygium is re-illustrated with line drawings here with the pregenital sternites and more detail of the distiphallus included.

### Distribution

Canary Islands, Cyprus, Morocco, Tunisia (Ebejer 1998, 2016, 2021a; Ebejer & Báez 2021). New records for Israel, Jordan, and Saudi Arabia.

### *Aphaniosoma verecundum* Ebejer, 1998 Figs 83–84

### Material examined

CYPRUS • 1 ♂; Akrotiri Peninsula, 3km southwest of Kolossi; 30 Apr. 2022; M.J. Ebejer leg.; ruderal meadow and marsh; MJE.

GREECE • 1 ♂; Sterea Elada, Fthiotida, Thermopiles; 14 May 1998; M.J. Ebejer leg.; hot spring and marsh; MJE.

### Remarks

This is a species of the *collini* group, having long anterior scutal setae, a reduced number of dorsocentrals to 1+3 (Fig. 83A) and prescutellar setae (Fig. 83B). There is no special development on the male hind trochanter (Fig. 84A). It is best identified on dissection of the male hypopygium. The surstylus is relatively short compared to that of *A. hackmani* and *A. harteni*. The abdominal sternite 6 is distinctive, being small and transversely rectangular with protruding angles and a deep invagination into the abdomen at its middle (Ebejer 1998: 228, figs 81–83). The male hypopygium is illustrated in situ (Fig. 84B–C).

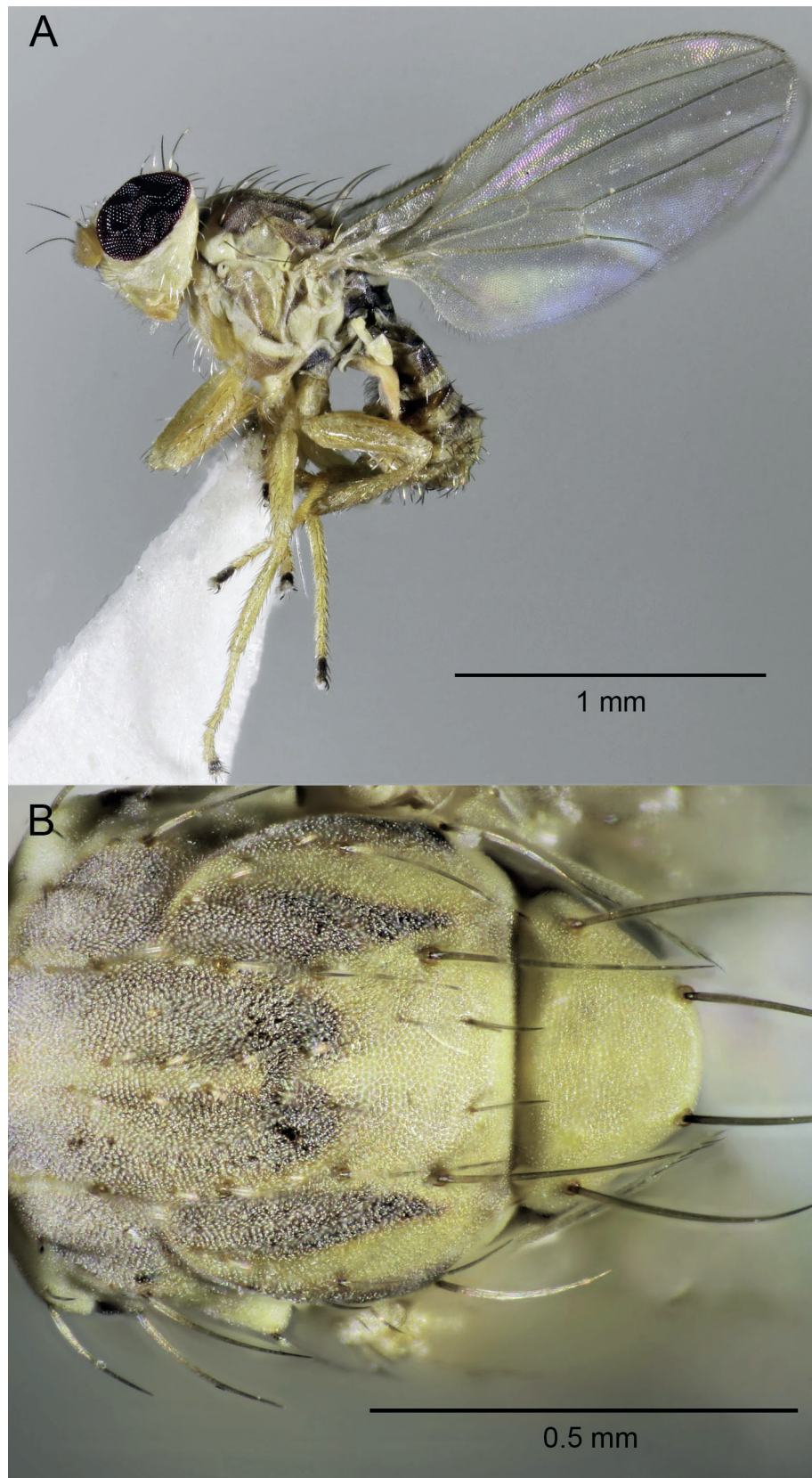
### Distribution

Greece, Cyprus, Turkey (Ebejer 1998, 2021a). New record for Greece.

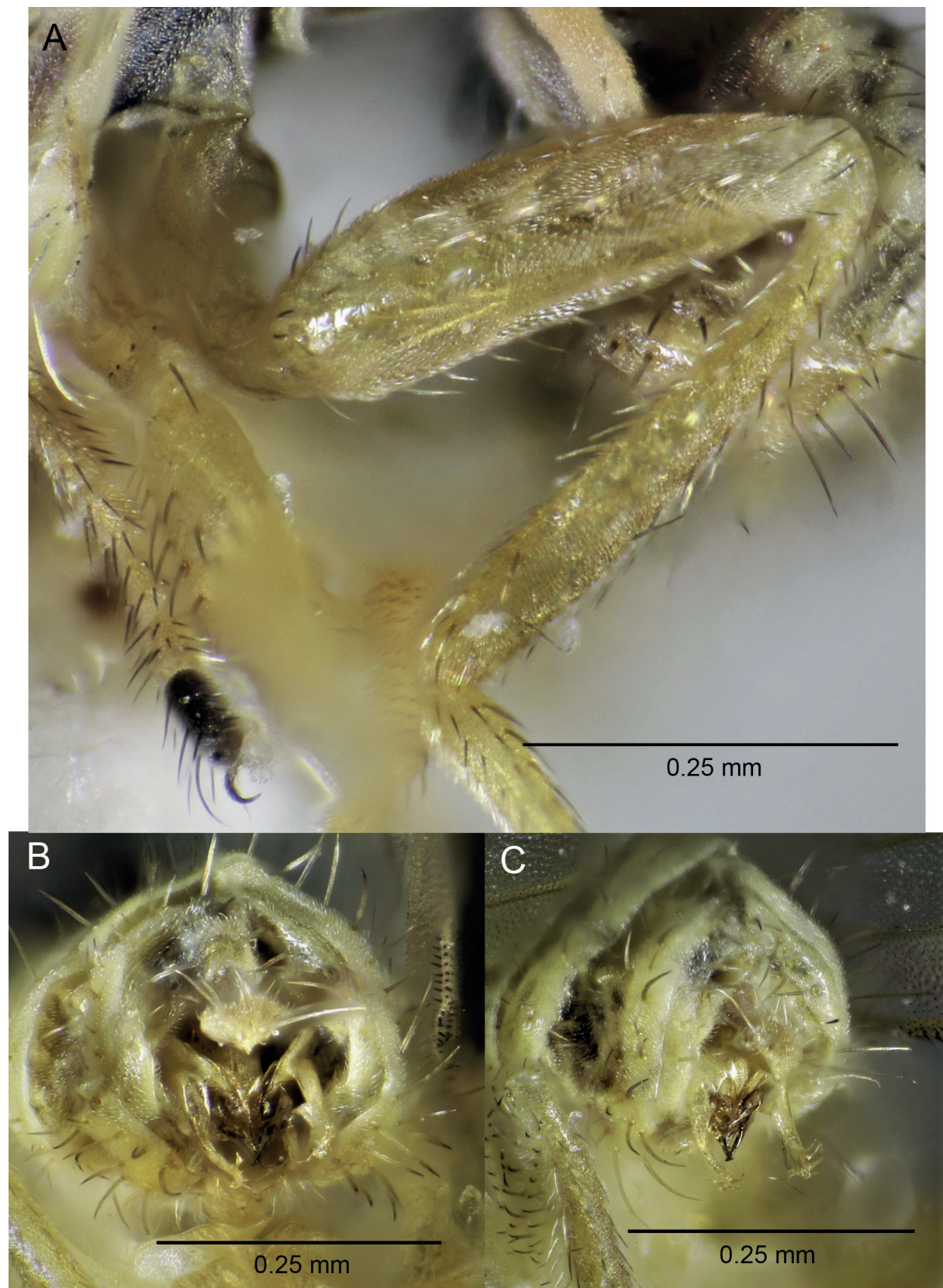
### *Aphaniosoma yaromi* sp. nov. urn:lsid:zoobank.org:act:ADB15AEB-E163-432E-A3F9-B4BDBD46D7FE Figs 85–87

### Diagnosis

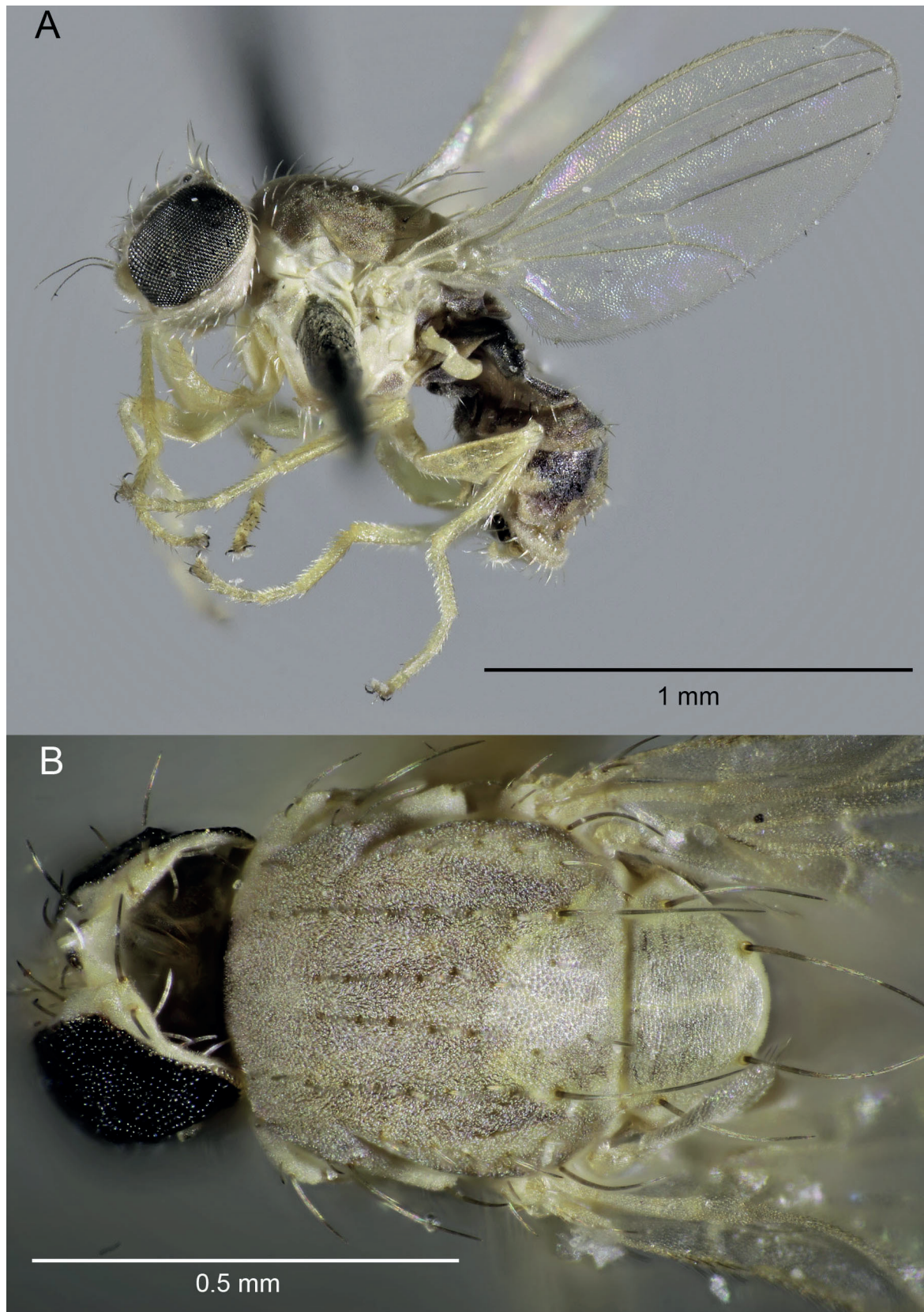
A species very similar to *A. falciferum* (Fig. 85A). It has an orange-yellow colour with pale brown scutal vittae, sometimes absent, and dense yellowish microtomentum; 2 moderately well-developed fronto-orbital setae. Male with large tergite 5 that is long dorsally along its middle, and, viewed from the side, markedly elongated and narrowed laterally, so that each side is extended into lobes that curve under the abdomen; hypopygium yellow with contrasting long, shining black postgonite. In general appearance and in chaetotaxy, this species shares many characters with *A. falciferum*. It also has a characteristic long black postgonite, a structure that only subtly differs between the two species. However, the highly modified tergite 5 (Fig. 87A) and the shapes of sternites 5 and 6 differentiate this species from



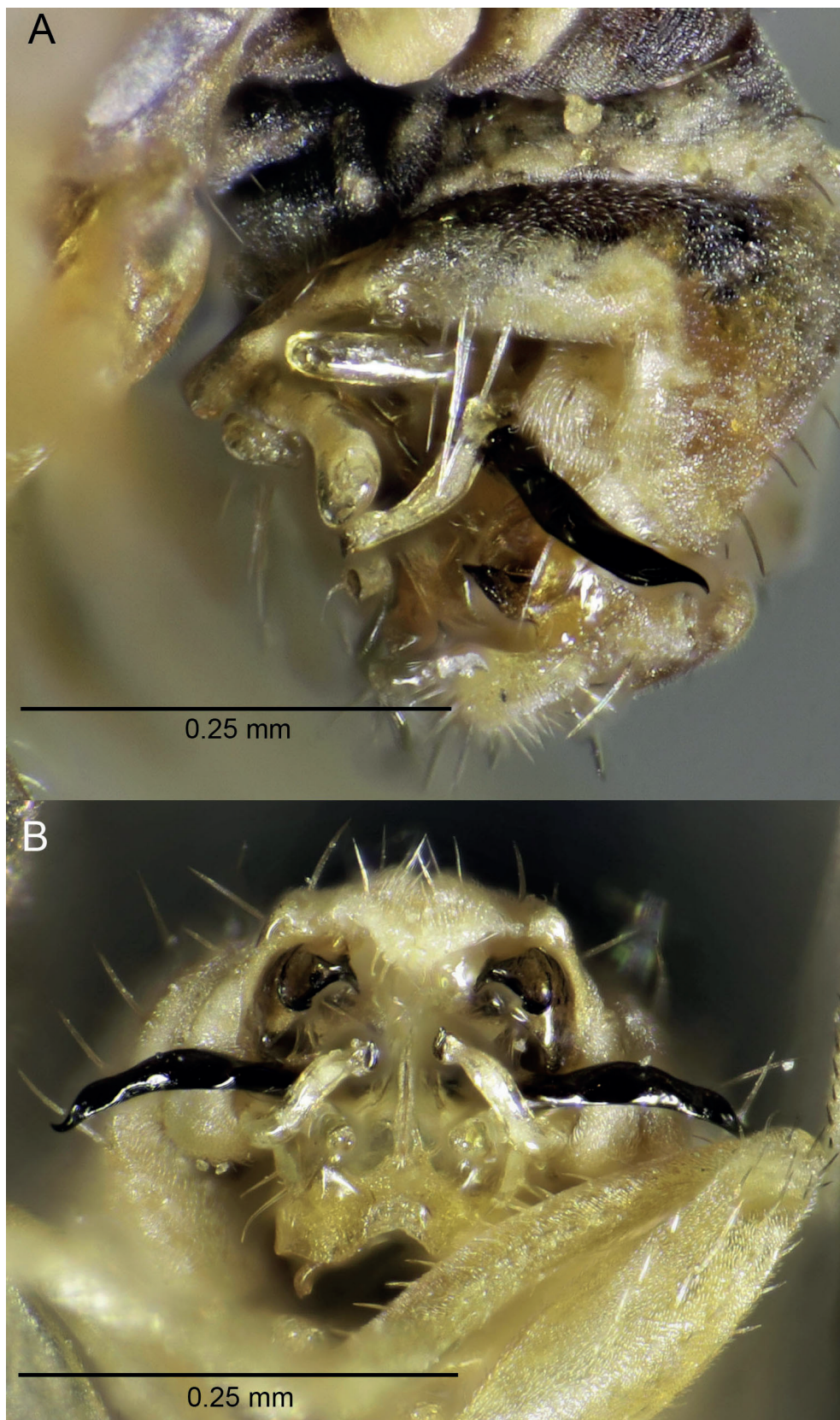
**Fig. 83.** *Aphaniosoma verecundum* Ebejer, 1998, ♂, (MJE). **A.** Habitus, lateral view. **B.** Head and thorax dorsal view.



**Fig. 84.** *Aphaniosoma verecundum* Ebejer, 1998, ♂ (MJE). **A.** Hind trochanter and femur. **B–C.** Hypopygium in situ. **B.** Postero-ventral view. **C.** Postero-lateral view.



**Fig. 85.** *Aphaniosoma yaromi* sp. nov., ♂, holotype (SMNHNTAU 405830). **A.** Habitus, lateral view. **B.** Head and thorax, dorsal view.



**Fig. 86.** *Aphanosoma yaromi* sp. nov., ♂, paratype (SMNHTAU), hypopygium in situ. **A.** Lateral view. **B.** Posterior view.

*A. falciferum*, which has a normal shaped tergite 5 and an almost square pregenital sternite with two short and broad posterior projections (Ebejer 1998: 207, figs 25–27).

### Etymology

The species is named in honour of Ilan Yarom who collected numerous Chyromyidae in Israel.

### Material examined

#### Holotype

ISRAEL • ♂; 'Enot Zuqim; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU 405830.

#### Paratypes

ISRAEL • 3 ♂♂; 'Enot Zuqim; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 20 ♂♂, 35 ♀♀; Revivim; 1 May 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂; Nahal Neqarot; 3 May 1995; I. Yarom leg.; SMNHTAU • 2 ♂♂; Nahal Neqarot, N Sappir; 2 Feb. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix aphylla*; SMNHTAU • 2 ♂♂; same collection data as for preceding; 4 Mar. 1998; on *Tamarix* sp.; SMNHTAU • 1 ♂; same collection data as for preceding; 6 Apr. 1998; on *Tamarix nilotica*; SMNHTAU • 14 ♂♂; 'Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 1 ♂; 'Enot Zuqim; 3 Feb. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂; Zomet Zohar; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂, 1 ♀; same collection data as for preceding; 'En Gedi; SMNHTAU • 1 ♂, 1 ♀; same collection data as for preceding; 'Iddan; SMNHTAU • 1 ♂, 1 ♀; Elot; 18 Mar. 1996; A. Freidberg leg.; on *Tamarix* sp.; SMNHTAU • 3 ♀♀; same collection data as for preceding; 19 Mar. 1995; SMNHTAU • 2 ♂♂, 1 ♀; Deqel; 30 Apr. 1996; A. Freidberg leg.; SMNHTAU • 1 ♂; 'En Mor; 16 Mar. 1995; B. Merz leg.; MHNG • 2 ♂♂; Western Negev, Nahal Lavan; 30°58' N, 34°24' E; 24 Mar. 2000; M.J. Ebejer leg.; shrubs on sand; MJE • 3 ♂♂; Dead Sea, 'Enot Zuqim; 31°43' N, 35°27' E; alt. -400 m; 25 Mar. 2000; M.J. Ebejer leg.; on *Tamarix* sp.; MJE.

#### Other material (females of *A. yaromi* sp. nov. or *A. falciferum*)

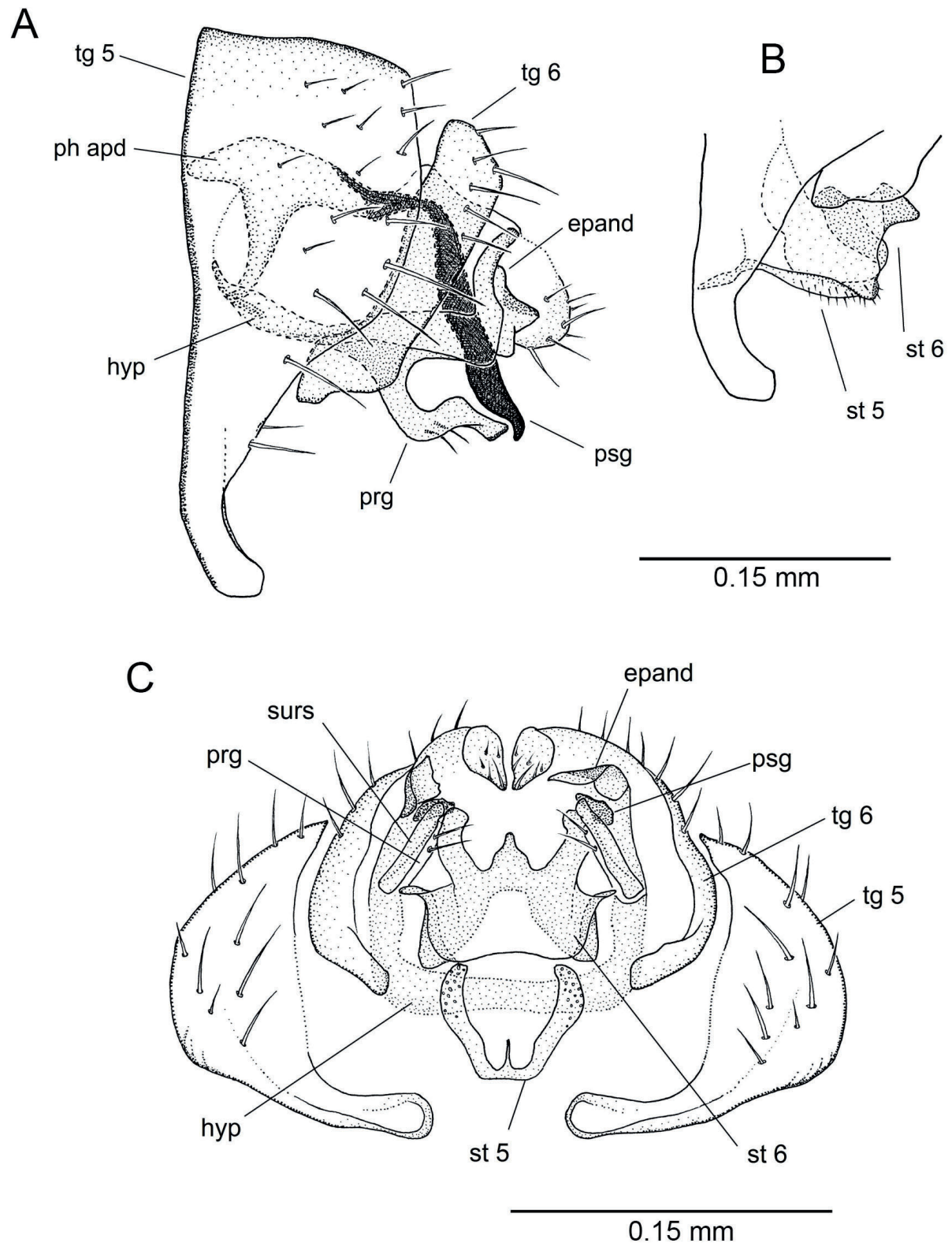
38 ♀♀; 'Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 1 ♀; same collection data as for preceding; 18 Mar. 1996; SMNHTAU • 1 ♀; 'Enot Zuqim; 3 Mar. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix* sp.; SMNHTAU • 1 ♀; same collection data as for preceding; 22 Apr. 1998; on *Tamarix jordanis*; SMNHTAU • 1 ♀; Nahal Neqarot, N Sappir; 2 Feb. 1998; I. Yarom and V. Kravchenko leg.; on *Tamarix aphylla*; SMNHTAU • 2 ♀♀; same collection data as for preceding; 6 Apr. 1998; on *Tamarix nilotica*; SMNHTAU • 1 ♀; same collection data as for preceding; on *Tamarix parviflora sodomensis*; SMNHTAU • 1 ♀; Nahal Neqarot; 3 May 1995; I. Yarom leg.; SMNHTAU • 1 ♀; Nahal Neqarot; 10 May 1999; I. Yarom and V. Kravchenko leg.; on *Tamarix aphylla*; SMNHTAU.

### Description

MEASUREMENTS. Body length: male 1.5 mm, female 1.7 mm. Wing length: male 1.4 mm, female 1.7 mm.

#### Male

HEAD. Yellow and slightly longer than high; gena about  $0.7 \times$  as high as eye at middle and with scattered pale yellowish white setulae; 2 vibrissal setae on each side; frons narrow at anterior margin, about  $0.5 \times$  as wide as at level of anterior ocellus; ocellar setae about as long as anterior fronto-orbital, 2 well-developed fronto-orbital setae and 3 short setulae anterior to these; about 14 subequal setae on frons; inner and outer vertical well-developed; paraverticlar setae short and convergent, postocular setae in one row; face short, poorly sclerotized and depressed; median carina distinct, sharp and low, not reaching clypeus; antenna yellow, pedicel paler than basal flagellomere and with short seta dorsally; basal flagellomere with fine and dense pubescence along anterior margin shorter than diameter of base of arista; arista yellow at basal  $\frac{1}{4}$  and finely pilose.



**Fig. 87.** *Aphaniosoma yaromi* sp. nov., ♂, paratype, (SMNH-TAU). **A.** Hypopygium, lateral view. **B.** Pregenital sternites, lateral view. **C.** Hypopygium and pregenital sternites, ventral view. Abbreviations: See Material and methods.

THORAX (Fig. 85B). Scutum pale brown and covered with yellowish microtomentum; scutellum, pleura and mediotergite yellow; chaetotaxy: 1 postpronotal with weaker seta adjacent, 1 presutural, 1 incurved intra-postpronotal, 2 notopleurals, 0+5 intra-alars, 1 postalar, 3+5 dorsocentrals with only posterior seta well-developed, 0+5 acrostichals, no prescutellars, 4 scutellars, 1 anepisternal on upper posterior margin, 1 katepisternal at upper posterior corner.

WING. Veins pale brownish; distance on costa between  $R_{2+3}$  and  $R_{4+5}$  about  $0.4 \times$  that between  $R_{4+5}$  and  $M_1$ ; distance between crossveins about  $1.4 \times$  as long as posterior crossvein, which is about  $0.4 \times$  as long as apical section of  $M_4$ . Haltere pale yellow.

LEGS. Numerous pale yellow setulae scattered on legs and with long setulae posteriorly on fore femur; apico-ventral seta on mid tibia present; claws black and pulvilli normal; tarsi yellow but 5<sup>th</sup> tarsomere brownish; hind trochanter not modified.

ABDOMEN (Fig. 86A). Tergites pale brown with narrow yellow hind margins; tergite 5 about  $2.5 \times$  as long as tergite 4 and about  $3.5 \times$  as long as tergite 6; tergite 5, laterally narrows to a long yellow apically rounded lobe (Fig. 87A); tergites sparsely pale setulose with longer more distinct setulae on margins of tergites 5 and 6. Pregenital sternites strongly modified (Fig. 87B–C).

HYPOPYGIUM (Figs 86, 87A, C). Epandrium shining black dorsally; postgonite shining black, a little broadened at middle and ending in slightly curved pointed tip; epandrium small, round and pale; surstylus not identified; pregonite pale, long and sinuous, truncate and dark at apex; aedeagus pale but not clearly visible; cercus pale yellow, fused with the opposite side and setulose but without any exceptionally long setae.

### Female

As in male but without secondary sexual characters. It is indistinguishable from the female of *A. falciferum*.

### Variation

As with most species of *Aphaniosoma*, there is some chromatic variation, although it seems to be rather limited in this species. The length and number of the scutal setae and setulae are variable, such that there may be one or two additional setae in front of the transverse scutal suture and one or two behind, or both.

### Distribution

Israel.

### *Aphaniosoma yittii* Ebejer, 1996

Fig. 88

### Material examined

UNITED ARAB EMIRATES • 1 ♂; Sharjah Desert Park; 4–8 Oct. 2004; A. van Harten leg.; yellow water trap; MJE.

### Remarks

A distinctive and relatively easily identified species that was described from the north of Oman and later recorded from the United Arab Emirates with the inclusion of a photograph of its habitus (Ebejer 2008). The relatively large, completely black hypopygium is one of its most distinctive features (Ebejer

2006: 293, figs 13–15). Much of it can be seen without dissection. The most common appearance of the scutum is illustrated (Fig. 88). This uncommon species could easily occur in Israel.

### Distribution

Oman, United Arab Emirates (Ebejer 1996, 2008).

### *Aphaniosoma* spp.

Figs 89–90

Most specimens afflicted with *Stigmatomyces* H. Karst. could be identified though not all were added to the type series or to the specimen data for previously described species. They are listed here for easier retrieval should further studies be required on these specimens.

### Not added to type series or specimen data above

#### *Aphaniosoma acitergum* sp. nov.

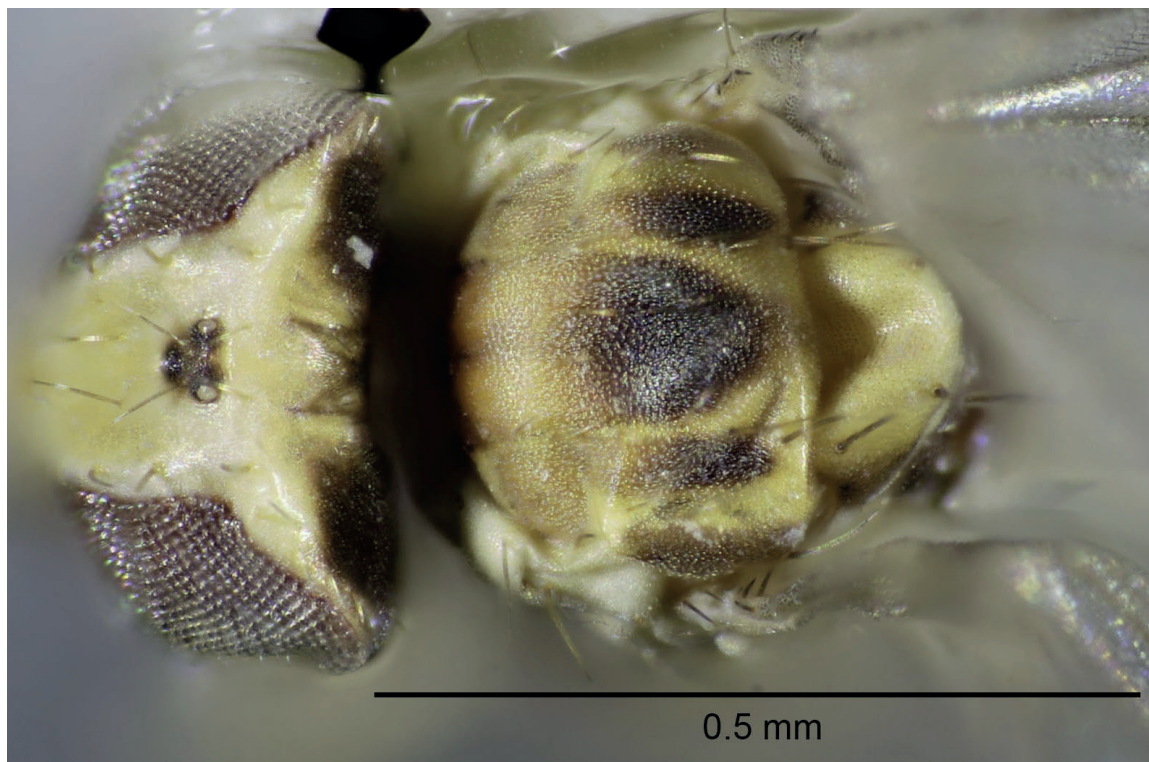
ISRAEL • 1 ♂; ‘Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU.

#### *Aphaniosoma angulitergum* sp. nov.

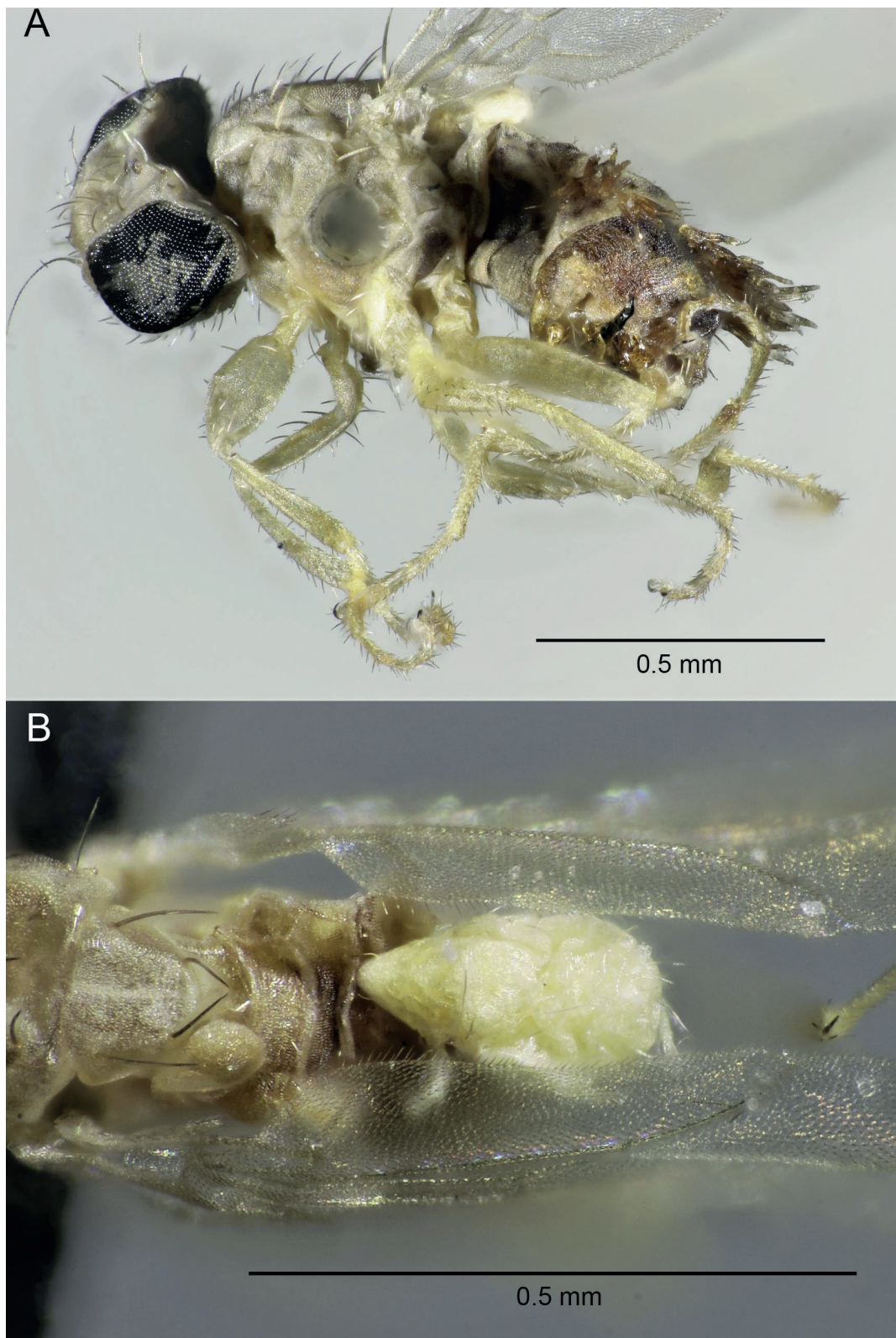
ISRAEL • 1 ♂, 1 ♀; ‘Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 2 ♂♂, 1 ♀; Qalya; 2 Jan. 1997; A. Freidberg leg.; SMNHTAU • 1 ♀; ‘Enot Zuqim; 22 Apr. 1998; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU.

#### *Aphaniosoma daedalum* sp. nov.

ISRAEL • 1 ♀; ‘Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU.



**Fig. 88.** *Aphaniosoma yittii* Ebejer, 1996, ♂ (MJE), head and thorax, dorsal view (note: posterior part of thorax and base of scutellum shrunken).



**Fig. 89.** *Aphaniosoma* spp. **A.** *Aphaniosoma yaromi* sp. nov., ♂ (SMNHTAU), non-type specimen infected with *Stigmatomyces aphaniosomae* Rossi & Weir, 2011 (Laboulbeniales Lindau). **B.** *Aphaniosoma curvistylus* sp. nov., ♂ (SMNHTAU), non-type specimen with a phoretic mite on abdomen.

*Aphaniosoma yaromi* sp. nov. and *A. falciferum* Ebejer, 1998

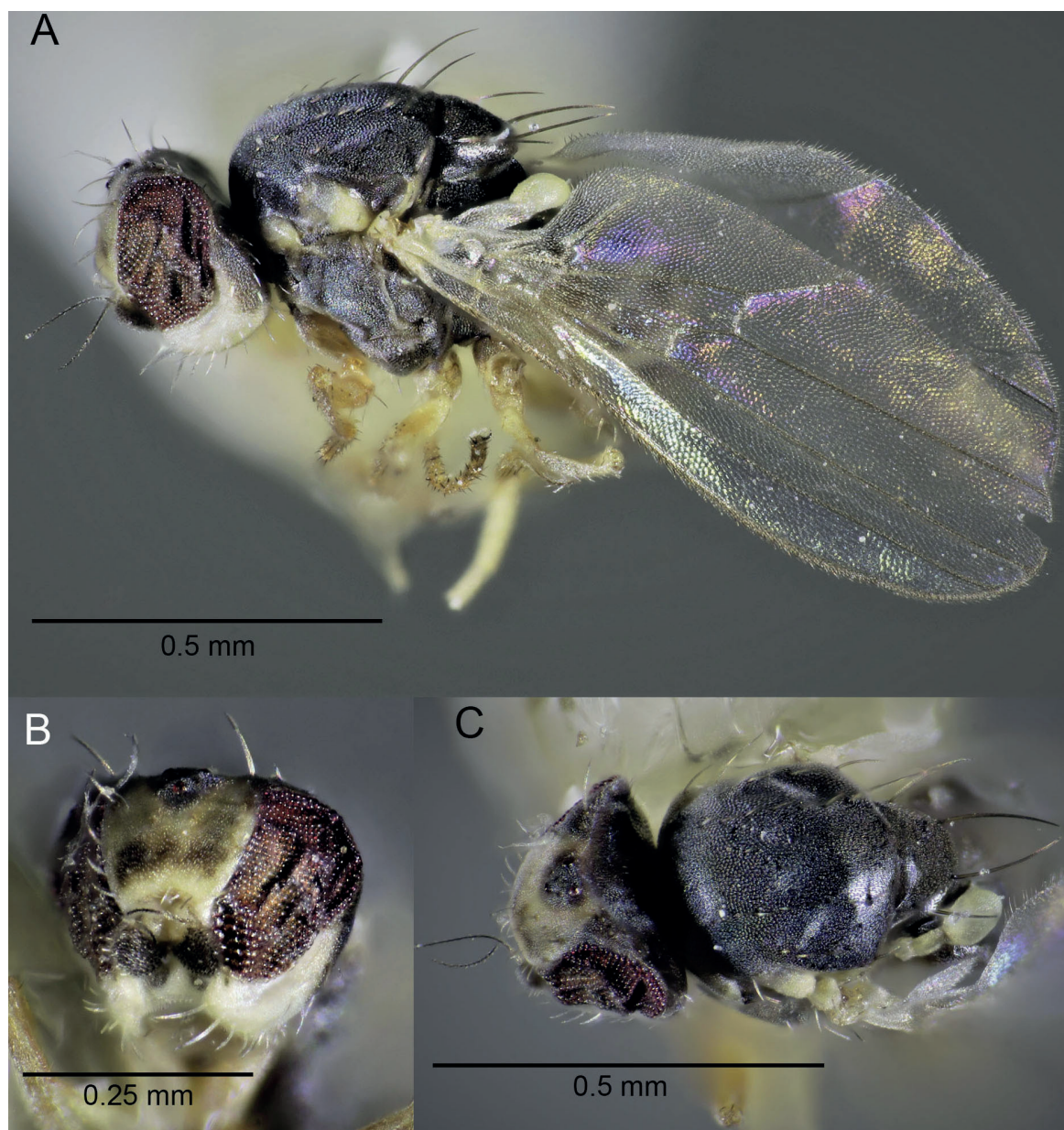
ISRAEL • 1 ♀; 'Iddan; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 2 ♀♀; 'Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU.

*Aphaniosoma freidbergi* sp. nov.

ISRAEL • 2 ♂♂, 'Enot Zuqim; 7 Jun. 1996; A. Freidberg leg.; SMNHTAU.

*Aphaniosoma fissum* Collin, 1949

ISRAEL • 1 ♂; 'Enot Zuqim; 30 Mar. 1995; I. Yarom leg.; on *Tamarix* sp.; SMNHTAU • 2 ♂♂; Qalya; 2 Jan. 1997; A. Freidberg leg.; SMNHTAU.



**Fig. 90.** *Aphaniosoma* sp., ♀ (NMWC), undescribed species from Syria. **A.** Habitus, lateral view. **B.** Head, frontal view. **C.** Head and thorax, dorsal view.

***Aphaniosoma lucidum* sp. nov.**

ISRAEL • 1 ♀; 'Enot Zuqim; 7 Jun. 1996; A. Freidberg leg.; SMNHTAU • 1 ♂; 'Enot Zuqim; 24 May 2000; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU.

***Aphaniosoma trisetum* Ebejer, 1998**

ISRAEL • 1 ♂; Timna'; 18 Mar. 1995; I. Yarom leg.; SMNHTAU • 1 ♂, 'Enot Zuqim; 7 Jun. 1996; A. Freidberg leg.; SMNHTAU • 2 ♂♂; Qalya; 2 Jan. 1997; A. Freidberg leg.; SMNHTAU • 1 ♂; 'Enot Zuqim; 28 Apr. 1999; N. Meltzer and V. Kravchenko leg.; on *Tamarix nilotica*; SMNHTAU • 1 ♂; En 'Iddan; 20 Jun. 1995; A. Freidberg leg.; SMNHTAU.

***Aphaniosoma* spp.**

ISRAEL • 2 specs not identified; SMNHTAU.

**Included in the type series above**

***Aphaniosoma daedalum* sp. nov.**

ISRAEL • 1 ♀; Zomet Zohar; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU.

***Aphaniosoma denticulosum* sp. nov.**

ISRAEL • 1 ♀; Zomet Zohar; 19 Mar. 1995; A. Freidberg leg.; SMNHTAU • 1 ♂; 'En Gedi/N Arugot; 31 May 2000; B. Merz leg.; MHNG.

## Discussion

### Biology and ecology

A summary of the biology and ecology of Chyromyidae was published in the *Manual of Afrotropical Diptera* (Ebejer 2021c), and a part of it is repeated here with clarification.

Most species are common and abundant if searched for in the right habitats, and many have a wide distribution. It is intriguing to note how many species, some remarkably similar, can co-exist in a tiny locality, even on a single tree or patch of grass. Almost nothing is recorded on the biology of *Aphaniosoma*. Information is so sparse that hardly anything conclusive can be deduced.

A single adult of *A. zaharensense* Ebejer & Deeming, 1997 reared from a pupa found in a rodent nest in Spain (Ebejer & Deeming 1997: 157) does not give much clue as to the larval development. The larva may have pupariated in the vegetation used to build the nest without developing in it or it may have developed in the droppings of the rodent. Likewise, an adult *A. fissum* swept from fresh elephant dung in Namibia (Ebejer 2009: 395) may have been visiting for nutrients as an adult and had nothing to do with larval development in the dung. The same applies to the male and two females of *A. harteni* swept from dung in Israel (this paper). The author reared three species from soil and leaf litter collected from beneath *Phragmites* Adans. and *Salicornia* L. in a small saltmarsh (Ebejer 1996). The species and their number were not specified at the time of publication. They are 6 ♂♂ and 6 ♀♀ of *A. claridgei*, 6 ♂♂ and 13 ♀♀ of *A. micromacro* Carles-Tolrà, 2001 (three females of which are teneral with incompletely expanded wings) and 1 ♀ that is probably *A. propinquans* Collin, 1949. The closest *Tamarix* trees were about 30 metres away from where the soil and leaf litter were collected. This makes it unlikely that these species had their larval development on *Tamarix*, but does not exclude the possibility that other species do.

Frey (1958a) documented the observation of swarming at *Tamarix*. The present author very frequently collected large numbers of many species from the flowers and leaves of trees of *Tamarix* that were nearly always in coastal or marshy habitats, although collections of central Asian species on *Tamarix* indicate

that coastal localities are not a pre-requisite. The data from Israel shows how commonly and abundantly they are collected from several species of *Tamarix*, although there is some bias with this data as *Tamarix* trees were specifically surveyed for their insect fauna and special attention was given to Chyromyidae. What can also be deduced is that no species shows any affinity for a particular species of tree. Adults of some species are also found on a variety of marsh dwelling Poaceae (e.g., *Sporobolus virginicus* (L.) Kunth and *Paspalum vaginatum* Sw. in Oman). Species have occasionally been collected from the undergrowth in coconut plantations, date palm groves, citrus and other fruit orchards, and *Phragmites* beds. While the association with species of *Tamarix* may be purely circumstantial, observations indicate that species are far less likely to be collected from other plants, such as Poaceae or Amaranthaceae. However, the *collini* group of *Aphaniosoma* species appear to be more strongly associated with *Tamarix* than others, although the author also collected them from flowering trees of *Eucalyptus* L'Her. Notwithstanding the above, the possibility arises that some *Aphaniosoma* may develop in damaged or decaying plant matter, or given the association with dung and nests, the larvae of some *Aphaniosoma* may develop asinquilines in burrows of insects attacking *Tamarix* and other trees, e.g., *Eucalyptus* and *Acacia* Mill. However, this life history has not been observed in other genera of Chyromyidae.

*Aphaniosoma* are not immune to attack by fungi of Laboulbeniales Lindau (Rossi & Weir 2011). Among 2330 specimens collected in Israel, 1.3% were infected. *Stigmatomyces aphaniosomae* Rossi & Weir (Ascomycota Caval.-Sm., Laboulbeniomycetes Engl., Stigmatomycetinae Tavares) was described from an undescribed species of *Aphaniosoma* collected in Jordan. The fungus attacking the specimens from Israel appears to be the same species based on an examination of specimen preparations compared with the description and images provided in the original description (Rossi & Weir 2011: 131–132, fig. 89A). Most *Aphaniosoma* were collected in the hot and arid Dead Sea area where some, but not all, were taken from riparian environments. This fits in only partly with the habitat reported in a review of the biology and ecology of the fungus in Iberia (Santamaria 2001) where it was stated that “Potential Laboulbeniales hosts must meet several requirements, the most important of which are that their imagoes (adults) must overwinter and inhabit wet environments and their populations must be large and stable. According to data from the Iberian Peninsula, the most suitable environments to catch insects with Laboulbeniales are riparian habitats”.

Notwithstanding their minute size, *Aphaniosoma* can also host phoretic mites (Acari Leach, 1817) (Fig. 89B). Mumcuoglu & Braverman (2010) reported this association of several mite species on a range of Diptera in Israel and Egypt where the smallest flies afflicted were Ceratopogonidae Grassi, 1900. This is the first record of a phoretic mite on *Aphaniosoma*.

In so far as current knowledge allows, *Aphaniosoma* is an Old World and Nearctic genus with its greatest diversity around the Mediterranean, with the Middle East appearing to be a biodiversity hot spot for the family. Although many species were described from Central Asia and almost nothing is known from countries between this and the Eastern Mediterranean, their lack of representation in the literature is only a reflection of inadequate collecting in the intervening countries.

There are species clearly similar to each other in external and hypopygial characters that can be found from places very far apart. For example, *A. frequens* Ebejer, 2009 from St. Helena Island and Namibia (Ebejer 2009: 397) and *A. impudens* from the Mediterranean; *A. nitidum* from Morocco and *A. nitididorsum* from Mongolia, both of which are so similar to *A. lucidum* sp. nov., a species widespread in the Middle East. Likewise, the three species *A. subtilis* from Kyrgyzstan, *A. nigripes* from Morocco and *A. captiosum* sp. nov. from Israel share similar hypopygial characters apart from several external characters, such as the dark colouration of the body, basal flagellomere and legs. Furthermore, where extremely similar or the same species are widely distributed, e.g., *A. hackmani*, there are often others closely related to them that inhabit neighbouring or the same territories, sometimes even habitat, but do

not have the same extensive distribution. This is best observed in the west Palaearctic, the best studied geographical area for Chyromyidae. The Mediterranean appears to be a significant subregion where diversification of species has taken place around two main foci: Iberia in the west and Israel in the east.

There are three species listed in this article (*A. egregium*, *A. hackmani* and *A. melitense*) that in Israel occur only in the northern coastal plain localities of Atlit, Hofit and Mikhmoret. This might suggest a strong affinity for a Mediterranean type of habitat, one that is less arid, and with cooler and wetter winters than the habitat location of most of the other species reported here.

Notwithstanding the present difficulties in defining and delimiting species groups, not least because of the highly diverse structural changes in the male abdomen and hypopygium, some species are clearly related, a relationship that can be recognized based on the general appearance and chaetotaxy, coupled with specific structures in the male abdomen and hypopygium. In the context of biogeography, some of these may eventually offer clues as to the centre(s) of species diversification and/or source(s) of spread.

The three species *A. nitidorsum* Ebejer, 2007 from Mongolia, *A. nitidum* from Morocco and *A. lucidum* sp. nov. from the Middle East are so similar in all external characters that it is not possible to separate them without examination of the male hypopygium. All three are distinctly different from other species of *Aphaniosoma* by being shiny black with a cream-coloured scutellum and haltere, scattered setulae between the acrostichal and dorsocentral rows, a hypopygium with heavily built structures, especially the hypandrium and phallapodeme, and a uniquely shaped dark pattern on the frons of most females (Fig. 55D).

The assemblage of species of *A. collini* is characterized by having fewer dorsocentrals (1+3 or 2+3, uncommonly with an additional seta) with the anterior-most seta well-developed and placed anterior to the transverse scutal suture, sparse acrostichals but with distinct prescutellars. They have a relatively simple and mostly membranous aedeagus, an elongate narrow surstylus, and often a distinctly modified hind trochanter in the male (in 16 of 24 species). So far, only two species are known from Central Asia – *A. asiaticum* Ebejer, 2007 with a modified hind trochanter and *A. virgatum* Ebejer, 2007 without a modified hind trochanter. No species are known from sub-saharan Africa. All the rest (22 of 24 described) are from the Mediterranean.

*A. retuertense* Carles-Tolrá, 2001 from Spain is similar to *A. falciferum* Ebejer, 1998 and *A. yaromi* sp. nov., two species apparently restricted to the Middle East. *A. kerzhneri* Ebejer, 2007, *A. separatum* Ebejer, 2007, *A. unciventriss* Ebejer, 2007, and *A. zaitsevi* Ebejer, 2007, from Mongolia and *A. ugabense* Ebejer, 2009 from Namibia share similarities with the Mediterranean species. All have a pale orange or yellow integument with a characteristic long, black, heavily sclerotized postgonite that is almost parallel sided throughout most of its length but ends in a slightly sinuous tip. It contrasts sharply with the rest of the hypopygium, which is pale. The basiphallus/epiphallus are indistinct. These features are quite unlike those belonging to the *approximatum-creperum* species complexes. More species similar to *A. falciferum* may be discovered in countries of the Middle East and in the western part of Central Asia where fieldwork has been limited.

Similar to *A. melitense* are several species that often have three well-developed reclinate orbitals on a somewhat elongate head (though usually the setae are not as strong as those in *A. collini* and its relatives where the setae are on a round head). With these they share prescutellar acrostichal setae, but acrostichals are much more numerous than those in the *collini* group, with 2–3 × as many pairs. *A. daedalum* sp. nov., *A. cypriense* from Cyprus, *A. corniger* Ebejer, 2007 and *A. korneyevi* Ebejer, 2007 from Kyrgyzstan, and *A. merzi* Ebejer, 2007 from Uzbekistan probably belong here.

A small group of species similar to *A. piligerum* Ebejer, 1998 is distributed across North Africa and the eastern Mediterranean, with one species, *A. hamatum* Ebejer, 2007 from Mongolia. They are easily recognized because of a variegated colour pattern with distinct dark scutal vittae, a relatively sparsely microtomentose abdomen that has very pale hind margins strongly contrasting with the dark (most often black) tergites, and a large polished black basiphallus/epiphallus. All, but one, have two pairs of strong fronto-orbital setae. Despite the ease of recognition, it is not clear what their relationship is to other *Aphaniosoma*, or if they form a specific lineage.

The diversity of the *approximatum-creperum-egregium-fissum* species complexes is so great that it is impossible to offer anything more than generalizations. They likely consist of several lineages. They exhibit a wide range of colouration from very pale yellow to almost completely black, but always with distinct microtomentum on the scutum. The tiny pale yellow species are found in Central Asia, the Middle East (most species) and Africa (including some Indian Ocean Islands). Similarly, black species with dark postgonites that are broad at their base and curved postero-ventrally at their apex, a dark basiphallus/epiphallus that is pointed at its apex, and a bilobed distiphallus, are also found in Africa and across the Palearctic, but most species are known from around the Mediterranean.

The Oriental and New World species of Chyromyidae have been investigated only very superficially and based only on a few specimens. The author has seen several species of Aphaniosominae from the Neotropics, but these do not belong in *Aphaniosoma* s. str., neither do the few specimens seen from Australasia and the Oriental Region. However, this does not exclude the presence of *Aphaniosoma* in these regions, as too little study of this family has been undertaken outside of the Palearctic and Afrotropical Regions. There are species from the Nearctic that do belong in *Aphaniosoma* and some can be assigned to the ill-defined *approximatum-creperum* complex. There are undescribed species in North America that the author is aware of but has not seen. Further discussion must await their study.

## Conclusion

Faunistics and diversity of Palearctic and Afrotropical Chyromyidae are becoming better understood. Various species complexes can be recognized, even though their interspecific relationships and phylogeny are uncertain. For this, studies applying molecular techniques will be necessary. It is now possible to select examples from a wide range of species representing the various species complexes discussed above, with each chosen species represented by specimens from as wide a geographical area as possible.

The number of species of *Aphaniosoma* known from this geographical region is 57, with 19 of them described as new. In addition, one species from Syria, very likely also new, has not been described because it is represented by a single female (Fig. 90). Undoubtedly there is more to discover, particularly in those countries of the Middle East where nothing is known about Chyromyidae. Most of the species described from Israel can be expected in one or more adjoining countries, and given the diversity of species in Israel, it is reasonable to suggest that countries just a little further afield will be equally rich and likely include new species.

During two very brief visits to Israel, B. Merz spent very little time collecting, but happened to find a species (*A. miricercus* sp. nov.) not collected by others. Similarly, the author, during only a few hours of fieldwork spread across several localities, also found four species not collected by others (*A. cristatum* sp. nov., *A. harteni*, *A. incudisternum* and *A. interispina* sp. nov.) This suggests that despite the extensive fieldwork undertaken to date it is still likely that there are more undescribed species to discover in Israel and neighbouring countries and more to learn about their local and regional distribution.

No important new insights into the biology and ecology of *Aphaniosoma* can be deduced from the data in this study.

## Acknowledgements

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