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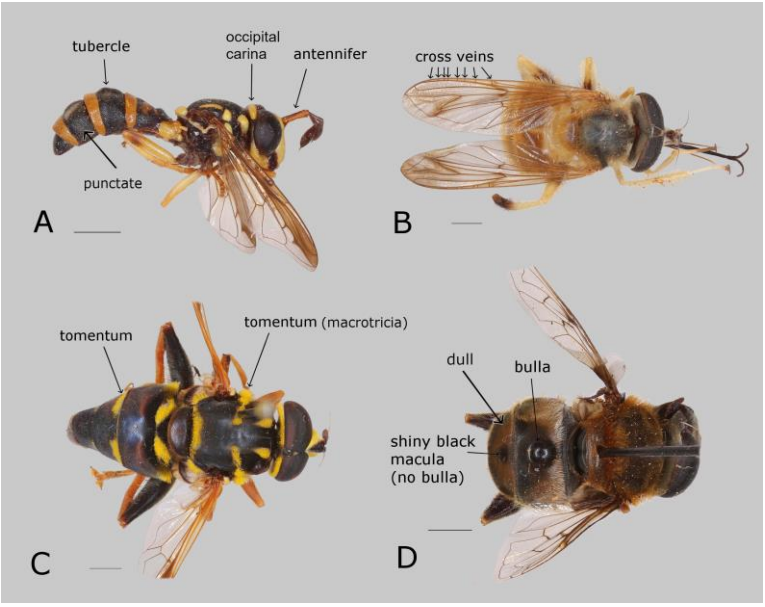

ISSN 2949-6748 Volume 2 No. 4 2023

Journaal van Syrphidae

An international journal on Syrphidae, “Journaal van Syrphidae” (http://zoobank.org/References/632F826B-7A33-4CA7-80D6-9B96135409C1), founded in 2022 by the Syrphidae Foundation. ***JvS*** publishes original work in the form of articles, comments and symposium papers on all topics concerning Syrphidae (Insecta, Diptera) from all biogeographical regions.

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Funding
JvS is financed though the Syrphidae Foundation, and can only survive by donations of readers and other organisations or private persons gifts.

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Journaal van Syrphidae 2(4): 1–99 ISSN 2949-6748
https://www.syrphidaeintrees.com/jvs/

Article

https://doi.org/10.55710/1.AIMS1978
https://zoobank.org/References/ 412906AC-7943-409E-8441-A6490164B380

Glossary of morphological terminology of adult Syrphidae (Diptera): an update and extension

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Received: 09-05-2023 Accepted: 08-09-2023 Available online: 02-10-2023
Handling Editor: Francis Gilbert

Abstract. An updated morphological terminology for adult Syrphidae (Insecta, Diptera) is presented. The need for an update and extension of the terminology became evident while preparing species descriptions for the European Commission funded Taxo-Fly project on European Syrphidae. The scope of this paper however is worldwide. The manuscript describes the method used in finding as many relevant terms as possible and also discusses the use of the preferred terms, e.g., based on novel insights on the wing venation and division of some of the thoracic segments. The main part comprises numerous figures depicting different body parts with terminology indicated on each figure. A glossary of all terms used is given in alphabetical order. In total 17 photos and 207 drawings are presented, depicting almost 400 terms. A total of 14 new terms are introduced to more accurately describe the different body parts of adult Syrphidae. A short description for each term is given, together with additional information such as synonymous terms.

Keywords. hoverfly, flower fly, morphology, new terminology, glossary of terms.

Citation: van Steenis J., Miranda G.F.G., Tot T., Mengual X. & Skevington J.H. 2023. Glossary of morphological terminology of adult Syrphidae (Diptera): an update and extension. Journaal van Syrphidae 2(4): 1–99. https://doi.org/10.55710/1.AIMS1978

Introduction

Since the work of Speight (1987) on the terminology of adult Syrphidae several attempts have been made to standardise the morphological terminology by publishing glossaries (Thompson 1999; Skevington *et al*. 2019) based on revised terminology as published in several Diptera manuals (McAlpine 1981; Vockeroth & Thompson 1987; Thompson & Rotheray 1998; Rafael & Skevington 2010; Cumming & Wood 2017). Other authors have introduced syrphid-specific terminology (Doczkal & Dziock 2004; Reemer & Ståhls 2013a, b) applied to a specific genus or subfamily. Hippa & Ståhls (2005) determined the external morphological characters of adult hoverflies useful in phylogenetics using a mixture of terminologies. In the most recent summary of morphological terms for Diptera, Cumming & Wood (2017) proposed different terms for similar features, such as fascia for general lines, bands for transverse lines and stripes or vittae for longitudinal lines. However, several characters also found in Syrphidae were overlooked, such as antennifer, cicatrix, fossette, and notal wing lamina.

The Taxo-Fly project, funded by the European Commission, was the motivator to update the works of Speight (1987) and Thompson (1999), and to produce an extended glossary of morphological terms used in adult hoverflies. Taxo-Fly is devoted to developing taxonomic tools for European species of hoverflies as a resource for the European Union Pollinator Monitoring Scheme (Potts *et al*. 2021).

Material and Methods

The adult morphological characters used for the present glossary were taken from several species to show the diversity of the features to make it more easy to recognize these in other species too. For each term the Latin or latinized version was preferred as stated by Thompson (1999). The orientation of all body parts in relation to the plane is given as anterior or posterior, lateral or medial, basal or apical, and dorsal or ventral. The terms used for each character were checked against known publications on Syrphidae, and thus each term in the glossary has a reference for its literature source. Morphological terms are listed in alphabetical order to facilitate their search. Several synonymous terms are listed alongside the preferred terms, with the preferred terms in bold. In order to check their current use in Syrphidae and other families or groups of insects, and to see how the different body parts are illustrated, several websites and handbooks have been consulted (Harbach & Knight 1980; Grimaldi & Engel 2005; Saigusa 2006; Yeates & Hastings 2010; Gordh 2011; Sorkin & Herman 2018; Dessì 2019; Geller-Grimm *et al.* 2021). The terminology of the structures of the female postabdomen in Syrphidae are from Kotrba (2000) and Miranda & Moran (2017).

The specimens used for this research are from the following collections, with acronyms in parentheses: California Academy of Science, San Francisco, USA (CAS); Canadian National Collection of Insects, Ottawa, Canada (CNC); Coleção Zoológica do Maranhão, Caxias, Brazil (CZMA); University of Guelph Insect Collection, Guelph, Canada (DEBU); Faculty of Sciences, Department of Biology and Ecology, University of Novi Sad, Serbia (FSUNS); Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil (INPA); Coleção Entomológica do Museu Nacional do Rio De Janeiro, Rio de Janeiro, Brazil (MNRJ); Museu de Zoologia da Universidade Estadual de Feira de Santana, Feira de Santana, Brazil (MZFS); Naturalis Biodiversity Center, Leiden, the Netherlands (NBC); private collection of

Jeroen van Steenis, Amersfoort, the Netherlands (JSA); Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia (ZISP).

All figures are made by JvS, except for those figures made by GFGM, TT or taken from published literature, indicated at the end of each caption. In the text and table each figure is hyperlinked to the corresponding figure, by clicking on the bold faced figure number. Line drawings made by JvS were made with the aid of a drawing mirror attached to a stereomicroscope, sketched with pencil and traced with ink. After scanning, the drawings were edited using the GNU image manipulation program (GIMP version 2.10.32). The wings and terminalia were drawn by GFGM using Inkscape 1.1, and manually tracing over extended focus TIFF images of specimens generated by Leica Application Suite software from images obtained with a Leica M205C stereomicroscope. The line drawings of the body orientation (Figs 1 and 2) and the thorax in dorsal view (Fig. 24) were made by TT using high quality photos, which were sketched with a pencil and traced with fine liner pen on tracing paper using a HUION Graphic tablet A3 Led Light Pad, followed by scanning and editing in Adobe Photoshop® version 10.0.

The photos were created by JvS with the aid of a DSLR camera and stacking software as outlined in Bot & van de Meutter (2019) and van Steenis & Wyatt (2020).
The list of morphological terms and the list of specimens used for the figures can be found as supplementary information on the website of the Syrphidae Foundation (https://www.syrphidaeintrees.com/jvs/volumes/volume-2-4/) under "Volume 2 No 4 supplement 1 and 2". In the list of specimens used to illustrate the present work, the locality information and the authorship of the species are included and this information is not repeated in the figure captions. In the glossary many genera and species are mentioned as examples. In order to keep the glossary as compact as possible no author names are added after the specific epithets, instead the authors of these epithets can be found in the supplementary file of species used for the illustrations.

Results

The suggested terminology, presented in bold face, of the present work is based on previous terminology. Several concepts are updated and redefined (clearly stated for each term). Some body parts were never named and a new term is introduced when the structure differs from the surrounding area.

The Latin or a latinized version of the structure, as adopted by Thompson (1999) has been used for the majority of terms; however, for convenience we have kept the English equivalent for some concepts, e.g., facial tubercle instead of facial tuberculum, postmetacoxal bridge instead of postmetacoxal pontis, postpedicel instead of postpedicellus, or suture instead of sutura among others.

In total, 16 terms are introduced here for the first time. Some new terms are derived from previously used terms and they identify structures for which there is no proper terminology. We explain the new application or definition of these terms in our glossary. Twelve of these new terms are the following: antevertical sulcus (Fig. 9B); frontal tubercle (Fig. 15B); malar tubercle (Figs 11B, 12B, 13B, 14B); mediotergal suture (Fig. 27B); metapostnotal tubercle (Fig. 29B); notopleural sulcus (Fig. 29A); occipital tubercle (Fig. 8A); paravertical sulcus (Fig. 9A); pseudo-mystax (Fig. 15B); temporal tubercle (Fig. 15D); vertical carina (Figs 8D, 9C), and vertical sulcus (Fig. 7C).

The remaining four newly introduced terms more precisely indicate structures that differ from other parts of the body. These terms are **antevertex**, **mala, M_4 base** and **paravertica**. These four terms are explained here with the reference to the figures given in parentheses.

- The antevertex (Fig. 9B) is the area on the dorso-medial part of the head present in some species in which the male is dichoptic. This area might be homologous to the area with frontal rugae in females. The antevertex is bordered by two transverse sulci, the frontal sulcus and the antevertical sulcus.
- The mala (Figs 12A, 12C, 12D, 13, 14A, 14C, 14D, 15B, 16D, 17C, 17D, 22) is a term for the anteroventral part of the face, between the face and gena. This area does not seem to be a truely separate structure but it has a distinctly different texture from the rest of the face and thus warrants a new term.
- M_4 base (Figs 34A, 37C) is a vein closing cell bm in the antero-apical corner connecting the following three veins: vein M_4, crossvein m-cu and vein M-M_2.
- The paravertica (Figs 8B, 9A) is situated on the frons and it is seen as a longitudinal depression along the eye margin medially bordered by a punctured integument.

The term hair is not used here as we prefer to use the Latin equivalent pile instead. Mammals are characterised by their hairs and body coatings but other animals like birds and fish have their own specific terms, i.e., feathers and scales (Dhouailly 2009). In insects, no such specific term could be found, so the latinized translation of hair, i.e., pilus, is used as suggested by Thompson (1999) and already used more than 150 years ago (Rondani 1857). Thompson (1999) used pile as the basic term and even if this does not seem to be a Latin word we prefer the continued use of this word. Pile is referring to the hairs on the body "thorax with yellow pile" the condition of having "hairs" is pilose and the singular is pilus.

The often used terms 'front/fore', 'mid' and 'hind' for the legs are considered subordinate to the terms 'pro', 'meso' and 'meta' as adopted from Thompson (1999) to indicate the origin of the locomotory organs and to locate the nearby pleural segments (e.g. prothoracic, mesothoracic and metathoracic). In order to avoid confusion with the locomotory organs of larvae, the prolegs, in adult terminology it is advised to use the singular proleg. The terms fore, mid and hind are not rejected, but the use of pro-, meso- and meta- in the legs seems more consistent with the use of these prefixes in the pleural segments like proepimeron, mesonotum and metakatepimeron.

We follow Thompson (1999) regarding the body orientation by looking at it in three planes: the horizontal, sagittal and transversal planes. This makes four pairs of terms possible: anterior-posterior, apical-basal, dorsal-ventral and lateral-medial.

For the terminology of the wing two systems have been in use for the last three decades. The system generally adopted in several of the Diptera manuals (e.g., McAlpine 1981; Thompson & Rotheray 1998) is regarded as the old one. An alternative terminology was established shortly after (Shcherbakov *et al*. 1995; Wootton & Ennos 1989; Saigusa 2006) and introduced to a greater audience in Cumming & Wood (2017), who suggested considering it the standard. Here we adopt the alternative terminology instead of the traditional system as it reflects the true origin of the basal veins more correctly (see Cumming & Wood 2017). The changes that follow from the new insights are:

- cell a_2 is now **cell a_1** (Fig. 34B)
- cell cup is now **cell cua** (Figs 34B, 36D)
- cell a_1 is now **cell cup** (Figs 34B, 36D)
- cell cua is now **cell m_4** (Fig. 34B)
- crossvein bm-cu is now **crossvein m-cu** (Figs 34A, 37C)
- crossvein bm-m is now **M_4 base** (Figs 34A, 37C)
- crossvein dm-cu is now **crossvein dm-m** (Figs 34A, 35, 36, 37C, 37D)
- vein CuP is now **pseudovein** (Fig. 34A)
- vein CuA_1 is now vein **M_4** (Fig. 34A)

- vein A_2 is now **vein A_1** (Figs 34A, 35A, 35C, 35D, 36B, 36C)
- vein CuA_2 is now **vein CuA** (Figs 34A, 35A, 35C, 35D, 36A–C)
- vein A_1 + CuA_2 is now **vein CuA+CuP** (Figs 34A, 36A)
- vein A_1 is now **vein CuP** (Figs 34A, 35B, 36A, 36D).

The words cell, crossvein or vein are used in the glossary, but these terms do not have a specific illustration in the Figures, where we refer to the different cells by their name (e.g., br, dm, r_{4+5}), or crossveins (e.g., h, m-cu, r_{4+5}-m_1), or veins (e.g., C, R_1, M_4). A vein may have an additional small vein, here called appendix, and their name is sometimes written in full, like appendix of vein R_{4+5}, or as appendix R_{4+5}.

As outlined by Snodgrass (1960) and adopted by Nayar (1964) the term sulcus instead of suture is used for the lines or grooves present on the face, as employed by Doczkal & Pape (2009). A sulcus is an invagination of the exoskeleton while a suture is a line separating two or more sclerites, so in the thorax most of the grooves are indeed sutures. Speight (1987) and Thompson (1999) discussed that sulcus is a groove/shallow depression on the exoskeleton, and although the former corrected ‘transverse suture’ to ‘transverse sulcus’ (as preferred by us), the latter kept the traditional term. Here the view of Snodgrass (1960) is adopted and most of the grooves on the head are sulci and those on the thorax are mostly sutures.

The surface structures of the body and the pilosity of the calypter and thoracic spiracles have not been studied in detail and the associated terms are mostly not added to the glossary. For a detailed study of the body sculpturing see Harris (1979) and for pilosity see Hippa & Ståhls (2005).

Some of the terms given in the glossary are membranous structures not easily visible in drawings, especially in the male and female terminalia, which need further study. The figures of the postabdomen (Figs 43–46) are shown in either dorsal or ventral view. The orientation of sclerites VI–VIII and the terminalia are not necessarily in the same plane as these structures are rotated to a large extent.

Despite the illustration of most terms used in the glossary, it is likely that other structures present in adult Syrphidae are not studied here. Several of the terms as given in the glossary are combined terms, such as the combination of tibia and carina in the term “tibial carina”; a narrow definition is given as it seems restricted to the apico-ventral part of the metatibia. If there were a carina on any other tibia or place on the tibia, the term “tibial carina” can still be applied but with reference to which tibia and its placement on the tibia. The terms are classified into a section with general terminology and other sections for each of the main body parts: head, thorax, wing, legs, abdomen, male terminalia and Female terminalia. Below we provide a list of figures depicting all the terms in each category and when terms are shown in more than one figure, only the first figure is listed:

- **general** terms are found in Figs 1–6, 8, 9, 16, 19–21, 23, 28, 29, 33, 35, 44–46, 53, 54 and 56.
- terms for the **head** are found in Figs 1, 3, 6–16, 18 and 22.
- the **thorax** in Figs 23, 24, 27–30, 32, 33 and 53.
- the **wing** in Figs 23 and 34–37.
- the **legs** in Figs 2, 38–42 and 53.
- the **abdomen** in Figs 43, 44 and 46–48.
- the **male terminalia** in Figs 54–56 and 58.
- the **female terminalia** in Fig. 52.

Glossary of terms

Hoverfly terminology	Part	Explanation/ synonym terms	Figures
Abdomen	Abdomen	Posterior division of the body (Thompson 1999).	Figs 1A, B, 3A, C, D, 32B, C, 43–51
acetabulum (pl. acetabula)	Head	Rounded membranous area from which antenna protrudes; acetabula can be separated from each other by extension of facial sclerotization [medial sclerotized stripe (Hippa & Ståhls 2005)], which can reach lunule; acetabula can be only partially separated or completely fused, in this case being referred to as the antennal fossa (in narrow sense of Sorkin & Herman 2018).	Figs 10C, D, 11A
acropod	Leg	Apical part of tarsomere 5, including arolium, empodium, unguitractor, claws and pulvilli (McAlpine 1981).	Fig. 42A, B
acrosternum	Abdomen	Anterior sclerite on sternum II, clearly separated by a membranous area from posterior sclerite (McAlpine 1981).	Figs 47A, B
aedeagal apodeme (McAlpine 1981; Speight 1987)	Male terminalia	see **phallapodeme**	
aedeagal apodeme of Microdontinae (Thompson 1972; Vockeroth & Thompson 1987)	Male terminalia	see **lateral strips**	
aedeagal projections; apex; ventromedial projection; baso-ventral projection; apico-ventral flange (see van Steenis *et al.* 2016).	Male terminalia	see **ejaculatory process**	
aedeagus (Metcalf 1921; Cumming & Wood 2017)	Male terminalia	see **phallus**	
aedeagus, stem of (van Steenis *et al*. 2016)	Male terminalia	see **phallapodeme**	
alar callus	Thorax	Supra-alar area, slightly elevated part of the scutum just posterodorsal from the wing base and anterior to the postalar callus, often with short black setae (after Knight & Laffoon 1970).	Figs 28A, 29B, 30B, 32A
alula	Wing	A basal lobe along the posterior margin of the wing, located between the calypter and anal lobe (Cumming & Wood 2017).	Figs 34B, 36D
alveolus (pl. alveoli)	General	Socket from which macrotrichia arise; sometimes the alveoli give a granulate aspect or "granulate alveoli" to the exoskeleton, like in many Cerioidini (McAlpine 1981).	Figs 4, 53C
anal cell (Speight 2020)	Wing	see **cell cua; vein CuP**	
anal lobe (McAlpine 1981; Speight 2020)	Wing	see **cell a_1**	
anal segment	Male terminalia	see **proctiger**	
anatergite (Cumming & Wood 2017),	Thorax	see **anatergum**	
anatergum	Thorax	Posterodorsal plate of the mesothoracic pleuron, posterodorsal to the katatergum; with pile tuft in *Allobaccha*; part of the lateral postnota of Speight (1987); (Thompson 1999).	Fig. 28A
anepimeron	Thorax	Plate ventral to the wing base, with three distinguishable areas in many species: anterior, posterior and dorsomedial; anterior area always pilose, posterior area sometimes and dorsomedial area pilose in *Eristalinus* (Thompson 1999).	Figs 23C, 28B, 29A, 30

anepisternum	Thorax	Anterodorsal plate of mesothoracic pleuron, consisting of a flat anterior part and a convex posterior part in many species, although its division is not always clear, see *Nausigaster* (Thompson 1999).	Figs 28, 29B, 30A
angle	General	The angle of meeting point of two lines, often used in the wing veins or in the eye contiguity (angle of approximation), indicated by the exact digit or the adjectives right-, acute- or obtuse-angle (Merriam *et al*. 2022).	Figs 5, 6C
angle of approximation	Head	In dorsal view, angle of eyes in holoptic males (Dusek & Laska 1973).	Fig. 6C
anteclypeus (McAlpine 1981)	Head	see **clypeus**	
antecoxal piece (Shannon 1922b)	Thorax	see **metasternum**	
antenna (pl. antennae)	Head	Sensory organ, anterodorsally placed on the head; formed by the scape, pedicel, postpedicel and arista (Thompson 1999).	Figs 1A, 18–21
antennal fossa	Head	Fused, or partially fused, membranous acetabula (Sorkin & Herman 2018).	Figs 9D, 10A, B, 11A, C
antennal pit (Shannon 1922a)	Head	see **acetabulum**	
antennal pits (Speight 1987)	Head	see **sacculus**	
antennal process (Vockeroth 1971)	Head	see **antennifer**	
antennal prominence (Curran 1925)	Head	see **frontal prominence**	
antennal sockets (Cumming & Wood 2017)	Head	see **acetabulum**	
antennifer	Head	Anterodorsal extension of head, anterior to frontal prominence, on which the antennae is placed, e.g. Cerioidini; differing from an extended frontal prominence in that the antennifer has the lateral margins parallel both in lateral and dorsal views (Thompson 1999).	Figs 3A, 6C, 9C, 12D
antepronotum	Thorax	Anterior part of pronotum, sclerite just above the proepisternum; unpaired anterior sclerite of the prothorax, visible in thorax in frontal view (Speight 1987).	Figs 23A, B, 24,B–E, 25A, B, D, 26A–C, 28A, 29, 30A
anterior (adv. anteriorly)	General	Towards the head end of the fly; opposite of posterior (Thompson 1999).	Figs 1B–D, 2, 38B, 42A, B, F, G, 54B
anterior anepimeron	Thorax	Anterior part of the plate ventral to the wing base, always pilose (Thompson 1999).	Figs 29A, 30
anterior anepisternum	Thorax	The anterior, often flat, part of the anterodorsal plate of mesothoracic pleuron (Thompson 1999).	Figs 28, 30A
anterior cervical sclerite	Thorax	Most anteriorly positioned sclerite of the cervix (Martin 1916; Michelsen 1996).	Figs 23B, 25B, D, 26C
anterior mesanepisternum (Speight 2020)	Thorax	see **anterior anepisternum**	
anterior mesocoxite (Speight 1987)	Leg	see **disticoxa**	
anterior mesonotal collar	Thorax	Transverse row of long erect pile on the anterior border of scutum, e.g. *Allobaccha*, *Asarkina*, *Hybobathus*, *Ocyptamus* (Vockeroth 1969).	Fig. 53D
anterior ocellus	Head	Single, anteriorly placed simple eye on ocellar triangle (Thompson 1999).	Figs 6D, 12B
anterior sclerite on sternum II (Speight 1987, Reemer & Ståhls 2013a).	Abdomen	see **acrosternum**	
anterior spiracle	Thorax	Respiratory opening on the anterior part of the pleuron; mesothoracic spiracle (McAlpine 1981).	Figs 23B, 25D, 26D, 28B, 30A
anterior surstylar lobe	Male terminalia	Anterior portion of a bilobed surstylus (Metcalf 1921).	Fig. 54A
anterior tentorial pit	Head	An invagination of the exoskeleton on the head that serves as an internal attachment site for muscles; visible externally on the boundary between the gena and mala (Thompson 1999).	Figs 10B, 11D, 12A, D, 13A, B, 14A, B, 16D, 17C

antero- and posterolateral rows of stout spines (Grković *et al*. 2015)	Leg	see **setose carina**	
anterocoxal spina	Leg	Anteroventral extension of the coxa; on the metacoxa (*Neocnemodon*) or on the eucoxa (*Platycheirus scutatus*) (after McAlpine 1981).	Fig. 42G
antetergite (Hippa & Ståhls 2005)	Abdomen	see **antetergum**	
antetergum	Abdomen	The median sclerite at the anterior margin of tergum I (Hippa & Ståhls 2005).	Figs 43A, 44B–D, 45B, C, 46C, D
antevertex	Head	Dorsomedial part of head capsule, bordered laterally by eyes, anteriorly by transverse frontal sulcus, posteriorly by transverse vertical sulcus, (*Lejogaster metallina*). Needs further investigation, might be homologous with vertical rugae in female *Lejogaster metallina* (Harbach & Knight 1980; Sorkin & Herman 2018).	Fig. 9B
antevertical sulcus	Head	Transverse sulcus on dorsal part of head capsule bordering the antevertex and the vertex, between the compound eyes, anterior to the ocellar triangle; e.g. male *Lejogaster metallina*.	Fig. 9B
apex	General	The end of a structure, most apical point (Thompson 1999; Merriam *et al*. 2022).	Fig. 2B
apical (adv. apically)	General	On, or towards, the apex of a structure; opposite to basal (Thompson 1999).	Fig. 1B
Apical section of vein A_1 (Vockeroth & Thompson 1987)	Wing	see **vein CuA+CuP**	
apically rounded anterior process of mesotarsus (Vockeroth 1990)	Leg	see **tarsal lamina**	
apicoposterior lamina of metafemur (Van Steenis *et al*. 2017)	Leg	see **femoral discus**	
apicoventral projection (Hippa 1978a)	Leg	see **tibial spina**	
apodemes of epiproct	Female terminalia	Basolateral internal extensions of the epiproct; absent in some Syrphini (Miranda & Moran 2017).	Figs 52A–C
appendage of upper process of hypandrium (van Steenis & Lucas 2011)	Male terminalia	see **hypandrial process**	
appendix	Wing	Small additional vein, arising from another vein or crossvein without connecting to other veins (Thompson 1999); spur (Vockeroth & Thompson 1987).	Figs 35B, C, 36B, C, 37B, C
appendix of crossvein dm-m	Wing	Extra longitudinal vein from crossvein dm-m into cell dm, so far only known to be present in *Nephentosyrphus capitatus* (Hippa 1978b).	Fig. 37D
appendix of crossvein r-m	Wing	Additional vein from crossvein r-m into cell r_{4+5} found in *Stilbosoma* (after Thompson 1972).	Fig. 36B
appendix of vein M_1	Wing	Additional vein from vein M_1 towards wing $margin_1$ like in *Eumerus*, and some *Eristalinus* species (Ssymank *et al*. 2021).	Figs 35C, 37B
appendix of vein M_{1+2}	Wing	Additional short vein from vein M_{1+2} into cell r_{4+5}; anterior appendix R_{4+5}. Found in *Mixogaster* and *Aristosyrphus* (after Reemer & Ståhls 2013a).	Fig. 37C
appendix of vein R_{2+3}	Wing	Additional vein from vein R_{2+3} into cell r_{2+3}, in some species of Oriental *Sphegina* (*Asiosphegina*) (Hippa *et al*. 2015).	Fig. 35B
appendix of vein R_{4+5}	Wing	Additional vein from vein R_{4+5} into cell r_{4+5}; posterior appendix R_{4+5} (Thompson *et al*. 2010; Reemer & Ståhls 2013a).	Figs 35C, 36C
appressed	General	Laying, almost, flat to the body surface, most often used of recumbent pile (Merriam *et al*. 2022). In Fig. 4 the scale is appressed.	Fig. 4

arcuate	General	Slightly curved, forming an arc; an adjective commonly used for maculae or fasciae (Thompson 1999).	Figs 5, 44B, 46D
arista	Head	Macrotrichia-like structure on postpedicel, derived from modified flagellomeres; in e.g. *Psarus abdominalis* and *Pelecocera*) incrassate; in other species positioned apically (Stuckenberg 1999).	Figs 18A, E, 19A–C, 20, 21A, C
aristomere (pl. aristomeres)	Head	Separate segments of the arista (McAlpine 1981).	Fig. 18B
armature	General	All kinds of expansions or projections from the exoskeleton; e.g. spina, lamina, dens etc (Thompson 1999).	Fig. 4
arolium	Leg	Median membranous plate on tarsomere 5, bearing the empodium, connecting the unguitractor with the empodium (McAlpine 1981).	Fig. 42A
auxiliary vein (Cumming & Wood 2017)	Wing	see **appendix of R_{4+5}**	
auxillary vein in *Eumerus* (Ssymank *et al*. 2021)	Wing	see **appendix of M_1**	
auxillary vein in *Lyneborgymyia* (Ssymank *et al*. 2021)	Wing	see **crossvein r-m_1**	
axillary lobe (Hull 1949)	Wing	see **alula**	
axillary plates (Sorkin & Herman 2018)	Wing	see **axillary sclerites**	
axillary sclerites	Wing	Irregularly shaped plates at wing base, between the thorax and the basal veins, the first three plates are hypothesised to be detached portions of the base of the veins, while the fourth is supposedly mesonotal in origin (McAlpine 1981; Dessì 2016).	Figs 23D, 29B, 30B
bacilliform sclerite (Sorkin & Herman 2018)	Male terminalia	see **subepandrial sclerite**	
band (Sorkin & Herman 2018)	General	see **fascia**	
bar (Sorkin & Herman 2018)	General	see **macula**	
bare	General	Surface lacking vestiture, including the wing; if surface lacks macrotrichia but with microtrichia, it should be stated as non-pilose and not bare (narrower specification of Thompson 1999).	Figs 19A, 20B, 34B, 36A
basal (adv. basally)	General	On, or towards, the base of a structure; opposite to apical (Thompson 1999).	Figs 1B, 2B
basalare	Thorax	One of two sclerotized areas at wing base, basalare is anterior and subalare is posterior. The basalare is often only visible as a tuberculate part of the posterior anepisternum (Snodgrass 1935; Crampton 1942).	Fig. 30B
basale (Speight 1987)	Male terminalia	see **epandrium**	
base	General	Part of a structure that is attached to another more central structure of the body; most proximal point (McAlpine 1981; Merriam *et al*. 2022).	Fig. 2B
basicosta	Wing	Anterobasal sclerite of wing, lateral to tegula (McAlpine 1981).	Figs 23D, 33D, 34A
basicostale (Cumming & Wood 2017)	Wing	see **basicosta**	
basicoxa	Leg	Dorsobasal part of the eucoxa in the mesoleg (McAlpine 1981).	Fig. 42F
basiphallus	Male terminalia	Basal part of two-segmented phallus (Cumming & Wood 2017).	Figs 55C, D
basipulvillus (pl. basipulvilli)	Leg	Paired connecting membrane between fifth tarsomere and pulvillis (McAlpine 1981).	Fig. 42E
basisternum	Thorax	In frontal view of prothorax, plate between the procoxa (Crampton 1942).	Figs 23B, 25A, 26A, C, D
basitarsomere	Leg	First/proximal tarsomere of each tarsus (after Speight 1987).	Figs 38A, B, 42B
basitarsus (Sorkin & Herman 2018; Cumming & Wood 2017)	Leg	see **basitarsomere**	

basoflagellomere (Thompson 1999)	Head	see **postpedicel**	
basotarsomere (Thompson 1999)	Leg	see **basitarsomere**	
beaded (Shannon 1926b).	General	see **premarginal sulcus**	
body length	General	Length of the fly from base of antenna to apex of abdomen (Thompson 1999).	see arrowed lines in Fig. 1A.
bristle (Sorkin & Herman 2018)	General	see **seta**	
buccal arm of tentorial sulcus (Speight 1987)	Head	see **subcranial sulcus**	
buccal cavity (HAO 2010)	Head	see **subcranial cavity**	
bulla (pl. bullae)	General	A blister-like, round shiny swelling, found on abdominal terga in some Afrotropical *Phytomia* (De Meyer *et al*. 2020).	Fig. 3D
calcar (pl. calcars, adj. calcarate)	General	Elongate articulated spine-like extension of the exoskeleton, longer than broad. In Syrphidae no articulating extensions of the exoskeleton were found so far. The term as used in Thompson (1999) is here referred to as spina (Sorkin & Herman 2018). Calcar is used in some calyptrate families to refer to a more distinct postero-dorsal seta situated at the metatibia (Cumming & Wood 2017).	not in Syrphidae
callus (Ssymank *et al*. 2021).	Head	see **facial tubercle**	
callus of 1st tergite of abdomen (van Steenis *et al*. 2016)	Abdomen	see **lateral tubercle of tergum I**	
callus of sternite I (van Steenis *et al*. 2016)	Thorax	see **metapostnotal "protuberance"**	
calypter (pl. calypteres)	Wing	A membrane connecting base of wing with thoracic wall, basal to alula; forming two lobes: dorsal calypter (dorsal lobe) and ventral calypter (ventral lobe, thoracic squamula); the calypters fold over each other when the wing is at rest (Thompson 1999).	Figs 23C, D, 27B, 29B, 30B, 32A, D
capitellum (Harbach & Knight 1980)	Thorax	see **capitulum**	
capitulum (pl. capitella)	Wing	Apical and bulbous part of the halter; knob (Sorkin & Herman 2018).	Fig. 23C
carina (pl. carinae, adj. carinate)	General	Sharp low ridge, longer than high, found on the face, legs and genitalia (Harris 1979; Thompson 1999).	Figs 4, 39A, D, 41B–D
cell	Wing	Any area of the wing enclosed by veins, crossveins or the wing margin, named after the vein that forms its anterior margin, written in lowercase (Thompson 1999).	Figs 34B, 36D
cell a_1	Wing	Area of the wing posterior to vein A_1; first anal cell. In the old system anal lobe or cell a_2 (McAlpine 1987; Saigusa 2006; Wootton & Ennos 1989).	Fig. 34B
cell a_1; first anal cell (McAlpine 1981)	Wing	see **cell cup**	
cell a_2; second anal cell (McAlpine 1981)	Wing	see **cell a_1**	
cell bc	Wing	Area of the wing enclosed by vein C anteriorly, crossvein h apically, and vein Sc posteriorly; basal-costal cell (Cumming & Wood 2017).	Fig. 34B
cell bm	Wing	Area of the wing enclosed by vein M anteriorly, M_4 base and m-cu apically, and vein CuA posteriorly; basal medial cell (Cumming & Wood 2017).	Figs 34B, 36D
cell br	Wing	Area of the wing enclosed by vein Rs anteriorly, crossvein r-m apically, and vein M posteriorly; basal radial cell (Cumming & Wood 2017).	Figs 34B, 36D
cell c	Wing	Area of the wing enclosed by crossvein h basally, vein C anteriorly, and by vein Sc apically and posteriorly; costal cell (Cumming & Wood 2017).	Figs 34B, 36D

cell cua	Wing	Area of the wing enclosed by vein CuA anteriorly and apically, and vein CuP posteriorly; anterior cubital cell. Cell cup in the old system (McAlpine 1987; Saigusa 2006; Wootton & Ennos 1989).	Figs 34B, 36D
cell cua_1; first anterior cubital cell (McAlpine 1981)	Wing	see **cell m_4**	
cell cup	Wing	Area of the wing between veins A_1 and CuA+CuP; posterior cubital cell. In the old system cell a_1 (McAlpine 1981; Saigusa 2006; Wootton & Ennos 1989).	Figs 34B, 36A
cell cup; posterior cubital cell (McAlpine 1981)	Wing	see **cell cua**	
cell dm	Wing	Area of the wing enclosed by M_4 base basally, the anterior branch of vein M anteriorly, crossvein dm-m apically, and vein M_4 posteriorly; discal medial cell (McAlpine 1981; Cumming & Wood 2017).	Figs 34B, 36D
cell m_4	Wing	Area of the wing delimited by crossvein m-cu basally, vein M_4 anteriorly, and vein CuA posteriorly; the cell is open apically; fourth medial cell. In the old system cell cua_1 (McAlpine 1981; Saigusa 2006; Wootton & Ennos 1989).	Fig. 34B
cell r_1	Wing	Area of the wing delimited by vein R_1 anteriorly and vein R_{2+3} posteriorly; might be open or closed (when vein R_1 joins R_{2+3} forming a petiole) before the wing margin; first radial cell (McAlpine 1981; Cumming & Wood 2017).	Figs 34B, 36D
cell r_{2+3}	Wing	Area of the wing delimited by vein R_{2+3} anteriorly, and vein R_{4+5} posteriorly; second + third radial cell (McAlpine 1981; Cumming & Wood 2017).	Fig. 34B
cell r_{4+5}	Wing	Area of the wing enclosed by crossvein r-m basally, vein R_{4+5} anteriorly, vein M_1 apically, and the anterior branch of vein M posteriorly; some groups have a posteroapical appendix on the cell, which is vein M_2; fourth + fifth radial cell (McAlpine 1981; Cumming & Wood 2017).	Figs 34B, 36D
cell sc	Wing	Area of the wing delimited by vein Sc anteriorly, and vein R_1 posteriorly; in some groups might be closed apically by a crossvein sc-r; subcostal cell (Cumming & Wood 2017).	Fig. 34B
cercus (pl. cerci)	Male terminalia	Single-segmented pair of appendages, connected to epandrium, lateral to anus; derived from proctiger; may be strongly developed and/or bearing lobes e.g. *Mimocalla* (Cumming & Wood 2017).	Figs 48D, 51B, 54A, 55A, D, 56A, C, E, 57A, C, D
cercus (pl. cerci)	Female terminalia	Pair of single segment structures lateral to the anus; membranous or slightly sclerotized, position in relation to epiproct varies among taxa (Miranda & Moran 2017).	Fig. 52
cervix	Thorax	The neck; primarily membranous area between thorax and head (Knight & Laffoon 1970; McAlpine 1981).	Figs 23A, 26D, 30B
chaetotaxy	General	The disposition of setae/pile on the body surface, especially on the costal vein of the wings (McAlpine 1981).	Fig. 33A
chitinous box	Male terminalia	Usually spherical structure at the base of the phallus in Microdontinae; Metcalf (1921) used this term to refer to the basal portion of the phallus in general (Thompson 1969).	Fig. 56F
chitinous box sensu Metcalf (1921)	Male terminalia	see **phallus**	
cicatrix (pl. cicatrices)	Leg	Sulcus or ridge-like scar on the femur and tibia of many genera within Microdontinae (Hull 1949, see also Harris 1979).	Fig. 40A
cilium (pl. cilia)	General	Special thick pile found on the occiput in some species, e.g., *Ceriogaster*. Narrower defined than Thompson (1999).	Figs 4, 15A
claw	Leg	Paired gripping structure, apico-lateral to fifth tarsomere (Thompson 1999).	Figs 42A, E
clypeal knob	Head	Tubercle formed by postclypeus, seen in lateral view, dorsal to subcranial cavity and ventral to facial tubercle. Not present in Pipizinae and several Microdontinae. Adjusted from Thompson (1972) and Hippa & Ståhls (2005).	Figs 12B, 14A, D

clypeus	Head	Baso-anterior sclerite of proboscis, located between apical margin of buccal cavity and labrum; divided into postclypeus and anteclypeus in some Syrphidae (e.g. *Syrphus*); clypeus commonly used as synonym of anteclypeus (Speight 1987).	Figs 16B, D, 17A–C, 22
comb (Sorkin & Herman 2018)	General	see **ctenidium**	
compound eye (Sorkin & Herman 2018)	Head	see **eye**	
copulatory pocket (Hippa 1986)	Female terminalia	see **genital chamber**	
cornea (Sorkin & Herman 2018)	Head	se **facet**	
coronal sulcus (in part, Nayar 1964)	Head	see **occipital sulcus**	
coronal suture (in part, Harbach & Knight 1980)	Head	see **occipital sulcus**	
costagium (Doczkal & Pape 2009)	Wing	see **basicosta**. Costagium (Séguy 1941; McAlpine 1981) is the base of vein C, between basicosta and crossvein h. In recent Diptera manuals this region is not differentiated from the rest of costa and thus costagium is not a term used in Syrphidae.	
coxa (pl. coxae, adj. coxal)	Leg	First, or most basal, segment of the leg, with prefix pro- meso- or meta- (Thompson 1999).	Figs 23A, C, 25C, 26C, 27A, C, 28A, 29A, 30A, 31, 32B, C, 38A, C, D, 39A, C, 40A, C, 42C, F
coxal spur (Thompson 1972)	Leg	see **anterocoxal spina**	
cranium	Head	The sclerotized cuticle of the head, indicated in one figure only (Snodgrass 1947).	Fig. 10A
crescent-shaped (Thompson 1999)	General	see **lunulate**	
crossvein	Wing	A short vein connecting major longitudinal veins, referenced with lowercase letters of the main veins it connects separated by an hyphen (exception: crossvein h), e.g., crossvein dm-m and crossvein m-cu (Thompson 1999).	Figs 3B, 34A, 35, 36, 37A, C, D
crossvein bm-cu; basal medial-cubital crossvein (McAlpine 1981)	Wing	see **crossvein m-cu**	
crossvein bm-cu; basal medial-cubital crossvein both in part (McAlpine 1981)	Wing	see **M_4 base**	
crossvein c-r_1	Wing	Additional crossveins between vein C and vein R_1, as seen in *Lycastris* (Saigusa 2006; Wootton & Ennos 1989).	Figs 3B, 35D
crossvein dm-cu; discal medial-cubital crossvein (McAlpine 1981)	Wing	see **crossvein dm-m**	
crossvein dm-m	Wing	Apical crossvein between M_4 and M. In the old system crossvein dm-cu (McAlpine 1987; Saigusa 2006; Wootton & Ennos 1989).	Figs 34A, 35, 36, 37C, D
crossvein h	Wing	Short crossvein between veins C and Sc; humeral crossvein (McAlpine 1981; Cumming & Wood 2017).	Figs 34A, 35, 36A–C
crossvein m-cu	Wing	Crossvein between veins CuA and M_4; medial-cubital crossvein, bm-cu (McAlpine 1981; Saigusa 2006; Wootton & Ennos 1989).	Figs 34A, 36A, 37C
crossvein r-m	Wing	Crossvein between veins R_{4+5} and anterior branch of M; radial-medial crossvein (McAlpine 1981; Saigusa 2006; Wootton & Ennos 1989).	Figs 34A, 35A, D
crossvein r_1-r_{2+3}	Wing	Crossvein on apical part of vein R_{2+3} to vein R_1, found in some Oriental *Sphegina* (*Asiosphegina*) species, not always entirely reaching vein R_1 (Hippa *et al*. 2015).	Fig. 35B

crossvein r_{4+5}-m_1	Wing	vein dividing cell r_{4+5} in two parts, running from vein R_{4+5} to vein M_1, found in the genus *Lyneborgimyia* (Doczkal & Pape 2009).	Fig. 37A
crossvein sc-r	Wing	Crossvein between veins Sc and R_1; subcostal-radial crossvein (McAlpine 1981; Cumming & Wood 2017); stigmal crossvein (Reemer & Ståhls 2013a).	Figs 35A, C, 36C
ctenidial lobe (Hippa & Ståhls 2005)	Male terminalia	see **postgonite**	
ctenidion, especially on the postgonite (Hippa & Ståhls 2005)	General	see **ctenidium**	
ctenidium (pl. ctenidia)	General	Closely set row of short spinae, comb-shaped; might be applied to a specific structure in some male genitalia (Thompson 1999; Hippa & Ståhls 2005).	Figs 54B, D, 56C, 58A
dens (pl. dentis, adj. dentate)	General	A pointed, short, non-articulating extension of the exoskeleton, as long as, or shorter than, broad (Thompson 1999).	Figs 4, 24A, 44B
dentate carina (Hippa 1978a)	Leg	see **setulate carina**	
dichoptic	Head	Eyes do not meet each other dorsally between antennal base and vertex; condition seen in all females and some males (Cumming & Wood 2017).	Figs 6D, 10A
discal cell; cell d (Speight 2020)	Wing	see **cell dm**	
discal sclerite	Proboscis.	Sclerotized strengthening on the labellum, together with the epifurca, furca and paraphysis (Schiemenz 1957).	Fig. 22
disticoxa	Leg	Apical/ventral part of the eucoxa of the mesoleg (McAlpine 1981).	Fig. 42F
distiphallus	Male terminalia	Apical part of two-segmented phallus (Cumming & Wood 2017).	Figs 55C, D
dorsal (adv. dorsally)	General	On the upper side of a structure; opposite to ventral (Thompson 1999).	Figs 1C, D, 2, 54A, B
dorsal occiput	Head	Most dorsal part of the occiput directly posterior to the ocellar triangle (in part Thompson 1999), often of different texture and chaetotaxy than rest of occiput, see further under occiput.	Figs 6A, B, 7B, 9D, 15C, 16A
dorsomedial anepimeron	Thorax	Dorso-medial part of the plate ventral to the wing base, pilose in *Eristalinus* (Thompson 1999).	Fig. 29B
dorsoventral bulge (Doczkal & Pape 2009)	Head	see **postcranial tubercle**	
dull	General	Bodyparts or markings that are not shiny, often covered in microtrichia. Although dull has a wider definition than matt(e), dull is the preferred term (Merriam *et al*. 2022).	Fig. 3D
ejaculatory apodeme	Male terminalia	Unpaired sclerotized structure of the sperm pump; not articulated to other sclerites of the genitalia; its shape varies among groups (Cumming & Wood 2017).	Figs 54C, 55C, D, 56D–F
ejaculatory duct	Male terminalia	Tube connecting the vasa deferentia to the sperm pump; not to be confused with the old term 'ejaculatory duct' used in Microdontinae, see phallus (Cumming & Wood 2017).	n/a
ejaculatory hood (Metcalf 1921)	Male terminalia	see **phallus**	
ejaculatory process	Male terminalia	Apically placed processes of the phallus “ejaculatory sac” in Microdontinae (Reemer & Ståhls 2013a) and possibly also homologous in Cerioidini (van Steenis *et al*. 2016).	Figs 56B, F
elongated anterior tentorial pit (authors)	Head	see **facial sulcus**	
emarginate (Vockeroth 1969).	General	see **premarginal sulcus**	
emargination on posterior eye margin	Head	Angulation of the posterior eye margin, seen from lateral view of the head, in genera like *Phytomia* and *Toxomerus* (Thompson 1999; Ssymank *et al*. 2021).	Fig. 14D
empodium	Leg	Long, seta-like, median process of the arolium (McAlpine 1981).	Figs 42A, E

endophallus	Male terminalia	Internal seminal duct of the phallus that extends basally into the sperm sac; only visible in some Microdontinae (Cumming & Wood 2017).	n/a
epandrial arm	Male terminalia	Lateral extremities of the apical cleft of the epandrium (Claussen 1991); in several *Pipizella* species distinctly differentiated; rarely the epandrial arms fuse together, fully enclosing the cerci apically e.g. *Victoriana parvicornis*.	Fig. 58B
epandrial rim	Male terminalia	A border on the apical part of the epandrium in *Pipizella* and *Ceriana* (van Steenis & Lucas 2011; van Steenis *et al*. 2016).	Fig. 58C
epandrium (adj. epandrial)	Male terminalia	Tergum IX, bearing the cerci+anus medially and the surstyli apically; usually clefted apically, but might completely encircle the cercus+anus (e.g. *Victoriana parvicornis*); articulates to the basolateral corners of the hypandrium (Cumming & Wood 2017).	Figs 43C, 45B, 46D, 47B, 48, 49, 50, 51, 54A, 55A, C, 56C, E, 57A, C, D, 58B, E
epaulet (Hippa 1990)	Wing	see **basicosta**	
epifurca	Proboscis.	A small oval sclerite in the middle of the outer wall of the labellum (Schiemenz 1957).	Fig. 22
epimeral spine of metapleura (Reemer & Hippa 2005)	Thorax	see **metapostnotal protuberance**	
epimeral spine of metathoracic pleura (Speight 1987)	Thorax	see **metapostnotal protuberance**	
epimeron (Crampton 1942)	Thorax	see **proepimeron**	
epimeron (pl. epimera)	Thorax	Plates of mesothoracic pleuron behind posterior anepisternum; anepimeron + katepimeron (Cumming & Wood 2017).	Figs 23C, 28, 29A, 30
epimeron of methothoracic pleura and the metathoracic notum sensu Speight (1987)	Thorax	see **metapostnotum**	
epipharynx	Proboscis.	Dorsal and lateral sides of the food canal, connected with the labrum, as part of the haustellum (Gilbert & Jervis 1998).	n/a
epiproct	Female terminalia	Dorsal sclerite of proctiger; single plate in Microdontinae, paired structure in other groups; it can be separate, connected by an apical extension, or fused to cerci (Miranda & Moran 2017).	Figs 52A–C, E
episternum (Crampton 1942)	Thorax	see **proepisternum**	
epistoma (Crampton 1942)	Head	see **postclypeus**	
equilateral	General	All sides of the triangle of equal length and thus all angles too, often used to indicate the relative distance of the ocelli to each other (Merriam *et al*. 2022).	Fig. 5
erect	General	Standing straight up out of the body (Merriam *et al*. 2022). In Syrphidae used for pile and armature, see Fig. 4 in which e.g. the pile and the spina are erect.	Fig. 4
eucoxa	Leg	Anterior part of mesocoxa, often divided into a basicoxa and a disticoxa (McAlpine 1981).	Fig. 42F
external process of sternite 10 (Thompson & Rotheray 1998)	Male terminalia	see **subepandrial sclerite**	
eye	Head	Visual organs on the postero-lateral part of the head, formed by individual ommatidia, the compound eye (McAlpine 1981) here shortened to eye.	Figs 8A, 12B, 15C
eye contiguity	Head	Line along which compound eyes meet in holoptic males; males of some species eyes very narrowly separated medially leaving a bare, shiny area free between eyes; eye-bridge sensu Doczkal & Pape (2009), not to be confused with eye bridge of McAlpine (1981) and others, restricted to a connection of eyes with narrow row of ommatidia forming a bridge between the large compound eyes, not found in Syrphidae see Merz & Haenni (2000); (Thompson 1999).	Figs 6B, 7A
eye-bridge (Doczkal & Pape 2009).	Head	see **eye contiguity**	

face	Head	Antero-ventromedial area of head, bordered dorsally by acetabula /antennal fossa, ventrally by mala, and laterally by eyes, or by parafacial sulcus in several species; very variable among taxa, e.g. flat, concave, convex, with tubercle(s), etc (Crampton 1942).	Figs 6C, 8C, D, 9C, 10A, 12A, B, D, 13A, C, 14A
facet	Head	The outer, transparent, cuticular covering of the individual ommatidia which make up the compound eye.	n/a
facial carina	Head	Longitudinal ridge on face; not facial carina of McAlpine (1981), Cumming & Wood (2017) and Sorkin & Herman (2018) which is a structure separating the acetabula. The carina can either be placed medially, in *Syritta* and *Tropidia scita* or laterally in *Ceriogaster* (after Thompson 1972; Hippa & Ståhls 2005).	Figs 11B, 12A
facial depression (Sorkin & Herman 2018)	Head	see **antennal fossa**	
facial groove (Hippa & Ståhls 2005)	Head	see **facial sulcus**	
facial pit (Curran 1925)	Head	see **anterior tentorial pit**	
facial prominence (Speight 1987)	Head	see **facial tubercle**	
facial ridge (Doczkal & Pape 2009)	Head	see **parafacia**	
facial stripe (Hippa & Ståhls 2005)	Head	see **parafacia**	
facial sulcus	Head	Groove parallel to eye margin along face ending in (anterior) tentorial pit, often a sharp border between face and paraface (Speight 1987).	Figs 10C, D, 12B, 17A, C
facial tubercle	Head	Medial to medio-ventrally positioned tubercle on the face, in *Ornidia obesa* there are more "protuberances" which are called lateral facial tubercles (Speight 1987).	Figs 7C, 10C, 11C, D, 12B, C, 13C, D, 14, 15A, B, 17C
falcate	General	Sickle-shaped, hook-shaped (Sorkin & Herman 2018), an adjective used in male terminalia (Hippa *et al*. 2015) and antennae (Reemer & Ståhls 2013a).	Fig. 5
false vein (Sorkin & Herman 2018)	Wing	see **vena spuria**	
fascia (pl. fasciae, adj. fasciate)	General	A transverse band (Thompson 1999).	Figs 9D, 44A, C, D, 46A, D, 53E, F
Female terminalia	Female terminalia	The female postabdomen with genital organs and adjoining structures. Focusing on mostly sclerotized external structures and not internal soft tissue organs (Cumming & Wood 2017).	Fig. 52
femoral discus	Leg	Flange on the apico-posterior outline of the mesofemur in some *Eumerus* species (van Steenis *et al*. 2017)	Fig. 39A
femoral lamina	Leg	Triangular-shaped anteroventral plate on the apex of the metafemur, like in the genera *Merodon*, *Tropidia* and others (Ssymank *et al*. 2021).	Figs 38C, 40B, 41A
femoral patch of setulae	Leg	Anterobasal area on the femur with short black setulae, present only in Eristalinae (Thompson 1999).	Fig. 39B
femoral spina	Leg	Spur on apico-lateral part of metafemur, as in genera *Milesia* and *Spilomyia* (Hippa 1990).	Fig. 40C
femoral tubercle	Leg	Any rounded to elongate extension of femur, most often on mesofemur as in *Brachypalpus* and *Eumerus stackelbergi*, dentate as in *Syritta* and *Xylota*, or with setae as in *Parhelophilus frutetorum* (Hippa 1978a); not triangular-shaped **femoral spina** or **femoral lamina**, see under those terms for explanation.	Figs 39B, 41A, B
femur (pl. femora, adj. femoral)	Leg	Third basal segment of the leg, between trochanter and tibia (Thompson 1999).	Figs 2A, 38A, D, 39A, C, 40C, D, 41A, 42G.
femoral expansion (Ssymank *et al*. 2021)	Leg	see **femoral lamina**	
fenestra, adj fenestrate	Male terminalia	Membranous areas on genitalia; on hypandrium in several Eristalinae but also found in other tribes (Hippa 1978a; Harris 1979).	Fig. 55C
first basal cell (Speight 2020)	Wing	see **cell br**	

first costal cell (Speight 2020)	Wing	see **cell bc**	
first flagellomere (Cumming & Wood 2017),	Head	see **postpedicel**	
first segment of flagellum (Speight 1987)	Head	see **postpedicel**	
flange (Sorkin & Herman 2018)	General	see **lamina**	
foramen magnum (Sorkin & Herman 2018)	Head	see **occipital foramen**	
fore leg (Cumming & Wood 2017)	Leg	see **proleg**; both terms are interchangeable	
fossette	Head	Elongate cavity on the anterodorsal surface of the postpedicel (Séguy 1961; Doczkal & Pape 2009).	Figs 18C, D
fringed plates (Hurkmans 1993)	Male terminalia	see **postgonite**	
fringed posteroventral extension of subalar sclerite (Ssymank *et al*. 2021)	Thorax	see **plumule**	
frons	Head	In dorsal view, the anterodorsal part of the head, bounded anteriorly by the lunule, laterally by the eye margin and posteriorly by the vertex, or the eye contiguity in holoptic males (Thompson 1999).	Figs 6A, D, 7C, D, 8A, C, D, 9A–C, 13A, C
frontal	General	Used to indicate features of the frons (Sorkin & Herman 2018). This term is thus restricted to the head and used in e.g. frontal triangle (Thompson 1999). Not indicating any direction.	Figs 6B, C, 7A, B, D
frontal lunule (Speight 1987)	Head	see **lunule**	
frontal prominence	Head	In lateral view the anterodorsal produced part around the antennal fossa (parts of the face and frons), more or less triangular-shaped, posterolaterally bounded by the eyes, and anteriorly by the lunule or the antennifer (in part Thompson 1999).	Figs 12A, C, 13, 14A, B, D, 15A
frontal rugae	Head	Area of rugae on ventral part of frons; *Phytomia* (De Meyer *et al*. 2020)	Fig. 11D
frontal striae (Speight 2020)	General	see **regulae**	
frontal triangle	Head	In holoptic males, the frons is bordered posteriorly by the eye contiguity, giving it a triangular shape (Thompson 1999).	Figs 6B, C, 7A, B
frontal tubercle	Head	Tubercle on frons, dorsal to frontal prominence, found in some species of *Nausigaster*. Not frontal tubercle of Speight (1987) which is frontal prominence and not frontal tubercle of McAlpine (1981) which is a structure of the vertex, hypothesised to be modified ocelli.	Fig. 15B
frontal tubercle (McAlpine 1981)	Head	a structure of the vertex, possibly modified ocelli	
frontal tubercle (Speight 1987)	Head	see **antennifer**	
fumose, fumeus (Sorkin & Herman 2018)	General	see **infuscate**	
fulcrum	Proboscis.	Extension sclerite of the rostrum (Gilbert & Jervis 1998)	Fig. 22
furca	Proboscis.	Sclerotized strengthening on the labellum, together with the epifurca, apical sclerite and paraphysis (Schiemenz 1957).	Fig. 22
furcasternum	Thorax	Furcasternum, a distinct part of the sternum, serving as a site for muscle attachment (McAlpine 1981).	Figs 25A, 26C
furcate	General	Latin for forked (Sorkin & Herman 2018), used in the postpedicel which can be bi- or multifurcate in *Cacoceria* and several Microdontinae, also used for pile or features of the terminalia.	Figs 21B, D
gena (pl. genae)	Head	Area on head ventral to eye, anterior to occiput and posterior to tentorial pit and buccal sulcus; more restricted definition (as Snodgrass 1960), not broader definition used by McAlpine (1981) and Thompson (1999), which includes part of mala, after Crampton (1942).	Figs 11C, D, 12, 13B–D, 14, 15A, 16B, D, 17B–D

gena of authors (McAlpine 1981; Thompson 1999)	Head	see **parafacia**	
genal sulcus	Head	Groove on the ventral part of the head, extending from the anterior tentorial pit to the eye margin (after Speight 1987).	Figs 12A, 13A, 16B, 17A
genal suture (Doczkal & Pape 2009)	Head	see **genal sulcus**	
genital chamber	Female terminalia	Membranous pocket, invaginated into segment VIII, with external opening between apex of sternum VIII and hypoproct; may have a distinct sternum IX on its dorsal wall; a more restricted view of the term genital chamber of Kotrba (2000), which is here limited to the external invaginated area located between the secondary gonopore and the genital opening (Miranda & Moran 2017).	Figs 52D, E
genital opening	Female terminalia	Opening of genital chamber to exterior; ventrally located, between sternum VIII and hypoproct (Kotrba 2000; Miranda & Moran 2017).	Figs 52D, E
genital opening (Cumming & Wood 2017)	Female terminalia	see **secondary gonopore**	
genital orifice/genital cleft (Kotrba 2000)	Female terminalia	see **genital opening**	
gonite (Claussen 1991)	Male terminalia	see **postgonite**	
Gonotreme (Nayar 1965), gonotrema (Kotrba 2000)	Female terminalia	see **genital opening**	
granulum (pl. granula, adj. granulate)	General	Upheaved ornamentation of cuticle, grain-like, triangular to rounded and often black found in Cerioidini and some *Paragus* species. In Syrphidae, granula always surrounding single pilus or alveoli (Sorkin & Herman 2018).	Fig. 53C
hair (Speight 1987)	General	see **pile**	
haltere (pl. halteres)	Wing	Drumstick-shaped reduced second wing, for balance during flight; consists of scabellum, pedicellum and capitulum (Thompson 1999).	Figs 23C, D, 27C, 29A
hamus (pl. hami)	Male terminalia	Hook-like paired structure attached dorso-basally to the phallus and to the interior dorso-lateral wall of the hypandrium, and seamlessly connected ventrally to the apex of the phallapodeme. Seen in *Eumerus*; possibly homologous to the 'lateral sclerite of the aedeagus' in *Merodon* (Doczkal 1996).	Fig. 54D
hang-vein (Speight 2020)	Wing	see **appendix R_{4+5}**	
Head	Head	Anterior division of the insect body (Thompson 1999).	Figs 1A–C, 3A, 5–17, 53C
hind leg (Cumming & Wood 2017)	Leg	see **metaleg**; both terms are interchangeable	
haustellum	Proboscis.	Apical of the two main parts of the proboscis (Gilbert & Jervis 1998).	Fig. 22
holoptic	Head	Eyes meet each other dorsally between antennal base and vertex; condition seen only in males (Cumming & Wood 2017).	Figs 6B, C, 10B
horn-shaped production (Curran 1941)	Abdomen	see **lateral tubercle of tergum II**	
humeral plate (Speight 1987; Cumming & Wood 2017)	Wing	see **basicosta**	
humerus, humeral callus (McAlpine 1982)	Thorax	see **postpronotum**	
hyaline	General	Transparent or clear; mostly used for the wing (Thompson 1999).	Fig. 35D
hypandrial arms	Male terminalia	Apico-dorsal portion of hypandrium that articulates with base of subepandrial sclerite, usually connecting dorsally over phallus (Cumming & Wood 2017). Usually fused in Syrphidae, forming dorsal wall on hypandrium, and can be narrow/short to wide/long; subepandrial sclerite always articulating with basal portion of this area.	Fig. 55D

hypandrial labium	Male terminalia	Weakly chitinous flange on the baso-dorsal margin of the hypandrium, found in several species of *Pipizella*; inner median flange of hypandrium; "auffaltung der dorsalen Hypandriumwand" (Claussen 1991; van Steenis & Lucas 2011).	Fig. 58B
hypandrial process	Male terminalia	Additional extension of the hypandrium, most often tooth-like and apically placed; upper process of hypandrium; appendage upper process of hypandrium (van Steenis & Lucas 2011).	Figs 58D, E.
hypandrium (adj. hypandrial)	Male terminalia	Sternum IX + fused gonocoxites (indistinguishable from one another), ventral segment of male genitalia, articulating to baso-lateral corners of epandrium; bears postgonites apically; seem to have two distinct components in Microdontinae: a basal, convex in lateral view, sclerotized part and an apical, microtrichose, less sclerotized part, possibly fused gonocoxal component (Reemer & Ståhls 2013a).	Figs 43C, 46D, 47B, 48A–C, 49A, 50A, 51A, C, D, 54B, D, 55B, D, 56A, C, E, 57A, C, D, 58D, E.
hypopharynx	Proboscis.	Tongue-like process between the labrum and the rest of the haustellum; with salivary canals (Gilbert & Jervis 1998).	Fig. 22
hypopleuron (McAlpine 1981)	Thorax	see **meron**	
hypoproct	Male terminalia	Sclerite ventral to cerci, ventral to anus; indistinguishable in male Syrphidae; not to be confused with the subepandrial sclerite (Cumming & Wood 2017).	n/a
hypoproct	Female terminalia	Membranous unpigmented to lightly pigmented; as a distinct plate only in the Microdontinae; might bear a posterior apodeme (Miranda & Moran 2017).	Figs 52D, E
hypopygium	Male terminalia	Epandrium, hypandrium and associated structures (Cumming & Wood 2017).	Figs 55C, 57A, C, D
hypostomal bridge	Head	Region ventral to occipital foramen, bounded by the postgena, and sometimes separated by a suture, including transverse crest of hypostomal bridge (Doczkal & Pape 2009); not hypostomal bridge of Doczkal & Dziock (2004), which is the postgena (McAlpine 1981).	Figs 15C, D, 16A, C
incrassate	General	Thickened, swollen; often used in combination with the shape of the metafemur or the arista (Sorkin & Herman 2018).	Figs 19C, 20D, 41A
inferior lobe of gonite (Claussen & Hayat 1997)	Male terminalia	see **ventral postgonite**	
infuscate (adj. infuscated)	General	Darkened; an adjective used for a partly to entirely darkened wing (Sorkin & Herman 2018).	Figs 35B, 36A
inner median flange of hypandrium; auffaltung der dorsalen Hypandriumwand (Claussen 1991; van Steenis & Lucas 2011)	Male terminalia	see **hypandrial labium**	
inner prong of the ejaculatory hood (Thompson 1974	Male terminalia	see **inner surstylar lobe**	
inner surstylar lobe	Male terminalia	Basal lobe on medial surface of surstylus in *Trichopsomyia* and several *Sphegina*; "zahn des syrstylus" (Claussen *et al*. 1994; Hippa *et al*. 2015).	Fig. 58F
isosceles	General	A triangle with two sides of equal length, often used to indicate the relative distance of the ocelli to each other (Merriam *et al*. 2022)	Fig. 5
katatergite (McAlpine 1981)	Thorax	see **katatergum**	
katatergum	Thorax	Dorsoposterior plate of mesothoracic pleuron, dorsal to posterior spiracle (Thompson 1999).	Figs 28A, 30A
katepimeron	Thorax	Posteroventral plate of the mesothoracic pleuron; demarcation between katepimeron and meron often weak (Thompson 1999).	Figs 23C, 28, 30A
katepisternum	Thorax	Anteroventral plate of mesothoracic pleuron; sternopleuron of older authors (Thompson 1999).	Figs 28, 29B, 30A, 31
knob (Cumming & Wood 2017)	Wing	see **capitulum**	

labellum	Proboscis.	Apical cushion-like prolongation of the labium, with pseudotracheae; they are highly modified labial palps (Gilbert & Jervis 1998).	Fig. 22
labium	Proboscis.	Forms the ventral wall of the proboscis, the prementum + labellum; connected to apical part of fulcrum (Gilbert & Jervis 1998)	n/a
labrum	Proboscis.	Dorsal and lateral sides of the food canal, connected with the epipharynx, as part of the haustellum (Gilbert & Jervis 1998).	Fig. 22
lacinia	Proboscis.	Blade-like sclerite, connected with the maxillary palp and stipes (Gilbert & Jervis 1998))	Fig. 22
lamina (pl. laminae, adj. laminate)	General	Thin extension of the exoskeleton, not much longer than high, plate (Thompson 1999).	Figs 4, 38B, C, 40B, 41A
lateral (adv. laterally)	General	At the side, away from the centre; opposite of medial (Thompson 1999).	Fig. 1B
lateral arm of lunule	Head	The lunule consists of two lateral arms and in many cases a medial arm (Speight & Sarthou 2017).	Figs 10C, D
lateral cervical sclerite	Thorax	Laterally positioned sclerite of the cervix (Martin 1916).	Figs 23B, 25A, C, D, 26C
lateral facial strips (Shannon 1922a)	Head	see **parafacia**	
lateral facial tubercles	Head	Tubercles on the dorso- and ventrolateral side of face as in *Ornidia obesa* (Thompson 1972).	Fig. 14C
lateral keel (Thompson 1972)	Head	see **facial carina**	
lateral lobes to epiproct	Female terminalia	Small pigmented area located baso-laterally to the epiproct in 'Eristalinae'; might bear pile; assumed as tergum IX by authors (Miranda & Moran 2017).	Fig. 52C
Lateral parapsidial suture (Cumming & Wood 2017)	Thorax	see **parapsidal suture**	
lateral plate (Thompson 1972)	Leg	see **femoral lamina**	
lateral sclerite of phallus	Male terminalia	Sclerotized structure that sheathes the phallus in *Merodon*; seemingly continuous with the phallapodeme (Marcos-García *et al*. 2007).	Fig. 54C
lateral strips	Male terminalia	In some Microdontinae, basal dark lines on both sides of the ejaculatory hood that seem to extend into the hypandrium (Reemer & Ståhls 2013a, b).	Fig. 56E
lateral tubercle of tergum I	Abdomen	Rounded and slightly upheaved section on anterolateral corner of tergum I in several Microdontinae and Cerioidini; erroneously mentioned as callus on 2nd tergite in Speight (1987).	Figs 3A, 29B, 43A, 46A, 53F
lateral tubercle of tergum II	Abdomen	Dens-like protuberance on anterolateral margin of tergum II, in *Nausigaster* (Shannon 1922a) and *Ubristes* (Reemer & Ståhls 2013a).	Fig. 47E
laterotergite (McAlpine 1981)	Thorax	see **anatergum and katatergum**	
laterotergite (Speight 1987)	Thorax	see **anatergum**	
laterotergum	Thorax	Lateral part of postnotum ventrally from the scutellum, the anatergum + katatergum (McAlpine 1981).	Fig. 27C
Leg	Leg	The thoracic locomotory organ; paired organs in descriptions used in singular form, e.g. proleg, mesoleg and metaleg; proleg (singular) in contrast to prolegs, which is the term used for the locomotory organs of dipteran larvae (Thompson 1999).	Figs 1A, B, D, 2, 32B, C, 38–42, 53A, B
lingula	Male terminalia	An apical projection from the ventral surface of the hypandrium, e.g. *Merodon tarsatus* (Metcalf 1921; Speight 1987).	Figs 56A, C, 58A
lingular appendages; apico-lateral; medio-dorsal projection; medio-ventral flange; dorso-basal tooth (see van Steenis *et al*. 2016).	Male terminalia	see **lingular process**	
lingular process	Male terminalia	Apically placed processes of lingula, e.g., Cerioidini (van Steenis *et al*. 2016).	Figs 56C, 58A
longitudinal depression (Sedman 1964)	Head	see **medial frontal sulcus**	

longitudinal furrow (Sedman 1964)	Head	see **medial frontal sulcus**	
lower pair (Shatalkin 1981)	Female terminalia	see **apodemes of the epiproct**	
lunulate	General	Adjective for more deeply curved macula or vitta (Thompson 1999).	Figs 5, 44C
lunule	Head	Anterior boundary of frons, above acetabula; different texture and usually shiny, bare and differently coloured than rest of frons, consisting of two lateral arms and in many cases a medial arm; not lunule of Cumming & Wood (2017) (Thompson 1999).	Figs 6A, B, D, 7C, D, 8D, 9B, 10A, B, 11A, C
M_4 base	Wing	Base of vein M_4, a crossvein between veins M_4, M and crossvein m-cu; crossvein bm-m in Cumming & Wood (2017). In the old system crossvein m-cu and bm-cu, in part (McAlpine 1981).	Figs 34A, 37C
macrotrichium (pl. macrotrichia, adj. macrotrichose)	General	Vestiture connected to nerves and arising from an alveolus. Found on the body surface and sometimes also on the wing veins, comprising pile, cilium, seta, setula and scale (Thompson 1999).	Figs 4, 39A, B
macula (pl. maculae, adj. maculate)	General	A marking on the insect body, requiring an adjective to describe its shape, e.g. arcuate, lunulate, rectangular (= bar), punctate, triangular, round (= spot) (Thompson 1999).	Figs 3D, 9D, 43D, 44A–C, 45A, C, 46C, D
mala (pl. malae)	Head	Anteroventral part of face (Taxo-Fly); not a true structure but area often non-pilose and black with shiny areas, contrasting to rest of face; part of prefrons (Crampton 1942), part of the rostrum or nasus in Tipulidae (Cumming & Wood 2017) and part of the "snout" in Syrphidae (Ssymank *et al*. 2021).	Figs 12A, C, D, 13, 14A, C, D, 15B, 16D, 17C, D
malar tubercle	Head	Lateral protuberance at the antero-ventral corners of the anteroventral part of the face, i.e. mala.	Figs 11B, 12B, 13B, 14B
Male terminalia	Male terminalia	The male postabdomen with its genitalia and adjoining structures (Cumming & Wood 2017)	Figs 43C, 46A, D, 47B, C, 48–51, 54–57
marginal cell; cell M (Speight 2020)	Wing	see **cell r_1**	
markings	General	Different patterns of the integument of the body, might be from different colouration/reflection of the exoskeleton or different coloured/type of microtrichia/macrotrichia; further classified into macula, fascia or vitta (Thompson 1999).	Figs 3D, 9D, 43D, 44A–C, 45C, 46C, D
matt(e) (Merriam *et al*. 2022)	General	see **dull**	
maxillary palp	Proboscis.	Sensory appendage on the maxilla (Speight 1987).	Fig. 22
medial (adv. medially)	General	On, or towards, the middle/centre of a structure (Thompson 1999).	Fig. 1B
medial arm of lunule	Head	The lunule consists of two lateral arms and in many cases a medial arm (adopted from Speight & Sarthou 2017).	Fig. 10D
medial callus, in *Graptomyza* (Ssymank *et al*. 2021)	Head	see **facial tubercle**	
medial frontal sulcus	Head	Medial longitudinal impression on the frons; in some species visible as a non-pruinose shiny depression (after Sedman 1964, 1965).	Figs 6B, D, 11C
medial surstylar lobe	Male terminalia	Medial lobe of the surstylus on the ventral margin (Hippa 1978a).	Fig. 54A
median keel (Thompson 1972)	Head	see **facial carina**	
median mesocoxite (Speight 1987)	Leg	see **basicoxa**	
median postnotal sclerite of mesonotum (Speight 1987)	Thorax	see **mediotergum**	
median spinose ridge (Hippa 1978a)	Leg	see **tibial carina**	
median vein (Speight 2020)	Wing	see **vein M**	

median-cubital crossvein; crossvein m-cu (Speight 2020)	Wing	see **crossvein dm-m**	
mediocoxal spina	Leg	Medio-lateral extension on the mesocoxa (McAlpine 1981).	Fig. 42F
mediotergal suture	Thorax	Dorsoventral suture on the posterior part of the thorax, lateroventrally to the scutellum, located between the medio- and laterotergum	Fig. 27B
mediotergum	Thorax	Part of the postnotum ventral to the scutellum; part of subscutellum sensu Doczkal & Dziock (2004) (Cumming & Wood 2017). In some Cyclorrhapha, named the dorsal transverse convex bulge bordering the mediotergum as subscutellum (McAlpine 1981).	Figs 27B, C
membranous socket (McAlpine 1981)	General	see **alveolus**	
meron	Thorax	Posteroventral plate of the mesothoracic pleuron ventrally to katepimeron, The demarcation between the meron and the katepimeron is not always clear, earlier authors used meropleuron for this fused plates; meropleuron, hypopleuron (McAlpine 1981).	Figs 23C, 28A, 29B, 32B, 42F, G.
meropleuron (McAlpine 1981)	Thorax	see **meron**	
meso	General	Related to the mesothorax; middle, mid; used for the leg or thoracic pleura (Thompson 1999).	Fig. 2A
mesoanepimeron (Thompson 1999)	Thorax	see **anepimeron**	
mesoanepisternum (Thompson 1999)	Thorax	see **anepisternum**	
mesocoxite of middle leg (Speight 1987)	Leg	see **eucoxa**	
mesoleg	Leg	The leg, related to the mesothorax (Thompson 1999).	Fig. 2A
mesonotum	Thorax	Dorsal part of thorax including scutum and scutellum (Thompson 1999).	Fig. 23A
mesopleuron (Thompson 1999)	Thorax	see **anepisternum**	
mesoscutum (Thompson 1999)	Thorax	see **mesonotum**	
mesothoracic leg (Sorkin & Herman 2018)	Leg	see **mesoleg**	
meta	General	Related to the metathorax; last, hind; used for the leg or thoracic pleurae (Thompson 1999).	Fig. 2A
metabasisterno-precoxite (Speight 1987)	Thorax	see **metasternum**	
metaepimeron, in part (Thompson 1999)	Thorax	see **metepimeron**	
metakatepimeron	Thorax	Sclerite of the metepimeron, anterodorsally to metacoxa. The different sclerites of the metepisternum are not always clearly defined, visible in some Microdontinae (Tachi 2014).	Figs 32B, C
metakatepisternum	Thorax	Sclerite of the metepisternum, antero-dorsally to metacoxa. The different sclerites of the metepisternum are not always clearly defined (Tachi 2014).	Figs 23C, 28B, 29, 32B, C
metaleg	Leg	The leg, related to the metathorax (Thompson 1999).	Fig. 2A
metanepimeron	Thorax	Sclerite of the metepmeron, antero-dorsally to metacoxa. The different sclerites of the metepisternum are not always clearly defined (Tachi 2014).	Figs 32B, C
metanepisternum	Thorax	Sclerite on which the posterior thoracic spiracle is embedded in. Part of the metepisternum, not always clearly defined (Tachi 2014).	Figs 28B, 32B, C
metanotum	Thorax	Sclerite of the metathorax, ventrally to the postnotum and hidden under the connection of tergum I and the thorax, so only visible when detaching the abdomen from the thorax (Crampton 1942).	Figs 27A, B

metanotum sensu Hippa & Ståhls (2005).	Thorax	see **subscutellum**	
metapleuron	Thorax	Sclerite ventrally to the metanotum. The metapleuron is differentiated into the presutural metepisternum (EPS) and postsutural metepimeron (EPM) by the metapleural suture (Tachi 2014).	Figs 32D, E
metapostnotal "protuberance"	Thorax	Tuberculate or dens-like protuberance on the dorsolateral margin of the metapostnotum, in dorsal view visible at the anterolateral corner of tergum I, clearly visible in *Neoascia* and several Cerioidini (after Tachi 2014). Epimeral spine of metathoracic pleura (Speight 1987) or epimeral spine of metapleura (Reemer & Hippa 2005).	Figs 27D, 30A, 45A, 46A, B
metapostnotal tubercle	Thorax	Tubercle on posteromedial surface of metapostnotum, might be functioning as articulating point with tergum I (see Tachi 2014).	Fig. 29B
metapostnotum	Thorax	Connective sclerotized membrane between abdomen and thorax, visible as two round projections at anterolateral corner of tergum I, sometimes connected dorsally along "metanotum" and lateroventrally ending in the metepimeron (Tachi 2014). In part metepimeron sensu Thompson (1999).	Figs 23C, 27A, C, D, 28, 29A, 30A, 32B, C, 43A–C, 44A, D, 45A, 46C
metasternum	Thorax	Ventral thoracic plate anterior to metacoxa; metabasisterno-precoxite (Speight 1987) is a more accurate term, but not likely to be used, nor used in the past (Shannon 1926a; Thompson 1999).	Figs 28A, 29B, 31
metathoracic leg (Sorkin & Herman 2018)	Leg	see **metaleg**	
metathoracic spiracular pile patch (Thompson 1972)	Thorax	see **posterior spiracular fringe**	
metepimeron	Thorax	A small sclerite ventrally between the metepisternum sensu McAlpine (1981) and metapostnotum (Tachi 2014).	Figs 28B, 29B, 32D, E
metepisternum	Thorax	Anterior part of metathoracic pleuron; combined sclerite of metakatepisternum (ventral part) and metanepisternum (dorsal part) together (Tachi 2014).	Fig. 32D
microtrichium (pl. microtrichia, adj. microtrichose)	General	Usually smaller vestiture, without an alveolus or nerve connection, found on the entire body surface and especially used in connection to the wing (Thompson 1999).	Figs 4, 34B
mid coxal prong (McAlpine 1981)	Leg	see **mediocoxal spina**	
mid leg (Cumming & Wood 2017)	Leg	see **mesoleg**; both terms are interchangeable	
mouth opening (HAO 2010)	Head	see **subcranial cavity**	
neck (Cumming & Wood 2017)	Thorax	see **cervix**	
notal wing lamina	Thorax	Flap-like extension of the scutum at the base of the wing, e.g. found in *Eumerus*, *Nausigaster* (Thompson 1999; Hippa & Ståhls 2005).	Fig. 28A
notal wing process	Wing	Lateral processes of scutum which articulate with axillary sclerites of wing; 1. anterior notal wing process connects to medioposterior axillary sclerite (first axillary sclerite); 2. median notal wing process (pleural wing process), connects to medioanterior axillary sclerite (second axillary sclerite); 3. posterior notal wing process, connects to lateroanterior axillary sclerite (third axillary sclerite), and the apical portion of this process is assumed to have been detached from the thoracic wall and represents the fourth axillary sclerite. The processes are inconspicuous due to their articulation with the axillary wing sclerites (McAlpine 1981; Dessì 2016).	n/a
notal wing shield (Thompson 1972)	Thorax	see **notal wing lamina**	
notaulus (Sorkin & Herman 2018)	Thorax	see **parapsidal suture**	
notched; oral margin (Thompson 1972; Hippa & Ståhls 2005)	Head	see **clypeal tubercle**	

notopleural sulcus	Thorax	Sulcus anterior to notopleuron and ending medially in transverse sulcus. Same term in Coleoptera (Evans 1974) and Hemiptera (Ouvrard *et al*. 2002), but homology uncertain, this term is here used for the first time in Syrphidae.	Fig. 29A
notopleural suture (Crampton 1942)	Thorax	see **parapsidal suture**	
notopleuron	Thorax	Anterolateral part of the scutum posterior to postpronotum and anterior to transverse sulcus; presutural area, -callus, -depression (Thompson 1999).	Figs 23A, D, 24, 30A, 53F
oblique	General	An adjective to denote the direction of e.g. macula (Thompson 1999).	Figs 5, 44B, 45C
occipital carina	Head	Ridge-like part on the posterodorsal part of the postcranium, or the posterior margin of the dorsal occiput in many species of the genera *Ceriana* and *Eumerus*, after Doczkal & Pape (2009). Thickened part of the occiput posterior to the ocellar triangle (Thompson 1972).	Figs 3A, 6C, 7A, 9C, 12D, 15D
occipital foramen (pl. occipital foramina)	Head	Contiguous opening in the postcranium, with two finger-like projections making the opening have a figure 8 appearance. Bounded ventrally by the hypostomal bridge (Nayar 1964; Harbach & Knight 1980).	Figs 15D, 16C
occipital setae (Sorkin & Herman 2018)	General	see **cilium**	
occipital sulcus	Head	Dorsal sulcus on the postocciput, lateroventral border of the postvertex; not occipital sulcus sensu Sorkin & Herman (2018), after Speight (1987).	Figs 15C, 16A
occipital tubercle	Head	Rounded swelling on the dorsoposterior margin of the postocular orbit; as seen in *Spheginobaccha* (Thompson 1999)	Fig. 8A
occiput	Head	Posterior area of head closest to posterior eye margin, consisting of a dorsal (or lateral, area immediately posterior of the ocellar triangle), medial (posterior of the eye margin) and ventral (posteroventrally to eye margin) part; differentiated from postocciput by presence of macrotrichia and, in some species, separation by postcranial carina; a broader definition than Cumming & Wood (2017) (Thompson 1999).	Figs 6A, C, 7A, B, D, 8B, C, 12B, C, 13B, 14A, 15C, D, 16A, C
ocellar triangle	Head	Triangular elevated area on which the three ocelli are situated (Thompson 1999).	Figs 6A, C, 7A, B, D, 8A–C, 9B, C, 10A, B, 13A, B, D, 15B, C
ocellus (pl. ocelli)	Head	Simple eye (single beadlike lens), located medially on vertex/vertical triangle, one anterior and two posterior (Thompson 1999), in some Microdontinae only two or even four present (Reemer & Ståhls 2013a).	Figs 6D, 12B
ocular arm of anterior tentorial sulcus (Speight 1987)	Head	see **genal sulcus**	
ocular strips (Vujić & Claussen 2000)	Head	see **paravertica**	
odd little lobes (Hull 1949)	Abdomen	see **ventral dens of tergum IV**	
ommatidium (pl. ommatidia)	Head	Single unit of the compound eye (McAlpine 1981).	n/a
oral fossa (HAO 2010)	Head	see **subcranial cavity**	
orbital strips (Speight 1987)	Head	see **parafacia**	
orientation	General	In the three dimensional world there are three planes, in insects they are the sagittal, the transverse and the horizontal plane. The orientation of body parts in each of the planes is given by the following terms: lateral-medial; dorsal-ventral and anterior-posterior. An additional fourth orientation indicating an in- or outwards direction has the terms apical-basal (Thompson 1999).	Figs 1B–D, 2
oval	General	Oval shaped, an adjective used to indicate the shape of the basoflagellomere, the abdomen or macula (Sorkin & Herman 2018).	Figs 5, 44A

parafacia (pl. parafaciae, adj. parafacial)	Head	A narrow strip on the frontal part of the face located posterior to the buccal, facial, and/or genal sulcus, anterior to the eyes, and dorsal to the gena; not parafacial of McAlpine (1981), since that is defined by the facial ridge and ptilinal suture, which are limited to Schizophora (after Thompson 1999).	Figs 10D, 11B, C, 12A–C, 13B, C, 14A, 16B, 17A, B, D
paraphysis	Proboscis	Sclerotized strengthening on the labellum, together with the epifurca, furca and discal sclerite (Schiemenz 1957).	Fig. 22
parameral sheath (Cumming & Wood 2017)	Male terminalia	see **phallus**	
parameral sheet	Male terminalia	Fused and modified parameres; combined with the aedeagus to form the **phallus** (Cumming & Wood 2017).	n/a
paramere (McAlpine 1981)	Male terminalia	see **postgonite**	
paraphysis	Proboscis.	Sclerotized strengthening on the labellum, together with the epifurca, furca and discal sclerite (Schiemenz 1957).	Fig. 22
parapsidal suture	Thorax	Line of junction between the scutum and pleuron; suture along the scutum ventrally to the notopleuron and anteriorly to the notal wing lamina (McAlpine 1981).	Fig. 29B
parasagittal sulcus (Speight 1987)	Head	see **occipital sulcus**	
paravertica (pl. paraverticae)	Head	Lateral longitudinal area on vertex, along eye margin; delimits a strip along eye margin of different texture than rest of frons, see parafacia (ocular strips Vujić & Claussen 2000). Not the region where the paravertical bristles are located (Steyskal 1976).	Figs 8B, 9A
paravertical sulcus	Head	Sulcus on the dorsal part of the head along the eye-margin separating the paravertica from the rest of the vertex.	Fig. 9A
pectinate	General	Comb-shaped; very densely arranged setae on either side of the structure where it is found; one type of arrangement for the vestiture of the arista (Sorkin & Herman 2018).	Fig. 21A
pedicel	Head	Second antennal segment, between the scape and postpedicel (Stuckenberg 1999).	Figs 18A, B, 19D, 20B
pedicellum	Wing	Medial part of halter, the stem; connecting the scabellum (base) to the capitulum (knob) (Harbach & Knight 1980).	Fig. 23C
penis sheath (Metcalf 1921)	Male terminalia	see **hypandrium**	
peristoma	Head	Sharp narrow part at lower region of the mala in some species of *Sphegina* (e.g. *S. latifrons*, *S. licina*), separating the gena and the rest of the mala from the subcranial cavity along the ventrolateral part of the head; not epistoma, as that is regarded to be the postclypeal region (Crampton 1942) after van Steenis *et al*. (2018b).	Fig. 13A
petiole (adj. petiolate)	General	A stem or stalk on a structure, narrower than the rest of the structure; commonly used to refer to the base (petiole) or overall shape (petiolate) of the abdomen or wing cells (Thompson 1999).	Fig. 46B
phallapodeme	Male terminalia	Rod-shaped appendage articulating with the base of the phallus, supporting its movement during copulation; might have apical modifications which associate through different lengths with the phallus; absent in Microdontinae, except African *Spheginobaccha* (Reemer & Ståhls 2013a; Cumming & Wood 2017).	Figs 54C, D, 55B–D, 56B, D, 57
phallotrema	Male terminalia	External genital opening at the apex of the phallus (Cumming & Wood 2017).	n/a
phallus	Male terminalia	Intromittent copulatory organ, aedeagus + parameral sheath; might be a single or two-segmented (basiphallus and distiphallus) structure. In Microdontinae divided into ejaculatory hood and ejaculatory duct (Thompson 1969): ejaculatory hood involves and follows most of the shape of internal space where sperm is pumped through, with a basal spherical part (chitinous box) and tubular part that bifurcates into dorsal and ventral processes (Metcalf 1921; Thompson 1969).	Figs 48A, 49B, 50B, 54C, D, 55B, 56B, D, E, 57, 58B, D

pile; (sing. pilus); (adj. pilose); (pl. pili)	General	A threadlike macrotrichium covering the body of adult insects; thinner than setae/setulae; Latin noun for hair; use of pile is recommended for pragmatic reasons, leaving singular 'pilus' for specific cases where the user needs to refer to a single one (Shannon 1922a, in part Thompson 1999).	Figs 4, 19B, 20C
plate (Sorkin & Herman 2018)	General	see **lamina**	
pleural suture	Thorax	Vertical suture line from the mesocoxa to the anterior wing base, between anepisternum and anepimeron often forming a membranous cleft between these sclerites (Crampton 1942; McAlpine 1981).	Figs 28A, 30B
pleuron (pl. pleura)	Thorax	Lateral part of thorax (Sorkin & Herman 2018).	Figs 28–30
pleurotergite (Thompson 1999)	Thorax	see **katatergum**	
plumose	General	Most often used to refer to an arista with distinct vestiture, in this case long pile on the entire surface of the arista (Sorkin & Herman 2018).	Figs 20A, 21C
plumule	Thorax	Extended posteroventral margin of the subalar sclerite, dorsal to the anepimeron, pilose; often feather-like (Thompson 1999).	Figs 23C, 27B, 30B
pollen, pollinose (Thompson 1999)	General	see **pruinescence**	
post-anal hood	Male terminalia	Membranous lobe placed between the two surstyli, connected to the subepandrial sclerite; postanal hood; postanalanhang; postanallamelle (Claussen 1991; Claussen *et al*. 1994; Coovert & Coovert 1996).	Figs 58C, E, F
post cephalic region (Speight 1987)	Head	see **postcranium**	
postocular orbit (Speight 1987)	Head	see **occiput**	
postabdomen	Female terminalia	Usually telescoped into the preabdomen; usually less sclerotized or with different patterns of sclerotization when compared to the preabdominal segments; segment VII and onwards for most Syrphinae, VI and onwards for the remaining groups (Miranda & Moran 2017).	Fig. 52
postalar callus	Thorax	Posterolateral elevated part of the scutum (Thompson 1999).	Figs 23A, D, 24, 28B, 30A, 32A, D
postalar carina	Thorax	Ridge running from postpronotum to wing base (after McAlpine 1981).	Figs 32A, D
postalar pile tuft (Thompson 1999)	Thorax	see **supra-alar pile tuft**	
postalar ridge (McAlpine 1981).	Thorax	see **postalar carina**	
postalar wall	Thorax	Ventrolateral surface below the postalar carina, often with a different texture than the postalar carina (McAlpine 1981).	Fig. 32A
postalare, postalar bridge (Sorkin & Herman 2018).	Thorax	see **postalar carina**	
postclypeus	Head	Dorsal or basal part of a divided clypeus; normally if the proboscis is retracted into the buccal cavity, the postclypeus is actually placed anteriorly to the clypeus (Speight 1987).	Figs 16B, 17A, 22
postcranial carina (Speight 1987)	Head	see **postcranial suture**	
postcranial suture	Head	Border between occiput and postocciput, seen as an angulate structure on the head capsule (adjusted from Speight 1987).	Fig. 16B
postcranial tubercle	Head	Elevated part lateral to the occipital foramen; same area of the "band of sensilla on postgena" sensu Speight (1987); often not present but might be differentiated by the "band of sensilla" or another different texture (adjusted from Doczkal & Pape 2009).	Figs 8A, 15C, D, 16A, C
postcranium	Head	Posterior portion of the head, posterior to the compound eyes, consisting of the occiput, postgena, postocciput and hypostomal bridge (McAlpine 1981).	Fig. 16A
posterior (adv. posteriorly)	General	Away from the head end of the fly; opposite of anterior (Thompson 1999).	Figs 1B–D, 2, 54B

posterior anepimeron	Thorax	Posterior part of the plate ventral to the wing base, pilose in some species (Thompson 1999).	Figs 29A, 30B
posterior anepisternum	Thorax	Posterior convex part of the anterodorsal plate of mesothoracic pleuron (Thompson 1999).	Figs 28, 30A
posterior cell; cell po (Speight 2020)	Wing	see **cell r_{4+5}**	
posterior cervical sclerite	Thorax	Posteroventrally positioned sclerite of the cervix, mostly triangular shaped sclerite (Martin 1916).	Figs 23B, 25A, C, 26C
posterior mesocoxite (Speight 1987)	Thorax	see **meron**	
posterior ocellus (pl. ocelli)	Head	Two simple eyes, symmetrically placed on the posterior part of the ocellar triangle (Thompson 1999).	Figs 6D, 12B
posterior spiracle	Thorax	Metathoracic spiracle (McAlpine 1981).	Figs 27B, D, 29B
posterior surstylar lobe	Male terminalia	Posterior portion of a bilobed surstylus (Metcalf 1921).	Fig. 54A
posterior tentorial pit	Head	Invagination of the exoskeleton on the head that serves as an internal attachment site for muscles; visible externally on the posterior part of the head, ventrolaterally to the occipital foramen (Harbach & Knight 1980).	Figs 15C, D, 16C
posterior tentorial sulcus	Head	Sulcus on the postocciput from the hypostomal bridge to the posterior tentorial pit (Nayar 1964).	Figs 15D, 17B
postero-lateral spina of abdomen	Abdomen	Sharp posterolateral triangular extension on terga III and IV, as seen in several *Chrysotoxum* species (Shannon 1926b).	Fig. 44B
postgena	Head	Ventral part of postcranium. Harbach & Knight (1980), McAlpine (1981).	Figs 15C, D, 16, 17B, D
postgonite (pl. postgonites)	Male terminalia	Pair of articulated lobes on apical portion of the hypandrium, flanking the phallus; hypothesised to be derived from the gonocoxite; might be fused to hypandrium or absent, e.g. Microdontinae (Sinclair 2000).	Figs 55B, D, 56A, C, 57A, C, D, 58A, B, D, E.
postmetacoxal bridge	Thorax	Sclerotized area posterior and dorsal to the metacoxa connecting the epimeron with the furcasternum. Tending to be correlated with petiolate abdomen and enlarged metafemora (Thompson 1999).	Fig. 30A
postnotum	Thorax	Thoracic sclerite bounded by the scutellum and the metanotum divided into a medial part and two lateral parts the mediotergum and laterotergum (Crampton 1942).	Fig. 27A
postoccipital suture (in part, Harbach & Knight 1980),	Head	see **postcranial suture**	
postocciput	Head	Posterior part of head, occiput of many authors, here differentiated from occiput as more posteroventral area and separated from occiput by postcranial suture. In some species divided into dorsal and ventral parts by medially elevated area (Harbach & Knight 1980; McAlpine 1981).	Figs 15C, 16A, C
postpedicel	Head	Third segment of the antenna where the arista is inserted, used in Brachycera (Stuckenberg 1999).	Figs 18A, D, 19D, 20A, B
postpronotum	Thorax	The elevated area on anterolateral part of the scutum; humerus or humeral callus; pronotum, the dorsal part of the most anterior part of the scutum, which is greatly reduced in Diptera, where the remaining elevated part is called postpronotum (Thompson 1999).	Figs 23A, B, 24, 25A, B, 26B, 28A, 29A, 30A, 53E.
postscutellum (Cumming & Wood 2017)	Thorax	see **subscutellum**	
postvertex	Head	Slightly elevated area posteroventrally from postocular orbit, ending ventrally in the occipital sulcus (Speight 1987); part of the median occipital sclerite sensu McAlpine (1981).	Figs 15C, 16C
premarginal sulcus	General	Groove or furrow along the margin of a sclerite, usually found on the scutellum or abdomen (Thompson 1999).	Figs 44A, B
prementum	Proboscis.	Ventral plate of the labium; premental sclerite of labium (Speight 1987).	Fig. 22
premetacoxal bridge sensu Doczkal & Pape (2009).	Thorax	see **metasternum**	

premetacoxite (Speight 1987)	Thorax	see **metasternum**	
presutural area, -callus, -depression (Crampton 1942)	Thorax	see **notopleuron**	
primary gonopore	Female terminalia	Internal; opening from the common oviduct into the anterior part of the vagina, anterior to the openings of the spermathecal ducts and accessory glands (Kotrba & Weniger 2017).	n/a
pro	General	Related to the prothorax; first or fore; used for the leg or thoracic pleura (Thompson 1999).	Fig. 2A
Proboscis	Proboscis.	Mouthparts of flies which are adapted for sucking (Gilbert 1981).	Figs 16B, 22
Process, pl. processes	General	A prominent or projecting part of an organism or organic structure (Merriam *et al*. 2022).	Figs 56B, C, F, 58A, D, E
procoxal bridge	Thorax	see **proepisternum**	
proctiger	Male terminalia	All structures posterior to segment IX; in male Syrphidae restricted to anus + cerci (Cumming & Wood 2017).	n/a
proctiger	Female terminalia	Epiproct + hypoproct + anus + cerci (Miranda & Moran 2017).	n/a
produced posteroventral margin of subalare (McAlpine 1981)	Thorax	see **plumule**	
proepimeron	Thorax	Sclerite lateral to procoxa, ventral of anterior spiracle (Speight 1987).	Figs 25B, 28A, 29B, 30A
proepisternum	Thorax	Sclerite dorsal to procoxa, anteroventrally to anterior spiracle; procoxal bridge (Speight 1987).	Figs 23B, 25B, D, 26B, 29A
projecting postero-lateral angles (Vockeroth 1992)	Abdomen	see **posterolateral spina of abdomen**	
proleg	Leg	The leg related to the prothorax (Thompson 1999), not to be confused with prolegs, the locomotory organs in Syrphidae larvae.	Fig. 2A
pronotum (Thompson 1999)	Thorax	see **postpronotum**	
prosternum (Knight & Laffoon 1970)	Thorax	see **basisternum**	
prothoracic basisternum (Speight 1987)	Thorax	see **basisternum**	
prothoracic leg (Sorkin & Herman 2018)	Leg	see **proleg**	
pruinosity (adj. pruinose)	General	Microtrichia resembling a cover of fine powder/dust on any body area except the wing (Harris 1979; Cumming & Wood 2017). Pruinosity is here used as a synonym of pruinescence.	Figs 45C, 46D, 53E, F
pseudo-mystax	Head	Aggregation of strong pile situated on postclypeus, in some species of *Mallota* and *Nausigaster*; comparable to the feature found in the family Asilidae (McAlpine 1981).	Fig. 15B
pseudovein	Wing	Vein-like thickening of the membrane posterior to vein CuP, but without an enclosed trachea. In the old system vein CuP (McAlpine 1981; Wootton & Ennos 1989; Saigusa 2006).	Fig. 34A
pteropleuron (Thompson 1999)	Thorax	see **anepimeron**	
pterostigma	Wing	Pigmented area on the apex of cell sc; supports gliding and reduces vibration (Cumming & Wood 2017).	Fig. 34B
pubescence (Thompson 1999)	General	see **pruinosity**	
pulvillus (pl. pulvilli)	Leg	Pair of lobes located on the base of the claws on the fifth tarsomere which aids the fly in holding on to the surface (Thompson 1999).	Figs 42A, E
punctum (pl. puncta, adj. punctate)	General	Minute pit depressions on exoskeleton, spot-like (Harris 1979; Thompson 1999).	Figs 3A, 4
pyxis of the aedeagus (Speight 1987)	Male terminalia	see **phallus**	

R5 (Curran 1923)	Wing	see **appendix crossvein r-m**	
radial sector vein Rs_{1+2} (Speight 2020)	Wing	see **vein R_{2+3}**	
radial sector vein $Rs3+_4$ + M_1 (Speight 2020)	Wing	see **vein R_{4+5}+M_1**	
radial vein, vein R (Speight 2020)	Wing	see **vein Rs**	
rectangular	General	A shape with right angles but sides of different length, an adjective used to denote the shape of macula (Merriam *et al*. 2022).	Figs 5, 44A, 46C
regula (pl regulae, adj. regulose)	General	Linear furrows and upheavals on the exoskeleton, visible as closely set sulci and carinae, especially on the head in genera such as *Chrysogaster* and *Orthonevra* (Speight 1987).	Fig. 6A
remigium (see McAlpine 1981)	Wing	see **stem vein**	
respiratory spiracle	General	see **spiracle**	
ridge (McAlpine 1981)	General	see **carina**	
rostrum	Proboscis.	Basal of the two main parts of the proboscis (Gilbert & Jervis 1998).	Fig. 22
ruga (pl. rugae, adj. rugose)	General	Small rounded, depressed spots on the exoskeleton, as seen on the face or frons of several taxa, e.g. *Ceriana*, *Phytomia* and *Melanogaster* (Harris 1979; Sorkin & Herman 2018).	Figs 8D, 9C, 11D, 12D
sacculus (pl. sacculi)	Head	All kinds of excavations on the lateral part of the postpedicel, in contrast to the anterodorsally placed fossette (McAlpine 2011).	Figs 18A, D, E, 19A–C, 20B, 21A, C
scabellum	Wing	Basal part of the haltere, rich in sensilla (Harbach & Knight 1980).	Fig. 23C
scale	General	Flattened pilus, more reflective than other surrounding pili; present on the ventral surface of the occiput in different genera or on other parts of the body of *Lepidomyia* and *Myolepta* (Thompson 1999).	Fig. 4
scape	Head	First antennal segment, articulating on the head capsule (Stuckenberg 1999).	Figs 18A, B, 19D, 20B
sclerite	General	Any plate of the body wall bounded by a membrane or sutures (Sorkin & Herman 2018)	n/a
scutellar dens	Thorax	Paired tooth like protuberance on the posterior margin of the scutellum e.g. in *Microdon* (Thompson 1999)	Fig. 24,A
scutellar depression	Thorax	Apicomedial depression on the scutellum as seen in e.g. *Brachyopa bicolor*. In *Copestylum* and *Graptomyza* often with a different texture than the rest of the scutellum (see Ssymank *et al*. 2021).	Fig. 33B
scutellar fringe	Thorax	Pile fringe along the posteroventral part of the scutellum (Vockeroth 1969).	Figs 27A, B, 33C
scutellum	Thorax	The dorsoposterior semicircular part of the thorax, or posterior sclerite of the scutum (Thompson 1999).	Figs 23A, D, 24, 27A, 28A, 30A, 32A
scutoscutellar sulcus	Thorax	Groove between scutum and scutellum, it is possibly not a true connecting line between the scutum and the scutellum so the term suture (McAlpine 1981) does not seem to be correct in this case (after McAlpine 1981).	Figs 23A, 32A
scutum	Thorax	Main sclerite (anterior) of the mesonotum, in dorsal view between the scutellum and the head (Thompson 1999).	Figs 23A, D, 26A, 27A, 32A, D
second basal cell (Speight 2020)	Wing	see **cell bm**	
second costal cell (Speight 2020)	Wing	see **cell c**	
secondary gonopore	Female terminalia	External opening of the vagina into the genital chamber (Kotrba 2000).	n/a
secondary gonopore (male) (Cumming & Wood 2017)	Male terminalia	see **phallotrema**	
secondary sclerite	Thorax	Sclerite lateral to the prothoracic basisternum (Speight 1987).	Figs 23B, 25C, 26A

sella	Thorax	Sclerite of the cervical region, bearing sensilla, visible in frontal view of prothorax between lateral cervical sclerite and basisternum; sella of cervical organ (Speight 1987).	Figs 23B, 25A, D
sensory pit (Sorkin & Herman 2018)	Head	see **sacculus**	
seratostylate (Crampton 1942)	Head	see **apical arista**	
seta (pl. setae, adj. setose)	General	Large macrotrichium much longer than wide; thicker than pilus, longer than setula; difference between seta and setulae is arbitrary since it depends on the surrounding vestiture (Thompson 1999).	Figs 4, 39B, 41B
setose carina of metafemur	Leg	On the apicoventral margin of the metafemur there are one or two carinae, either anterior, medial or posterior or combination of anterior and posterior, with short to long setae in several genera; e.g. *Chalcosyrphus*, *Eumerus* and *Xylota* (Hippa 1978a).	Figs 39A, D, 41B, C
setula (pl. setulae, adj. setulate)	General	Macrotrichium, slightly longer than wide; thicker than pilus, shorter than seta; difference between setae and setulae is arbitrary since it depends on the surrounding vestiture (Thompson 1999).	Figs 4, 399B
setulate carina of metatibia	Leg	Basoventral carina with setulae; e.g. *Xylota* (Hippa 1978a).	Figs 39B, D
sharp edge at the ventral apex of tibia 3 (Doczkal & Dziock 2004)	Leg	see **tibial carina, apico-ventral**	
shining (of many authors)	General	see **shiny**	
shiny	General	Used for a surface of the body which glistens, or that reflects light as if polished; that shines; not synonymous to 'shining' which means to emit light like the sun, a lamp or fireflies; might be combined with 'metallic' when it is similar to the reflecting metals (Merriam *et al*. 2022).	Fig. 3D
size	General	Length of body (parts), usually given to tenth of millimetre; wing length is usually measured from the basicosta to apex; body length from base of antenna to apex of abdomen (Thompson 1999).	see arrowed lines in Fig. 1A
sperm duct	Male terminalia	Membranous tube connecting the sperm pump to the phallus: ejaculatory duct (Cumming & Wood 2017).	n/a
sperm pump	Male terminalia	The combined sperm sac + ejaculatory apodeme responsible for pumping sperm through the phallus (Cumming & Wood 2017)	n/a
sperm sac	Male terminalia	Membranous sperm reservoir (Cumming & Wood 2017).	n/a
spermatheca (pl. spermathecae)	Female terminalia	Internal sclerotized structures responsible for storing male sperm (Miranda & Moran 2017).	n/a
spina (pl. spinae, adj. spinose)	General	Elongate, non-articulating extension of the exoskeleton, much longer than broad. Different from a calcar as it is non-articulating and hence calcar is not found in Syrphidae. All previous spurs or calcaris are now named spina (in part Thompson 1999).	Figs 4, 38B–D, 39D, 40C, 42F, G
spine (Snodgrass 1935; McAlpine 1981)	General	see **spina**	
spinose ridge, apicoventral lateral or apicoventral median spinose ridge (Hippa 1978a).	Leg	see **setose carina**	
spiracle	General	Respiratory opening, two on either side of the thorax and on the lateral membranous surface of each abdominal sternum (Thompson 1999).	Figs 23B, 26D, 27D, 28B, 29B, 32B, C, 48B, D, 49D, 51D
spiracle (pl spiracles)	Abdomen	Respiratory opening; embedded in the lateral membranous part of the sternum (McAlpine 1981).	Figs 29B, 48B, D, 49D, 51D
spiracular fringe	Thorax	Row or patch of long pile anteroventral to the posterior spiracle, e.g. *Psilota*, *Rhingia* and *Eristalodes* (Thompson 1999).	Fig. 33D
spot (Sorkin & Herman 2018)	General	see **macula**	

spur (Snodgrass 1935; Sorkin & Herman 2018)	General	see calcar; so far not found in Syrphidae	
spur, as used in the veins (Vockeroth & Thompson 1987)	Wing	see **appendix**	
spurious vein (Cumming & Wood 2017)	Wing	see **vena spuria**	
squama, squamula (Linnaeus 1758; Cumming & Wood 2017)	Wing	see **calypter**	
squarish	General	A shape with equal sides at right angles, an adjective used to denote the shape of macula (Merriam *et al*. 2022).	Figs 5, 44C
stem vein	Wing	Thickened base of vein R between wing base and vein M (Cumming & Wood 2017).	Fig. 34A
sternite (Cumming & Wood 2017; McAlpine 1981)	General	see **sternum**	
sternite (McAlpine 1981; Cumming & Wood 2017;)	Abdomen	see **sternum**	
sternopleuron (Shannon 1922a)	Thorax	see **katepisternum**	
sternum (pl. sterna)	General	Ventral division of any segment of the thorax or Abdomen The sclerotized part should actually be called sternite (McAlpine 1981), but as the abdominal sterna in several species consist of a sclerotized and a membranous parts, here the term sternum can be used as a synonym of sternite and the term "membranous part of sternum" refers to the non-sclerotized part (Snodgrass 1935; Thompson 1999).	Figs 28B, 29A, 30, 43C, 47A–C, E, 48A, B, D, 49, 50B, 51
sternum (pl. sterna)	Abdomen	Ventral division of any segment of the abdomen; used here for the sclerotized ventral division of each segment of the abdomen, coded with Roman numbers I–IX (Snodgrass 1935, Thompson 1999).	Figs 28B, 29A, 30, 32B, C, 43C, 47A–C, E, 48A, B, D, 49, 50B, 51
Sternum 10 (Cumming & Wood 2017)	Female terminalia	see **hypoproct**	
sternum VII	Female terminalia	Present as a lightly pigmented area to a distinct sclerotized plate; shape can vary among taxa (Miranda & Moran 2017).	Figs 52D, E
sternum VIII	Female terminalia	Present as a lightly pigmented area to a distinct sclerotized plate; shape can vary among taxa (Miranda & Moran 2017).	Figs 52D, E
sternum IX	Female terminalia	May be completely membranous or as a hardened sclerotized plate on the dorsal surface of the genital chamber; the wholly membranous sternum IX are easily everted during preparation of specimens; the opening visible on this structure is the secondary gonopore (Miranda & Moran 2017).	Figs 52D, E
sternum, membranous part	Abdomen	Ventral division of any segment of the abdomen; used here for the membranous ventrolateral division of each segment of the abdomen (Snodgrass 1935).	Fig. 48B
stigma of wing (Speight 2020)	Wing	see **pterostigma**	
stipes	Proboscis.	Basal sclerite of the maxilla, bearing the lacinia and maxillary palp (Sorkin & Herman 2018).	Fig. 22
stripe (Sorkin & Herman 2018)	General	see **vitta**	
style (Thompson 1999)	Head	see **apical arista**	
styli (Speight 1987)	Male terminalia	see **surstylus**	
subalare	Thorax	One of two sclerotized areas at wing base, subalare is posterior and basalare is anterior. Posteriorly often bearing the plumule (Snodgrass 1935; Crampton 1942).	Figs 29B, 30A

sub-anal plate (Kotrba 2000)	Female terminalia	see **hypoproct**	
sub-epaulet (Thompson 1999)	Wing	see **basicosta**	
subapical prolateral dentate plate-like projection (Hippa 1978a)	Leg	see **femoral lamina**	
subapical prolateral ventral spur (Hippa 1990)	Leg	see **femoral spina**	
subcranial cavity	Head	Ventral cavity of the head where the proboscis can be retracted into (McAlpine 1981).	Figs 10B, 16B, D, 17B
subcranial margin (in part, Speight 1987)	Head	see **peristoma**	
subcranial sulcus	Head	A short groove on the ventral part of the face from the anterior tentorial pit to the buccal cavity; may be complete, incomplete or absent (after Speight 1987).	Figs 11D, 12B, C, 13C, 16B, 17A
subepandrial membrane	Male terminalia	Membranous roof of the pouch that separates the epandrium and proctiger from the hypandrium and postgonites (Cumming & Wood 2017)	n/a
subepandrial sclerite	Male terminalia	Sclerite formed on the subepandrial membrane, located internally in the genitalia, between epandrium and hypandrium; articulates apically with the base of the surstyli or apex of the epandrium, and basally with the anterodorsal surface of the phallus or the hypandrial arms (Cumming & Wood 2017).	Figs 55A, D, 56A, 57A, D, 58E.
subgena (McAlpine 1981)	Head	see **peristoma**	
submarginal cell; cell sm (Speight 2020)	Wing	see **cell r_{2+3}**	
subscutellum	Thorax	Ventral to the scutellum, and supposed to be the dorsal part of the mediotergum (part of the postnotum) (McAlpine 1981; Cumming & Wood 2017); postscutellum (Cumming & Wood 2017)	Figs 27A, B
sulcus (pl. sulci, adj. sulcate)	General	Invagination of the exoskeleton seen as distinct furrows on the outside of the insect body; not to be mistaken with suture (Snodgrass 1960).	Figs 6B, D, 10C, D, 11C, 12A–C, 13A, 15B, C, 16A, B, 17A–C, D, 44A, B
superior lobe of gonite (Claussen & Hayat 1997)	Male terminalia	see **postgonite**	
superior/inferior lobe (Metcalf 1921; Speight 1987; Thompson 1999)	Male terminalia	see **postgonite**	
supra-alar area	Thorax	The lateral margin of the scutum immediately dorsally to the attachment of the wing (McAlpine 1981).	Figs 32A, D
supra-alar pile tuft	Thorax	A dense congregation of pile on the lateral side of the scutum, anterior to the postalar callus and posterior to the wing base found in *Eristalinus*, close to the postalar carina (after Thompson 1999).	Fig. 32D
supra-anal plate (Speight 1987; Kotrba 2000)	Female terminalia	see **epiproct**	
surstylar apodeme, sternum X, minis (Speight 1987)	Male terminalia	see **subepandrial sclerite**	
surstylus (pl. surstyli, adj. surstylar)	Male terminalia	Paired clasping structure, articulated externally on the apex of the epandrium and internally on the apex of the subepandrial sclerite; might be highly modified with extensions and lobes (Speight 1987).	Figs 45B, 46D, 47B, C, 48, 49A, B, 50, 51, 54A, 55A, D, 56A, C, E, 57A, C, D, 58C
sustentacular apodeme (Metcalf 1921)	Male terminalia	see **phallapodeme**	

suture	General	Lines/divisions seen on the body where different sclerites meet (Snodgrass 1960).	Figs 16B, 27B, 28A, 29B, 30B
tarsal cavum	Leg	Excavation of the tarsus; alternatively, the tarsus with this condition can be called a cavate tarsus or a tarsus cavatum (Sorkin & Herman 2018).	Fig. 42D
tarsal lamina	Leg	Ventrally curved part on the posterior surface of tarsomeres 1-4 on the mesotarsus as seen in *Pyrophaena granditarsa* (Vockeroth 1990).	Fig. 42B, 53A
tarsomere (pl. tarsomeres)	Leg	Individual segment of tarsus, five in total; most basal is basitarsomere, next are 2nd, 3rd, 4th and most apical is 5th tarsomere (Thompson 1999).	Figs 42A, B, D, E.
tarsus (pl. tarsi, adj. tarsal)	Leg	Fifth and apical segment of the leg, consisting of 5 tarsomeres and the acropod (Thompson 1999).	Figs 2, 38A, 40D, 41D
tegula	Wing	Sclerite at base of wing, lateral to basicosta; often (Fig. 32D) with dense tuft of setae (Thompson 1999). Tegula in e.g. *Eristalinus* divided into two parts, large and proximal "basi-tegula"; small and apical "disti-tegula".	Figs 23D, 32D
temporal sulcus	Head	A sulcus on the postcranium dorsolaterally from the occipital foramen (Nayar 1964).	Figs 15C, D, 16A
temporal tubercle	Head	A structure on the posterior part of the head, dorsal to the occipital foramen, often absent or only denoted by a weak swelling or different texture on the post occiput; area where the supracervical setae (Cumming & Wood 2017) are located.	Fig. 15D
tentorial sulcus (Speight 1987)	Head	see **facial sulcus**	
terga 9+10 (Cumming & Wood 2017)	Female terminalia	see **epiproct**	
tergite (Cumming & Wood 2017; McAlpine 1981)	General	see **tergum**	
tergite (McAlpine 1981; Cumming & Wood 2017)	Abdomen	see **tergum**	
Tergite 9 (Hippa 1986; Speight 1987; Jilong & Zhihua 1992)	Female terminalia	see **lateral lobes to the epiproct**	
tergum (pl. terga)	General	The dorsal division of any segment of the thorax or Abdomen Tergite (McAlpine 1981) is used for the sclerotized part and tergum for the entire part. In Syrphidae the entire dorsal surface of each sclerite is entirely sclerotized (Thompson 1999), so here we use tergum as synonym of tergite.	Figs 29, 30A, 43, 44D, 45A, B, D, 46A, C, 47D, E, 48A, C, D, 49, 50, 51
tergum (pl. terga)	Abdomen	Dorsal division of the abdomen; used here for the sclerotized dorsal division of each segment of the abdomen, coded with Roman numerals I-X (Thompson 1999).	Figs 29, 30A, 32B, C, 43, 44D, 45A, B, D, 46A, C, 47D, E, 48A, C, D, 49, 50, 51
tergum 10 (Hippa 1986)	Female terminalia	see **epiproct**	
tergum IX	Female terminalia	Kotrba (2000) considers tergum IX as absent in most Cyclorrhapha (or fused to X, i.e., epiproct/supra-anal plate) (Kotrba 2000; Miranda & Moran 2017).	n/a
tergum VII	Female terminalia	Present as a lightly pigmented area to a distinct sclerotized plate; shape can vary among taxa (Miranda & Moran 2017).	Fig. 52
tergum VIII	Female terminalia	Present as a lightly pigmented area to a distinct sclerotized plate; shape can vary among taxa (Miranda & Moran 2017).	Fig. 52
tergum VIII of Speight (1987)	Abdomen	see **sternum VIII**	
theca (Speight 1987)	Male terminalia	see **hypandrium**	
Thorax	Thorax	Second division of the insect body, between the head and abdomen (Thompson 1999).	Figs 1A, 3C, 23–31

tibia (pl. tibiae, adj. tibial)	Leg	Fourth segment of the leg, located between the femur and tarsus (Thompson 1999).	Figs 2, 38A, B, 39A, 40B, D, 42D
tibial carina	Leg	Ridge along the basoventral line of the metatibia, well visible as a darkened ridge and often with black or yellow setulae in *Xylota* (Hippa 1978a).	Fig. 41D
tibial carina, apico-ventral	Leg	Ridge-like edge on the apico-ventral margin of the metatibia in several species of *Brachyopa* (after Doczkal & Dziock 2004).	Fig. 53B
tibial cavum	Leg	Excavation of the tibia; alternatively, the tibia with this condition can be called a cavate tibia or a tibia cavatum (Sorkin & Herman 2018).	Fig. 41D
tibial lamina	Leg	Ventro-apical extension of the metatibia, sometimes there is both an anterior and posterior extension; present in several genera like *Brachypalpus*, *Chalcosyrphus* and *Merodon*. Sometimes this extension is more flange-like and thus called tibial lamina (Hippa 1978a).	Fig 38B
tibial spina	Leg	Ventro-apical extension of the metatibia, sometimes there is both an anterior and posterior extension; present in several genera like *Brachypalpus*, *Chalcosyrphus* and *Merodon*. Sometimes this extension is more flange-like and should be called tibial lamina (Hippa 1978a).	Figs 38B, C
tibial tubercle	Leg	Any rounded or more or less elongate extension of the tibia, like in *Brachypalpus chrysites* (Hippa 1978a).	Fig. 40A
tomentum (adj. tomentose)	General	Thick vestiture; usually refers to the condition of the thick pile that is densely arranged and forms areas completely covering the exoskeleton, in genera such as *Meromacrus* and *Quichuana* (Thompson 1999).	Fig. 3C
tooth (Sorkin & Herman 2018)	General	see **dens**	
transparent (Speight 1987)	General	see **hyaline**	
transverse frontal sulcus	Head	A transverse groove along the posterior border of the frons between the frons and the (ante)vertex, connecting the two compound eyes, only found in dichoptic specimens (Raffray 1897; Gumovsky 2001).	Figs 7D, 8, 9B, C
transverse sulcus	Thorax	Anterolateral groove separating notopleuron from the posterior part of the scutum, can be complete or incomplete (Speight 1987).	Figs 23A, 24, 28, 29A, 30B, 32A, D
transverse sulcus (Speight 1987)	Head	see **temporal sulcus**	
transverse suture (Thompson 1999)	Thorax	see **transverse sulcus**	
triangular	General	A shape with three sides, an adjective used for macula (Merriam-Webster 2022).	Figs 5, 45A, 46D
triangular processus of metafemur (Hurkmans 1993)	Leg	see **femoral lamina**	
trochanter (pl. trochanters, adj. trochanteral)	Leg	Second segment of the leg, located between the coxa and femur (Thompson 1999).	Figs 31, 38A, D, 40A–C, 42C, F, G
trochanteral dens	Leg	Short triangular extension, often on the metatrochanter, in genera like *Eumerus*, *Merodon* and *Xylota* (Hippa 1978a).	Fig. 38C
trochanteral pile tuft	Leg	Lateral pile tuft on protrochanter like in *Platycheirus scutatus*; cluster of rather long stiff setae (Vockeroth 1990).	Fig. 42C
trochanteral process of posterior mesocoxite of mesoleg (Speight 1987)	Leg	see **mediocoxal spina**	
trochanteral spina	Leg	Long thin extension, often on the postero-ventral side, of the mesotrochanter, like in *Neocnemodon* and Xylotini (Hippa 1978a).	Figs 38D, 39D
tubercle (pl. tubercles, adj. tuberculate)	General	Rounded to oval protuberance on the body, e.g. facial, abdominal and clypeal tubercle (Thompson 1999).	Figs 3A, 38A, 41A, B
tubercle (Thompson 1999)	Head	see **facial tubercle**	
tubus of the aedeagus (Speight 1987)	Male terminalia	see **phallus**	
unguis (McAlpine 1981)	Leg	see **claw**	

unguitractor	Leg	Medial connecting plate between fifth tarsomere, claws and empodium (McAlpine 1981).	Fig. 42E
upper gonocercus; dorsal gonocercus (Verlinden 1999; van Steenis et al. 2018a)	Male terminalia	see **postgonite**	
upper process of hypandrium (van Steenis & Lucas 2011)	Male terminalia	see **hypandrial process**	
vagina	Female terminalia	Internal organ situated on the ventral part of segment VIII; constituted of different internal pouches and where the common oviduct, spermathecal ducts and accessory glands open into (Kotrba 2000; Kotrba & Weniger 2017).	n/a
vasa deferentia	Male terminalia	Sperm ducts (Merriam et al. 2022).	n/a
Vein	Wing	Longitudinal sclerotized structure for stabilising the wing membrane (Sorkin & Herman 2018).	Figs 34A, 35, 36, 37
vein A_1	Wing	Anterior vein. Vein A_2 in the old system (McAlpine 1981; Saigusa 2006; Wootton & Ennos 1989)	Figs 34A, 35A, C, D, 36B, C
vein A_1; first anal vein (McAlpine 1981)	Wing	see **vein CuP**	
vein C	Wing	Anterior thickened margin of the wing; costal vein (McAlpine 1981; Cumming & Wood 2017).	Figs 33D, 34A, 35, 36A–C
vein CuA	Wing	Cubital vein; anterior branch of cubitis. Vein CuA_2 in the old system (McAlpine 1981; Saigusa 2006; Wootton & Ennos 1989).	Figs 34A, 35A, C, D, 36A–C
vein CuA_1; first anterior cubitus vein (Mcalpine 1981; Speight 2020)	Wing	see **vein M_4**	
vein CuA_2; second anterior cubitus vein (McAlpine 1981; Speight 2020)	Wing	see **vein CuA**	
vein CuA+CuP	Wing	Posteroapical appendix of cell cua. Apical section of A_1 (Vockeroth & Thompson 1987). Vein A_1 + CuA_2 in the old system (McAlpine 1981; Saigusa 2006; Cumming & Wood 2017).	Figs 34A, 36A
vein CuP	Wing	Cubital vein; posterior branch of cubitis. Vein A_1 in the old system (McAlpine 1981; Saigusa 2006; Wootton & Ennos 1989).	Figs 34A, 35B, 36A, D
vein CuP; posterior cubital vein (McAlpine 1981)	Wing	see **pseudovein**	
vein M	Wing	Middle vein, between veins R and CuA; medial vein (McAlpine 1981; Saigusa 2006; Wootton & Ennos 1989).	Fig. 34A
vein M_1	Wing	Branch of M that joins R_{4+5}, in some groups joining as close to the wing margin; its apical end might be directed to wing apex (processive) or towards base (recessive), or M_1 might be wholly straight (Cumming & Wood 2017).	Figs 34A, 35, 36B, 37A, B, D
vein M_{1+2}	Wing	Apical part of vein M from M_4 base to the point where M_1 branches off and where in some species vein M_2 starts (Cumming & Wood 2017)	Figs 34A, 37D
vein M_2	Wing	A short stump at the point where M_1 branches off from vein M_{1+2} (Cumming & Wood 2017).	Figs 34A, 35C, 36A, C, 37A–C
vein M_4	Wing	Fourth median vein, vein CuA_1 in the old system. This vein sometimes extends beyond crossvein dm-m as a postero-apical appendix of cell dm (Saigusa 2006; Wootton & Ennos 1989).	Figs 34A, 37D
vein MA	Wing	Anterior branch of medial vein (Saigusa 2006; Wootton & Ennos 1989).	Fig. 34A
vein R	Wing	Main vein of the wing; branches into R_1 and Rs, and the latter branches into R_{2+3} and R_{4+5}; radius, radial vein (Cumming & Wood 2017).	Figs 34A, 36A
vein R_1	Wing	Anterior branch of vein R (Cumming & Wood 2017).	Figs 34A, 35A, C, 36
vein R_1+R_{2+3}	Wing	Petiole of cell r_1 to vein C, closing cell r_1 (after Hippa & Ståhls 2005); cell r_1 closed; cell r2+3 closed (Vockeroth & Thompson 1987); cell r1 closed and petiolate by Thompson *et al*. (2010).	Fig. 36D

vein R_{2+3}	Wing	Anterior branch of vein Rs (Cumming & Wood 2017).	Figs 34A, 35, 36
vein R_{4+5}	Wing	Posterior branch of vein Rs; might bear a short branch (auxiliary vein, appendix) into cell r_{4+5} (Cumming & Wood 2017). Deeply looped into cell r_{4+5} in some groups (Fig. 36D).	Figs 34A, 35A, C, 36B, C, 37A
vein R_{4+5}+M_1	Wing	Petiole of cell r_{4+5} to vein C (Hippa & Ståhls 2005) cell R_{4+5} closed; R_{3+4}+M_1 (sensu Speight 1987); last section of R_{4+5} (Vockeroth & Thompson 1987).	Figs 34A, 36A
vein Rs	Wing	Posterior branch of vein R; radial sector (Cumming & Wood 2017).	Fig. 34A
vein Sc	Wing	Slender vein between veins C and R ending on C; subcostal vein (Cumming & Wood 2017).	Figs 34A, 35, 36A–C
veinlet (Sorkin & Herman 2018)	Wing	see **appendix**	
vena spuria	Wing	Vein-like thickening of the wing membrane in Syrphidae, extending between cell br and r_{4+5}; might be evanescent or even absent e.g. *Cepa*, *Eristalinus sepulchralis*, *Psilota*, some species of *Orthonevra*, *Syritta flaviventris* (Cumming & Wood 2017).	Figs 34A, 37C
ventral (adv. ventrally)	General	On the lower side of a structure; opposite of dorsal (Thompson 1999).	Figs 1C, D, 2, 38B, 54A, B
ventral dens of tergum IV	Abdomen	Dens-like extension on the ventral margin of tergum IV, as seen in *Nausigaster* (Shannon 1922a).	Fig. 47E
ventral postgonite	Male terminalia	Additional process connected to the apicoventral wall of the hypandrium found in e.g. *Pipizella* and *Trichopsomyia*; inferior lobe of gonite; lower gonocercus; ventral gonocercus (Claussen & Hayat 1997; van Steenis & Lucas 2011; van Steenis *et al*. 2018a). The true origin of these structures are under debate and it might be that the structure in *Trichopsomyia* is the hamus, while the one in *Pipizella* is a different structure. This needs to be evaluated while dealing with the male genitalia in more detail.	Figs 58B, D
ventral scutellar fringe	Thorax	Row of pile on the apicoventral surface of the scutellum (Thompson 1999).	Fig. 32B
ventral scutellar fringe (Thompson 1999)	Thorax	see **scutellar fringe**	
vertex	Head	Posterodorsal or uppermost part of the head consisting of the ocellar triangle and surroundings; in holoptic males this forms a triangular area (McAlpine 1981).	Figs 6C, D, 7A, D, 8A–C, 9B, C, 12D, 13C
vertexal (Sorkin & Herman 2018)	General	see **vertical**	
vertical	General	Structures of the vertex, thus restricted to features of the head (Mcalpine 1981; Thompson 1999). Not to be mistaken for the orientation of the structure.	Figs 6A, C, 7A–C, 8D, 9B, C
vertical carina	Head	Ridge-like structure on the vertex, anterior to the anterior ocellus; only present in dichoptic specimens (e.g. *Melanogaster nigricans* and *Sphiximorpha subsessilis*).	Figs 8D, 9C
vertical regulae	Head	Linear furrows and upheavals on the exoskeleton, visible as closely set sulci and carinae on the vertex in genera like *Chrysogaster* and *Orthonevra* (Speight 1987).	Fig. 6A
vertical rugae	Head	Small rounded, depressed spots on the exoskeleton, on the frons of e.g. *Phytomia* and *Melanogaster* (Sorkin & Herman 2018).	Figs 8D, 9C
vertical sulcus	Head	Medial sulcus on the vertex, anterior to the anterior ocellus; mostly restricted to specimens with the dichoptic condition, e.g. *Asarkina porcina* (Thompson 1999).	Fig. 7C
vertical triangle	Head	The vertex, in holoptic males, forms a triangular area with in some genera a very specific shape (after Thompson 1999).	Figs 6C, 7A, B
Vestibular membrane (Shatalkin 1981)	Female terminalia	see **sternum IX**	
vestiture	General	Articulated and non-articulated coverings of the exoskeleton; divided into macrotrichia and microtrichia (Thompson 1999).	Fig. 4

vitta (pl. vittae, adj. vittate)	General	A longitudinal (placed lengthwise, anterior-posterior) stripe (Thompson 1999).	Figs 9D, 53E, F
vulva (Kotrba 2000)	Female terminalia	see **secondary gonopore**	
Wing	Wing	Membranous flight organ (Thompson 1999).	Figs 1A, 3B, 32A, D, 33D, 34–37
wing length	General	Length of wing measured from basicosta to apex (Thompson 1999).	Arrows in Fig. 1A
zygoma (Collins & Halstead 2008)	Head	see **parafacia**	

Discussion

Many terms are combinations of a certain body part with a certain extension of the exoskeleton like ‘femoral tubercle’ or ‘posterolateral spina of abdomen’. Many species will have similar extensions found on other body parts, which are not listed here, and it is advised to adopt the general construction of terms used here to describe the specific situation in other species.

The male and female terminalia comprise many structures, external and internal, not studied in depth in the present work and it is very likely that more terms are needed to adequately describe all these parts. We advise to start with the general terminology as employed here and those given by Shatalkin (1975a, b), Sinclair *et al*. (1994), Shatalkin (2012) and Sinclair *et al*. (2013) to build on further terms for the terminalia. Other relevant literature, which can be used for this purpose, can be found under the terms listed in the section terminalia.

Acknowledgments

Martin Speight (Wicklow, Ireland) gave valuable comments during the initial phase of this project. Ana Grković, Snežana Radenković and Ante Vujić (Novi Sad, Serbia), Lisa Fisler (Neuchâtel, Switzerland), Antonio Ricarte (Alicante, Spain), Jirka Hadrava (České Budějovice, Czech Republic) Libor Mazánek (Jívová, Czech Republic) and Wouter van Steenis (Breukelen, The Netherlands) gave valuable comments on the draft terms and figures. Gunilla Ståhls (Helsinki, Finland) hosted the online meetings. The following curators are acknowledged: Chris Grinter and Jere Schweikert (San Francisco, USA); Francisco Limeira de Oliveira (Caxias, Brazil); Steven Paiero (Guelph, Canada); Ante Vujić (Novi Sad); Márcio Luiz de Oliveira (Manaus, Brazil); Marcia Couri (Rio de Janeiro, Brazil); Freddy Bravo (Feira de Santana, Brazil); Pasquale Ciliberti (Leiden, the Netherlands) and Olga Ovchinnikova and Nikolai Paramonov (St Petersburg, Russia). Finally, the three reviewers; Brad Sinclair (Ottawa, Canada), Menno Reemer (Leiden, the Netherlands) and Martin Hauser (Sacramento, USA) are acknowledged for their good job in going through the manuscript and comments on the use of several of the terms.

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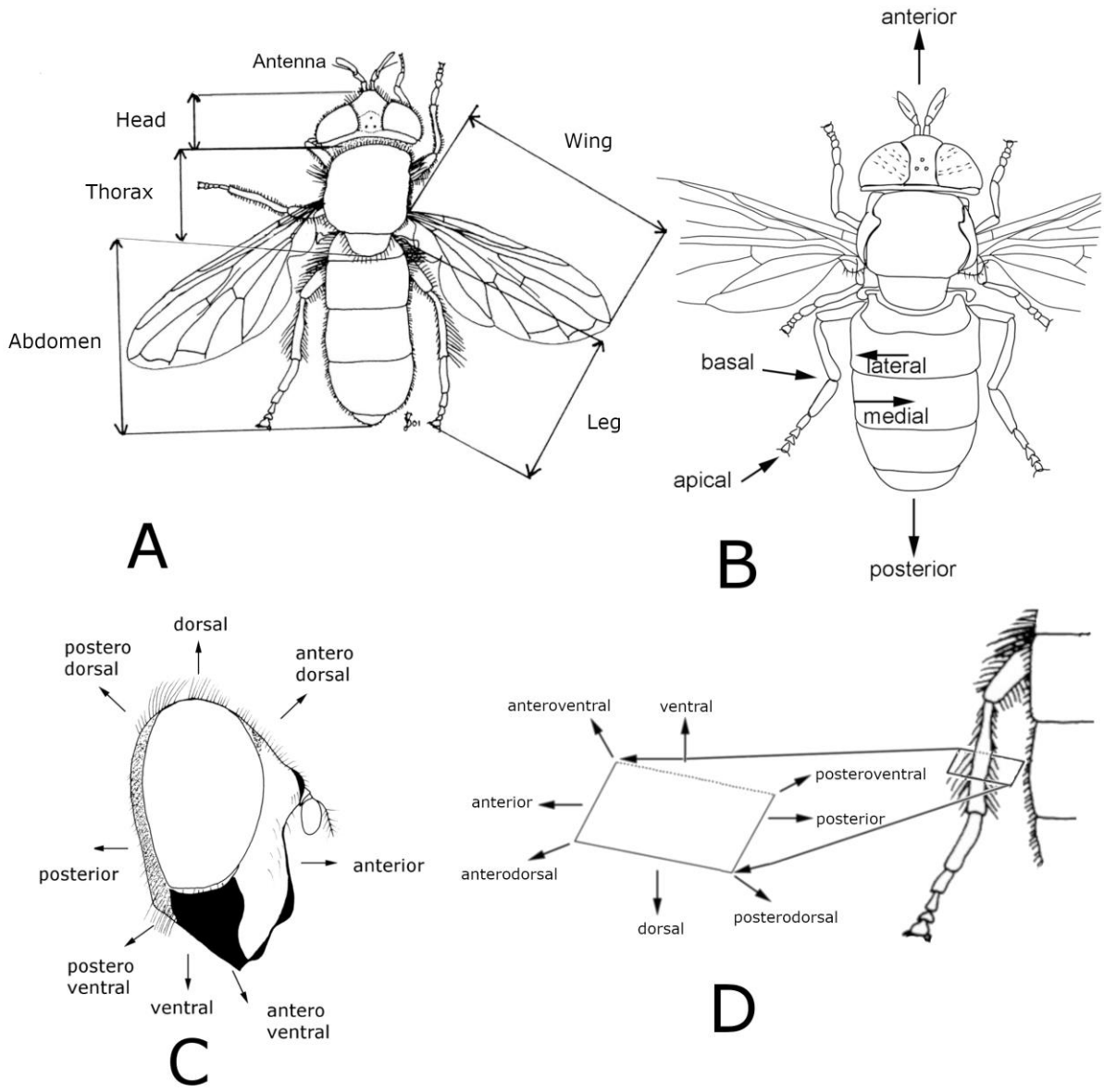

Figure 1. Syrphidae orientation. **A, B, D** dorsal view; **C** lateral view. **A**. *Pipizella ochreobasalis* ♀ paratype; Turkey; dorsal view. **B, D**. *Paragus pecchiolii* ♀; Serbia; dorsal view. **C**. *Eristalis arbustorum* ♀, Serbia; head, lateral view. **A** after van Steenis & Lucas (2011), **B–D** TT.

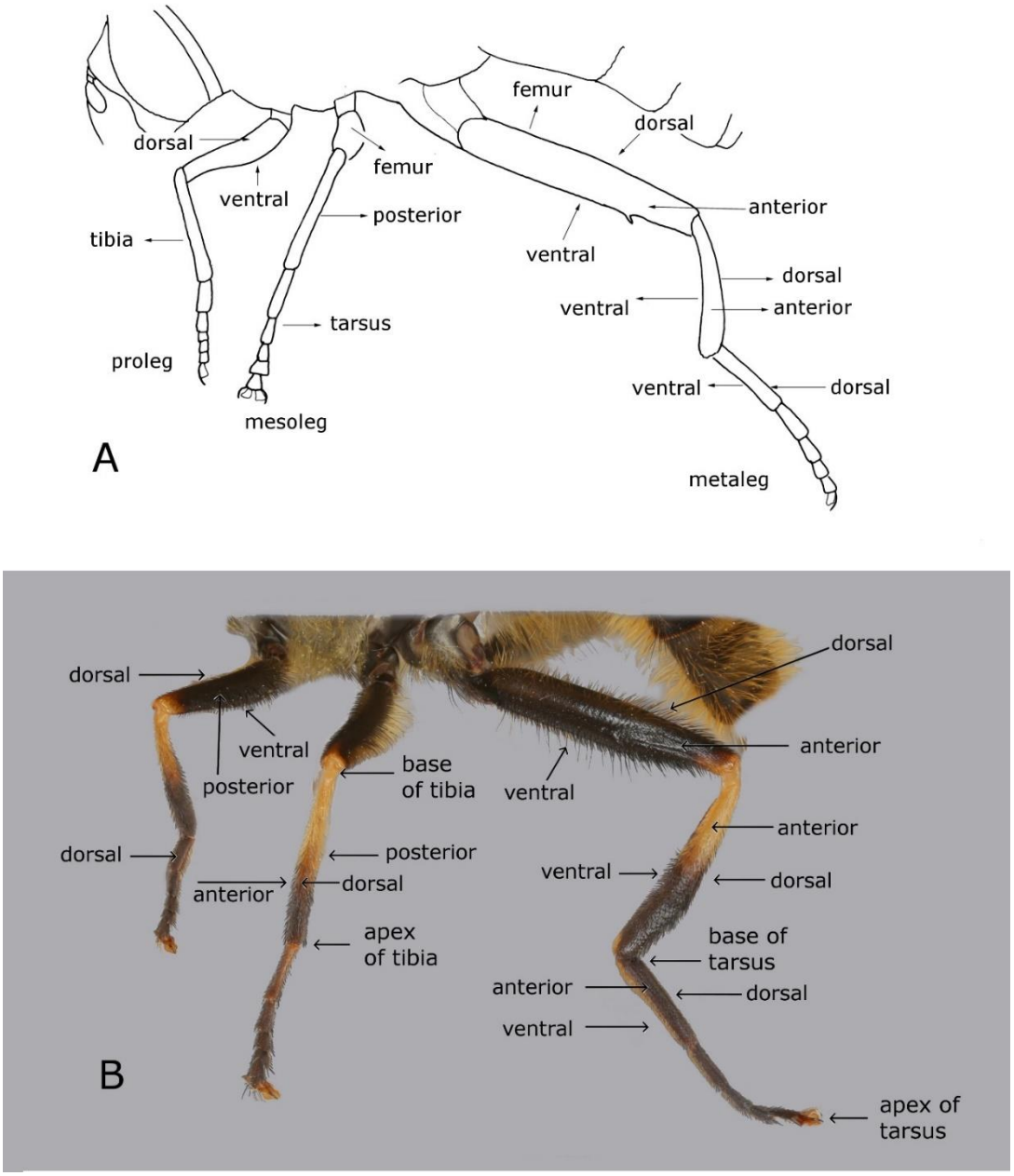

Figure 2. Syrphidae, ventral half of adult, lateral view. **A**. *Spilomyia manicata* ♀; Serbia. **B**. *Myathropa florea* ♂; France. **A**: TT.

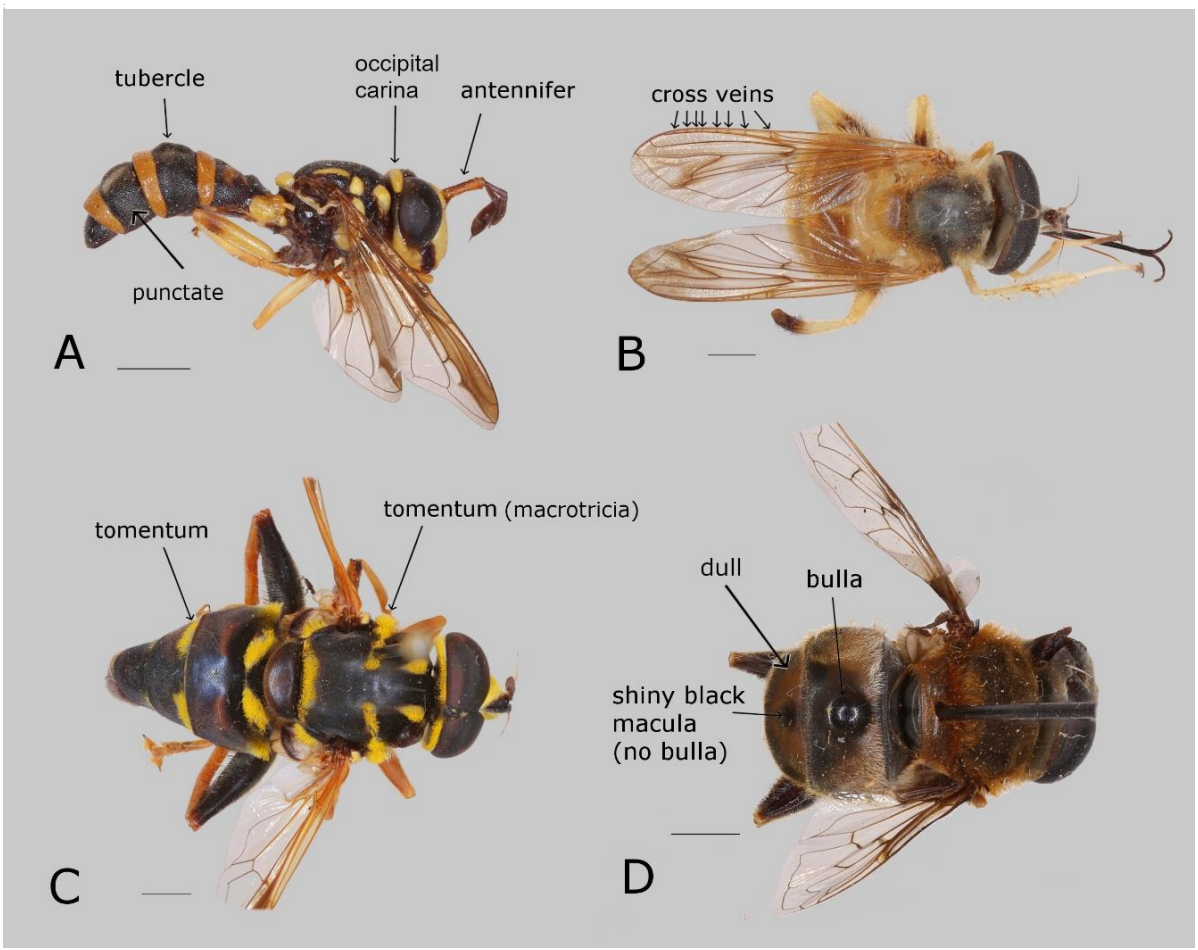

Figure 3. Syrphidae. **A**, lateral view, **B**–**D**, dorsal view. **A**. *Ceriana glaebosa* ♀; Cyprus. **B**. *Lycastris cornutus* ♂; Taiwan. **C**. *Meromacrus acutus* ♂; USA. **D**. *Phytomia bulligera* ♂; Uganda. Scale = 2.0 mm.

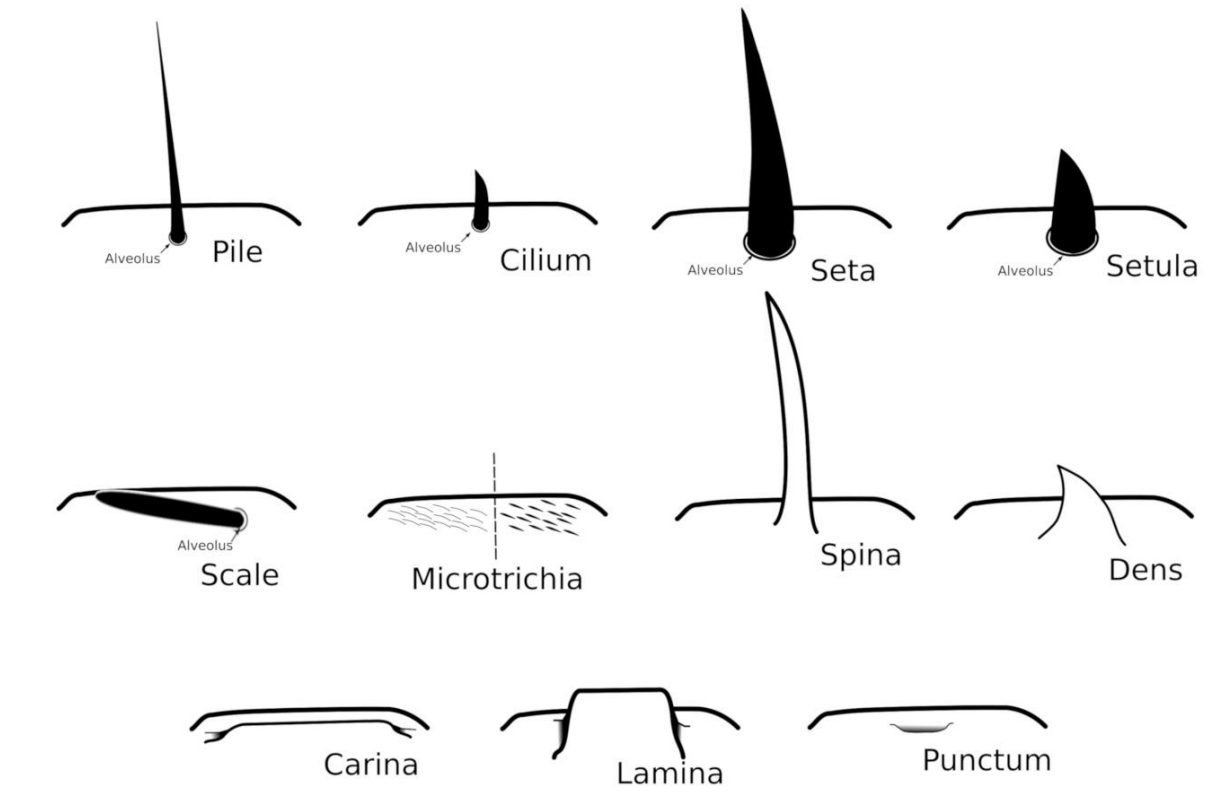

Figure 4. Different armature and vestiture. GFGM.

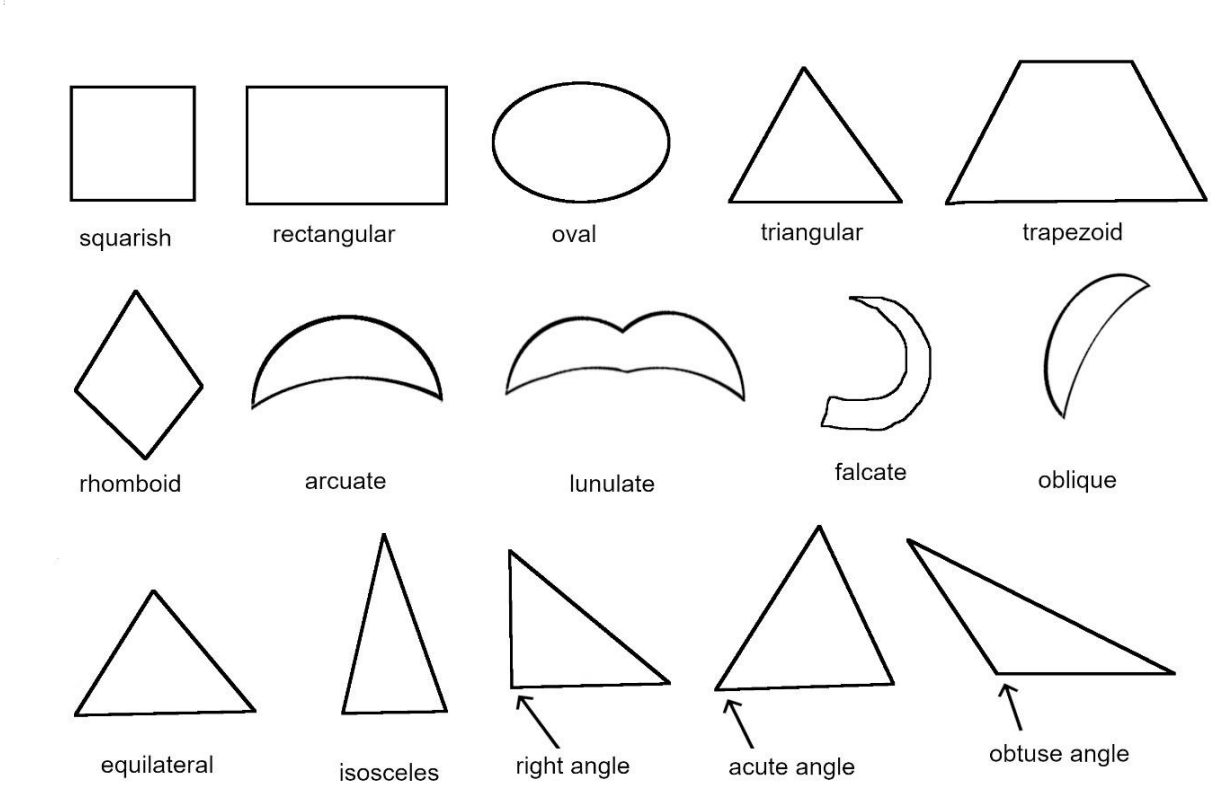

Figure 5. Shapes and angles.

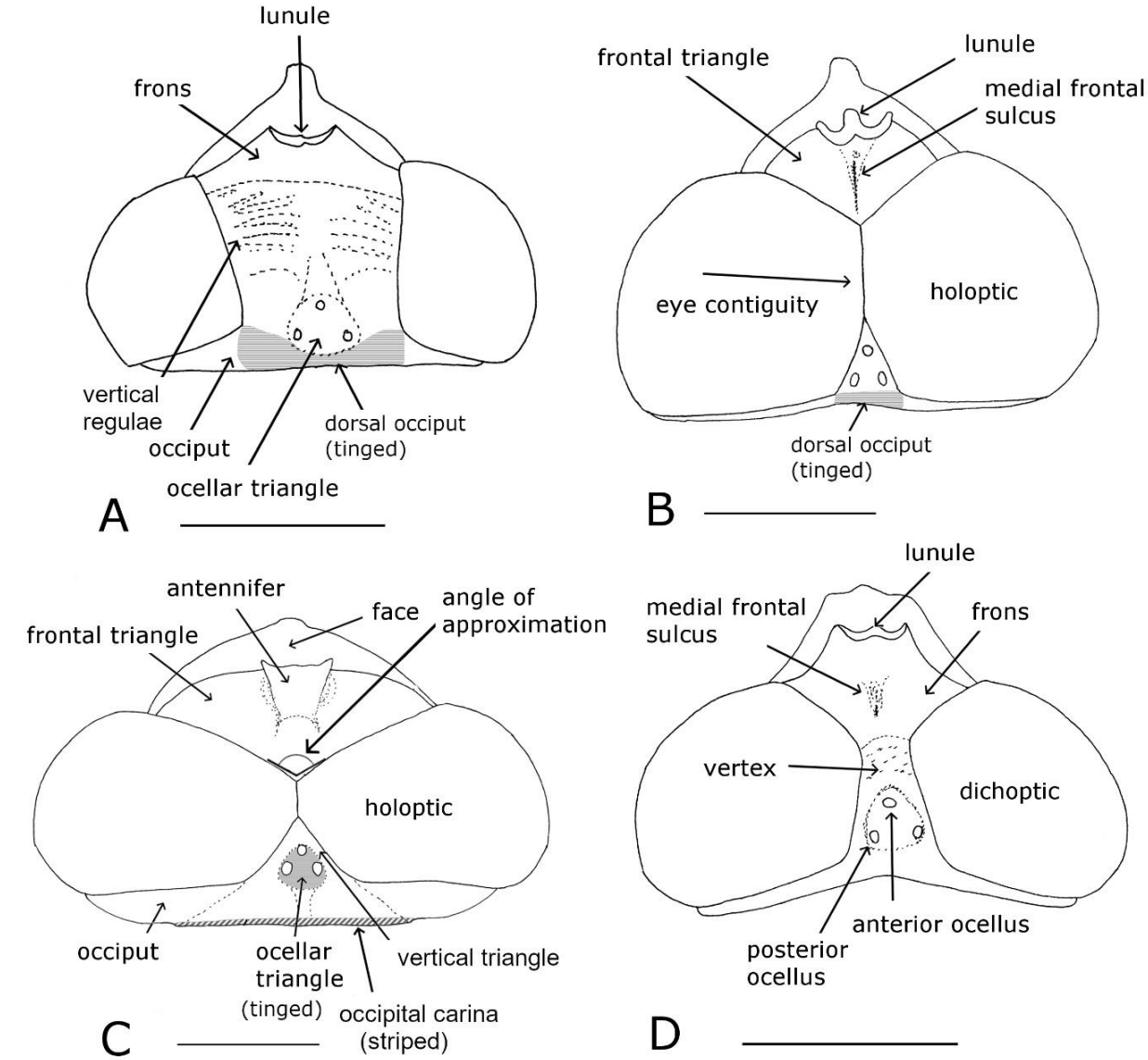

Figure 6. Head, dorsal view. **A**. *Lejogaster metallina* ♀; The Netherlands. **B**. *Cheilosia variabilis* ♂; Sweden. **C**. *Sphiximorpha subsessilis* ♂; Greece. **D**. *Lejota ruficornis* ♂; Sweden. Scale = 1.0 mm.

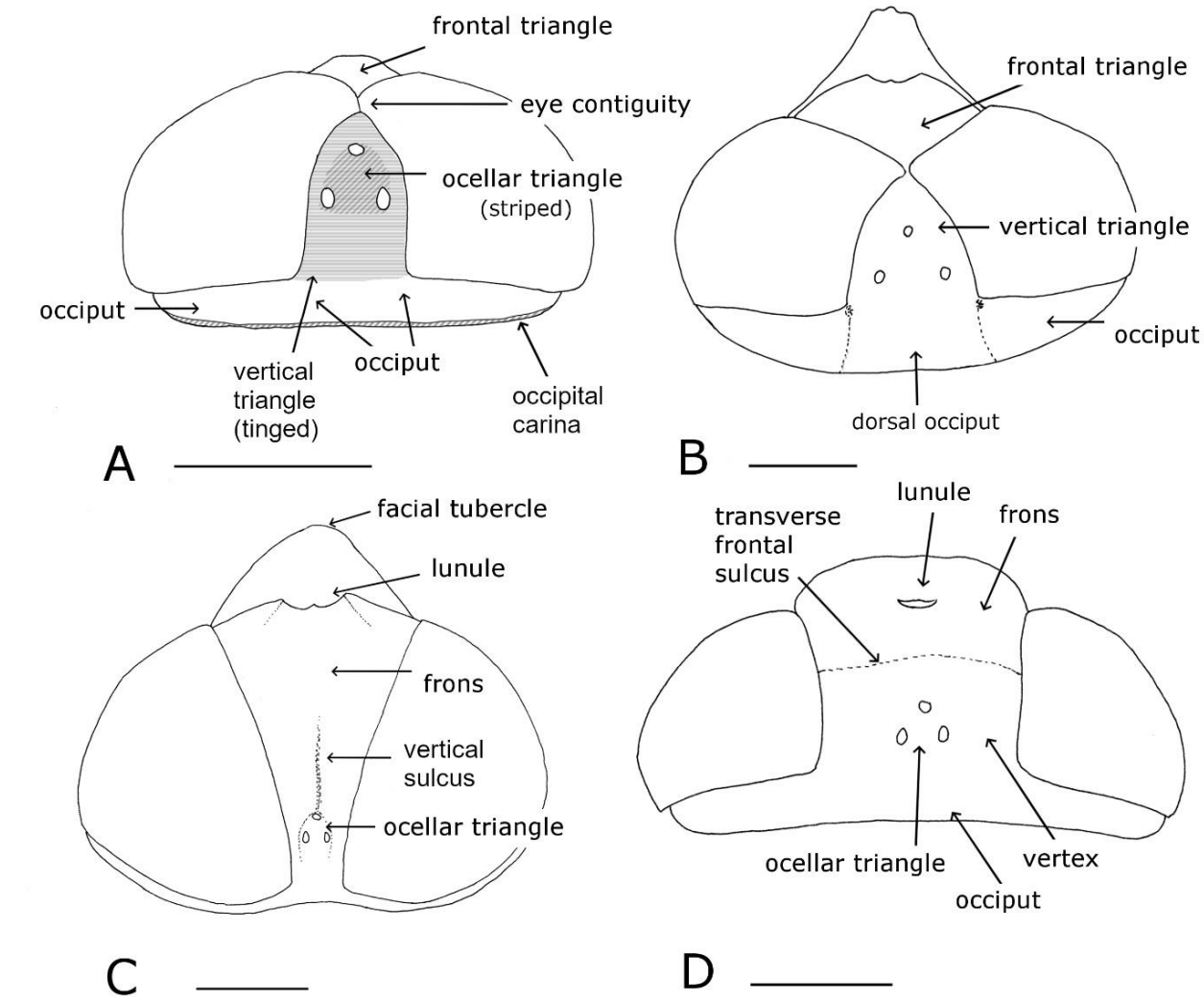

Figure 7. Head, dorsal view. **A**. *Eumerus sulcitibius* ♂; Spain. **B**. *Platynochaetus setosus* ♂; Spain. **C**. *Asarkina porcina* ♀; Russia. **D**. *Microdon mutabilis* ♀; Sweden. Scale = 1.0 mm.

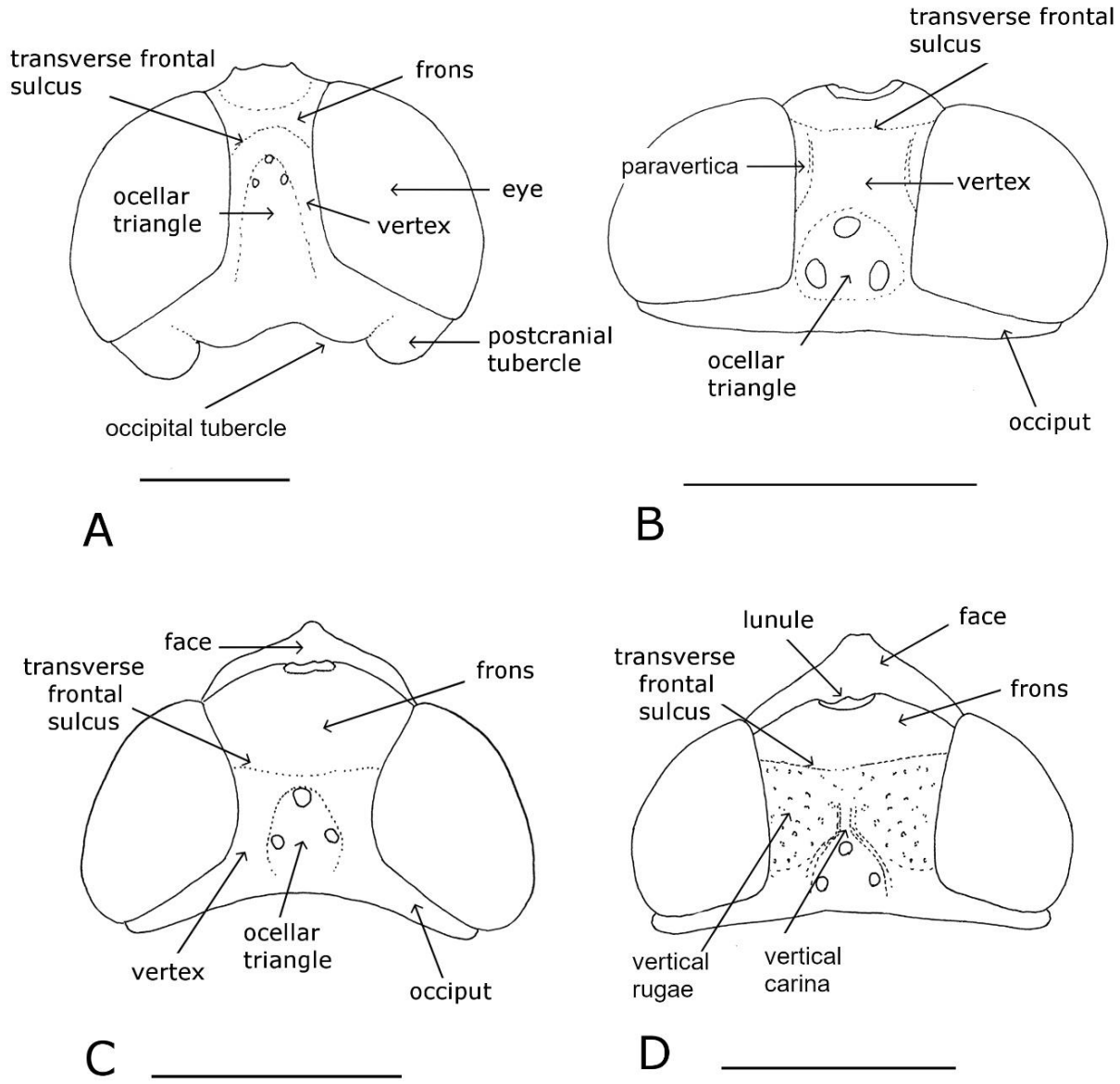

Figure 8. Head, dorsal view. **A**. *Spheginobaccha macropoda* ♂; Vietnam. **B**. *Pelecocera caledonica* ♀; Sweden. **C**. *Melanogaster nigricans* ♂; Russia. **D**. *Melanogaster nigricans* ♀; Russia. Scale = 1.0 mm.

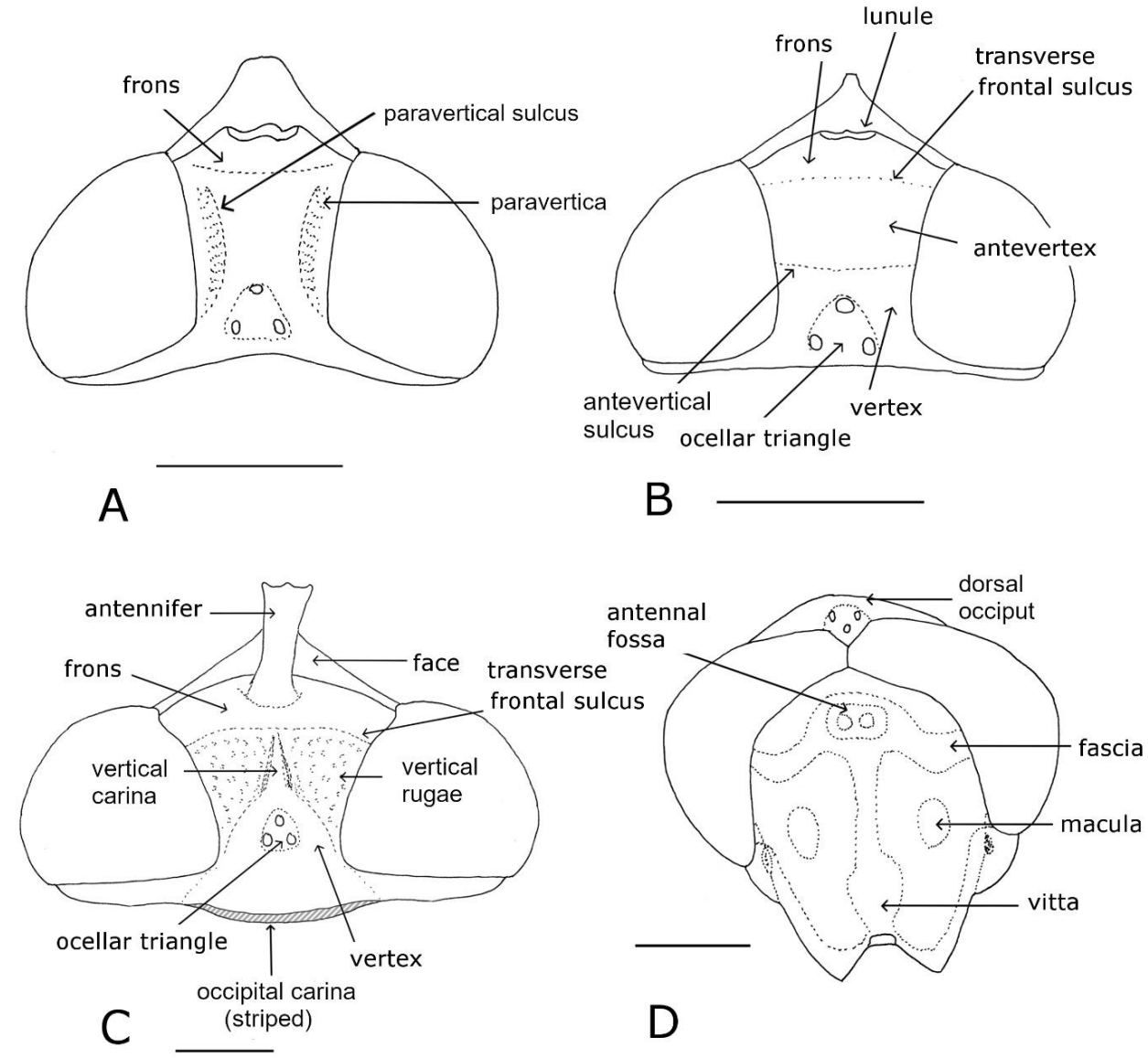

Figure 9. Head, **A**–**C**, dorsal view, **D**, anterior view. **A**. *Chrysosyrphus nasutus* ♀; Sweden. **B**. *Lejogaster metallina* ♂; Denmark. **C**. *Monoceromyia similis* ♀; Taiwan. **D**. *Sphiximorpha petronillae* ♂; Serbia. Scale = 1.0 mm.

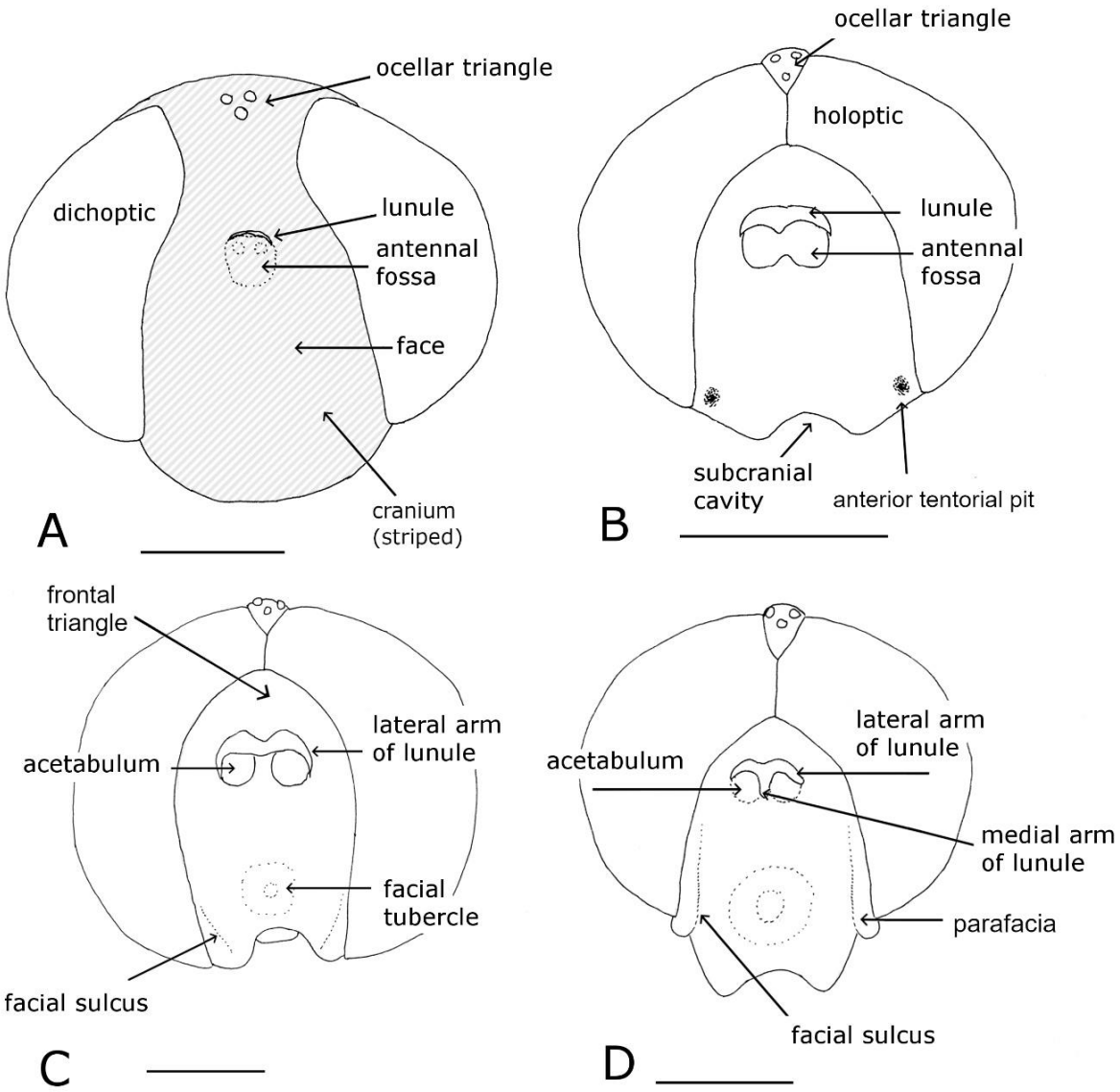

Figure 10. Head, anterior view. **A**. *Microdon devius* ♂; The Netherlands. **B**. *Pipiza luteitarsis* ♂; Sweden. **C**. *Xanthandrus comtus* ♂; The Netherlands. **D**. *Cheilosia variabilis* ♂; Sweden. Scale = 1.0 mm.

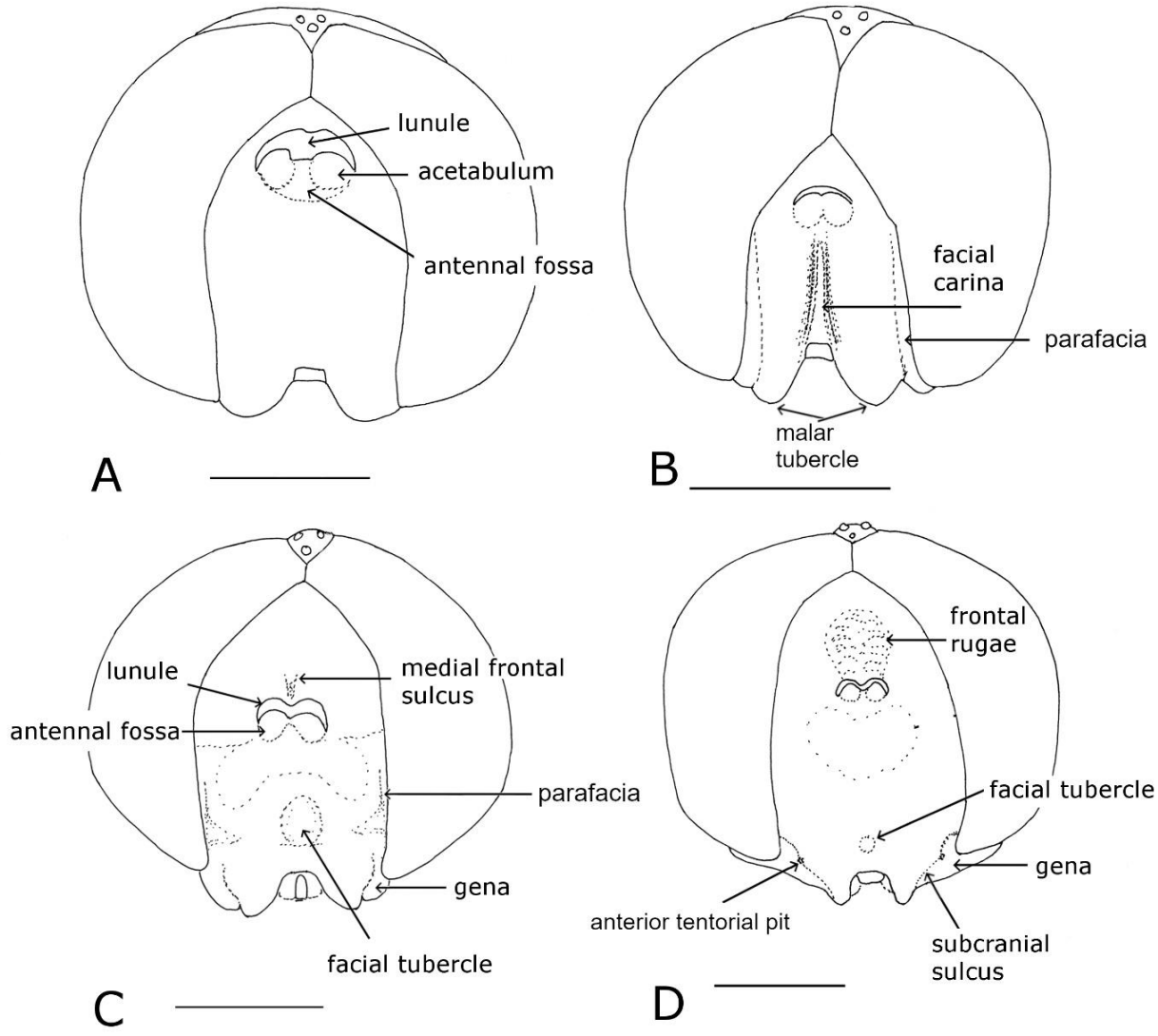

Figure 11. Head, anterior view. **A**. *Didea fasciata* ♂; Russia. **B**. *Tropidia scita* ♂; Sweden. **C**. *Chrysogaster virescens* ♂; Belgium. **D**. *Phytomia errans* ♂; Taiwan. Scale = 1.0 mm.

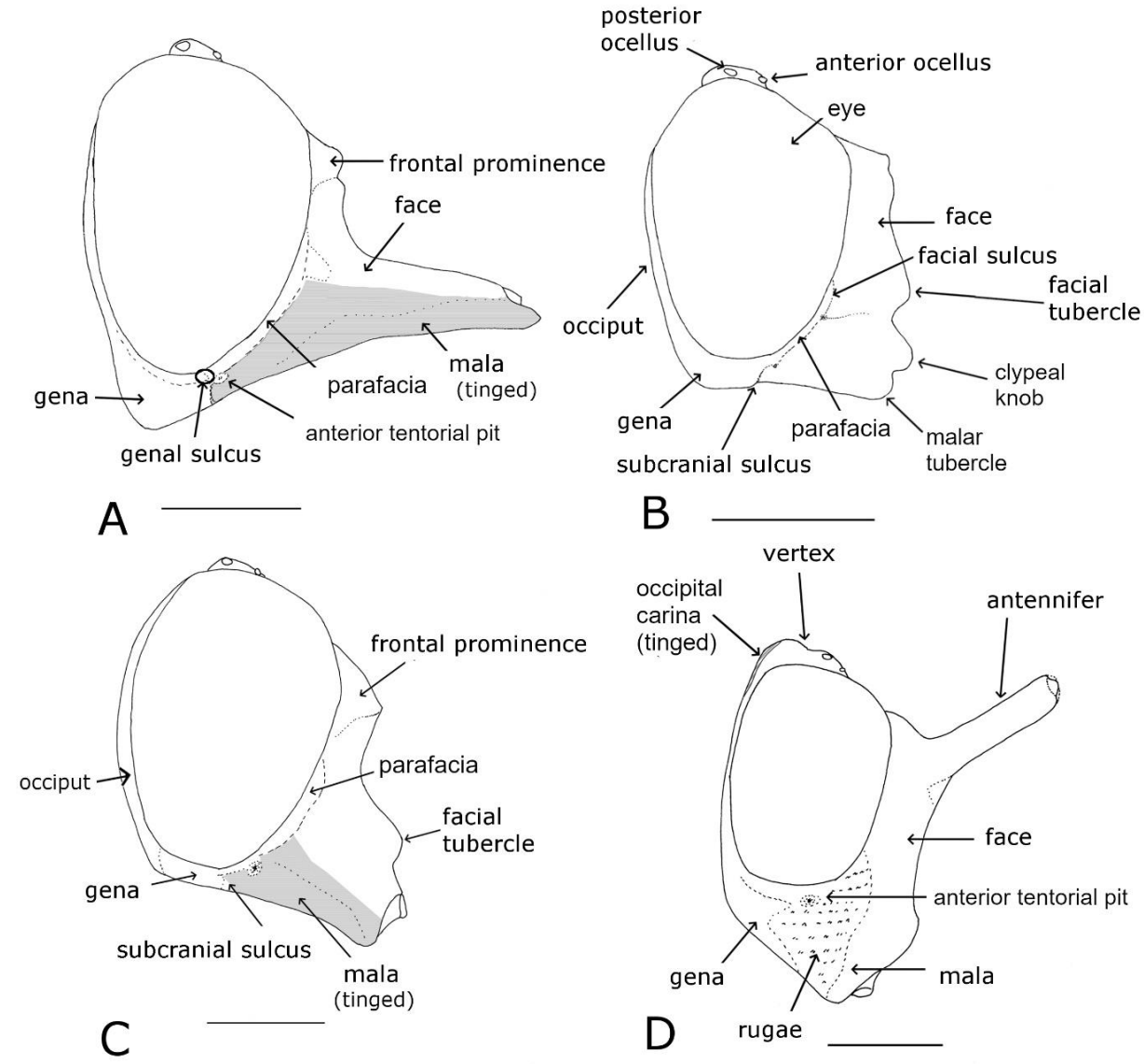

Figure 12. Head, lateral view. **A**. *Rhingia campestris* ♂; Sweden. **B**. *Chrysosyrphus nasutus* ♂; Sweden. **C**. *Cheilosia personata* ♂; France. **D**. *Ceriana conopsoides* ♂; Russia. Scale = 1.0 mm.

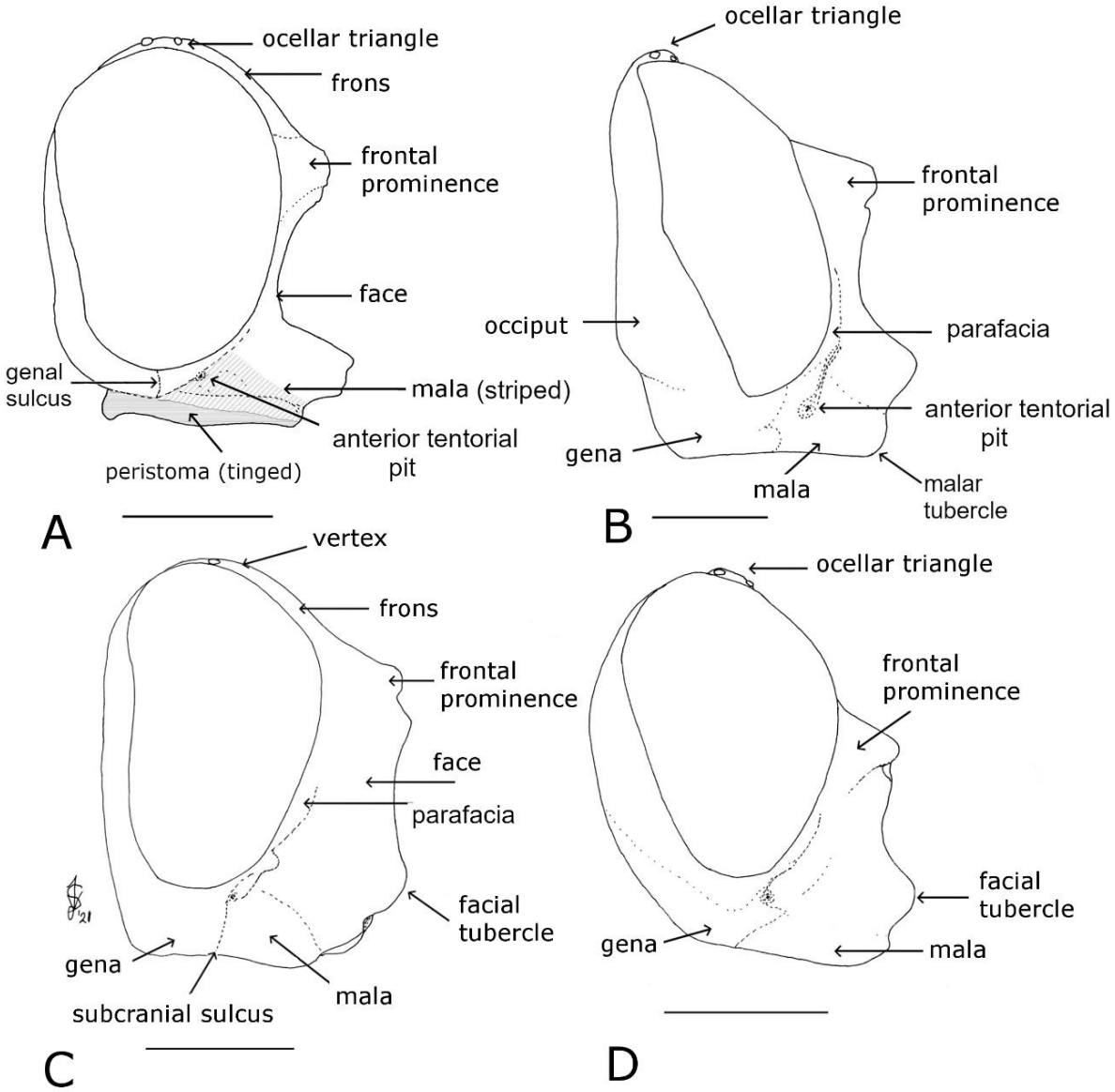

Figure 13. Head, lateral view. **A**. *Sphegina latifrons* ♂; Germany. **B**. *Pocota personata* ♂; Sweden. **C**. *Leucozona laternaria* ♀; Estonia. **D**. *Brachyopa maculipennis* ♂; Serbia. Scale **A** = 0.5 mm; **B**–**D** = 1.0 mm.

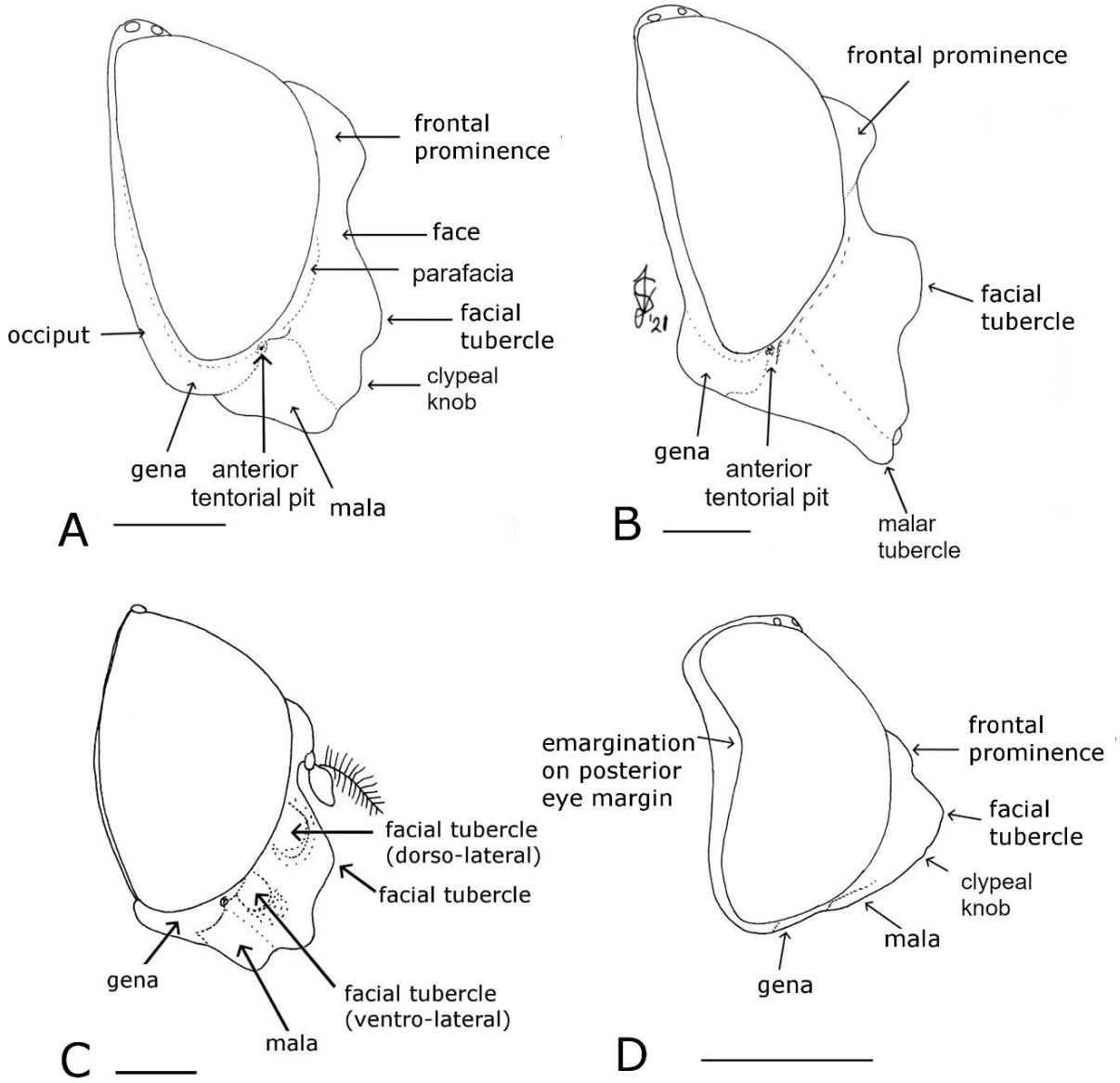

Figure 14. Head, lateral view. **A**. *Eristalis rupium* ♂; Sweden. **B**. *Volucella zonaria* ♂; France. **C**. *Ornidia obesa* ♂; Surinam. **D**. *Toxomerus geminatus* ♂; USA. Scale = 1.0 mm.

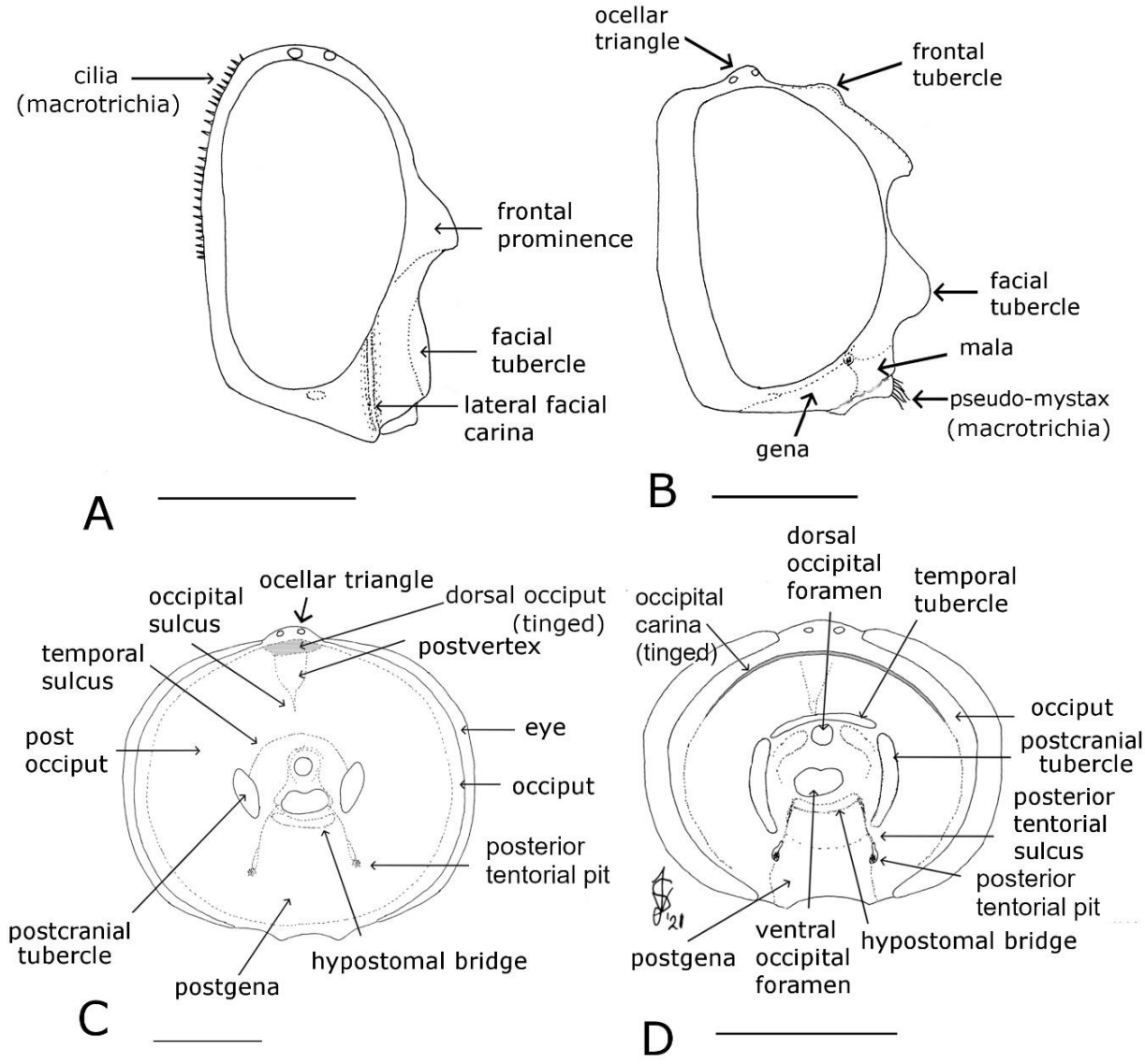

Figure 15. Head, **A, B**, lateral view, **C**, **D**, posterior view. **A**. *Ceriogaster* spp. ♀; Panama. **B**. *Nausigaster tuberculata* ♀; Brazil. **C**. *Xanthandrus comtus* ♀; France. **D**. *Eumerus ornatus* ♀; France. Scale = 1.0 mm.

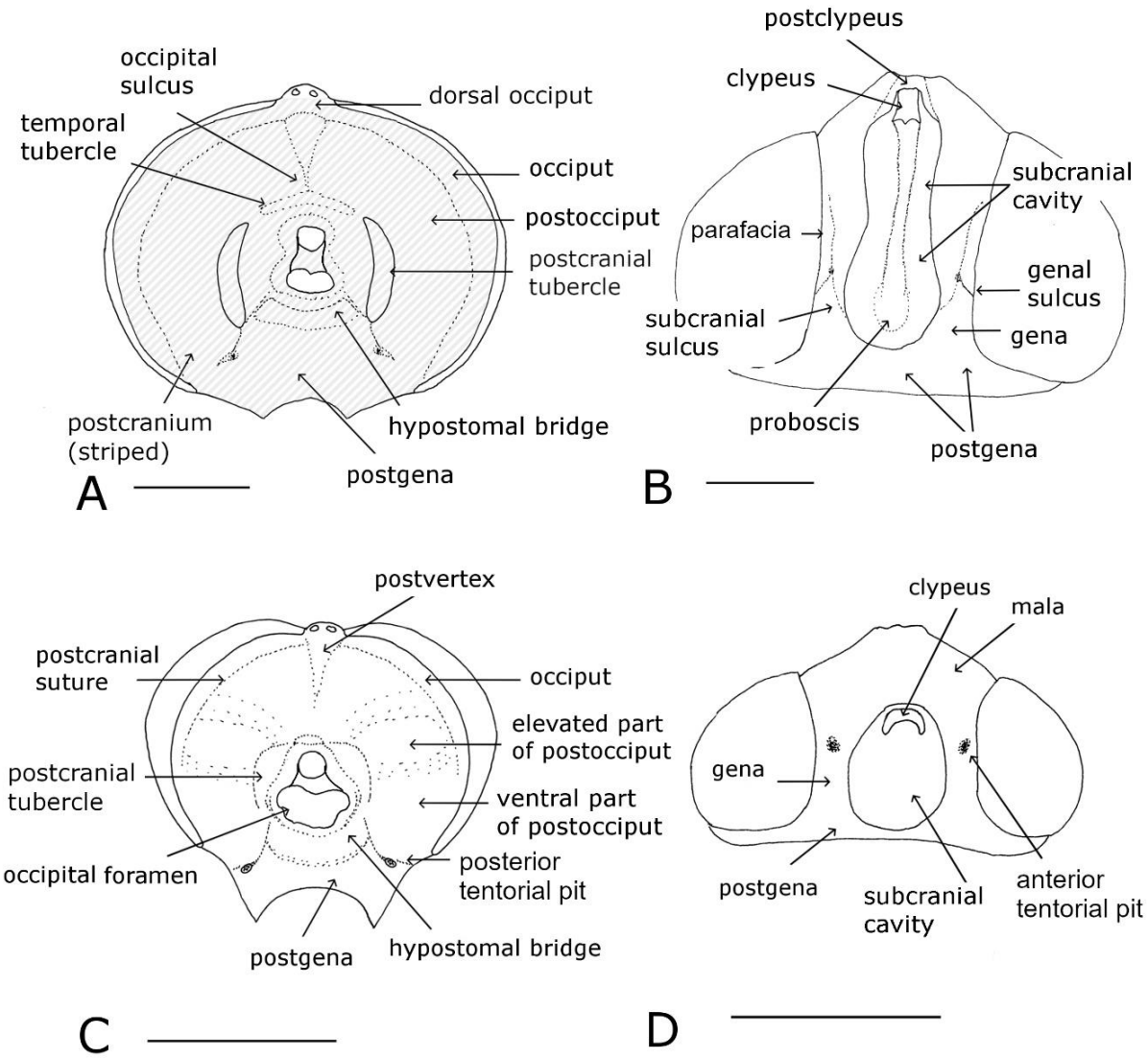

Figure 16. Head, **A**, **C**, posterior view, **B**, **D**, ventral view. **A**. *Merodon serrulatus* ♂; Montenegro. **B**. *Asarkina porcina* ♀; Russia. **C**. *Brachyopa testacea* ♂; Russia. **D**. *Neocnemodon vitripennis* ♂; The Netherlands. Scale = 1.0 mm.

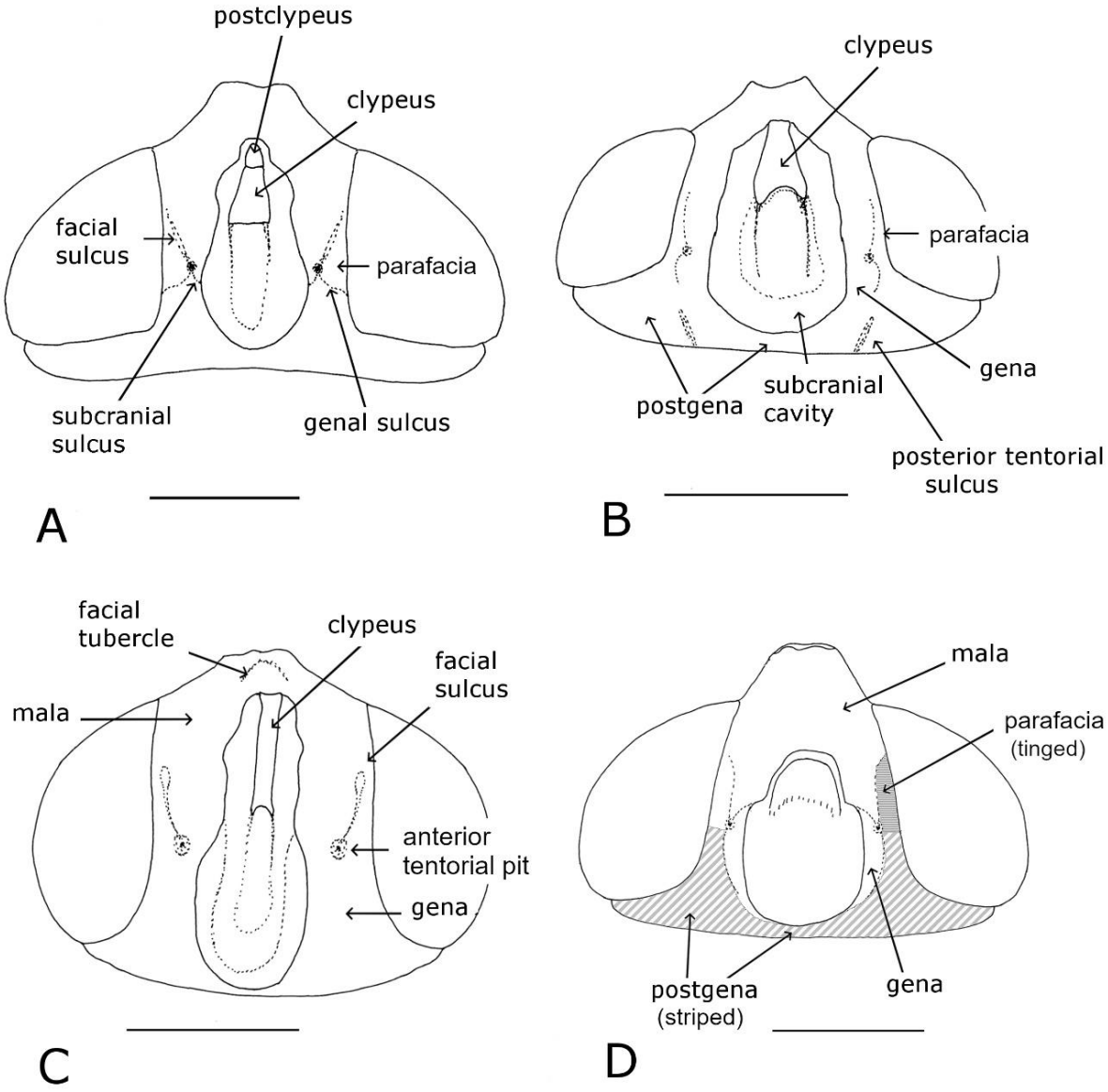

Figure 17. Head, ventral view. **A**. *Parhelophilus crococoronatus* ♂; Spain. **B**. *Brachyopa bicolor* ♂; The Netherlands. **C**. *Platycheirus naso* ♂; Sweden. **D**. *Brachypalpoides lentus* ♂; Sweden. Scale = 1.0 mm.

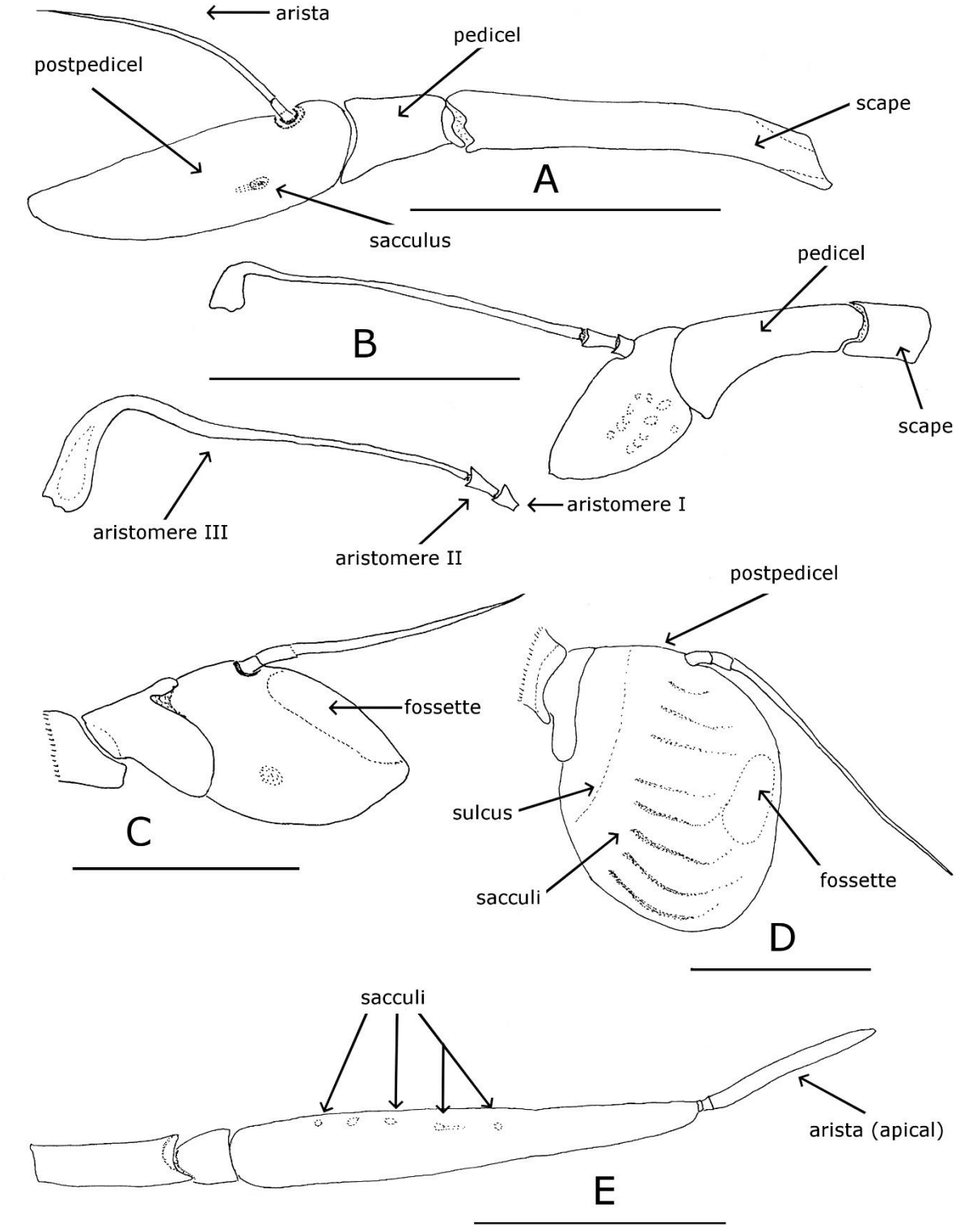

Figure 18. Antenna, lateral view. **A**. *Microdon miki* ♂; Hungary. **B**. *Platynochaetus setosus* ♂; Spain. **C**. *Merodon albifrons* ♂; Spain. **D**. *Eumerus grandis* ♀; France. **E**. *Callicera macquarti* ♂; Cyprus. Scale **A**, **B**, **E** 1.0 mm; **C**, **D** = 0.5 mm.

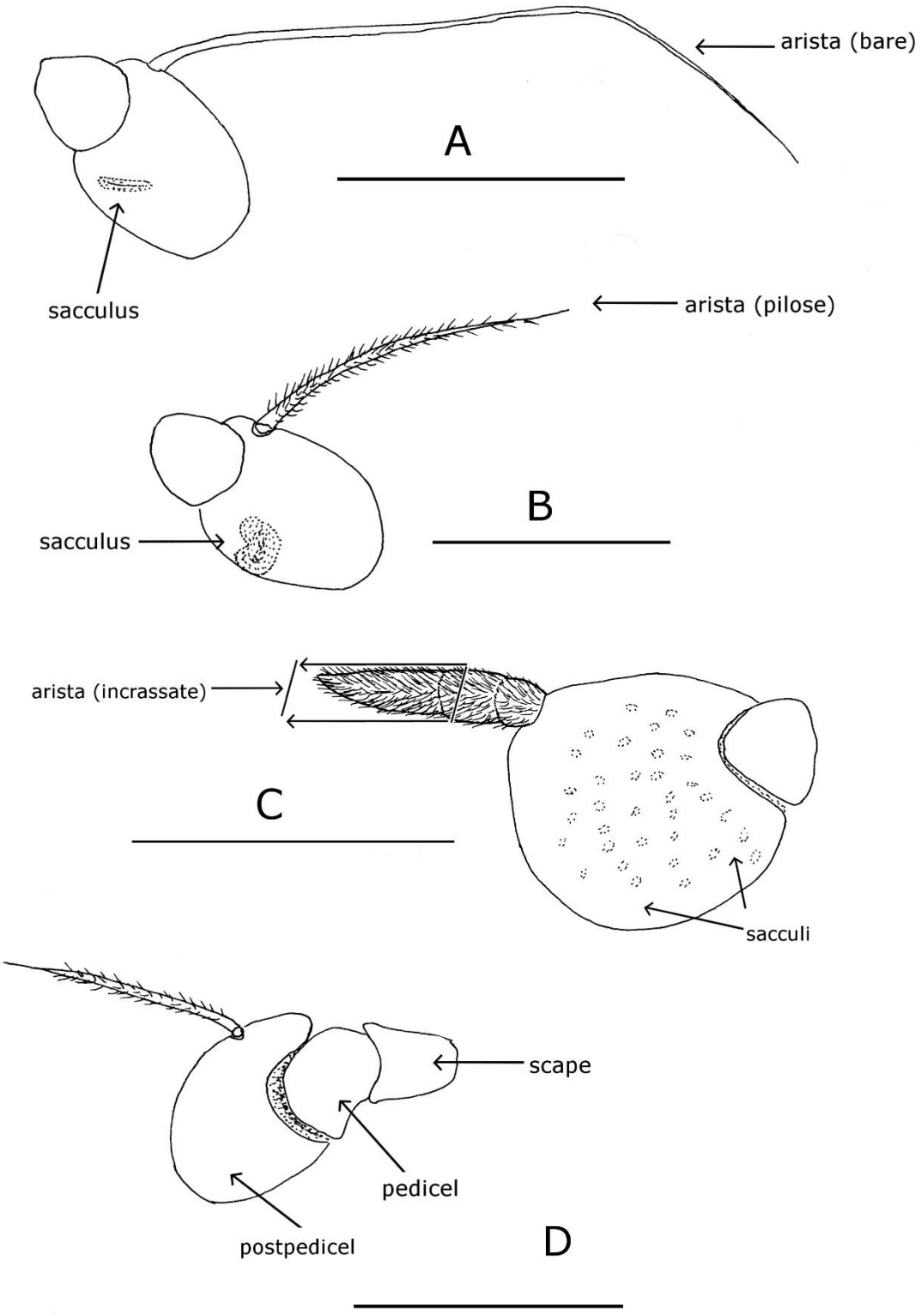

Figure 19. Antenna, lateral view. **A**. *Korinchia tenax* ♂; Malaysia. **B**. *Brachyopa scutellaris* ♂; The Netherlands. **C**. *Pelecocera tricincta* ♀; Sweden. **D**. *Pipiza luteitarsis* ♂; Sweden. Scale **A** = 1.0 mm; **B**–**D** = 0.5 mm.

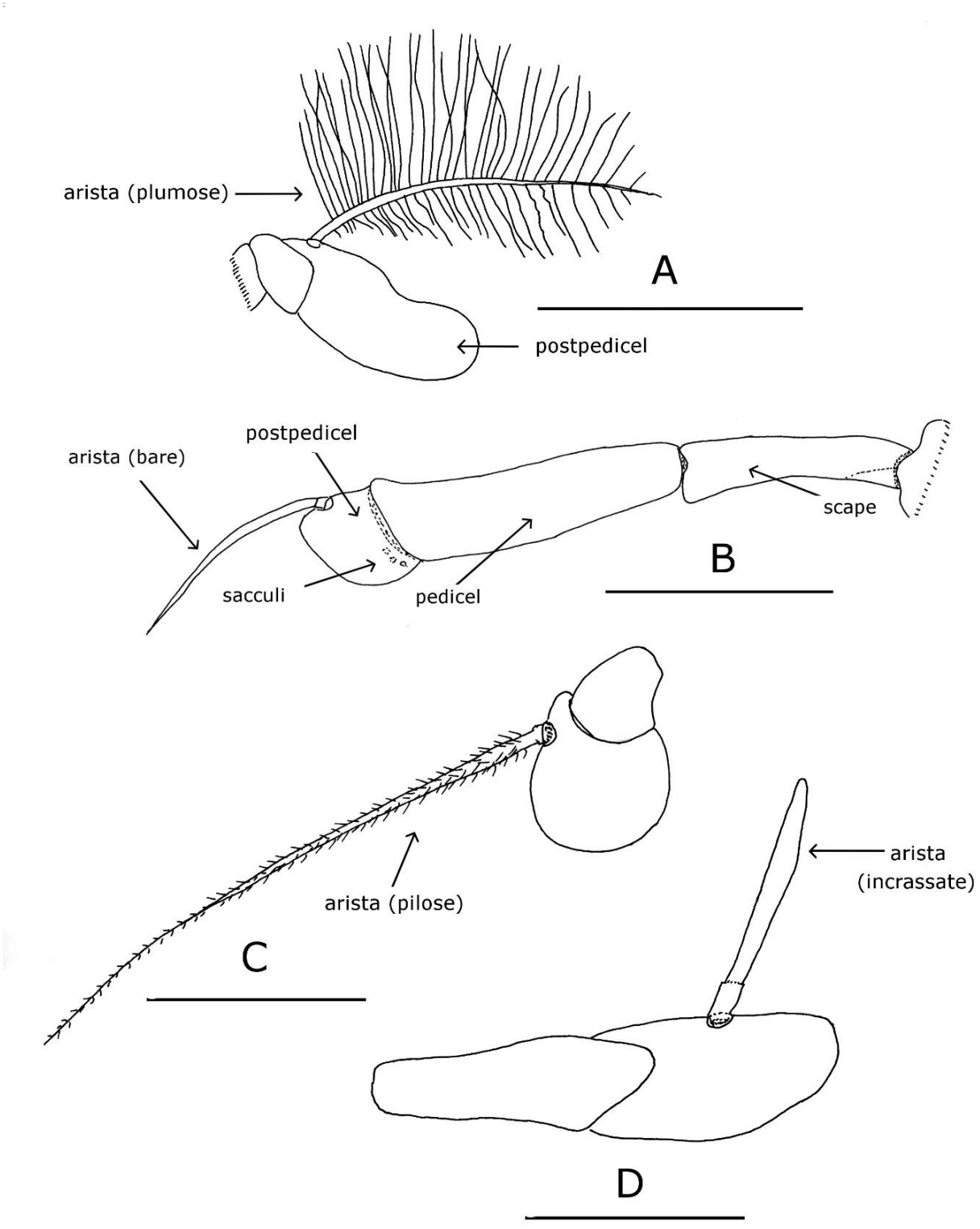

Figure 20. Antenna, lateral view. **A**. *Volucella inanis* ♂; Sweden. **B**. *Sphecomyia vespiformis* ♂; Russia. **C**. *Cheilosia personata* ♂; France. **D**. *Psarus abdominalis* ♂; France. Scale **A**, **B** = 1.0 mm; **C**, **D** = 0.5 mm.

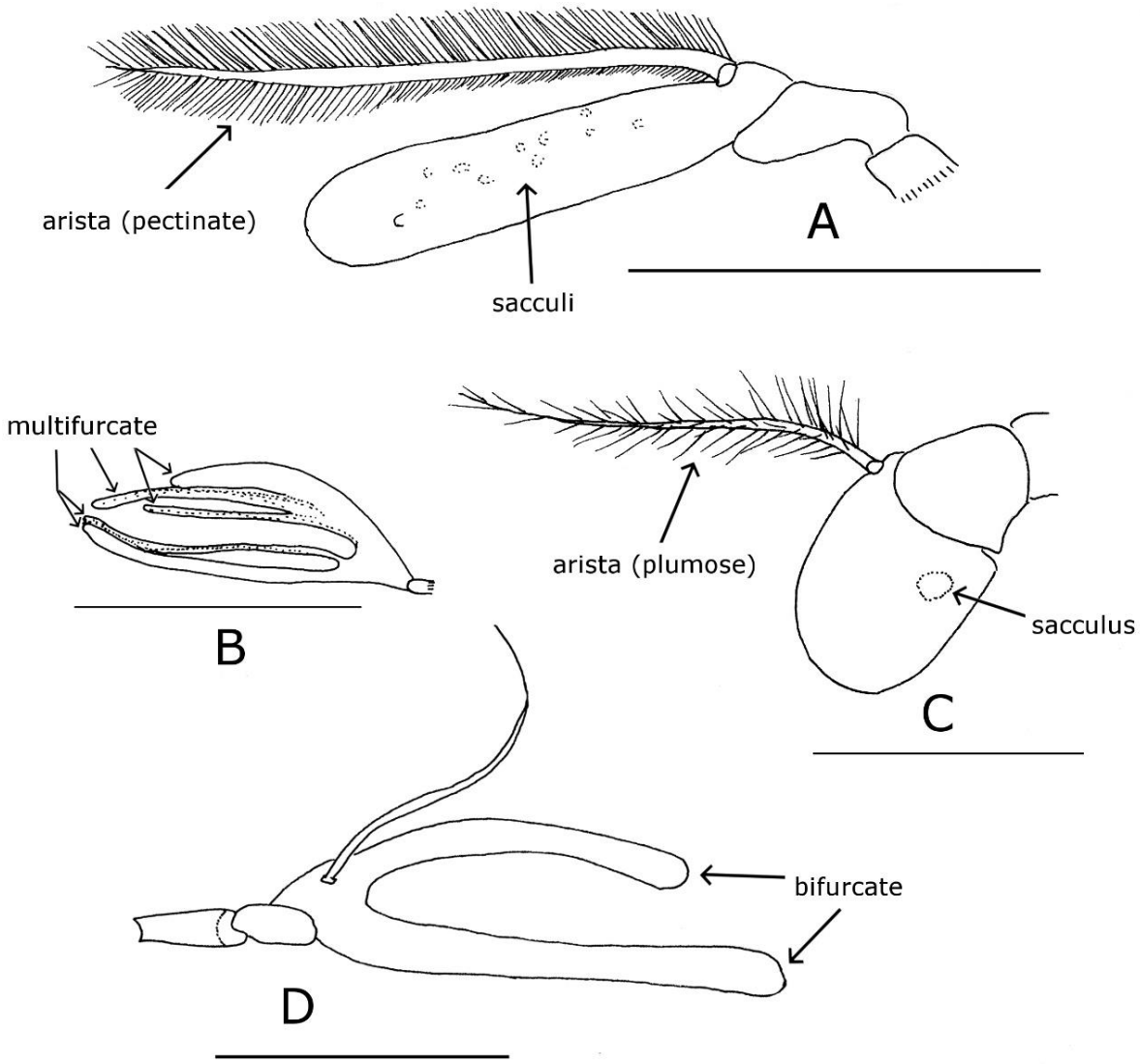

Figure 21. Antenna, lateral view. **A**. *Copestylum lentum* ♂; USA. **B**. *Masarygus palmipalpus* ♂; Holotype. **C**. *Hammerschmidtia ferruginea* ♀; Sweden. **D**. *Cacoceria willistoni* ♂; Argentina. Scale **A**, **D** = 1.0 mm; **B**, **C** = 0.5 mm.

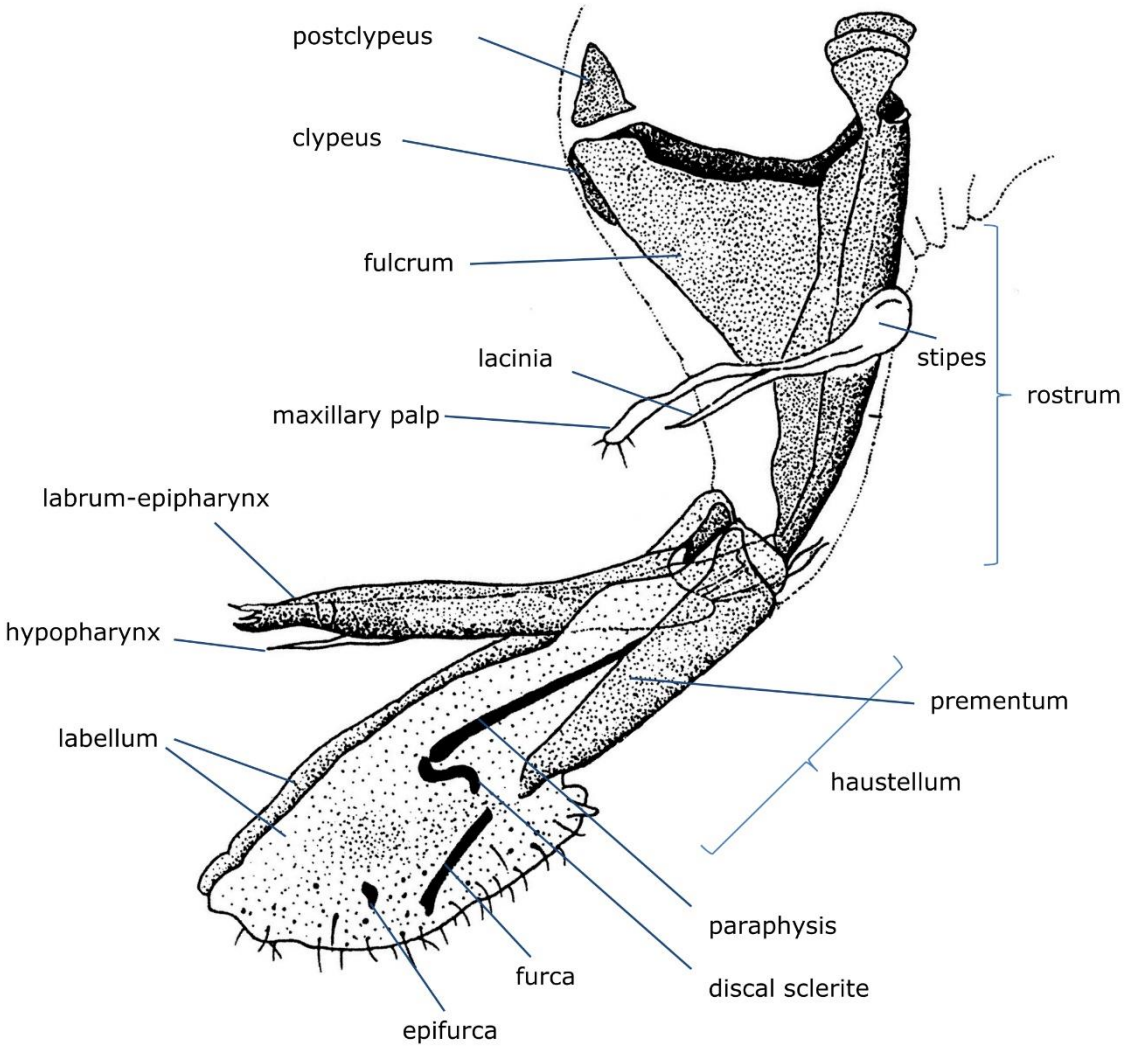

Figure 22. Mouthparts, lateral view. *Eristalis arbustorum* ♀. after Gilbert & Jervis 1998 from Schiemenz 1957

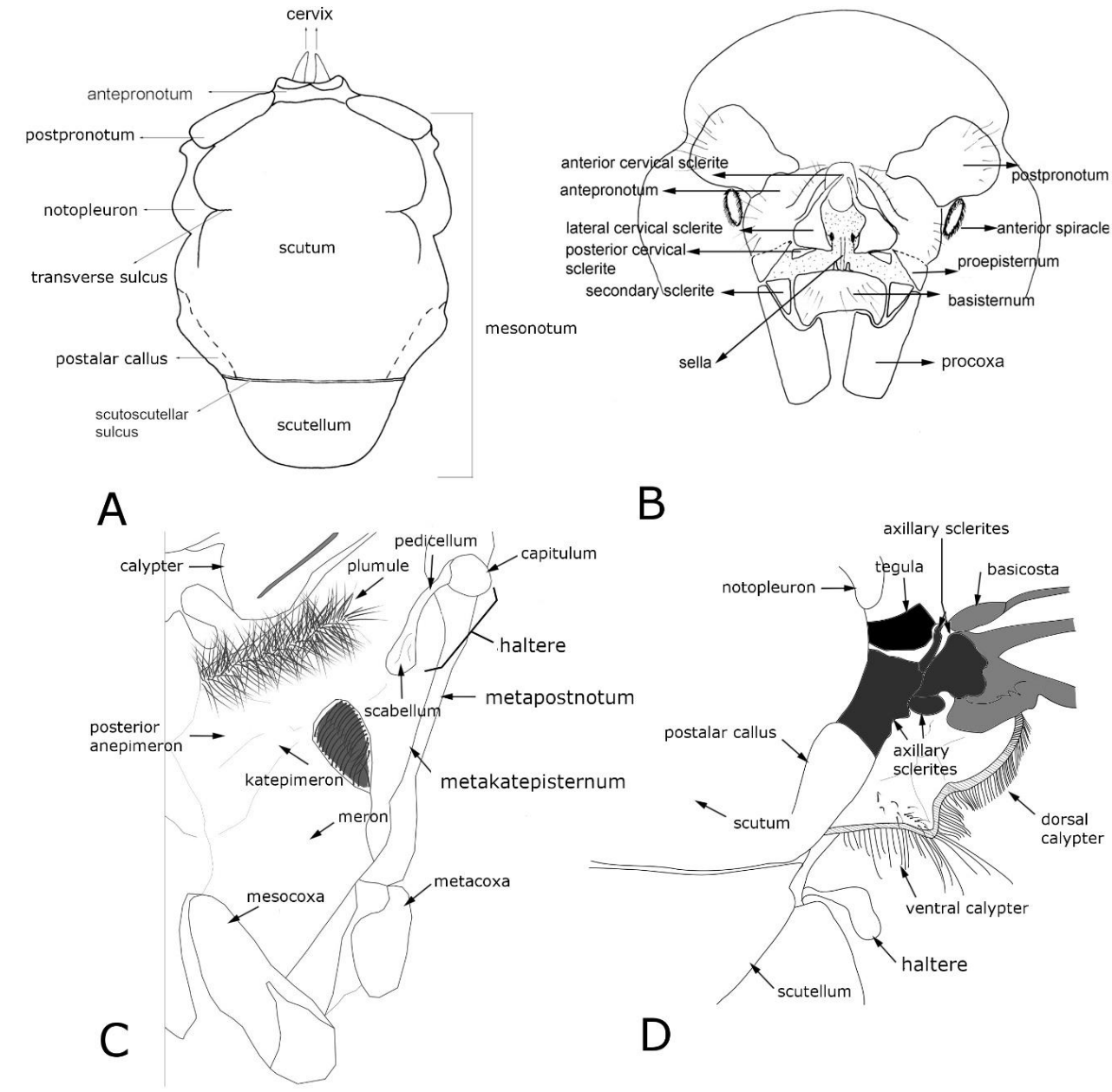

Figure 23. Thorax, **A**, anterior view, **B**, dorsal view, **C**, lateral view, **D**, latero-dorsal view. **A, B**. *Volucella pellucens* ♀; Serbia. **C**. *Copestylum* spp. ♀; Brazil. **D**. *Syrphus phaeostigma* ♂; Argentina. **A, B**: TT; **C, D**: GFGM.

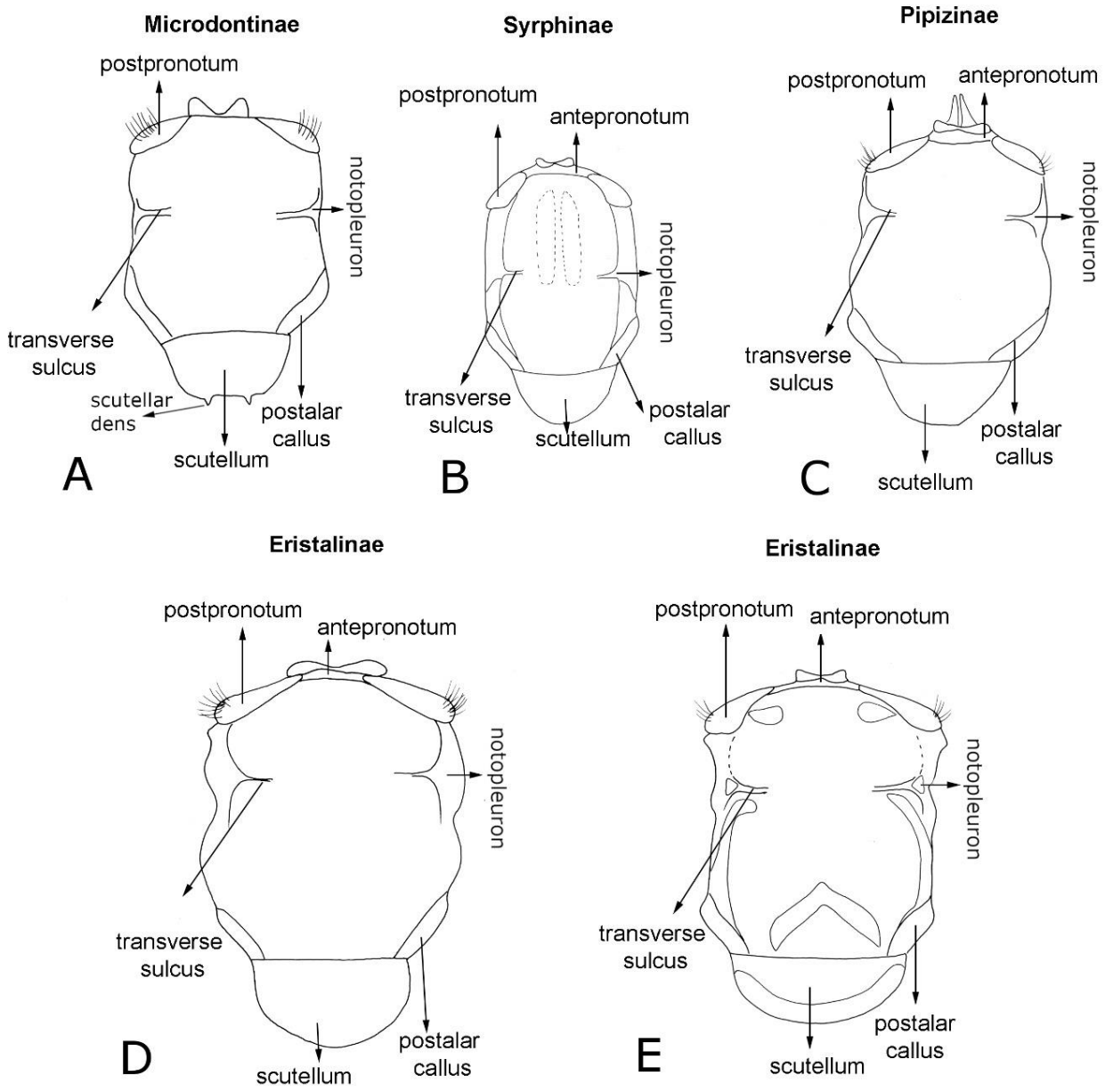

Figure 24. Thorax, dorsal view. **A**. *Microdon mutabilis* ♀; Bosnia-Herzegovina. **B**. *Sphaerophoria scripta* ♂; Serbia. **C**. *Pipiza larusi* ♂; Greece. **D**. *Sericomyia silentis* ♀; Serbia. **E**. *Spilomyia manicata* ♀; Serbia. All TT.

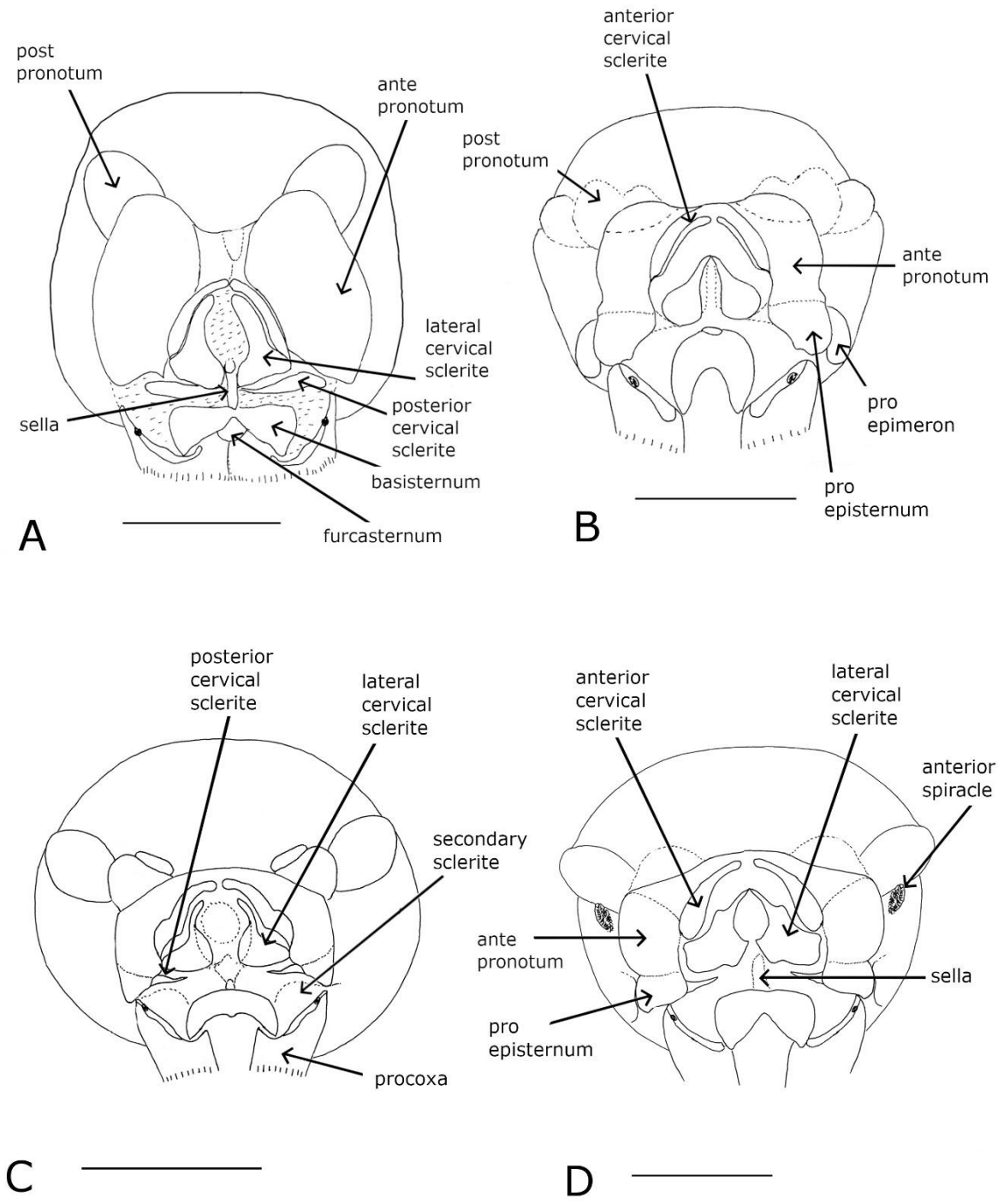

Figure 25. Thorax, anterior view. **A**. *Spheginobaccha macropoda* ♂; Vietnam. **B**. *Portevinia maculata* ♂; Sweden. **C**. *Pipizella ochreobasalis* ♂ paratype; Turkey. **D**. *Merodon aereus* ♂; Montenegro. Scale = 1.0 mm.

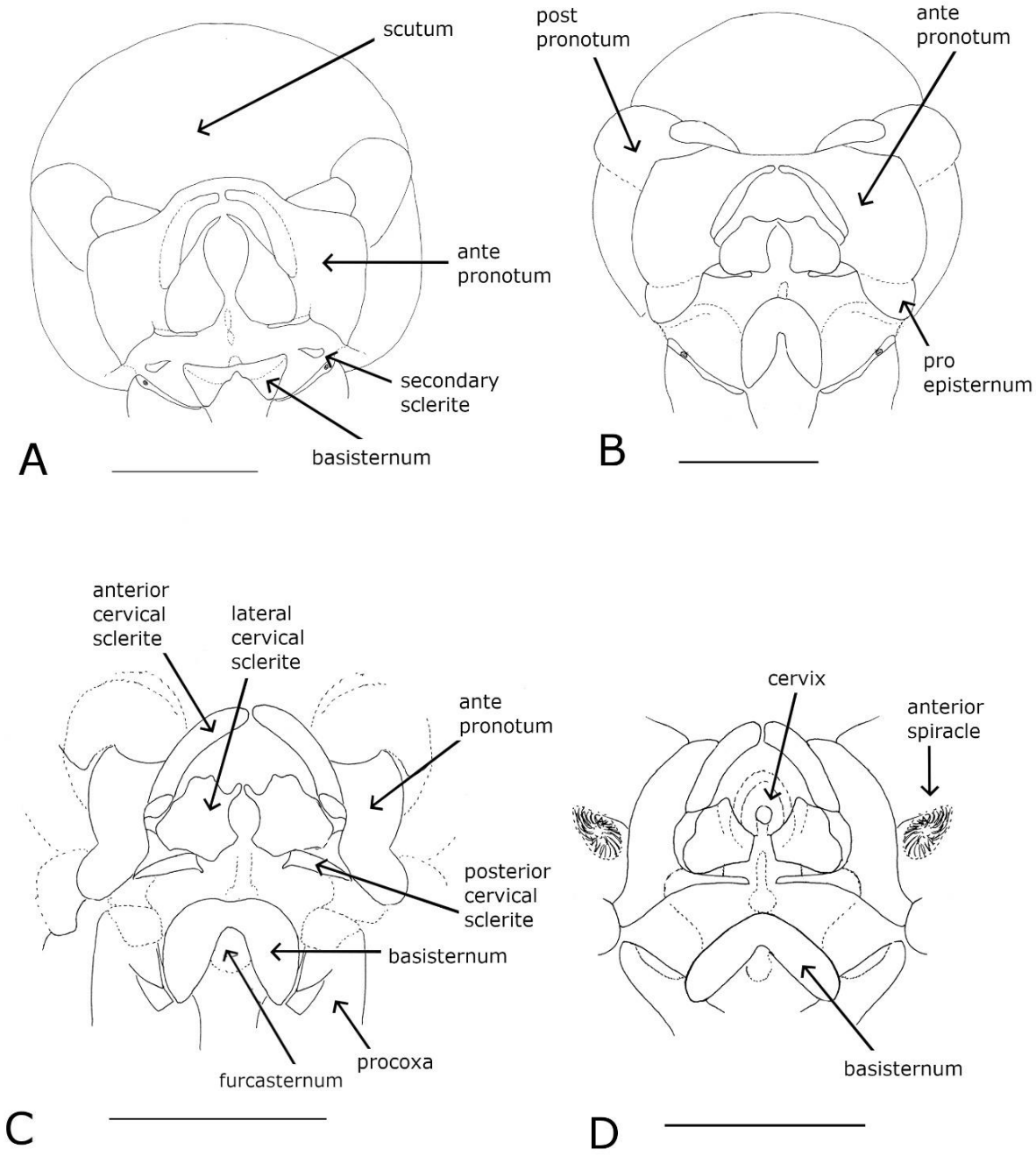

Figure 26. Thorax, anterior view. **A**. *Ceriana conopsoides* ♂; Russia. **B**. *Sphegina latifrons* ♀; Germany. **C**. *Xanthogramma dives* ♂; Greece. **D**. *Xanthandrus comtus* ♀; France. Scale **A, C, D** = 1.0 mm; **B** = 0.5 mm.

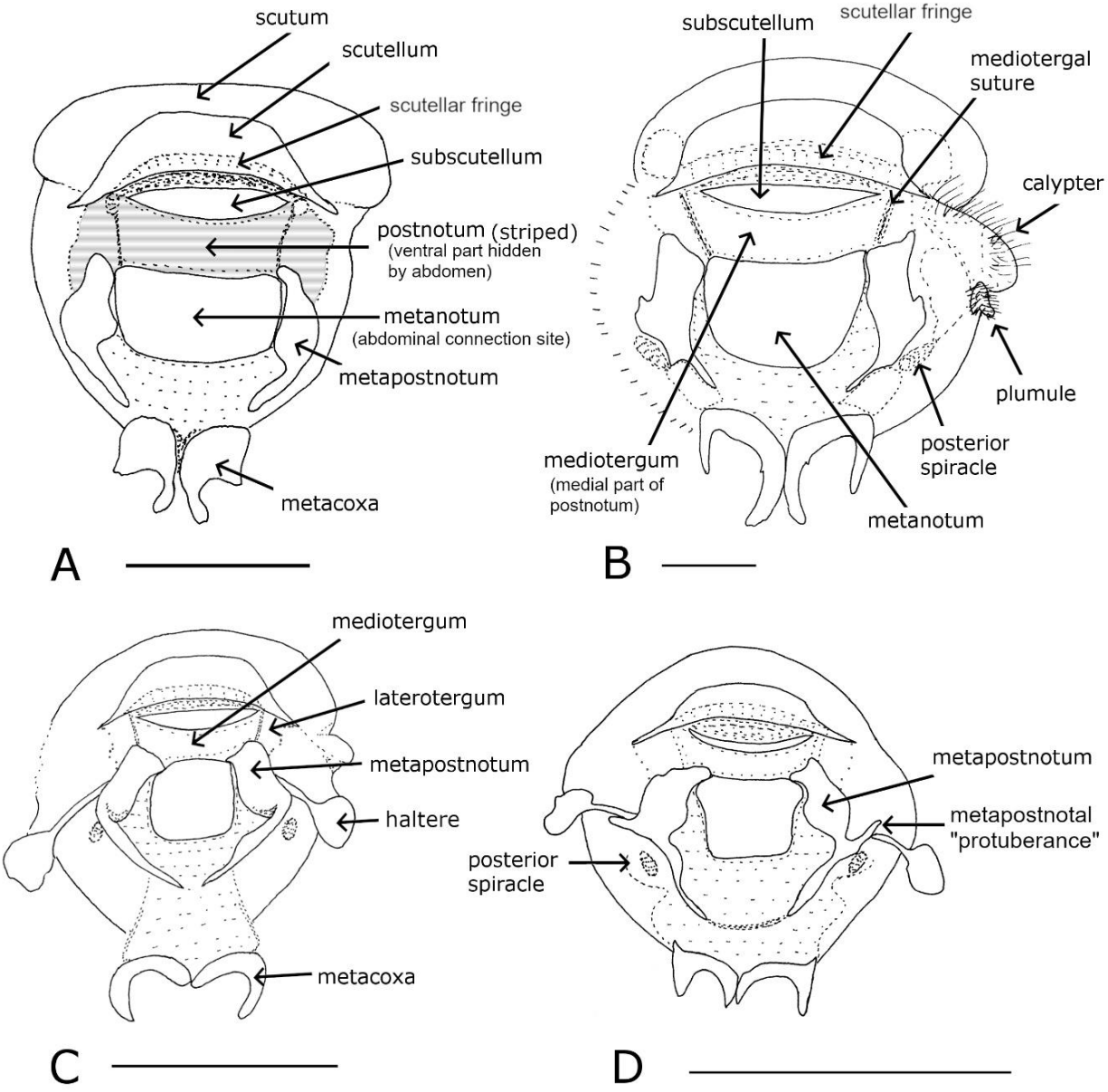

Figure 27. Thorax, posterior view. **A**. *Brachyopa insensilis* ♂; The Netherlands. **B**. *Chrysotoxum elegans* ♂; France. **C**. *Sphegina verecunda*. ♀; Serbia. **D**. *Neoascia tenur* ♂; Russia. Scale = 1.0 mm.

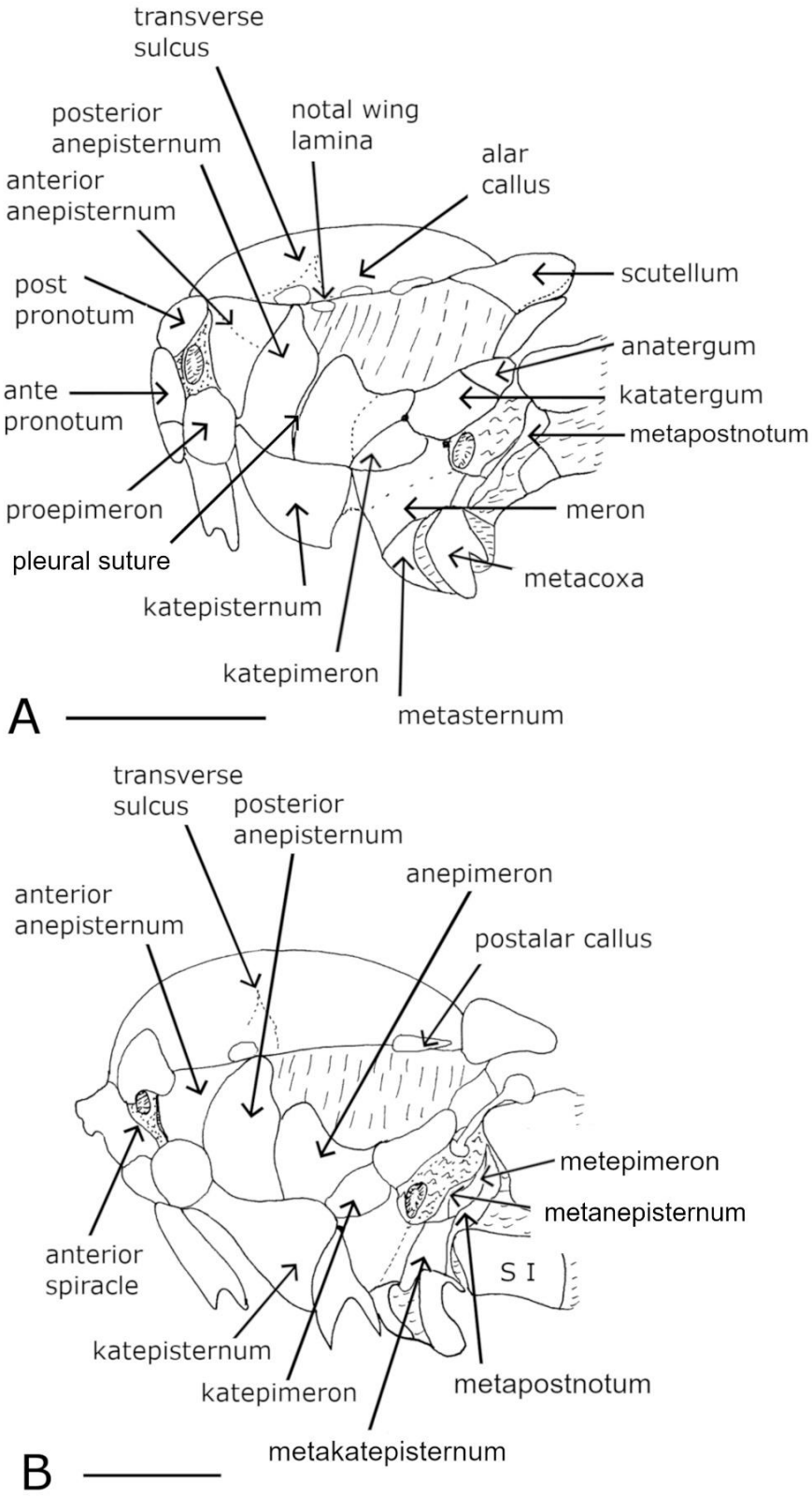

Figure 28. Thorax, lateral view. **A**. *Eumerus ornatus* ♀; France. **B**. *Portevinia maculata* ♂; Sweden. Scale = 1.0 mm. S I = sternum I.

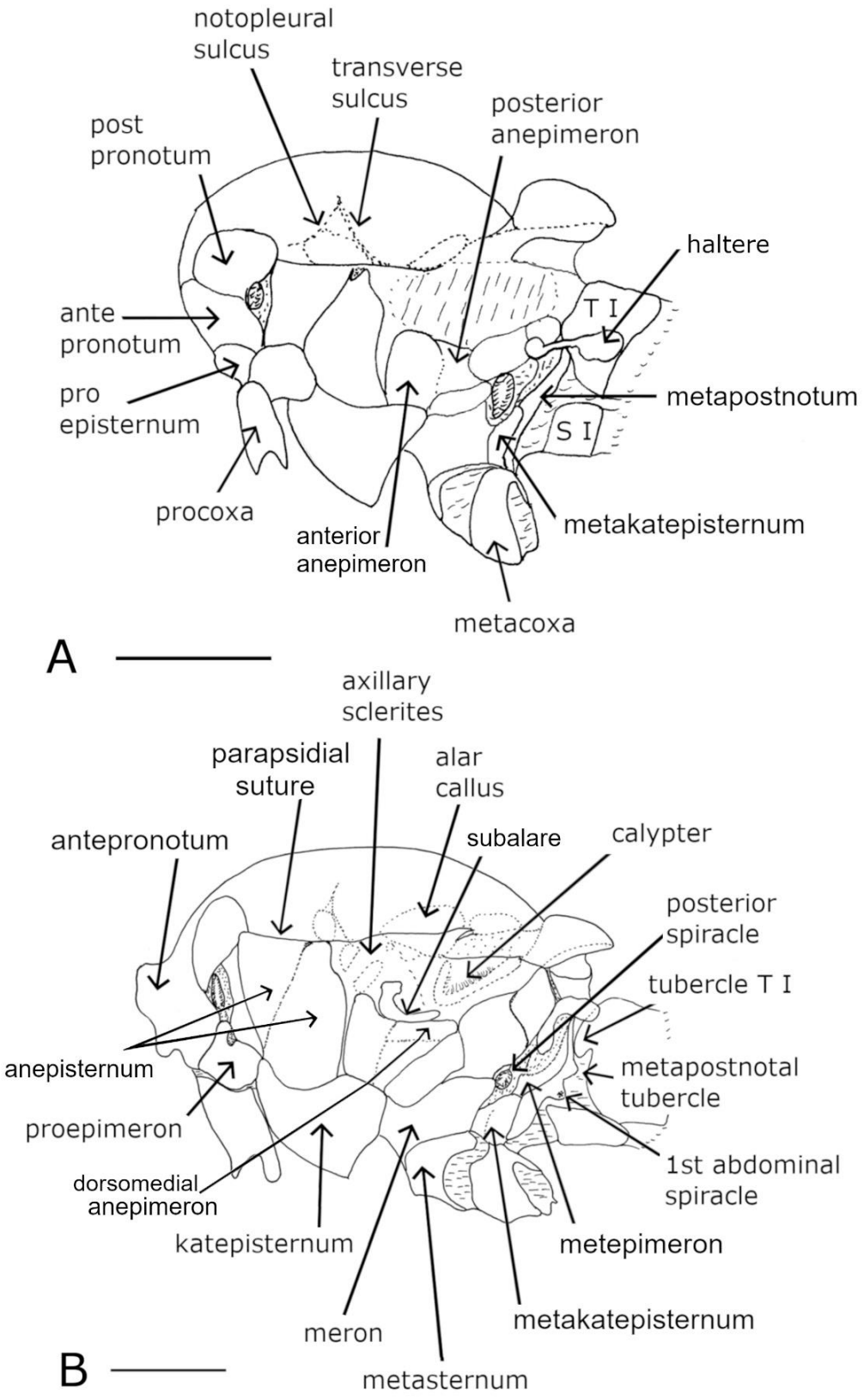

Figure 29. Thorax, lateral view. **A**. *Brachyopa testacea* ♂; Russia. **B**. *Ceriana conopsoides* ♂; Russia. Scale = 1.0 mm. T I = tergum I, S I = sternum I.

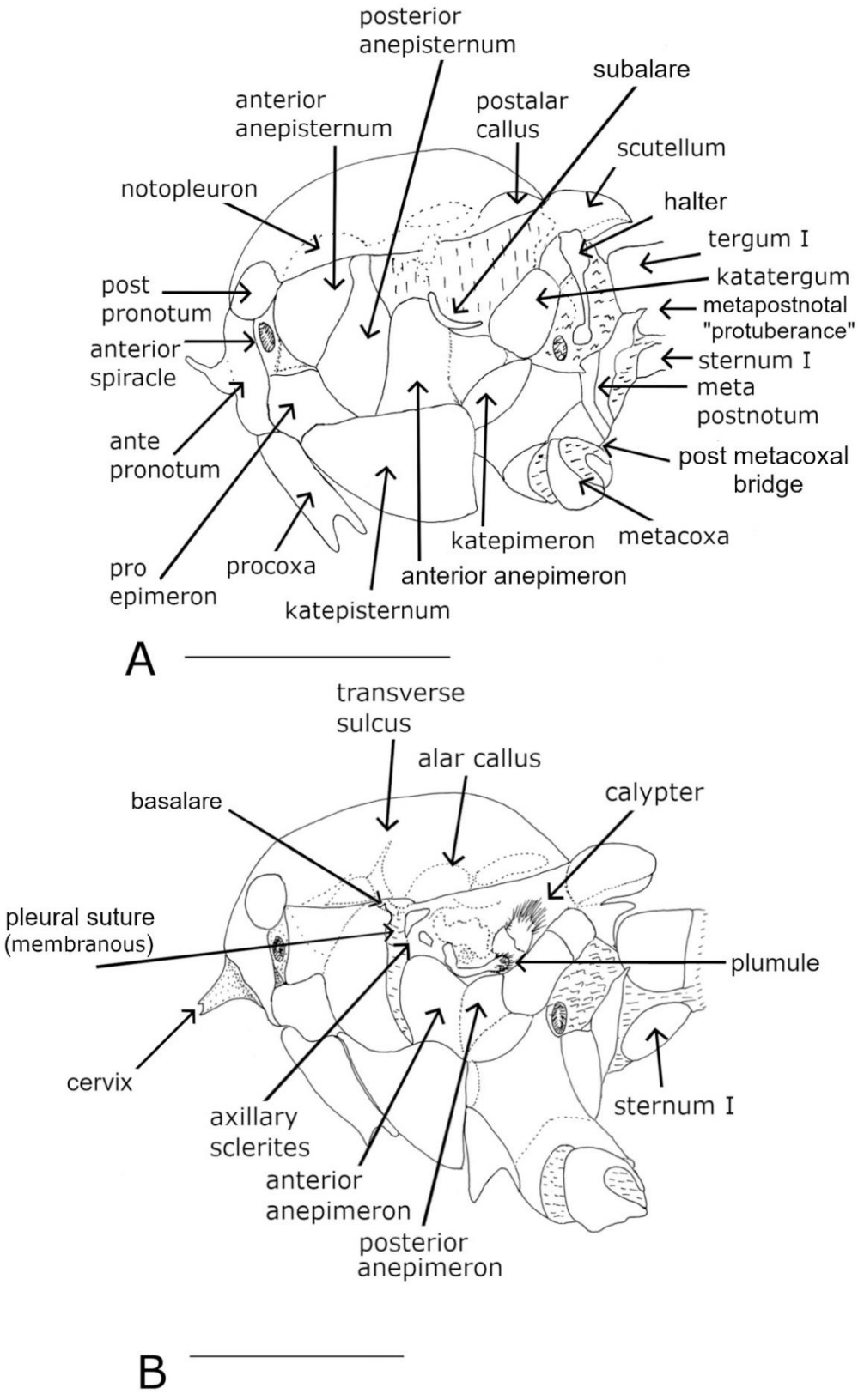

Figure 30. Thorax, lateral view. **A**. *Neoascia tenur* ♂; Germany. **B**. *Sphegina latifrons* ♀; Germany. Scale = 1.0 mm.

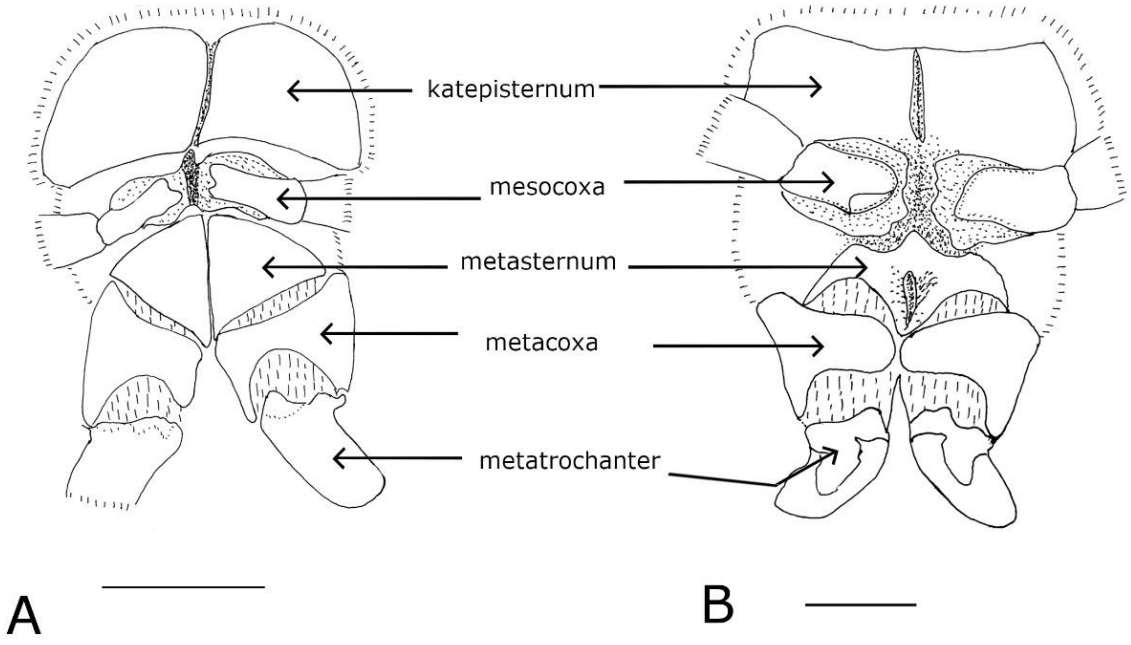

Figure 31. Thorax, ventral view. **A**. *Tropidia scita* ♂; Sweden. **B**. *Caliprobola speciosa* ♂; The Netherlands. Scale = 1.0 mm.

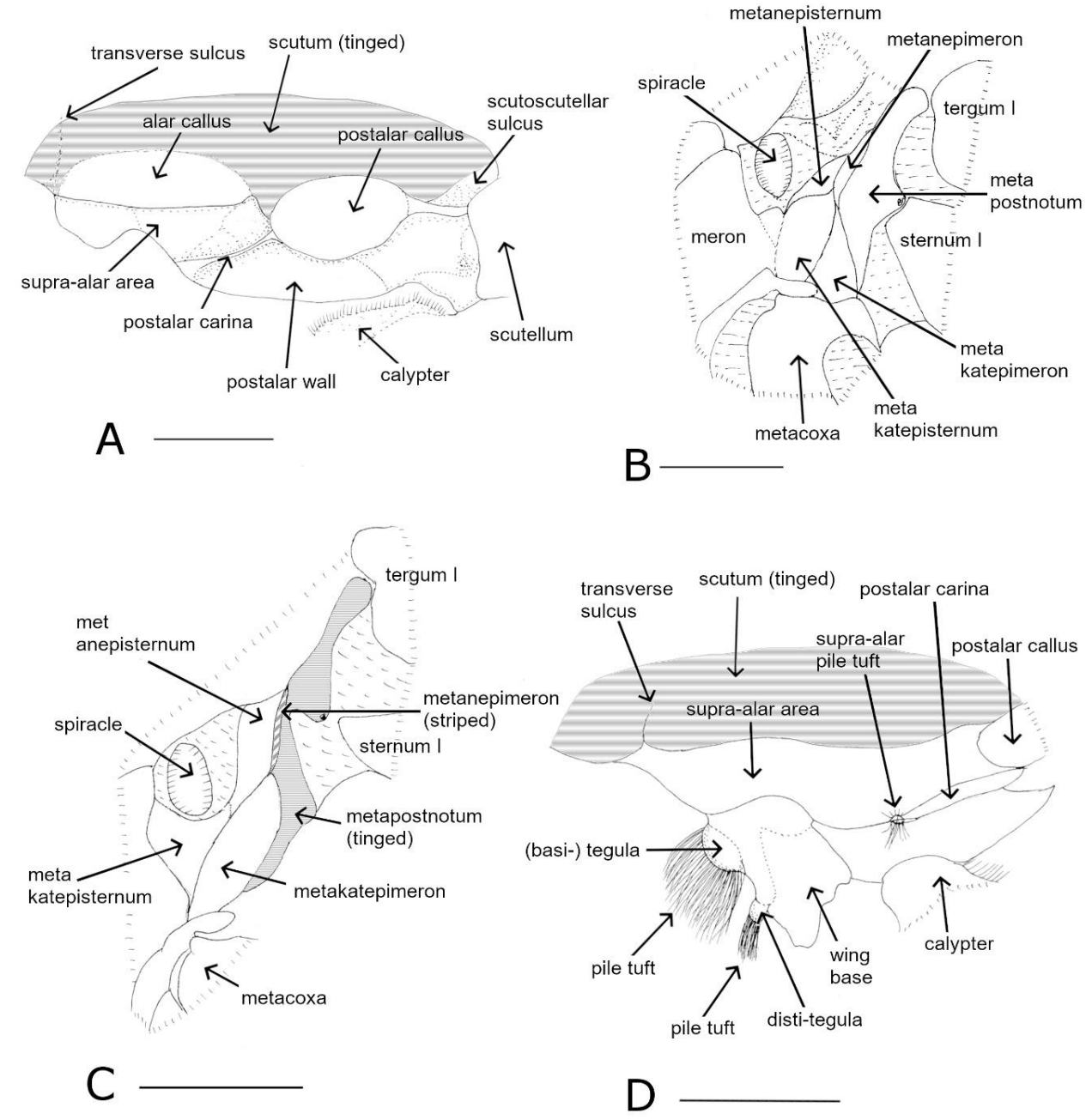

Figure 32. Thorax, lateral view. **A**. Postalar wall and carina, *Xanthogramma dives* ♂; Greece. **B**. Posterior part of pleura, *Xanthogramma dives* ♂; Greece. **C**. Posterior part of pleura, *Spheginobaccha macropoda* ♂; Vietnam. **D**. Supra alar area and pile tuft, *Eristalinus aeneus* ♂; Greece. Scale = 0.5 mm.

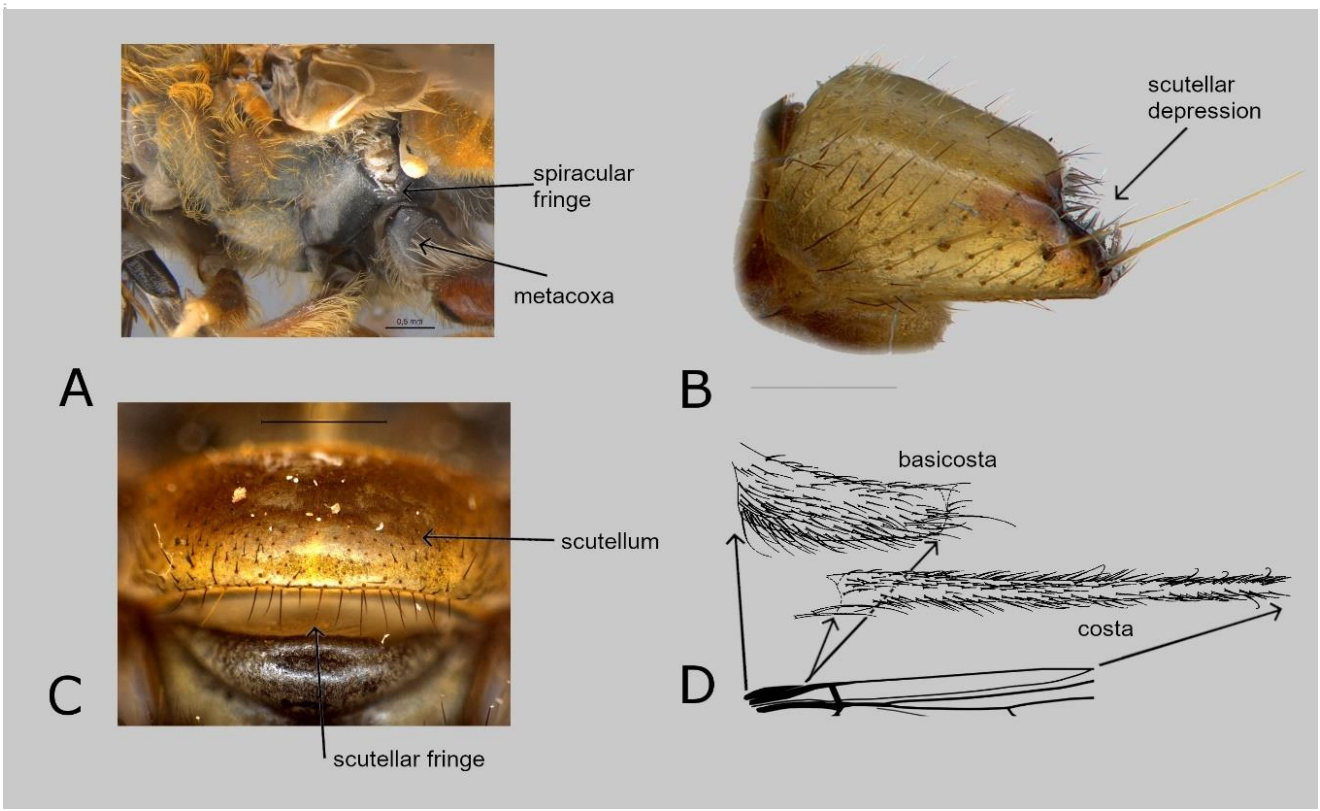

Figure 33. Thorax and wing. **A**. Spiracular fringe, *Palpada vinetorum* ♀; Brazil. **B**. Scutellar depression, *Copestylum chapadense* ♀; Panama. **C**. Scutellar fringe, *Pelecinobaccha summa* ♂; Brazil. **D**. Costal chaetotaxy, *Milesia apsycta* ♂; China. Scale = 0.5 mm. **A–C** GFGM, **D** after Hippa 1990.

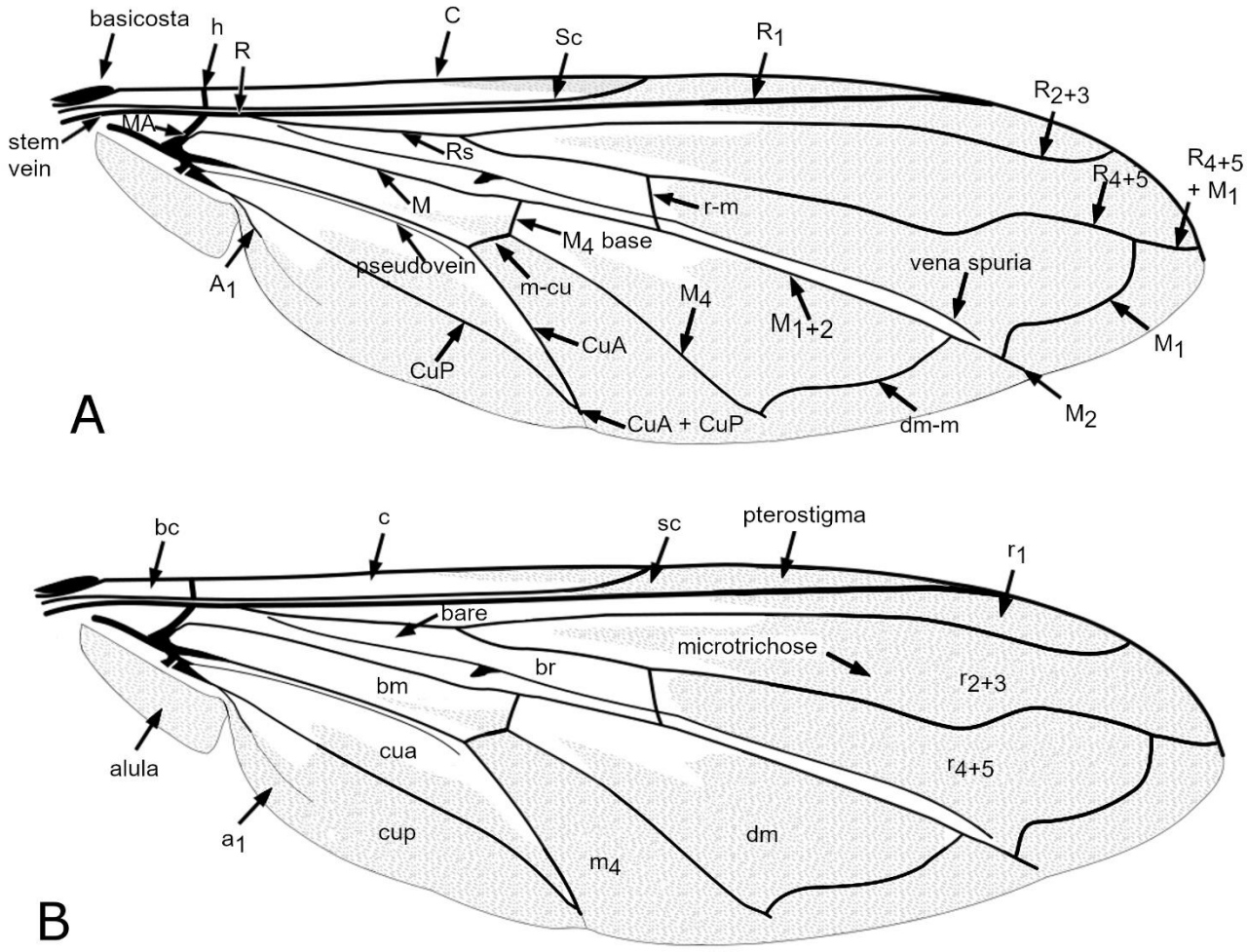

Figure 34. Wing, dorsal view. *Toxomerus tibicien* ♀; Brazil. **A**. Veins, **B**. Cells. All GFGM.

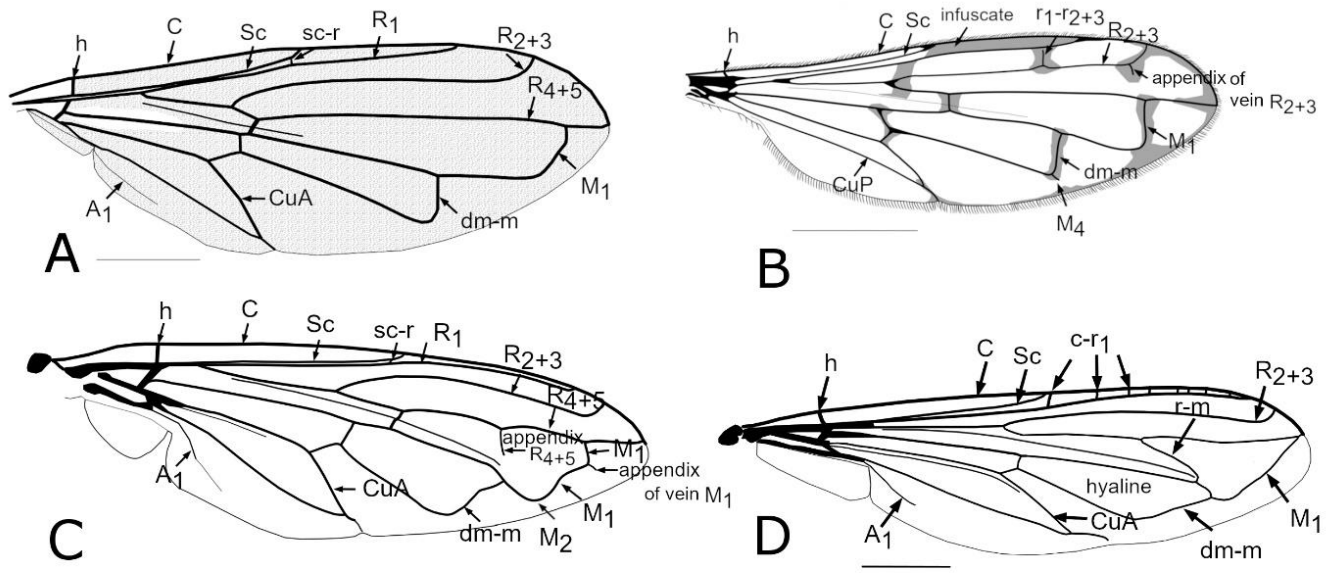

Figure 35. Wing, dorsal view. **A**. *Aristosyrphus* spp ♀; Brazil. **B**. *Sphegina (Asiosphegina) crucivena* ♂ paratype; Myanmar. **C**. *Microdon* spp ♀; Brazil. **D**. *Lycastris cornutus* ♂; Taiwan. Scale **A, B** = 1.0 mm; **D** = 2.0 mm. All GFGM.

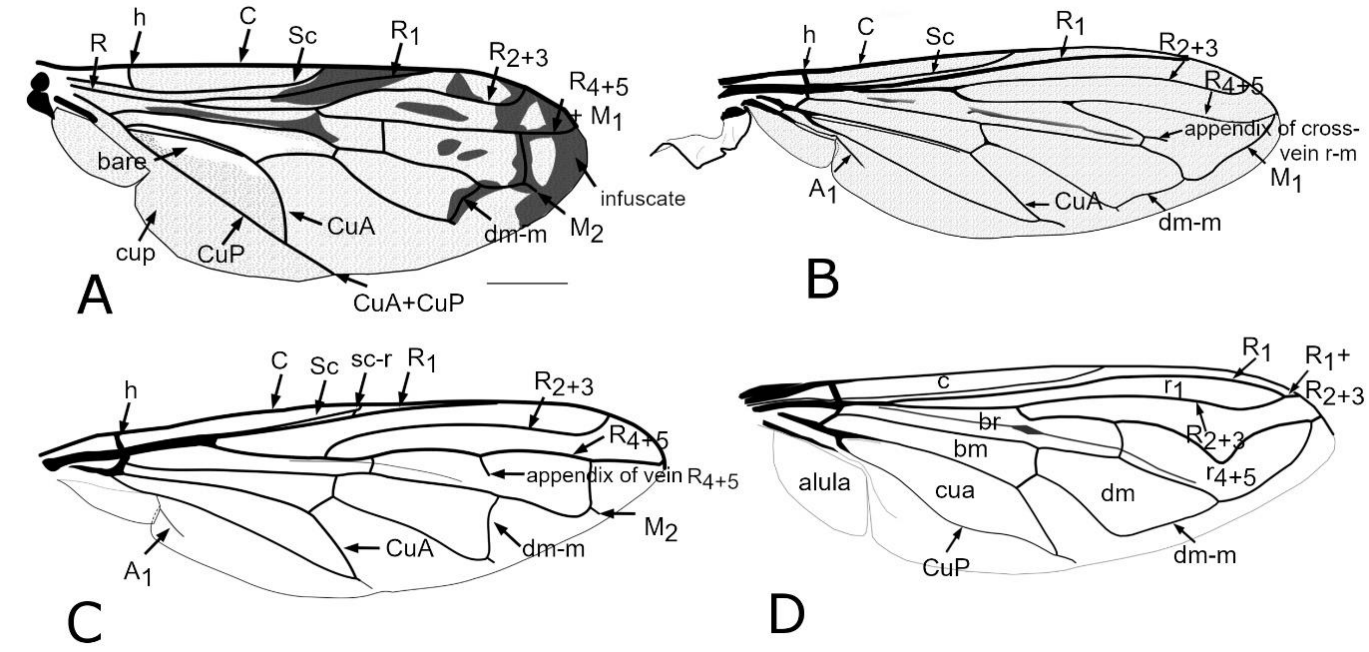

Figure 36. Wing, dorsal view. **A**. *Orthonevra* spp ♀; Brazil. **B**. *Stilbosoma cyaneum* ♀; Chile. **C**. *Stipomorpha apicula* ♂; Brazil. **D**. *Palpada langi* ♂; Brazil. Scale **A** = 0.5 mm. All GFGM.

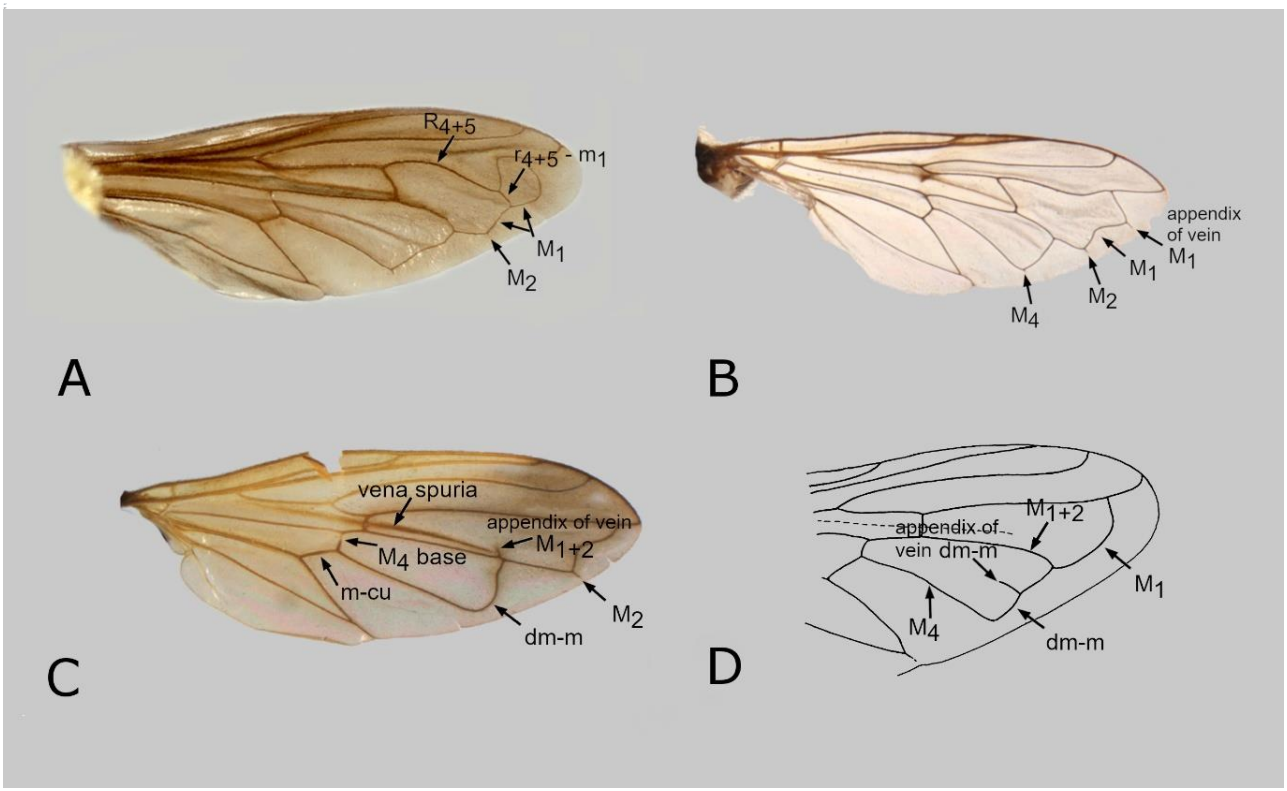

Figure 37. Wing, dorsal view. **A**. *Lyneborgimyia magnifica* ♂; Holotype, Tanzania. **B**. *Eumerus sulcitibius* ♂; Spain. **C**. *Arystosyrphus primus* ♂; Brazil. **D**. *Nepenthosyrphus capitatus* ♀; Paralectotype *N. tobiacus*, Sumatra. Scale **A** after Ssymank *et al*. 2021, **B** after van Steenis *et al*. 2017, **C** after Reemer & Ståhls 2013b, **D** after Hippa 1978.

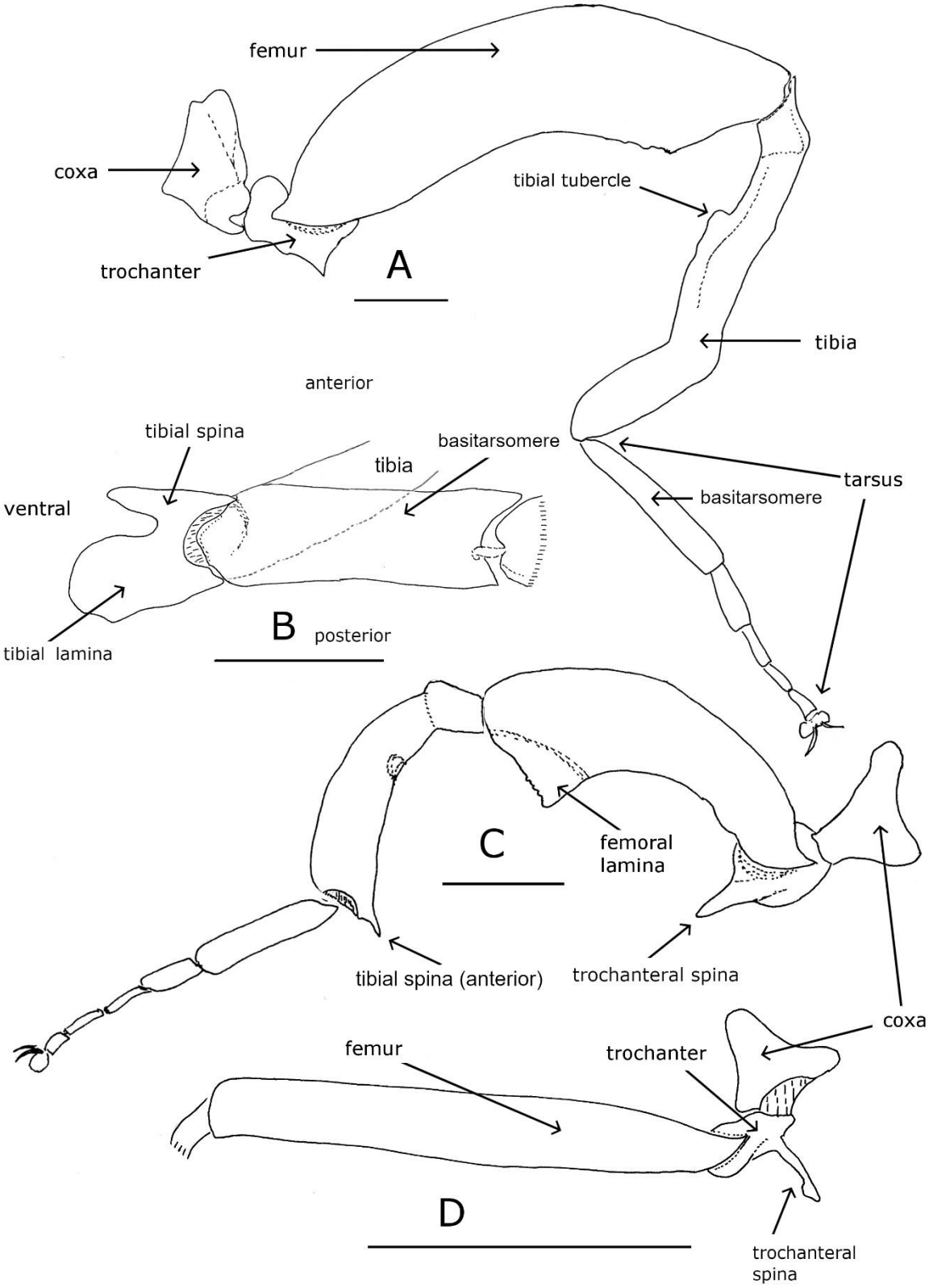

Figure 38. Legs, anterior view. **A**. *Brachypalpus chrysites* ♂; Germany. **B, C**. *Merodon armipes* ♂; Serbia. **D**. *Neocnemodon vitripennis* ♂; Sweden. Scale **A, C, D** 1.0 mm; **B** 0.5 mm.

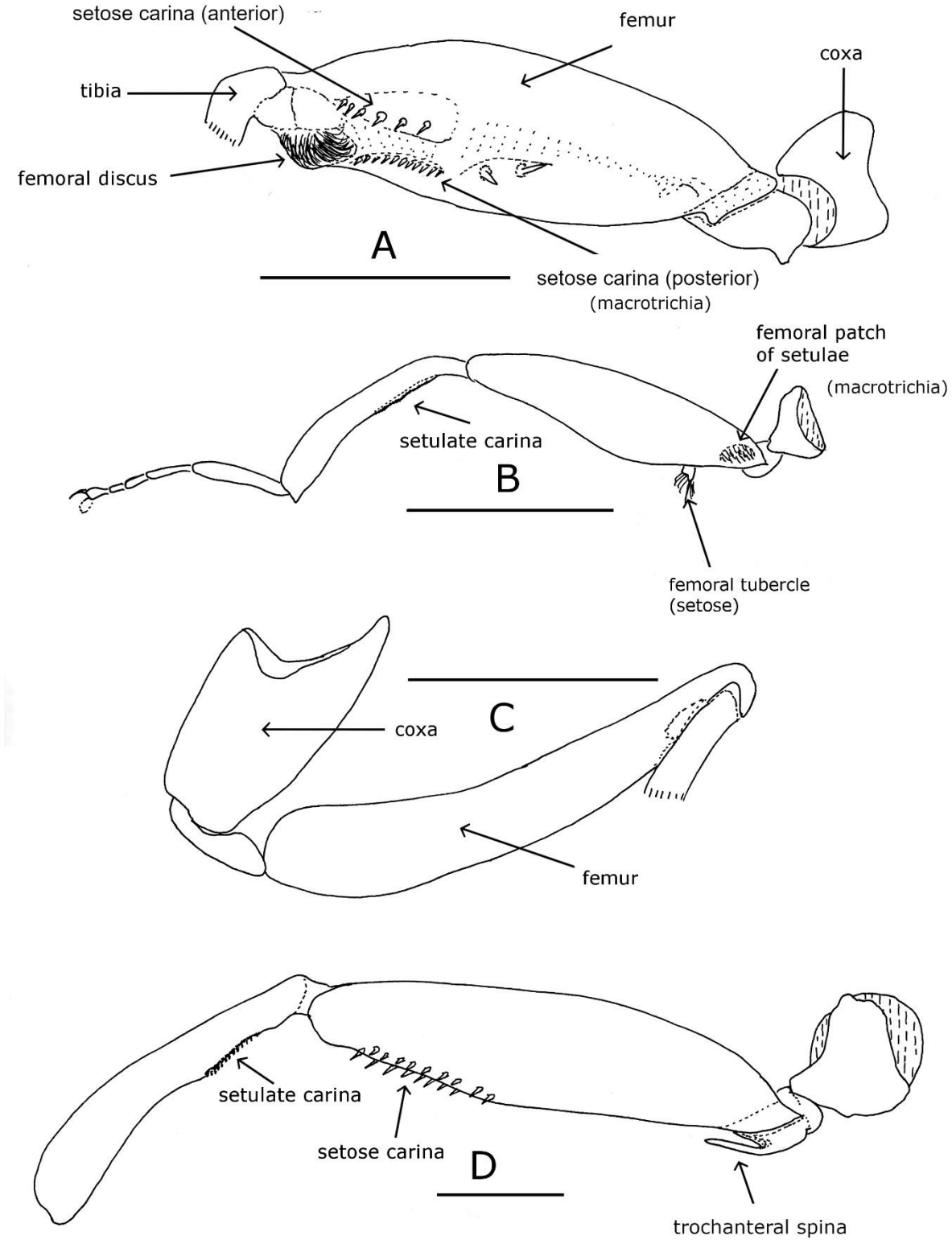

Figure 39. Legs, anterior view. **A**. *Eumerus sulcitibius* ♂; Spain. **B**. *Parhelophilus frutetorum* ♂; Sweden. **C**. *Xanthogramma dives* ♂; Greece. **D**. *Xylota segnis* ♂ The Netherlands. Scale = 1.0 mm.

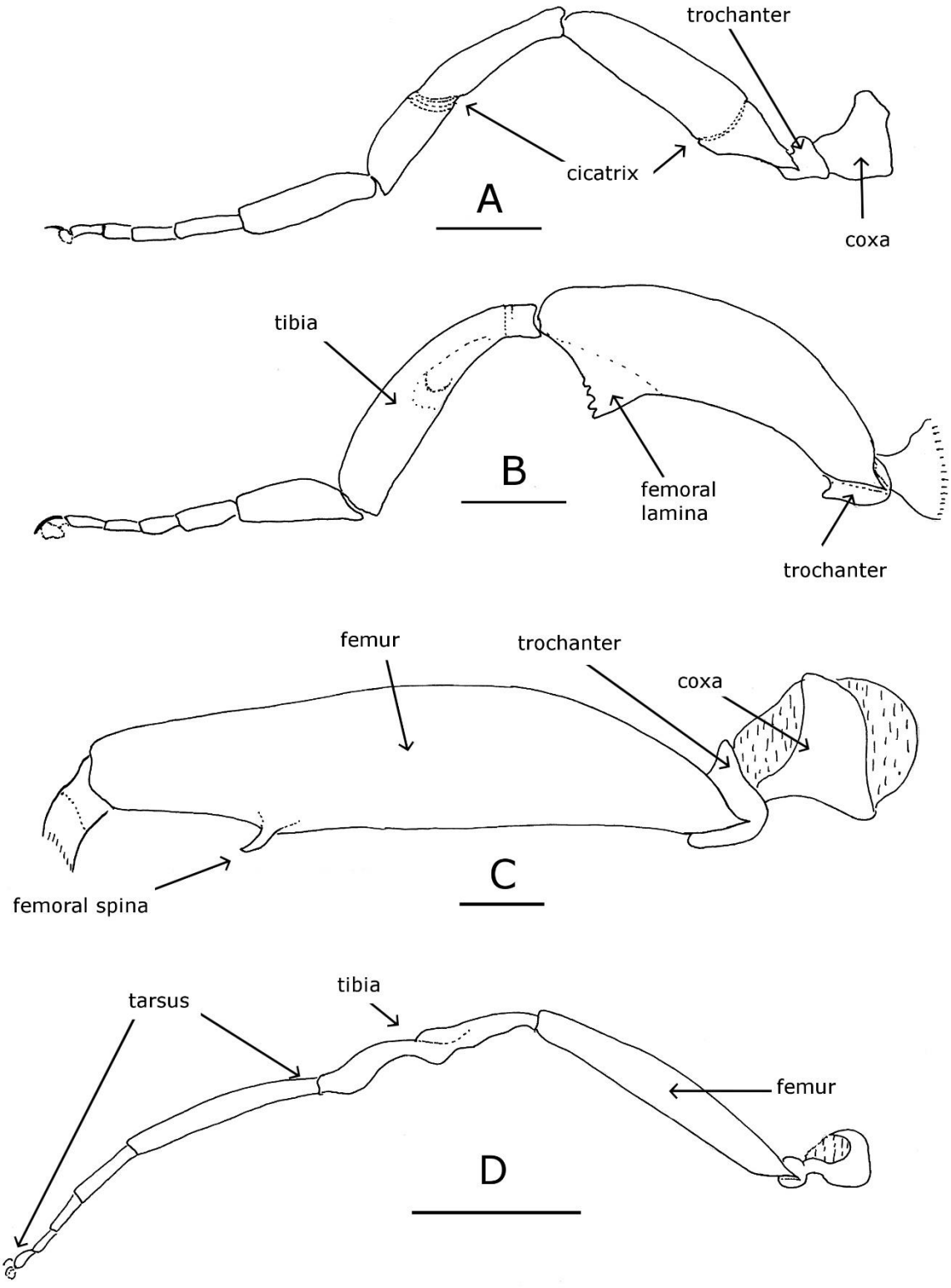

Figure 40. Legs, anterior view. **A**. *Microdon devius* ♂; The Netherlands. **B**. *Merodon ibericus* ♂; Spain. **C**. *Milesia crabroniformis* ♂; France. **D**. *Spazigaster ambulans* ♂; Georgia. Scale = 1.0 mm.

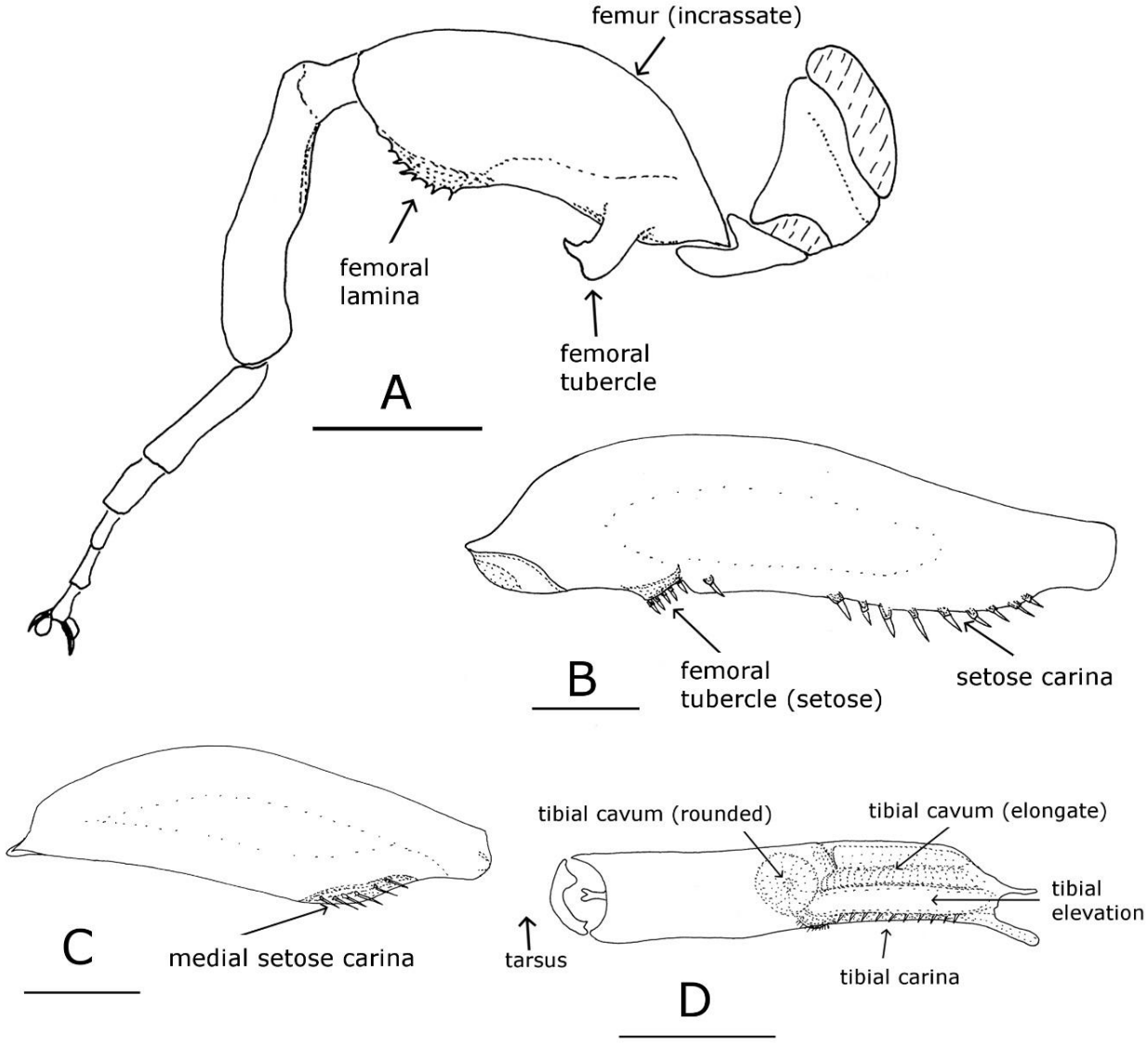

Figure 41. Legs, anterior view. **A**. *Eumerus stackelbergi* ♂; Holotype. **B**. *Xylota steyskali* ♂; Taiwan. **C**. *Chalcosyrphus flavipes* ♂; Taiwan. **D**. *Eumerus sulcitibius* ♂; Spain. Scale **A–C** = 1.0 mm; **D** = 0.5 mm.

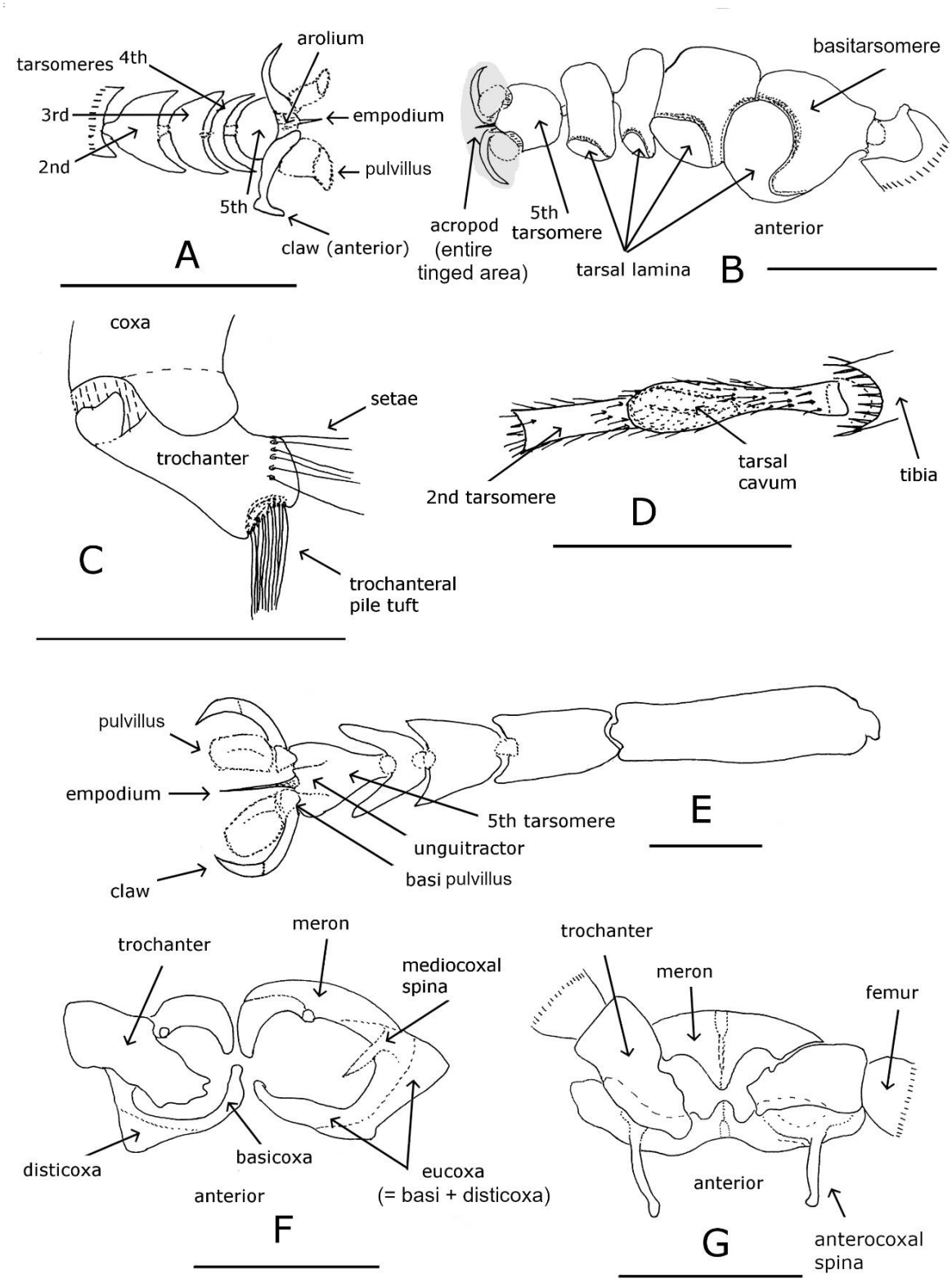

Figure 42. Legs, **A, B, D–G**, ventral view, **C**, anterior view. **A**. *Ischiodon aegyptius* ♂; Greece. **B**. *Pyrophaena granditarsa* ♂; Sweden. **C**. *Platycheirus aurolateralis* ♂; France. **D**. *Neocnemodon brevidens* ♂; Serbia. **E**. *Milesia crabroniformis* ♂; France. **F**. *Platycheirus naso* ♂; Sweden. **G**. *Platycheirus scutatus* ♂; The Netherlands. Scale **A–D, F, G** = 0.5 mm; **E** = 1.0 mm.

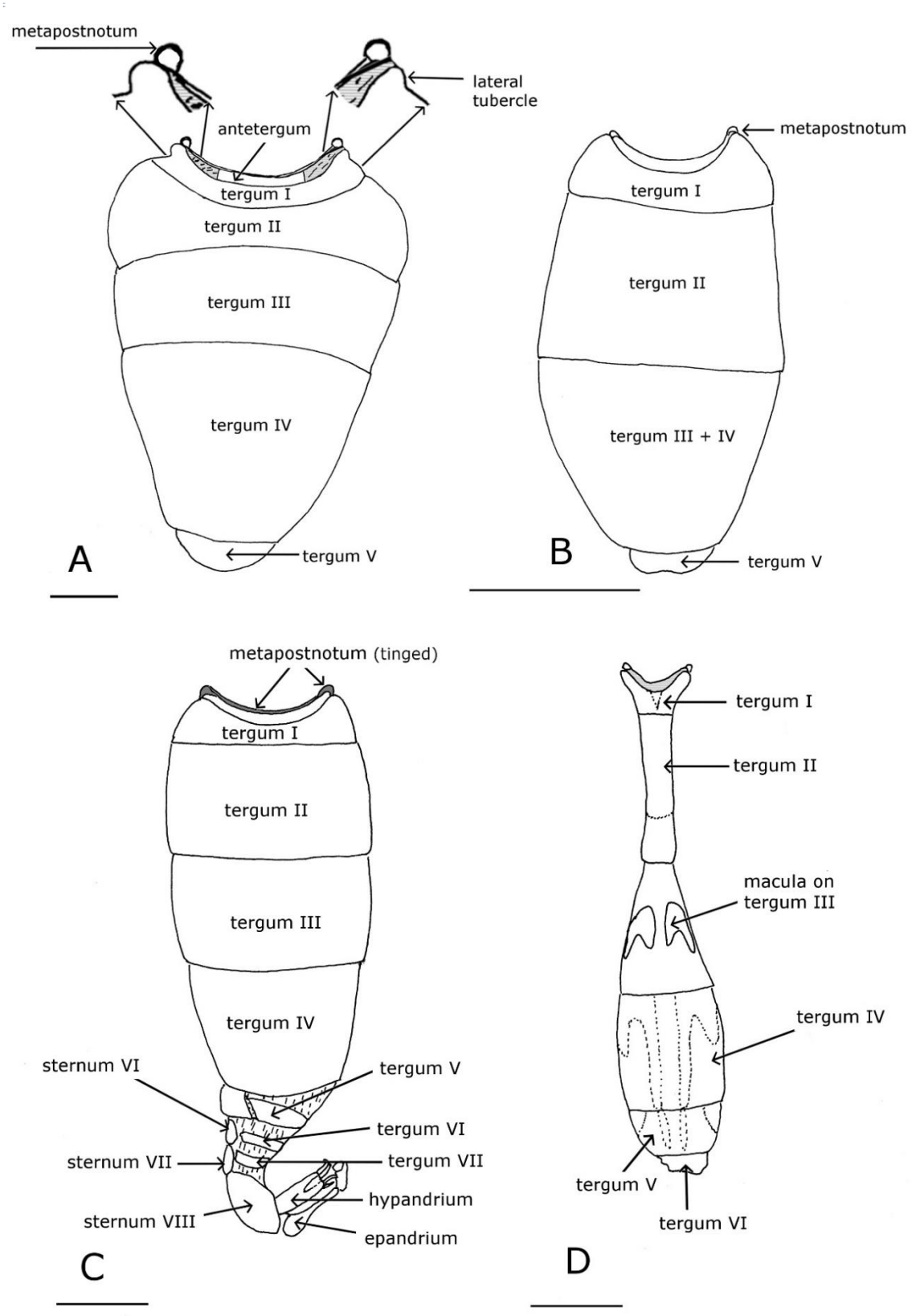

Figure 43. Abdomen, dorsal view. **A**. *Microdon devius* ♂; The Netherlands. **B**. *Triglyphus primus* ♂; The Netherlands. **C**. *Pipiza luteitarsis* ♂; Sweden. **D**. *Asiobaccha* spp ♀; Taiwan. Scale = 1.0 mm.

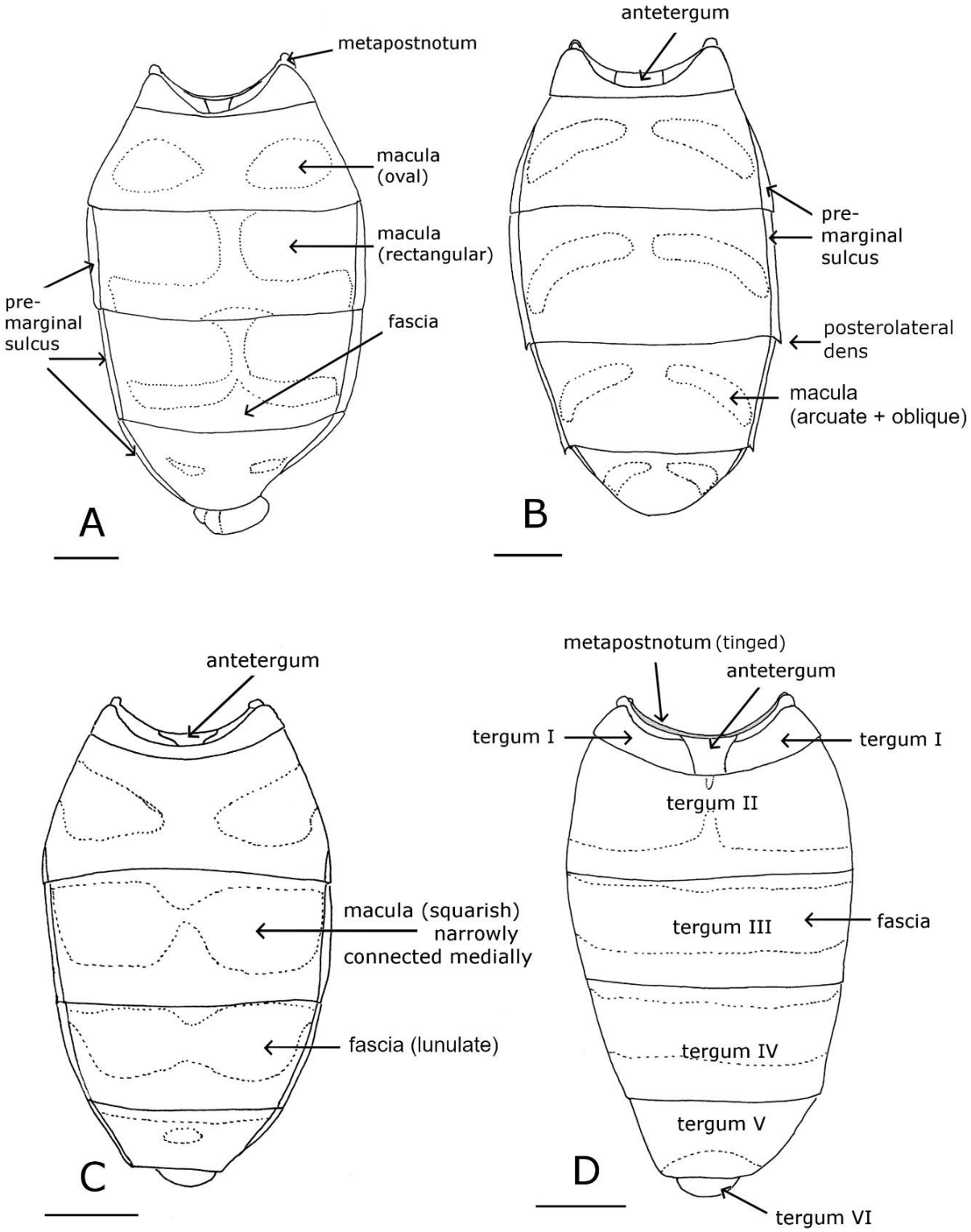

Figure 44. Abdomen, dorsal view. **A**. *Asiodidea nikkoensis* ♂; Japan. **B**. *Chrysotoxum orthostylus* ♂; France. **C**. *Eupeodes latifasciatus* ♂; Sweden. **D**. *Asarkina* spp ♂; Thailand. Scale = 1.0 mm.

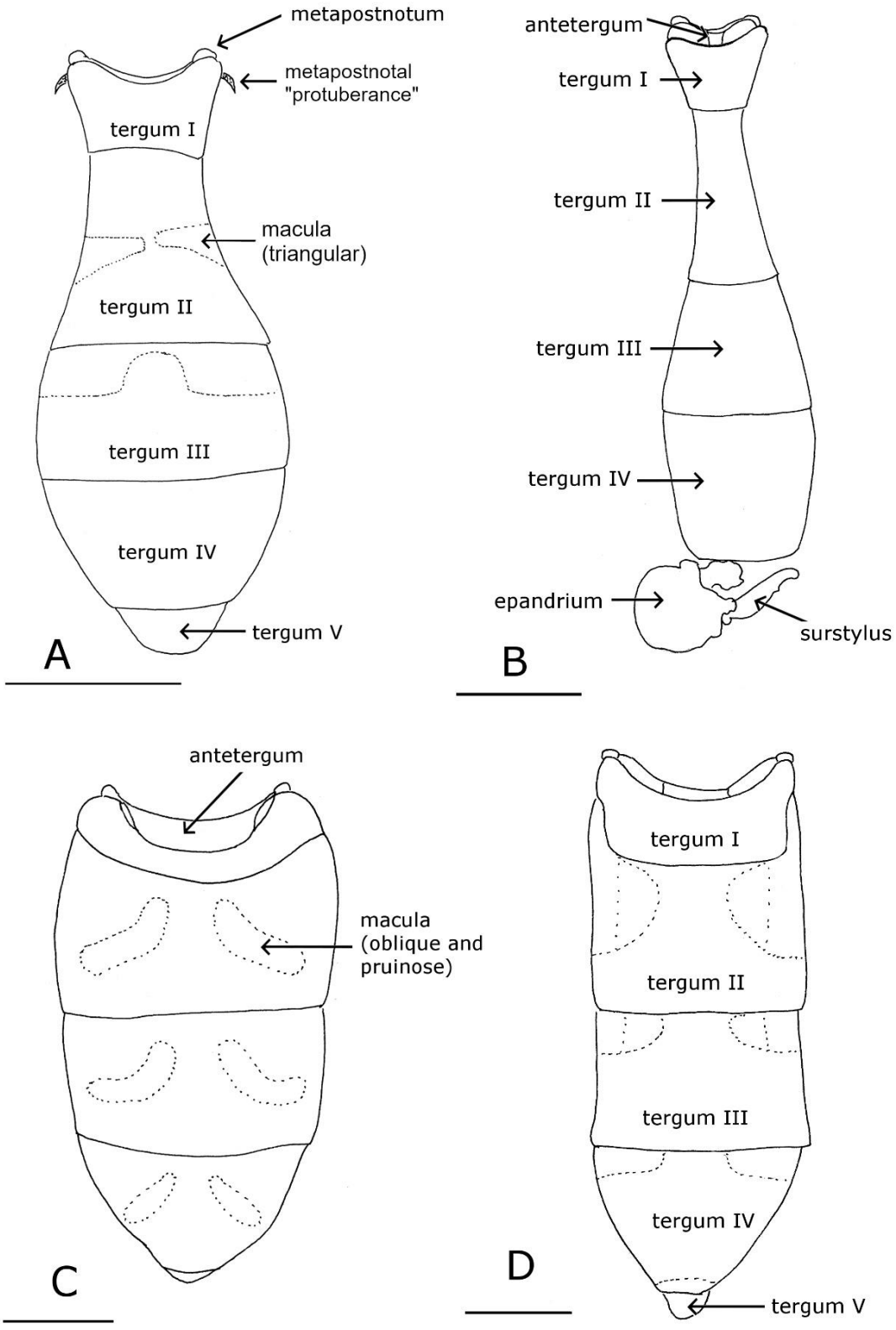

Figure 45. Abdomen, dorsal view. **A**. *Neoascia podagrica* ♀; The Netherlands. **B**. *Sphegina latifrons* ♂; Germany. **C**. *Eumerus barbarus* ♂; Algeria. **D**. *Syritta pipiens* ♀; Sweden. Scale = 1.0 mm.

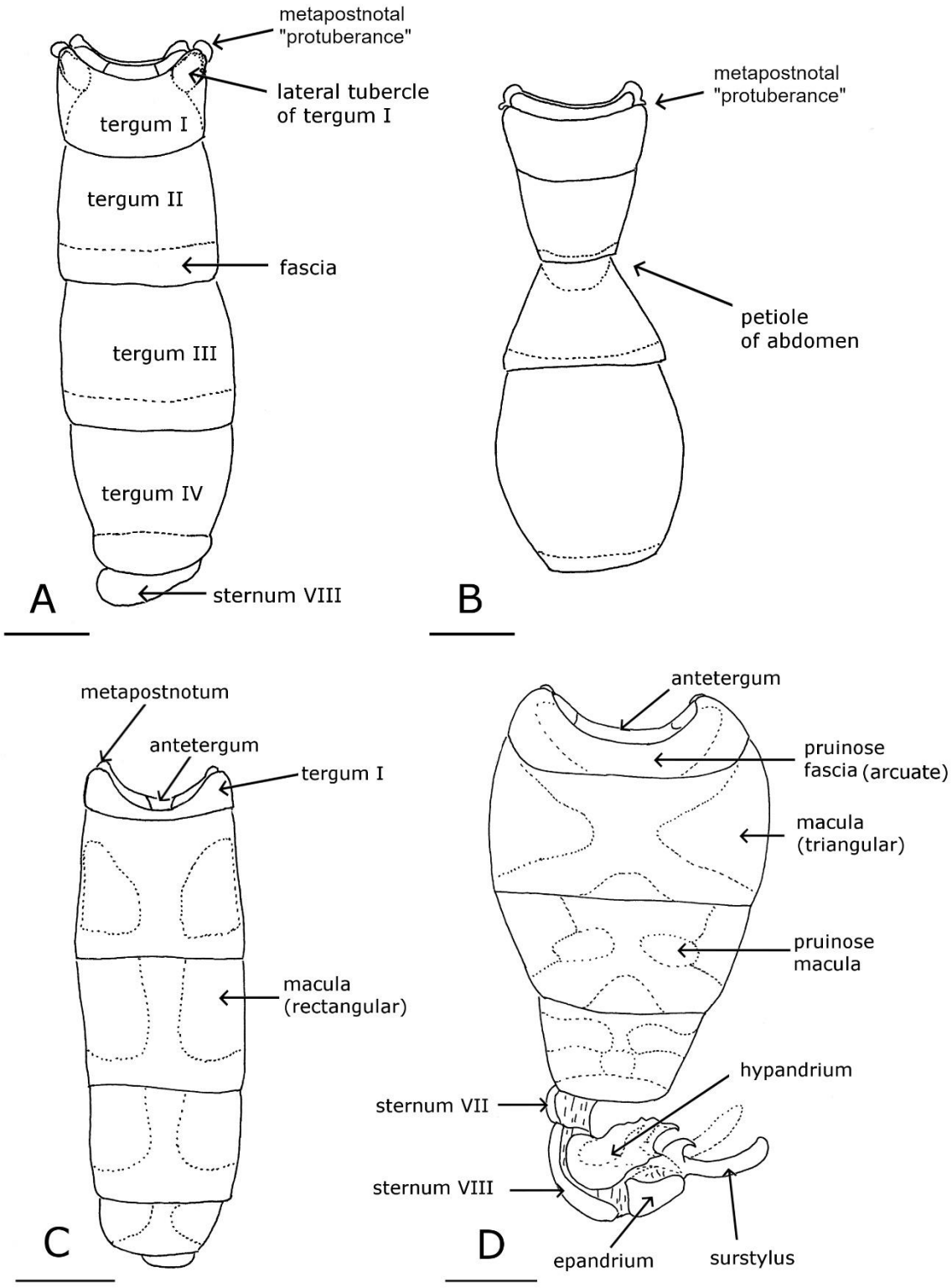

Figure 46. Abdomen, dorsal view. **A**. *Ceriana vespiformis* ♂; Greece. **B**. Cerioidini spp ♂; Papua New Guinea. **C**. *Platycheirus scambus* ♂; The Netherlands. **D**. *Parhelophilus frutetorum* ♂; Sweden. Scale = 1.0 mm.

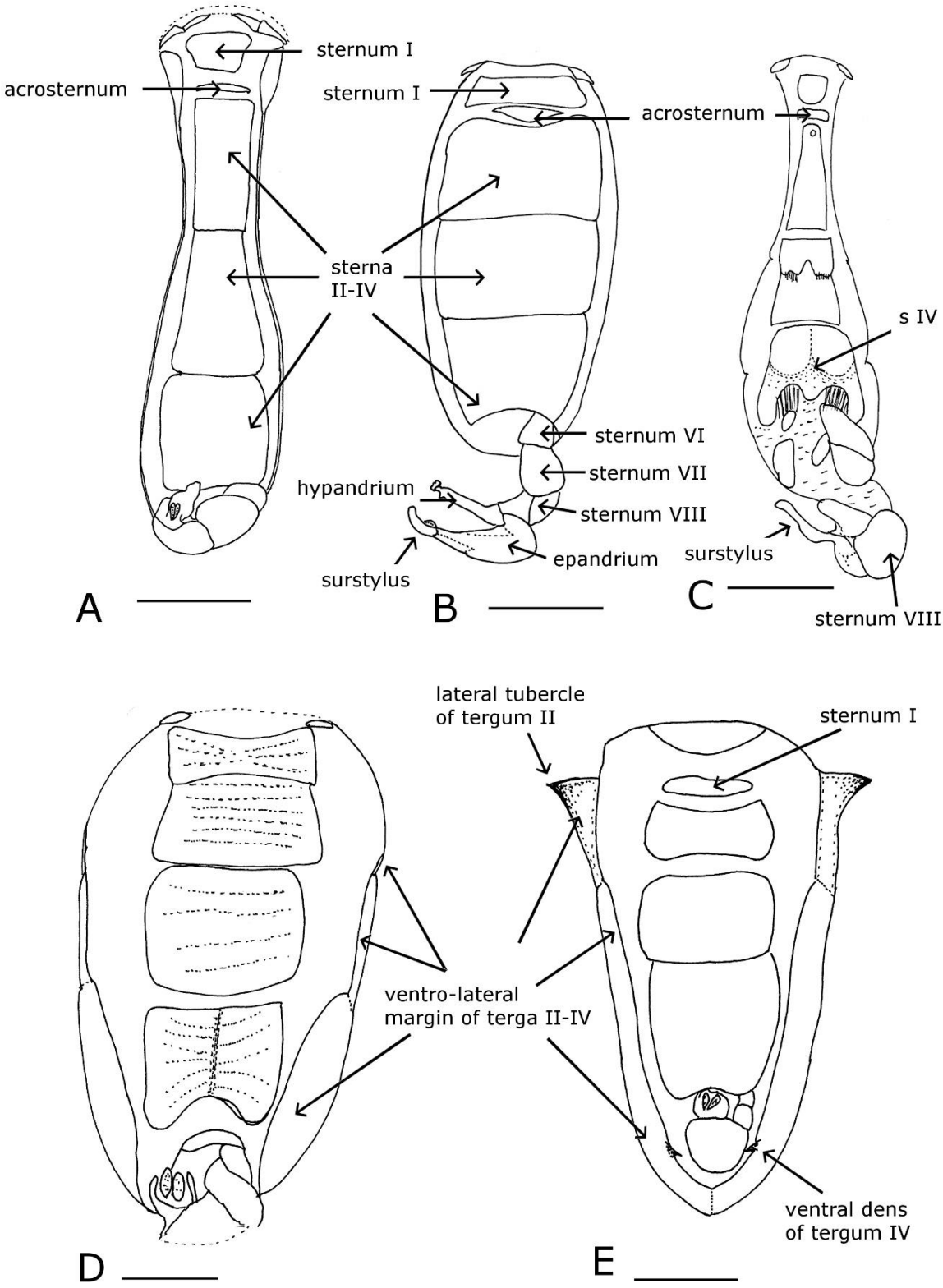

Figure 47. Abdomen, ventral view. **A**. *Spazigaster ambulans* ♂; Germany. **B**. *Neocnemodon vitripennis* ♂; The Netherlands. **C**. *Sphegina latifrons* ♂; Germany. **D**. *Eumerus minotaurus* ♂; Greece. **E**. *Nausigaster tuberculata* ♂; Brazil. Scale = 1.0 mm. s IV = sternum IV.

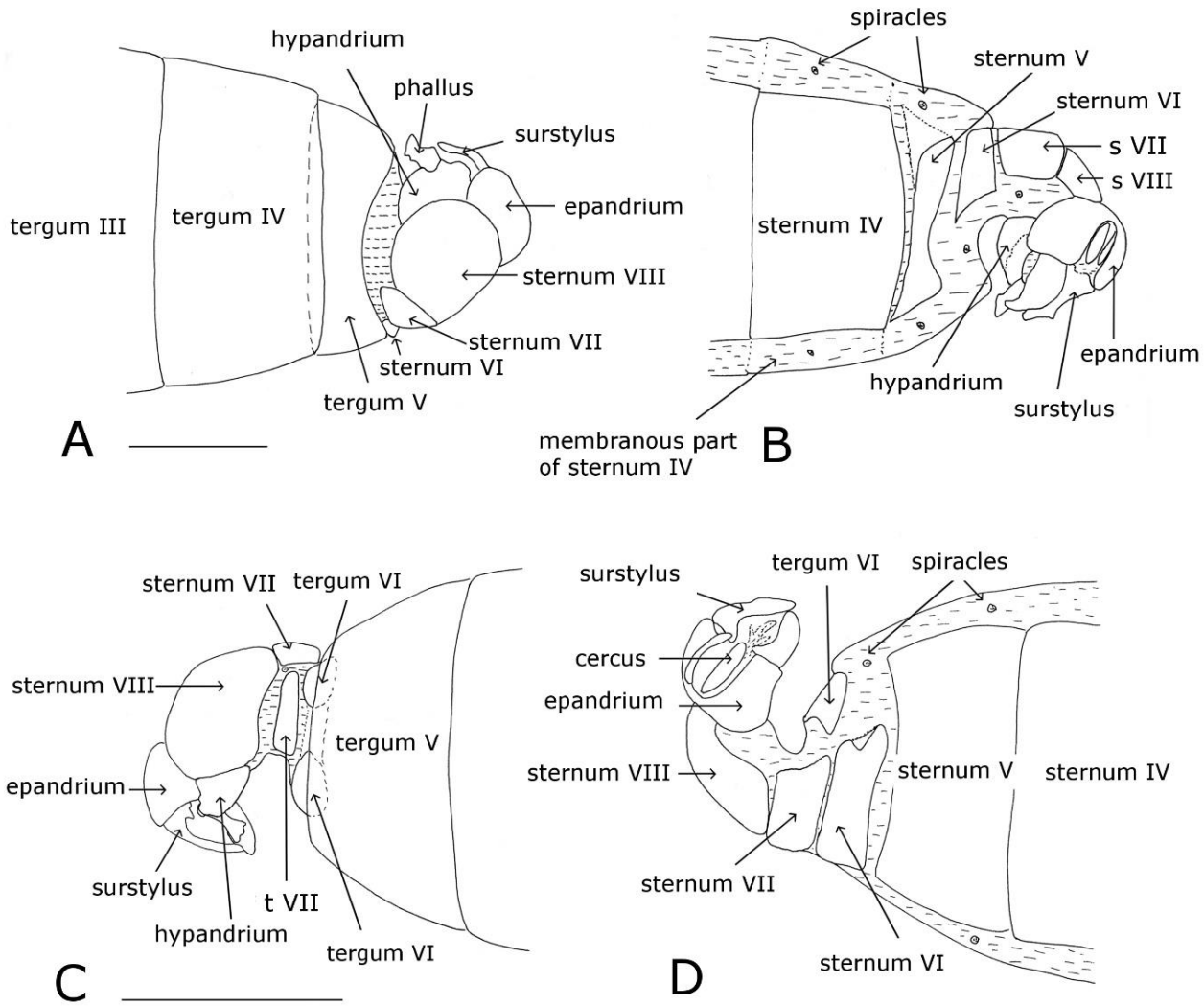

Figure 48. Postabdomen, **A, C**,dorsal view, **B, D**,ventral view. **A, B**. *Eupeodes corollae* ♂; Greece. **C, D**. *Pyrophaena granditarsa* ♂; Finland. Scale = 1.0 mm. s = sternum, t = tergum.

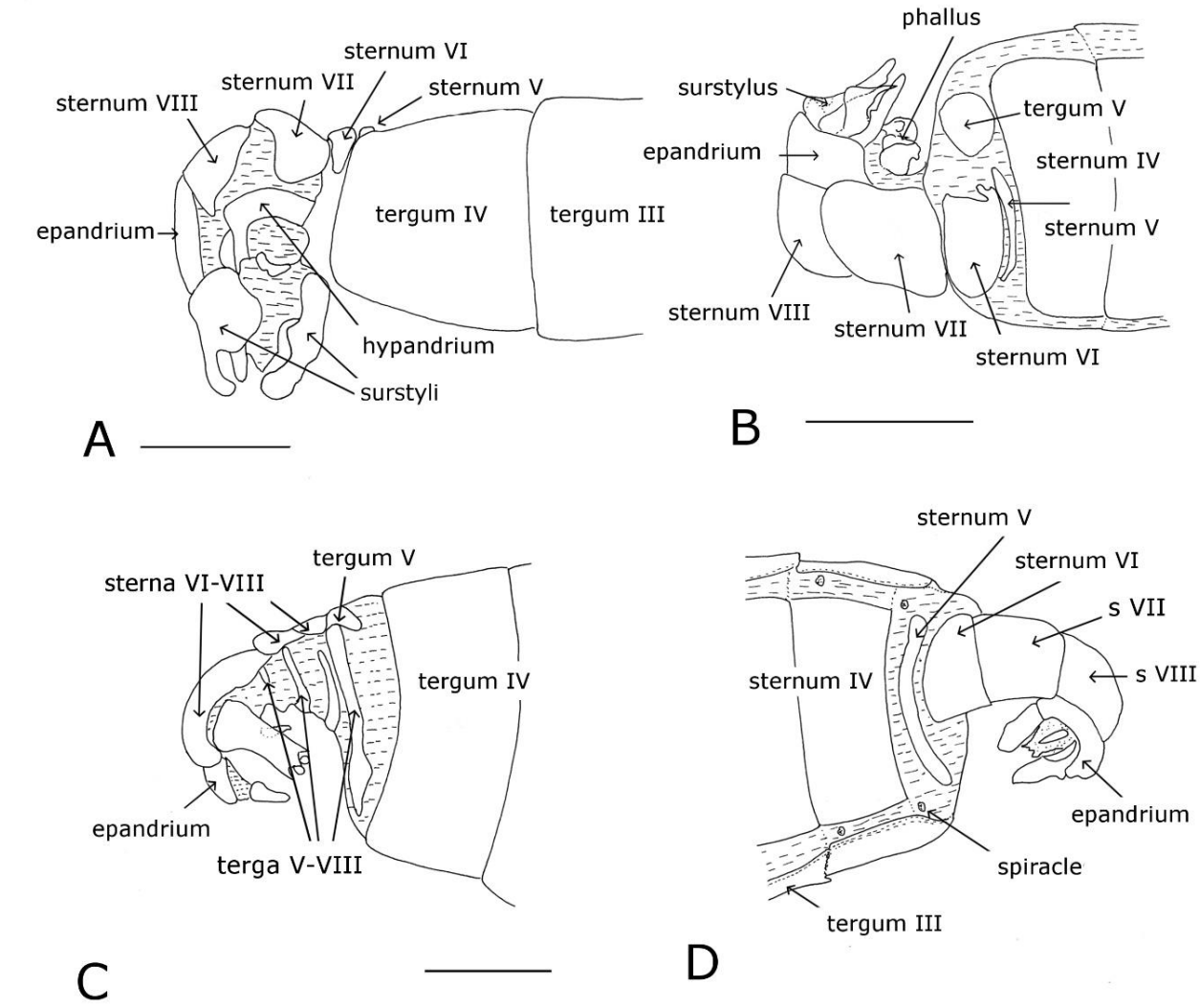

Figure 49. Postabdomen, **A, C**, dorsal view, **B, D**, ventral view. **A**. *Sphaerophoria scripta* ♂; Sweden. **B**. *Orthonevra nobilis* ♂; Sweden. **C, D**. *Eristalis abusiva* ♂; The Netherlands. Scale = 1.0 mm. s = sternum.

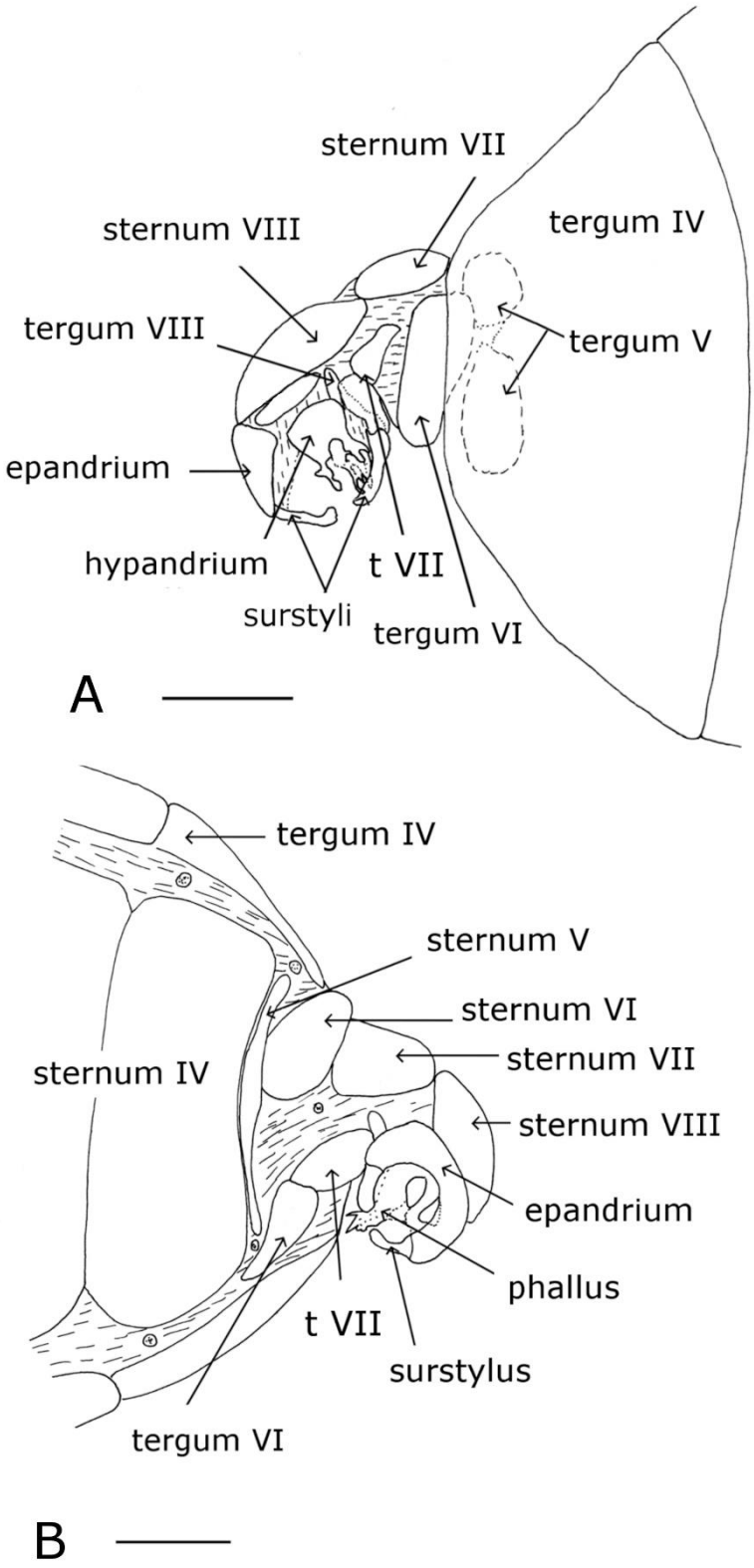

Figure 50. Postabdomen, *Volucella bombylans*; Russia. **A**. Dorsal view, **B**. Ventral view. Scale = 1.0 mm. t = tergum.

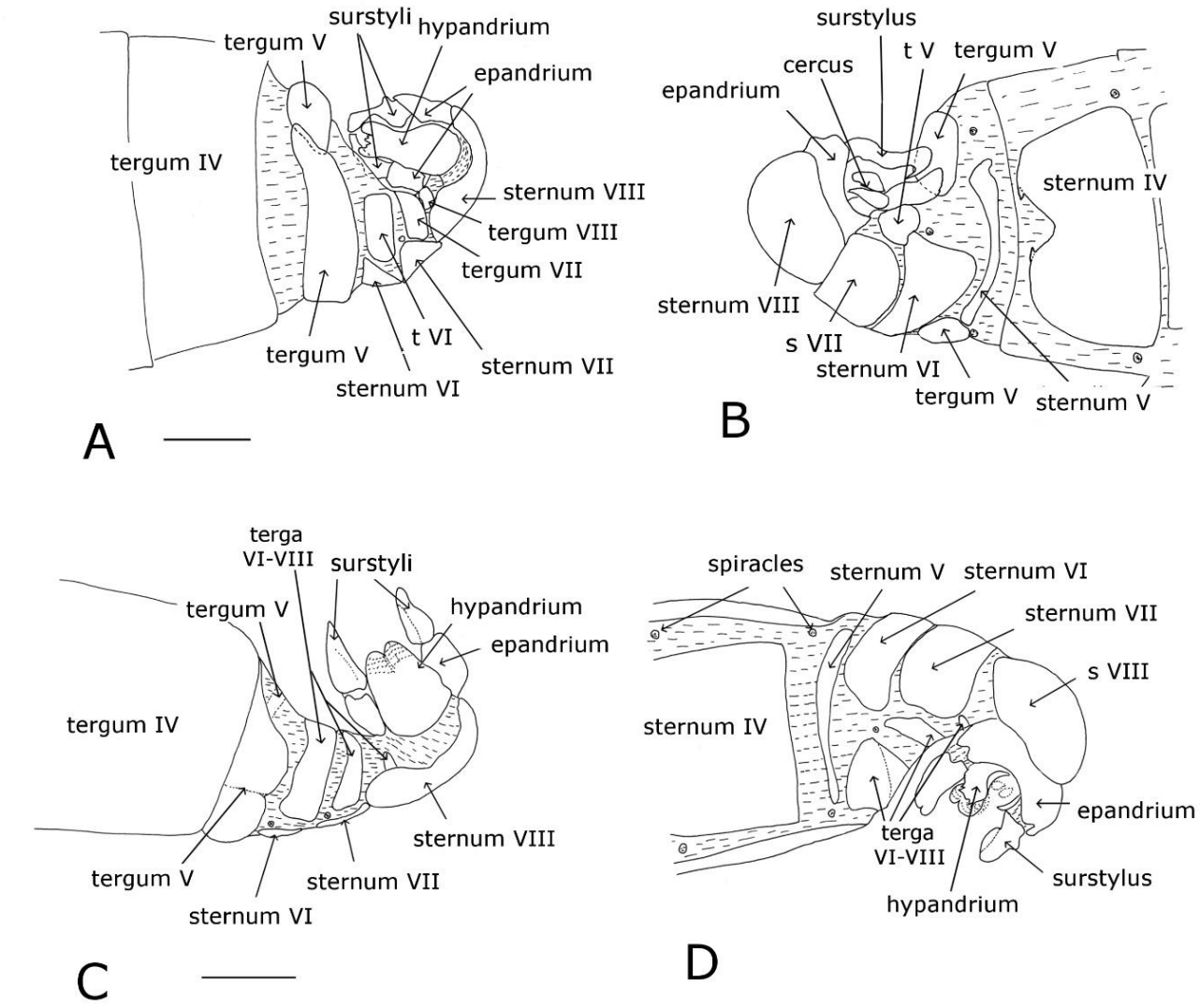

Figure 51. Postabdomen, **A, C**, dorsal view, **B, D**, ventral view. **A, B**. *Criorhina brevipila* ♂; Russia. **C, D**. *Temnostoma bombylans* ♂; The Netherlands. Scale = 1.0 mm. s = sternum, t = tergum.

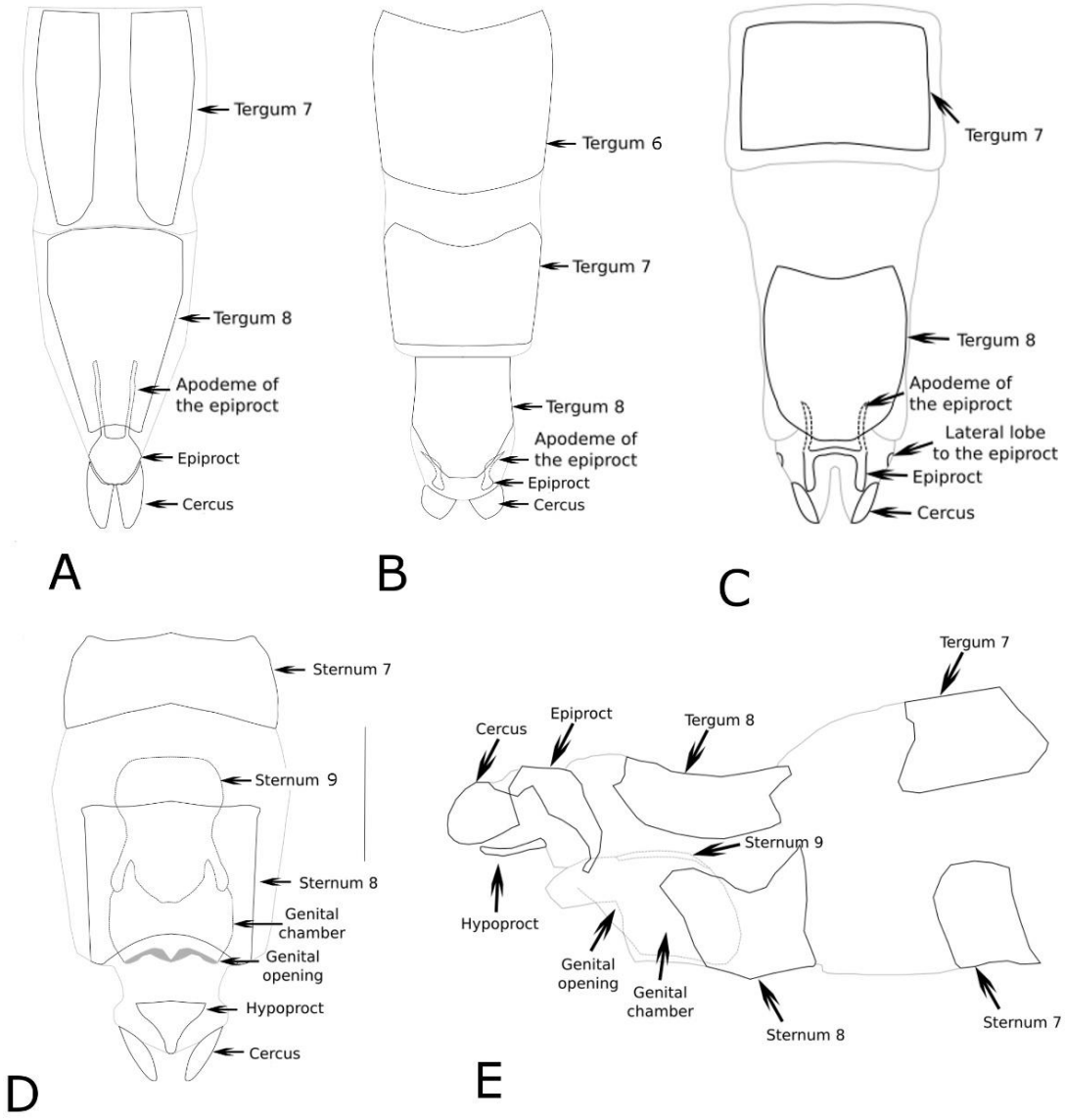

Figure 52. Postabdomen, female, **A–C**, dorsal view, **D**, ventral view, **E**, lateral view. **A**. *Ceriomicrodon petiolatus* ♀; Brazil. **B**. *Hybobatus phaeopterus* ♀; Brazil. **C**. *Sterphus plagiatus* ♀; Brazil. **D, E**. *Ornidia obesa* ♀; Brazil.

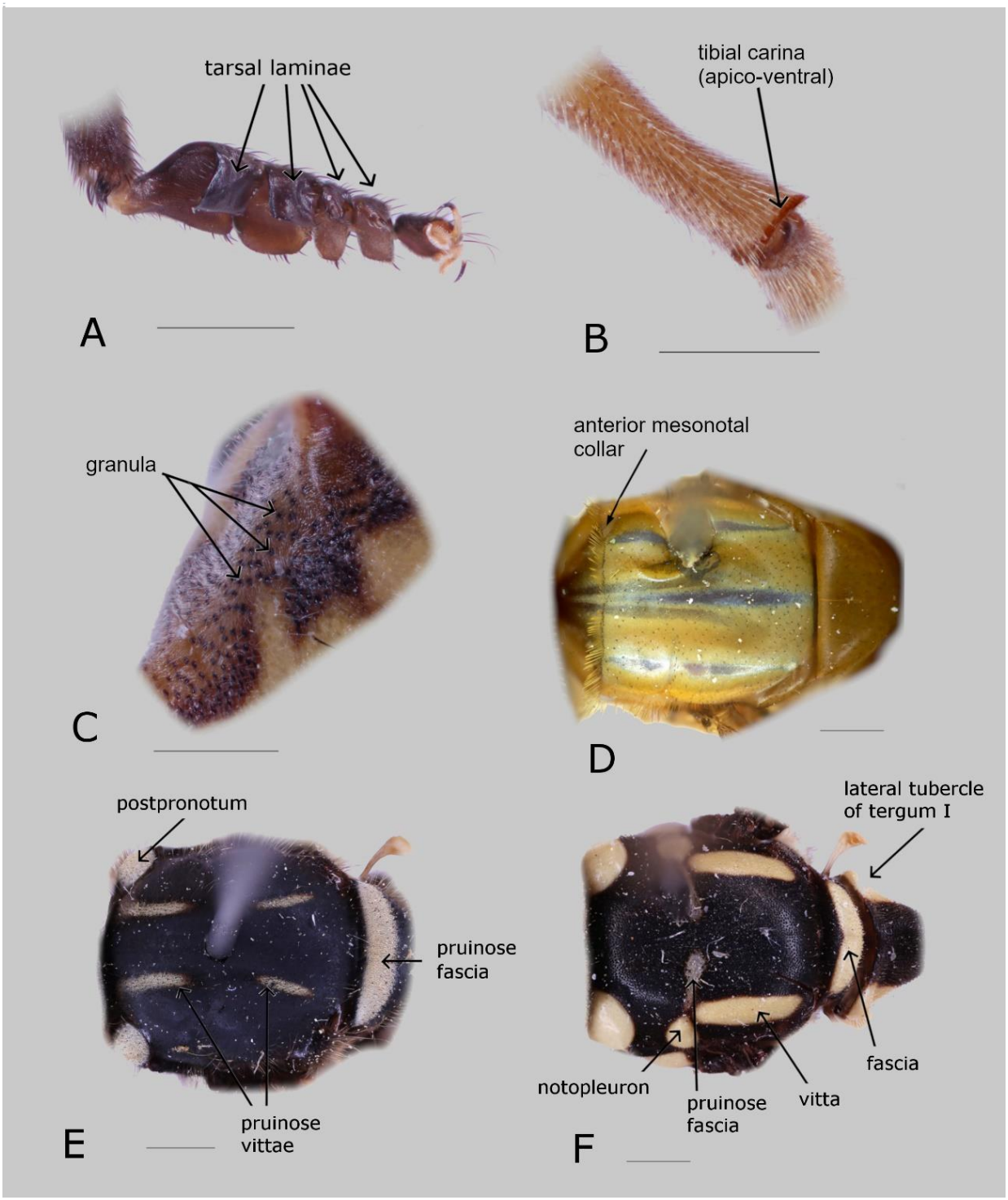

Figure 53. Photo. **A**. *Pyrophaena granditarsa* ♂; Sweden, mesotarsus, lateral view. **B**. *Brachyopa bicolor* ♂; The Netherlands, apex of metatibia, ventral view. **C**. *Ceriana ornatifrons* ♂; Nepal, face, antero-lateral view. **D**. *Hybobathus rubricosus* ♂; Brazil, thorax dorsal view. **E**. *Sphecomyia vespiformis* ♂; Russia, thorax, dorsal view. **F**. *Monoceromyia tredecimpunctata* ♂; India, thorax, dorsal view. Scale **A–C** = 0.5 mm; **E, F** = 1.0 mm. **D** GFGM. In Figs **E** and **F** "vitta" and "fascia" mean that they are non-pruinose and shiny, the pruinose vitta and fascia are dull.

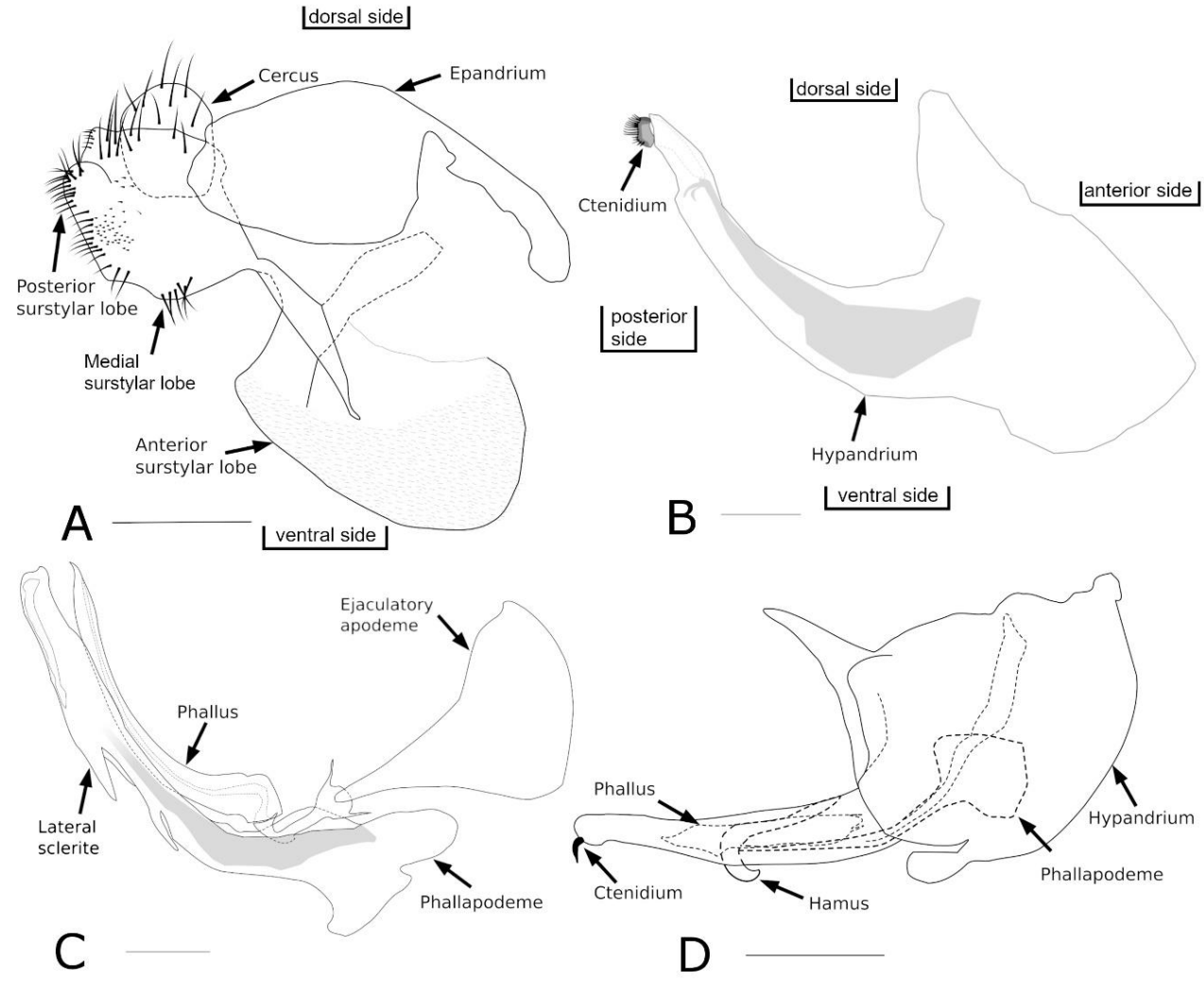

Figure 54. Male terminalia, lateral view, **A** Epandrium, **B, D** Hypandrium, **C** Phallus. **A–C**. *Merodon clavipes*; Spain. **D**. *Eumerus obliquus*; Angola. Scale **A–C** = 0.5 mm, **D** = 0.35 mm. All GFGM.

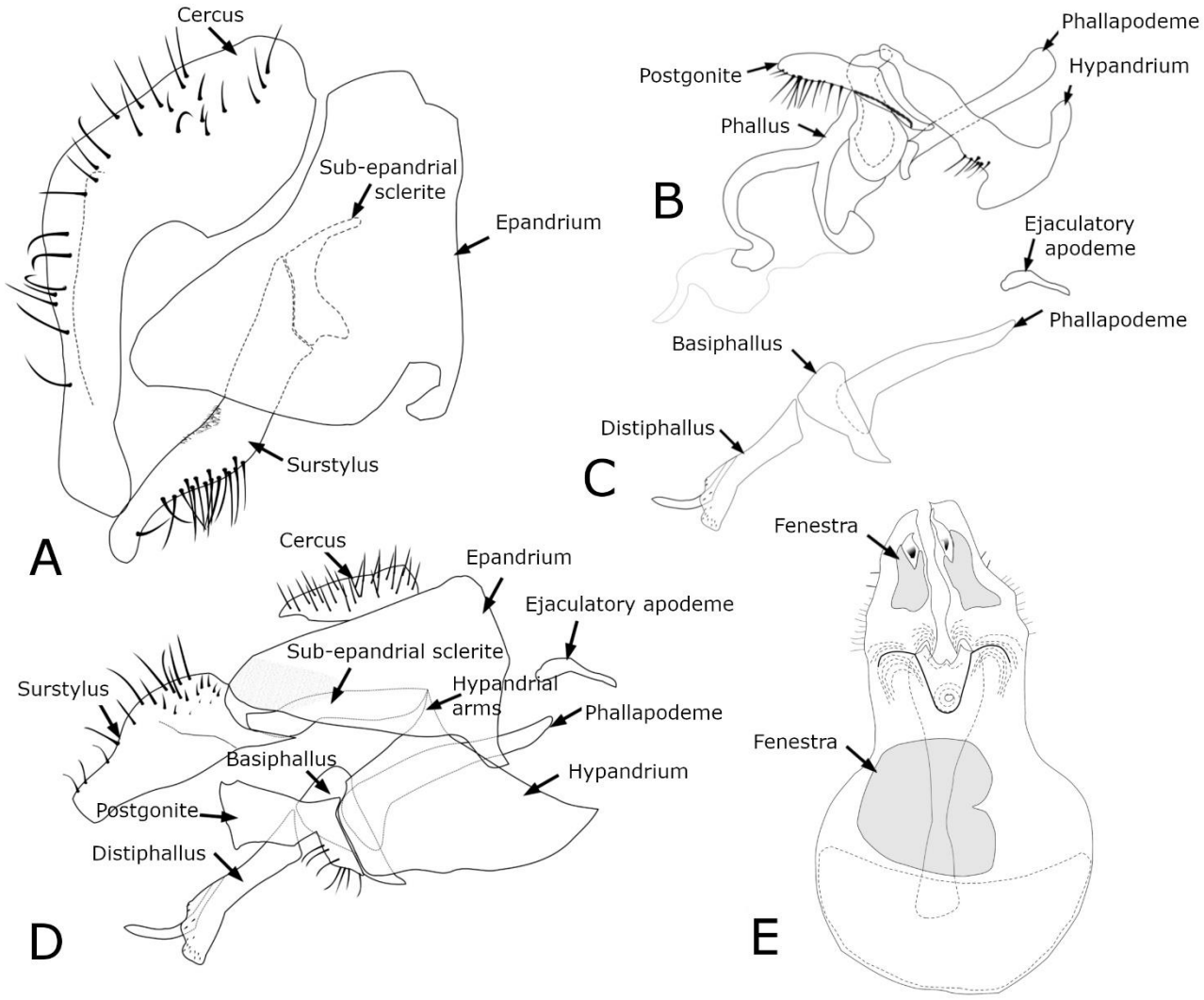

Figure 55. Male terminalia, **A–D**, lateral view, **E**,ventral view. **A**. Epandrium, **B**. Hypandrium, **C, D**. Phallus. **E**. Hypandrium. **A, B**. *Mimocalla erebus*; Brazil. **C, D**. *Ocyptamus gastrostactus*; Colombia. **E**. *Korinchia formosana*; Taiwan. All GFGM.

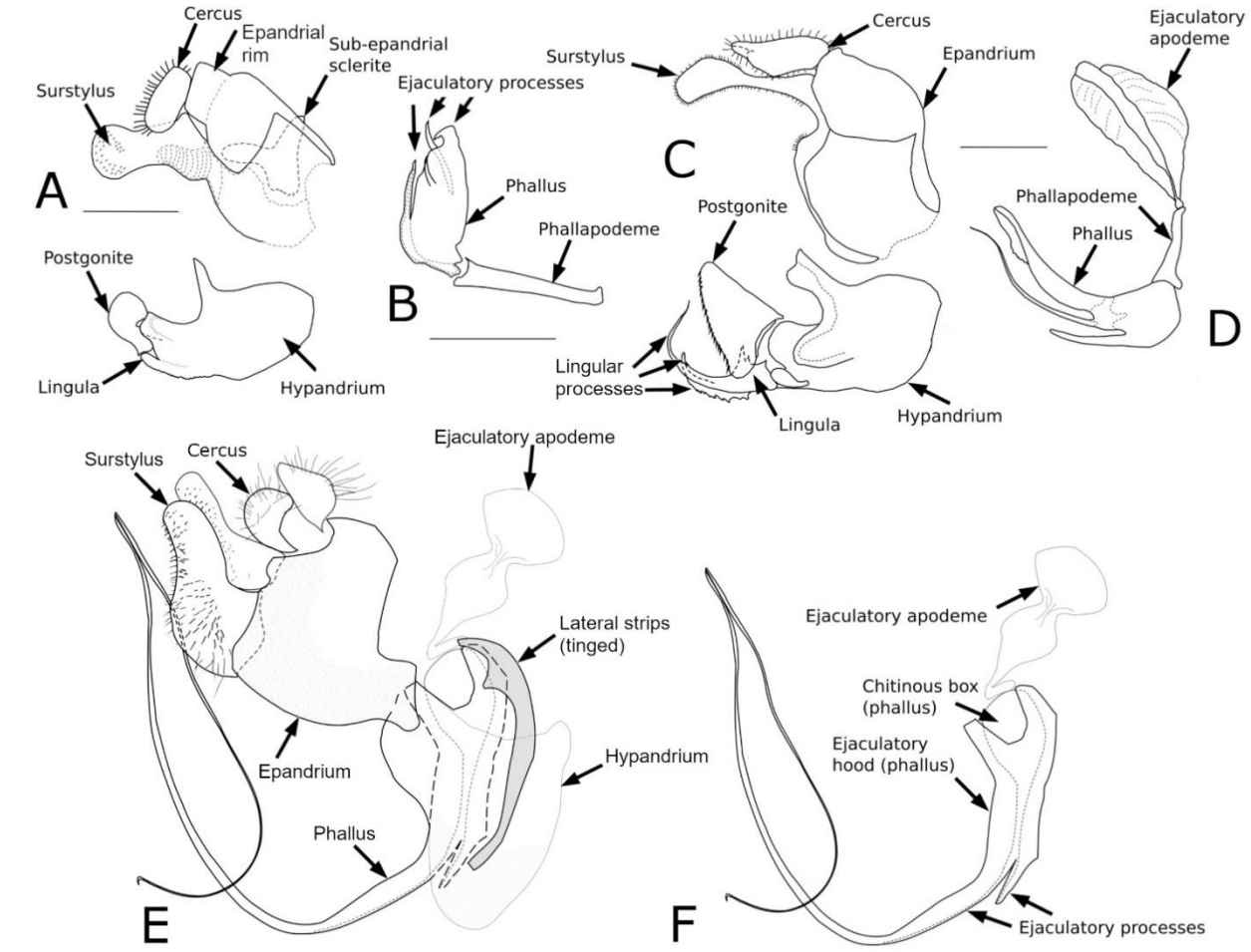

Figure 56. Male terminalia, lateral view. **B, D, F**. Phallus. **A, B**. *Ceriana caesarea*; Turkmenistan. **C, D**. *Ceriana conopsoides*; Russia. **E, F**. *Rhopalosyrphus* spp.; Brazil. Scale **A–D** = 0.5 mm. **A–D** after van Steenis *et al*. (2016), **E, F** GFGM.

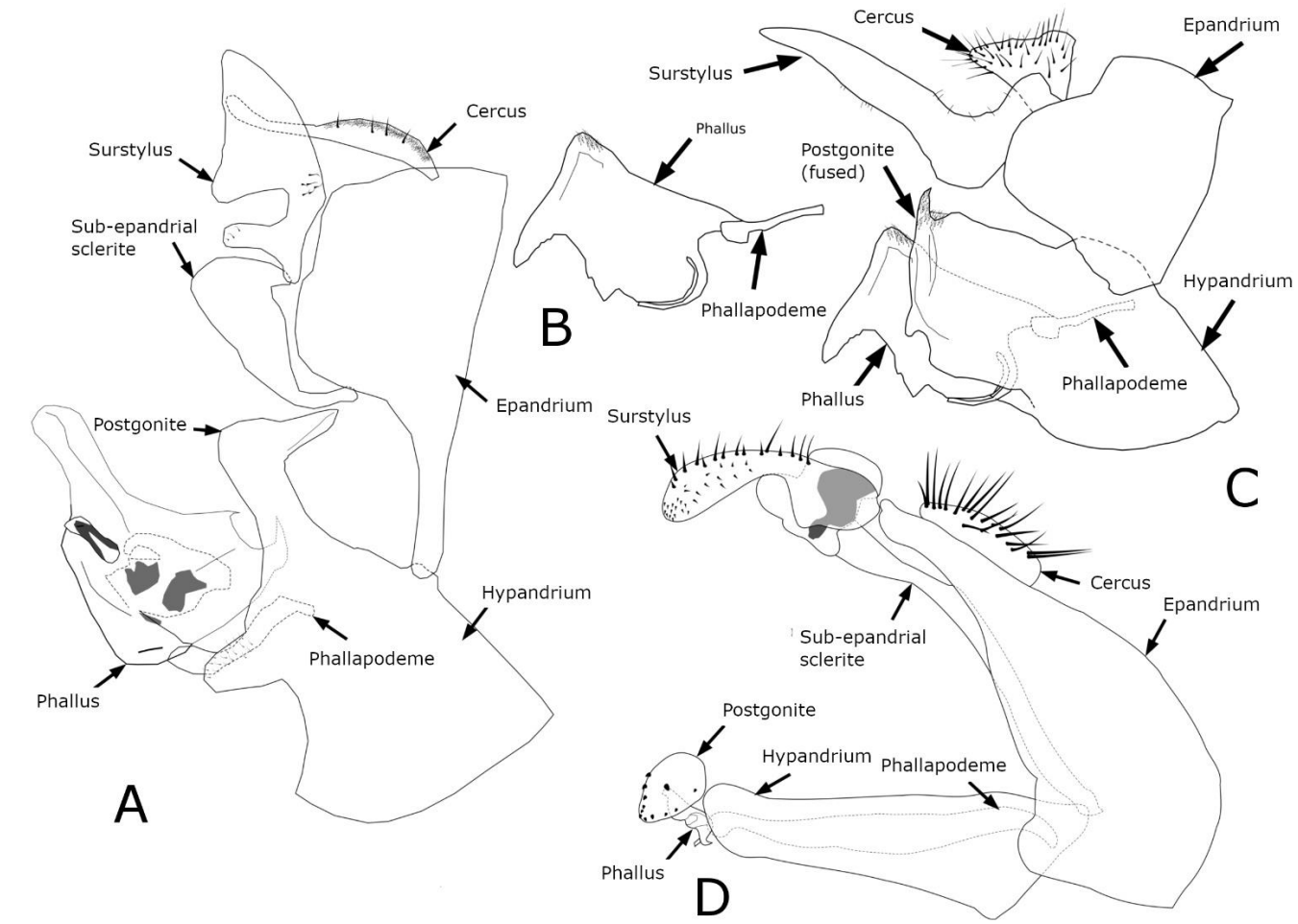

Figure 57. Male terminalia, lateral view. **B**. Phallus. **A**. *Maiana pumila*; Peru. **B, C**. *Orthonevra argentina*; Argentina. **D**. *Neocnemodon elongata*; Canada. All GFGM.

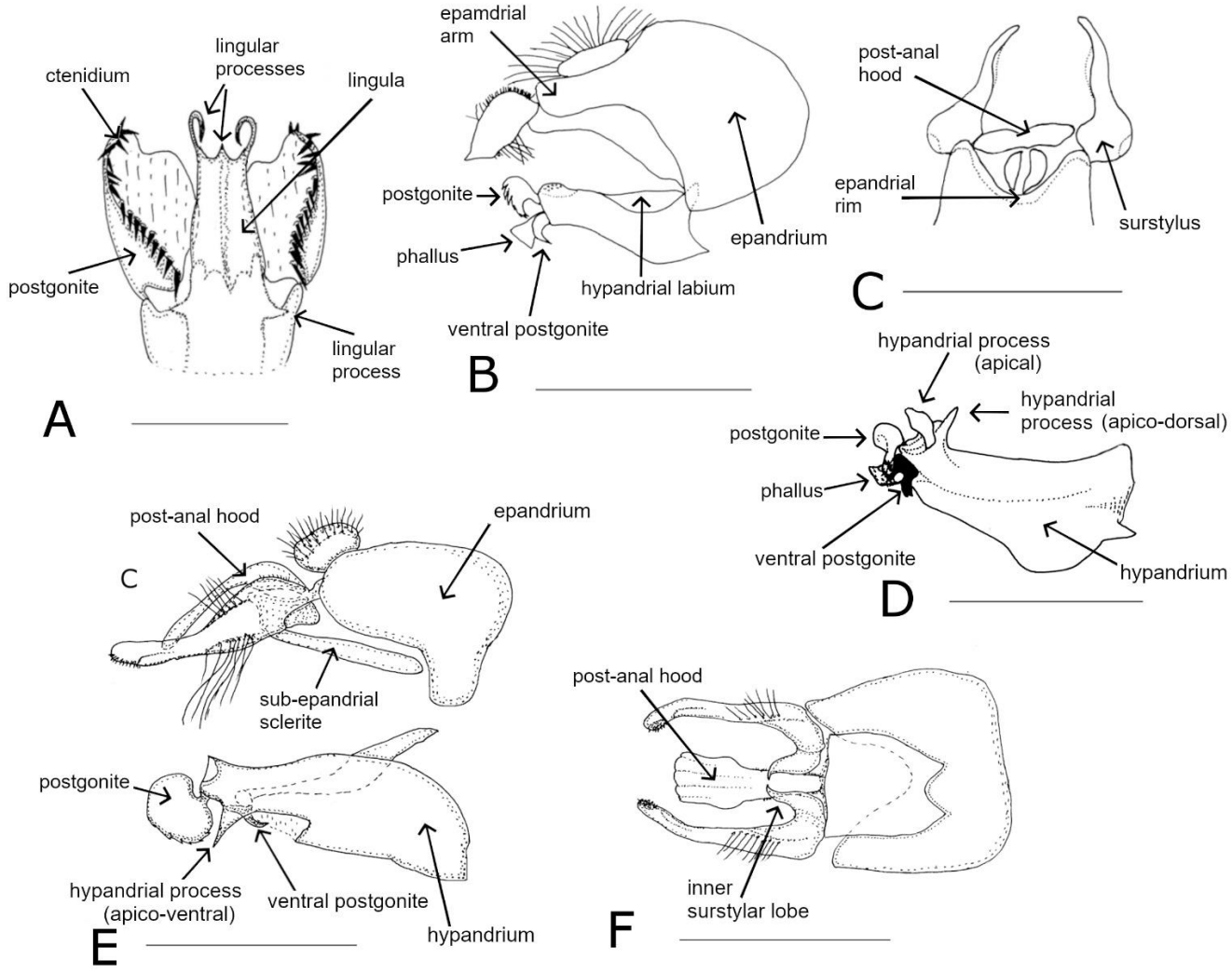

Figure 58. Male terminalia, **A, E**, ventral view, **B–D**, lateral view. **A, D**. Hypandrium. **C, F**. Epandrium. **A**. *Ceriana conopsoides*; Russia. **B**. *Pipizella cantabrica*; Spain. **C**. *Pipizella siciliana*; Italy. **D**. *Pipizella ochreobasalis*; Turkey. **E, F**. *Trichopsomyia flavitarsis*; Sweden. Scale = 0.5 mm. **A** after van Steenis *et al*. (2016), **B–D** after van Steenis & Lucas (2011), **E, F** after van Steenis *et al*. (2018a).