European Journal of Taxonomy 1023: 1–181
https://doi.org/10.5852/ejt.2025.1023.3097

europeanjournaloftaxonomy.eu
ISSN 2118-9773
2025 · Bot S. *et al.*

Received: 23 November 2024 • *Accepted: 4 July 2025* • *Published: 21 October 2025*

Topic editor: Tony Robillard • *Section editor: Torbjørn Ekrem* • *Desk editor: Pepe Fernández*

Monograph

urn:lsid:zoobank.org:pub:70585BDD-5981-4967-A09C-543CE5D7C717

Review of the genus *Cheilosia* Meigen, 1822 (Diptera: Syrphidae) from the Caucasus, with the description of 14 new species

Sander BOT [1,*], Ximo MENGUAL [2], Frank Van de MEUTTER [3] & Jeffrey H. SKEVINGTON [4]

[1] Gasterenseweg 1, 9467 TA Anloo, the Netherlands.
[2] Museum Koenig Bonn, Leibniz-Institut zur Analyse des Biodiversitätswandels, Adenauerallee 127, 53113 Bonn, Germany.
[3] Achterheide 16, 3980 Tessenderlo, Belgium.
[4] 146 Monty Drive, Ottawa, ON, K0A 3M0, Canada.

[*] Corresponding author: botsander@gmail.com
[2] Email: x.mengual@leibniz-lib.de
[3] Email: Frank.VandeMeutter@gmail.com
[4] Email: jhskevington@gmail.com

Abstract. A checklist and an identification key to the species of the hover fly genus *Cheilosia* (Diptera: Syrphidae: Rhingiini) from the Caucasus Region is presented, based on literature research and new field expeditions. The field expeditions and barcoding analysis resulted in 14 species new to science: *Cheilosia* (*Cheilosia*) *aurantia* sp. nov., *C.* (*C.*) *borjomi* sp. nov., *C.* (*C.*) *caucasi* sp. nov., *C.* (*C.*) *confusa* sp. nov., *C.* (*C.*) *gemmula* sp. nov., *C.* (*C*) *inarmata* sp. nov., *C.* (*C.*) *megaclama* sp. nov., *C.* (*C.*) *pogonias* sp. nov., *C.* (*C.*) *ushguliensis* sp. nov., *C.* (*C.*) *vansteenisi* sp. nov., *C.* (*Montanocheila*) *contrasta* sp. nov., *C.* (*M.*) *rufa* sp. nov., *C.* (*Taeniochilosia*) *ouwehandae* Bot sp. nov. and *C.* (*T.*) *longifacies* sp. nov. Further, *Cheilosia circassica* Ståhls & Barkalov, 2017 syn. nov. is herewith considered junior synonym of *Cheilosia armeniaca* Stackelberg, 1960, and we recognize *Cheilosia aenigmatosa* Barkalov, 1993 stat. rev. as a distinct species and not a junior synonym of *Cheilosia pollinifacies* Stackelberg, 1968. After our survey, we consider *Cheilosia caucasogenita* Kuznetzov, 1997 to be a doubtful species. Our extensive genetic analysis based on DNA barcodes including other European *Cheilosia* taxa clusters all members of the subgenus *Taeniochilosia* Oldenberg, 1916 in a well-supported group. A short discussion on the *Cheilosia* fauna of the Caucasus Region is provided, detailing the presence of the different subgenera and the high intraspecific morphological variability within *Cheilosia* in the Caucasus.

Keywords. Hover flies, flower flies, DNA barcoding, Georgia, Armenia, new species, checklist, identification key, new record, new synonym.

Bot S., Mengual X., Van de Meutter F. & Skevington J.H. 2025. Review of the genus *Cheilosia* Meigen, 1822 (Diptera: Syrphidae) from the Caucasus, with the description of 14 new species. *European Journal of Taxonomy* 1023: 1–181. https://doi.org/10.5852/ejt.2025.1023.3097

Introduction

Syrphidae Latreille, 1802, commonly known as hover or flower flies, is a species rich family with over 6200 described species (Marshall 2012; Evenhuis & Pape 2023). One of the largest genera in Syrphidae is *Cheilosia* Meigen, 1822 (member of Rhingiini) with some 450 described species (Evenhuis & Pape 2023; S. Bot unpubl. data). Species of *Cheilosia* are usually easy to distinguish from other genera by the general black ground-colour and the presence of well-developed parafaciae and a facial tubercle (Bot & Van de Meutter 2019, 2023; Skevington *et al.* 2019; Speight 2020b). *Cheilosia* is one of the few hover fly genera with various larval feeding modes: most known larvae are phytophagous, but some are fungivorous or sap-feeders on trees (Rotheray 1993; Stuke 2000). The greatest number of species occurs in the Palaearctic Region (343 species); the remainder in the Nearctic (75) and Oriental regions (31), a few species (3) extend into the northern Neotropics while it is absent from Afrotropics (Peck 1988; Ståhls *et al*. 2004; Thompson *et al*. 2010).

The Caucasus region lies between the Black Sea and the Caspian Sea and comprises the Republics of Armenia, Azerbaijan and Georgia (sometimes all together called Transcaucasia), parts of northeastern Turkey, northern Iran, and Russian republics and krais between the Sea of Azov and the Black Sea on the west and the Caspian Sea on the east (area known as Ciscaucasia or Northern Caucasus). The region is home to the Caucasus Mountains and is one of the global 'biodiversity hotspots' (Myers *et al*. 2000; Mittermeier *et al*. 2004). Previous research on *Cheilosia* in the Caucasus by mainly Russian authors was summarized by Barkalov (1993). After Barkalov (1993), few publications have covered Caucasian species of *Cheilosia*, with the most important ones being the revision of the subgenus *Taeniochilosia* Oldenberg, 1916 (Barkalov & Ståhls 1997), the hover fly checklists of Russia (Barkalov & Mutin 2018) and Georgia (Mengual *et al.* 2020), and Speight (2020a), who focuses on European species of Syrphidae but includes mentions to the Caucasus Region.

Here, we present a new checklist of the *Cheilosia* of the Caucasus including an identification key and the description of 14 species new to science. The present study is framed in the Caucasus Barcode of Life project (CaBOL) (Thormann *et al*. 2019; Mengual *et al*. 2020).

Material and methods

For compiling the checklist of the *Cheilosia* of the Caucasus, we used literature records and our own data from field work. Our literature research was mainly based on the most important works covering the Caucasus including Peck (1988), Barkalov (1993), Barkalov & Ståhls (1997), Gujabidze (2002), Barkalov & Mutin (2018), Mengual *et al.* (2020) and Speight (2020a). Most of the previous research in the region is already summarized in these publications. For each species, we cite only the references reporting the species for the Caucasus Region after an 'en dash' (–). We provide the page of the original publication when the references use the correct species concept as described by the original author. Although C. Claußen did not consistently use the same graphics for his surname in publications, we write his surname as Claussen for all his references used in this work.

Field expeditions took place between 15 June and 27 July 2018, 8 and 22 June 2019 and 26 June and 20 July 2021 in Georgia, between 4 and 15 September 2021 and 14 and 24 May 2022 in Armenia, and between 25 May and 1 June 2022 and 30 April and 13 May 2023 in Georgia. Additionally, we studied material collected by Andrey A. Przhiboro in the Republic of North Ossetia-Alania between 30 May and 8 June 2018, which is temporarily housed at the Museum Koenig Bonn, and the material of Jonas Mortelmans collected in Georgia between 2 and 12 September 2019 (housed in the personal collection of Frank Van de Meutter). During the expeditions, several Armenian and Georgian provinces were visited and the specimens were collected using an entomological hand net, unless stated otherwise.

Most results of the 2018 expedition are already reported in Mengual *et al.* (2020) and are not repeated here. If a species has no recent records in Mengual *et al.* (2020) but is recorded from 2019, 2021, 2022 and/or 2023, details are reported here. If a species has recent detailed records in Mengual *et al.* (2020) and the species is recorded again from 2019, 2021, 2022 and/or 2023, details of the 2019, 2021 2022 and/or 2023 records are not given here, with the exception if the records represent the first report for a country.

We list the species of *Cheilosia* in the Results following the alphabetic order of the species epithet, not considering the subgenus, to facilitate information finding.

Morphological terminology follows van Steenis *et al*. (2023), in addition to those terms related to male genitalia that follow Barkalov & Ståhls (1997) and Claussen (1998). The subgeneric classification of *Cheilosia* follows Barkalov (2002). For identification we mainly used keys published in Violovitsh (1983), Barkalov (1993), Barkalov & Ståhls (1997), Claussen (1998), Bartsch *et al.* (2009), Vujić *et al.* (2013), Barkalov & Ståhls (2017), Speight & Sarthou (2017) and Bot & Van de Meutter (2023).

Digital images and line drawings

All photographs were taken with a Canon EOS 6D camera with a Mejiro Genossen FL0530 4.0/110 Float Lens (habitus photographs) or Leitz-Wetzlar Photar 1:2/25 macro lens (other photographs). Before stacking in Helicon Focus ver. 7.7.5 (Kharkiv, Ukraine), exposure and sharpening of the photos was adjusted in Adobe® Lightroom Classic (ver. 10.4). For line drawings of the genitalia, the genitalia were cleared and photographed with the camera of a mobile phone through a binocular microscope. The photo was redrawn with a fineliner on tracing paper from the monitor. Body length was measured from the anterior oral margin to the posterior end of the abdomen, in lateral view. Wing length was measured from the wing tip to the basicosta.

Institutional abbreviations

The following acronyms are used to indicate entomological collections.

ASW = private collection of Axel Ssymank, Wachtberg, Germany
CNC = Canadian National Collection of Insects, Arachnids, and Nematodes, Ottawa, Ontario, Canada
FMT = private collection of Frank Van de Meutter, Tessenderlo, Belgium
GPA = private collection of Gerard Pennards, Amersfoort, the Netherlands
JMG = private collection of Jonas Mortelmans, Gent, Belgium
JSB = private collection of Jeroen van Steenis, Baarn, the Netherlands
LHH = private collection of Lenze Hofstee, Haren, the Netherlands
MTD = Senckenberg Naturhistorische Sammlungen Dresden, Museum für Tierkunde, Dresden, Germany
NBC = Naturalis Biodiversity Center (former Rijksmuseum van Natuurlijke Historie, RMNH), Leiden, the Netherlands
SBA = private collection of Sander Bot, Anloo, the Netherlands
WOR = private collection of Wout Opdekamp, Rochefort, Belgium
XLS = private collection of Xavier Lair, Sournia, France
ZISP = Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia
ZFMK = Museum Koenig Bonn, Leibniz-Institut zur Analyse des Biodiversitätswandels, Bonn, Germany

Molecular work

The nucleotide sequence of the mitochondrial Cytochrome *c* oxidase subunit I (COI) gene, also known as a DNA barcode (Hebert *et al.* 2003a, 2003b), was obtained from selected specimens. One or two legs of each sequenced specimen were used for DNA extraction. DNA primers, as well as extraction, amplification, purification, sequencing protocols and edition were carried out as described in Rozo-Lopez & Mengual (2015) for specimens sequenced at ZFMK, or as described in Gibson *et al.* (2010) for specimens sequenced at CNC. The remnants of the studied specimens were preserved and properly labelled as DNA voucher specimens.

All new sequences were submitted to GenBank via BOLD (www.boldsystems.org). GenBank accession numbers are listed for each sequenced specimen in the text or in the Supp. file 2: Table S1.

Public nucleotide sequences (with more than 500 bp and without contaminants) of the studied species of *Cheilosia* available at BOLD were downloaded (https://www.boldsystems.org/index.php; accessed on 19 January 2024). The public sequences and the newly obtained sequences were aligned without gaps or stop codons using Geneious Prime ver. 2022.1.1 (Biomatters Ltd). Specimen information (locality, date, collector, identifier and unique identifier) is accessible via the GenBank Accession Numbers (Supp. file 2: Table S1) and in BOLD (https://www.boldsystems.org/) under the data set DS-CHEICAUC (https://doi.org/10.5883/DS-CHEICAUC).

A distance-based Neighbor-Joining (NJ) analysis was done using the Jukes-Cantor Model as implemented in the software Geneious Prime ver. 2022.1.1 (Supp. file 1: Fig. S1). The DNA barcode of *Rhingia campestris* Meigen, 1822 (ZFMK-DIP-00077699|ZFMK-TIS-8009535) was constrained as the root for the NJ tree. Bootstrap support values (BS) were estimated from 1000 replicates directly from Geneious Prime ver. 2022.1.1. Uncorrected pairwise distances (p-distances) were calculated in Geneious Prime ver. 2022.1.1 and provided in the Supp. file 3: Table S2.

Results

An overview of the species of Cheilosia occurring in the Caucasus region

Class Insecta Linnaeus, 1758
Order Diptera Linnaeus, 1758
Family Syrphidae Latreille, 1802
Subfamily Eristalinae Newman, 1834
Genus *Cheilosia* Meigen, 1822

Cheilosia* (*Cheilosia*) *abagoensis Skufjin, 1979
Fig. 1

Cheilosia abagoensis Skufjin, 1979: 194.

Cheilosia abagoensis – Peck 1988: 95. — Barkalov 1993: 721. — Barkalov & Mutin 2018: 482. — Mengual *et al*. 2020: 14.

Differential diagnosis

It can be confused with several other species of *Cheilosia* that have the combination of a pilose eye, bare face, shiny sterna, black legs and posterior margin of scutellum with setae (e.g., *C. caucasi* sp. nov., *C. gemmula* sp. nov., *C. rhynchops*). Nevertheless, it can be relatively easy identified by the shiny posterior anepisternum, at least slightly pruinose in the others, and the blackish infuscate wings (Fig. 1A, C), hyaline or almost so in the other mentioned species.

Material examined

Collected in 2018, 2019 and 2021; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

DNA barcodes of *C. abagoensis* cluster all together with high support (BS = 99.6%), including three specimens of *C. caucasi* sp. nov.

Biology

During our expeditions, collected between June 15th and 13 July between 1900 and 2295 m a.s.l. All specimens were collected on alpine meadows.

Distribution

Caucasus (Russia, Georgia).

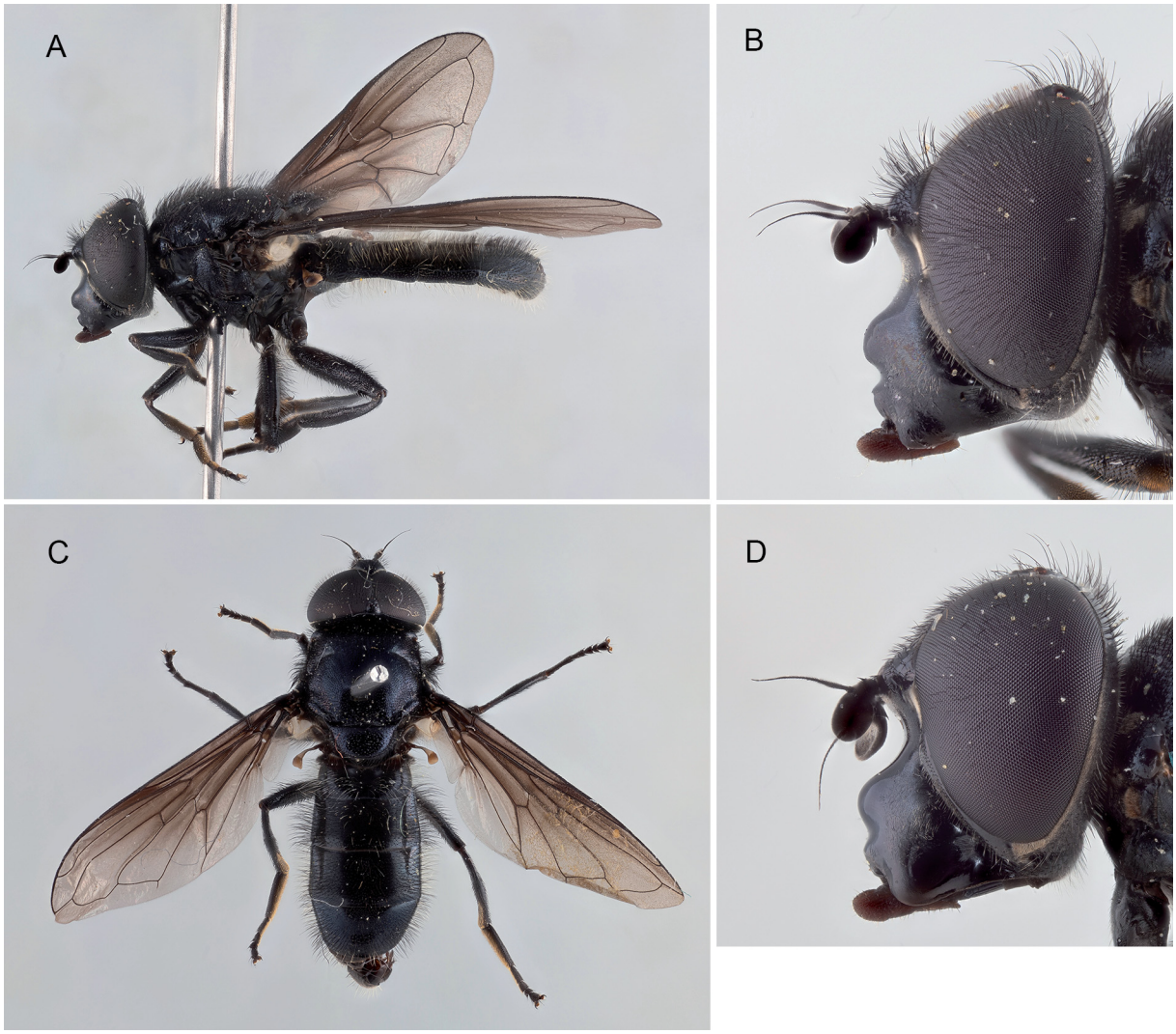

Fig. 1. *Cheilosia* (*Cheilosia*) *abagoensis* Skufjin, 1979. Collected in Georgia. **A**. ♂ (SBA, SB.002704); habitus, lateral view; body length 9.2 mm. **B**. ♂ (SBA, SB.002704); head, lateral view; eye width 1.3 mm. **C**. ♂ (SBA, SB.002707); habitus, dorsal view; body length 8.7 mm. **D**. ♀ (SBA, SB.002702); head, lateral view; eye width 1.2 mm. Not to scale.

Cheilosia* (*Taeniochilosia*) *aenigmatosa Barkalov, 1993 stat. rev.
Fig. 2

Cheilosia aenigmatosa Barkalov, 1993: 700.

Cheilosia grisella Becker, 1894 – Stackelberg & Richter 1968: 246. — Peck 1988: 104. — Barkalov & Ståhls 1997: 28. — Gujabidze 2002: 245. — Mengual *et al.* 2020: 25. — Speight 2020a: 35.
Cheilosia aenigmatosa – Barkalov 1993: 700. — Barkalov & Ståhls 1997: 52. — Barkalov & Mutin 2018: 486.

Differential diagnosis

Cheilosia aenigmatosa is identified as belonging to the subgenus *Taeniochilosia* by the combination of bare eye, black legs and the anterior process of lunula not broadly confluent with the face (Barkalov & Ståhls 1997). The male genitalia are figured in Barkalov (1993). The male of *C. aenigmatosa* is very similar to *C. pollinifacies* and can be distinguished as follows: posterior margin of scutellum with few and thin setae, diameter almost as thin as scattered black pile on disc of scutellum (Fig. 2E) (in *C. pollinifacies* the posterior margin of scutellum has multiple setae with a diameter much larger than diameter of scattered long black pile on disc of scutellum; Fig. 56E), scutum with dense erect short golden pile, with sparse long black erect pile intermixed (in *C. pollinifacies* scutum also with sparse long black pile, but short pile on scutum semi-adpressed, variable in colour, ranging from predominantly black to predominantly golden). Females of *C. aenigmatosa* differ from *C. pollinifacies* by the absence of black setae or pile on posterior margin of scutellum, while black setae are present on posterior margin of scutellum in *C. pollinifacies*. Genetically, it is similar to *C. ouwehandae* Bot sp. nov., but the male differs in many ways (the female of *C. ouwehandae* remains unknown): *C. aenigmatosa* is larger (body size usually at least 8 mm instead of 6.5 mm), face and parafacia densely pruinose (slightly pruinose in *C. ouwehandae*), facial tubercle less well developed, not further projecting than mouth edge (rounder, and further protruding, well beyond mouth edge in *C. ouwehandae*), postpedicel black (basoventrally orange in *C. ouwehandae*), frontal triangle with large proportion of yellow pile (pile black in *C. ouwehandae*), pile on scutum golden instead of whitish, and posterior margin of scutellum with black pile setae instead of black setae and abdomen with less dense pruinosity.

Material examined

Collected in 2018, 2019 and 2021, but 2018 records were not published in Mengual *et al.* (2020). Thus, all records are reported here.

GEORGIA – **Adjara Region** • 1 ♀; Kintrishi Nature Reserve; 41.7619° N, 42.1162° E; 2462 m a.s.l.; 16 Jun.–30 Jun. 2018; GGBC-members leg; ZFMK, ZFMK-TIS-8010536 • 1 ♀; Kintrishi Nature Reserve; 41.7619° N, 42.1162° E; 2462 m a.s.l.; 30 Jun.–14 Jul. 2018; GGBC-members leg; ZFMK, ZFMK-TIS-8010398 • 1 ♀; Mtirala N.P.; 41.6535° N, 41.8730° E; 1106 m a.s.l.; 16 Jul. 2021; S. Bot leg.;BA, SB.003061. – **Imereti** • 2 ♂♂; road from Abastumani to Sairme; 41.824° N, 42.847° E; 2150 m a.s.l.; 10 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♂; Abastumani area, along path; 41.823° N, 42.840° E; 2025 m a.s.l.; 11 Jun. 2019; F. Van de Meutter leg.; FMT. – **Mtskheta-Mtianeti** • 1 ♂; Gudauri-pass; 42.5336° N, 44.4751° E; 2210 m a.s.l.; 11 Jul. 2019; A. Ssymank leg.; ASW, Ssy9504-01, ZFMK-TIS-8009412 • 1 ♀; same data as for preceding; ASW, Ssy9504-02, ZFMK-TIS-8009413. – **Samegrelo-Zemo Svaneti** • 1 ♀; 43.0319° N, 42.8272° E; 1905 m a.s.l.; 13 Jun. 2019; X. Mengual leg; ZFMK, ZFMK-DIP-00066299 = ZFMK-TIS-8008764 • 1 ♂; 42.900° N, 42.934° E; 2700 m a.s.l.; 17 Jun. 2019; S. Bot leg.; SBA, SB.003064 • 1 ♀; 42.9140° N, 43.0911° E; 2575 m a.s.l.; 18 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066298 = ZFMK-TIS-8006837 • 1 ♂; 7 km W of Ushguli, near hilltop; 42.906° N, 42.937° E; 2615 m a.s.l.; 16 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♀; 7.5 km N of Mestia, path to glacier; 42.738° N, 43.113° E; 1800 m a.s.l.; 14 Jun. 2019; F. Van de Meutter leg.; FMT • 3 ♂♂; 43.0275° N, 42.9115° E; 2887 m a.s.l.; 14 Jul. 2021; S. Bot leg.; SBA, SB.003058 to

SB.003060 • 2 ♀♀; same data as for preceding; SBA, SB.003056, SB.003057. – **Samtskhe-Javakheti** • 1 ♂; Borjomi N.P.; 41.824° N, 42.848° E; 2165 m a.s.l.; 10 Jun. 2019; S. Bot leg.; SBA, SB.003062 • 1 ♀; same data as for preceding; SBA, SB.003063.

RUSSIA – **Kabardino-Balkaria** • 1 ♀; 43.4841° N, 43.1006° E; 1776 m a.s.l.; 6 Jun. 2018; A. Przhiboro leg.; ZFMK, ZFMK-DIP-00078649 = ZFMK-TIS-8009592 • 2 ♂♂; 43.4795° N, 43.0971° E; 1836 m a.s.l.; 7–8 Jun. 2018; A. Przhiboro leg.; yellow plates; ZFMK, ZFMK-DIP-00078658 = ZFMK-TIS-8009602, ZFMK-DIP-00078660 = ZFMK-TIS-8009567 • 2 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00078653 = ZFMK-TIS-8009596; ZFMK-DIP-00078659 = ZFMK-TIS-8009566; ZFMK.

Genetics

DNA barcodes of *C. aenigmatosa* were resolved into three clusters with high support (BS = 96.7–100%). DNA barcodes of European specimens of *C. grisella* were grouped together with high support (BS = 98.7%). See Remarks.

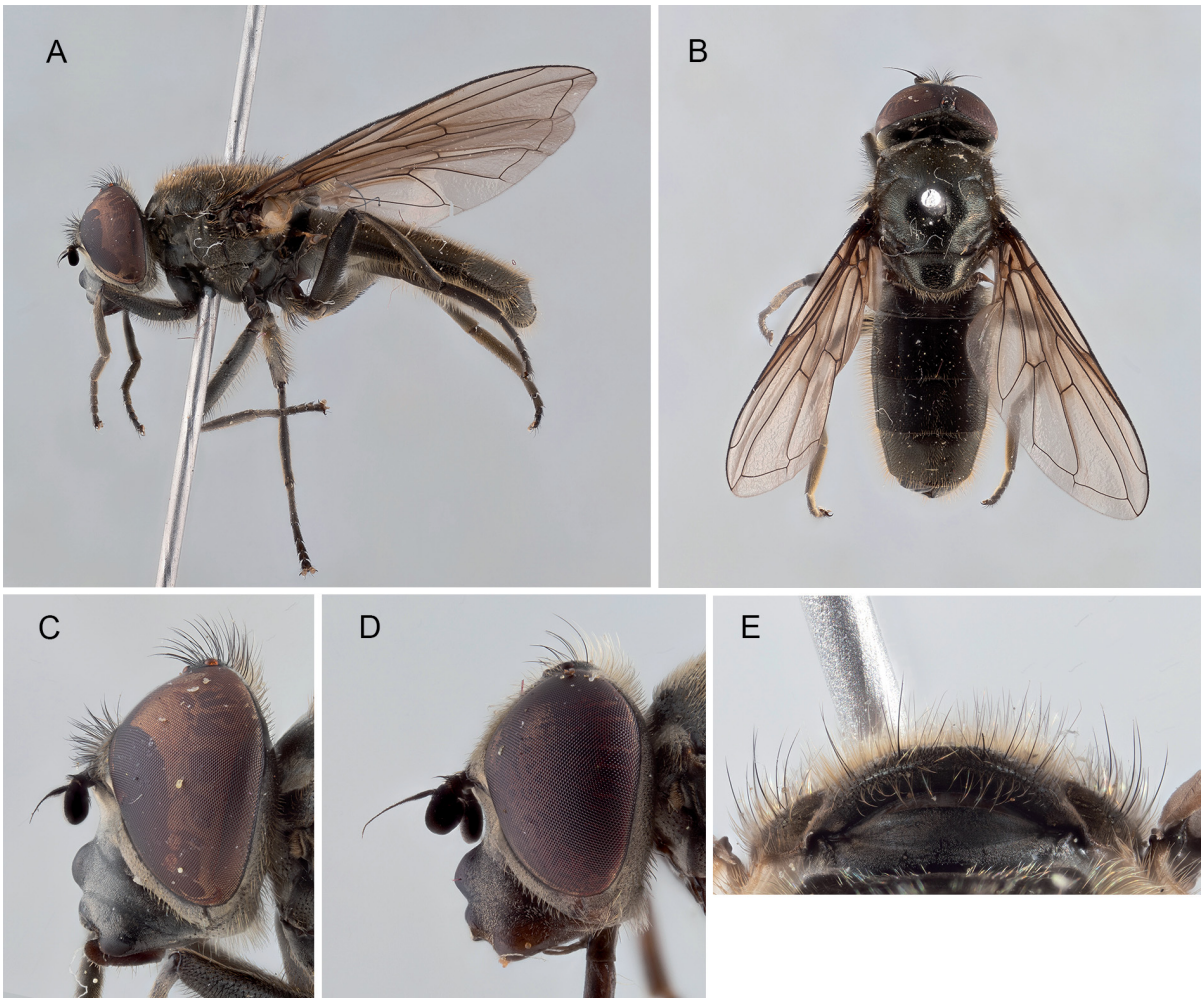

Fig. 2. *Cheilosia* (*Taeniochilosia*) *aenigmatosa* Barkalov, 1993. Collected in Georgia. **A**. ♂ (SBA, SB.003064); habitus, lateral view; body length 8.3 mm. **B**. ♂ (SBA, SB.003064); habitus, dorsal view; body length 8.3 mm. **C**. ♂ (SBA, SB.003064); head, lateral view; eye width 1.1 mm. **D**. ♀ (SBA, SB.003063); head, lateral view; eye width 1.3 mm. **E**. ♂ (SBA, SB.003062); scutellum, posterior view; scutellum width 1.7 mm. Not to scale.

Remarks

Previous records of *C. grisella* from the Caucasus are referred here to as *C. aenigmatosa* and *C. grisella* is considered absent from the Caucasus Region.

Barkalov & Ståhls (1997) synonymized *C. aenigmatosa* with *C. pollinifacies* without providing an explanation or comment. Our genetic study resolved *C. pollinifacies* and related species in several clusters. One group corresponds to the original description of *C. pollinifacies* and three other groups match the description of *C. aenigmatosa*, with *C. ouwehandae* sp. nov. branching in between (Supp. file 1: Fig. S1). Although genetically similar, *C. ouwehandae* differs from *C. aenigmatosa* morphologically (see Differential diagnosis). Within *C. aenigmatosa*, we could not find morphological differences between the genetic clusters. Here we reinstate *C. aenigmatosa* as a genetically and morphologically different species from *C. pollinifacies*.

Biology

During our expeditions, collected between 6 June and 16 July at an altitude between 1106 and 2887 m a.s.l. Behaviour difficult to ascertain due to confusion with the very similar *C. pollinifacies* with which it often co-occurs. At places where *C. aenigmatosa* was caught, individuals belonging to *C. aenigmatosa* or *C. pollinifacies* were often found in clearings in forest, along forest edges or near tall vegetation in alpine meadows, visiting low flowers including *Caltha palustris* L. and *Ranunculus* sp.

Distribution

Caucasus (Russia, Georgia).

Cheilosia* (*Cheilosia*) *aerea Dufour, 1848
Fig. 3

Cheilosia aerea Dufour, 1848: 209.
Chilosia correcta Becker, 1894: 488. Syn. by Claussen & Thompson (1996).
Chilosia zetterstedti Becker, 1894: 430. Syn. by Claussen & Thompson (1996).

Chilosia zetterstedti – Stackelberg & Richter 1968: 250. — Stackelberg 1970: 62. — Peck 1988: 121.
Chilosia correcta – Barkalov 1993: 724.
Cheilosia zetterstendti Becker, 1921 [sic] – Gujabidze 2002: 246.
Cheilosia aerea – Barkalov & Mutin 2018: 482. — Mengual *et al*. 2020: 14. — Speight 2020a: 26.

Differential diagnosis

Very similar to the species of the *proxima* group, and therefore often overlooked. It shares the following characters with the *proxima* group: eye pilose, face bare, legs bicoloured, posterior margin of scutellum with setae and sterna pilose. However, in *C. aerea* the posterodorsal corner of the anterior anepisternum is pilose, bare in all species of the *proxima* group, and the sterna are less pruinose in some specimens and populations. Morphologically and genetically, it is close to *C. vansteenisi* sp. nov., but that species has the posterodorsal corner of the anterior anepisternum bare. Moreover, *C. aerea* has the scutum more coarsely punctured, terga more pruinose and terga with on average more black pile. For more differences with *C. vansteenisi*, see the Differential diagnosis of that species.

Material examined

Not collected in 2018, but collected in 2019 and 2022.

ARMENIA – **Ararat Province** • 5 ♂♂; surroundings of Geghard Monastery; 40.13859° N, 44.81728° E; 1720 m a.s.l.; 22 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093544 = ZFMK-TIS-8014619,

ZFMK-DIP-00093545, ZFMK-DIP-00093550, ZFMK-DIP-00093551 = ZFMK-TIS-8014627, ZFMK-DIP-00094506 • 1 ♀; same data as for preceding; ZFMK, ZFMK-DIP-00093556. – **Syunik Province** • 1 ♀; from Lichk to the Zvaravank Monastery; 39.05497° N, 46.171353° E; 1765 m a.s.l.; 16 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093041 = ZFMK-TIS-8014612 • 6 ♂♂; near Gorayk, Spandarian Reservoir; 39.684513° N, 45.777478° E; 2078 m a.s.l.; 19 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093263 = ZFMK-TIS-8014620, ZFMK-DIP-00093265, ZFMK-DIP-00093269 = ZFMK-TIS-8014625, ZFMK-DIP-00093270, ZFMK-DIP-00093271, ZFMK-DIP-00093273 • 3 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00093277, ZFMK-DIP-00093278, ZFMK-DIP-00093280.

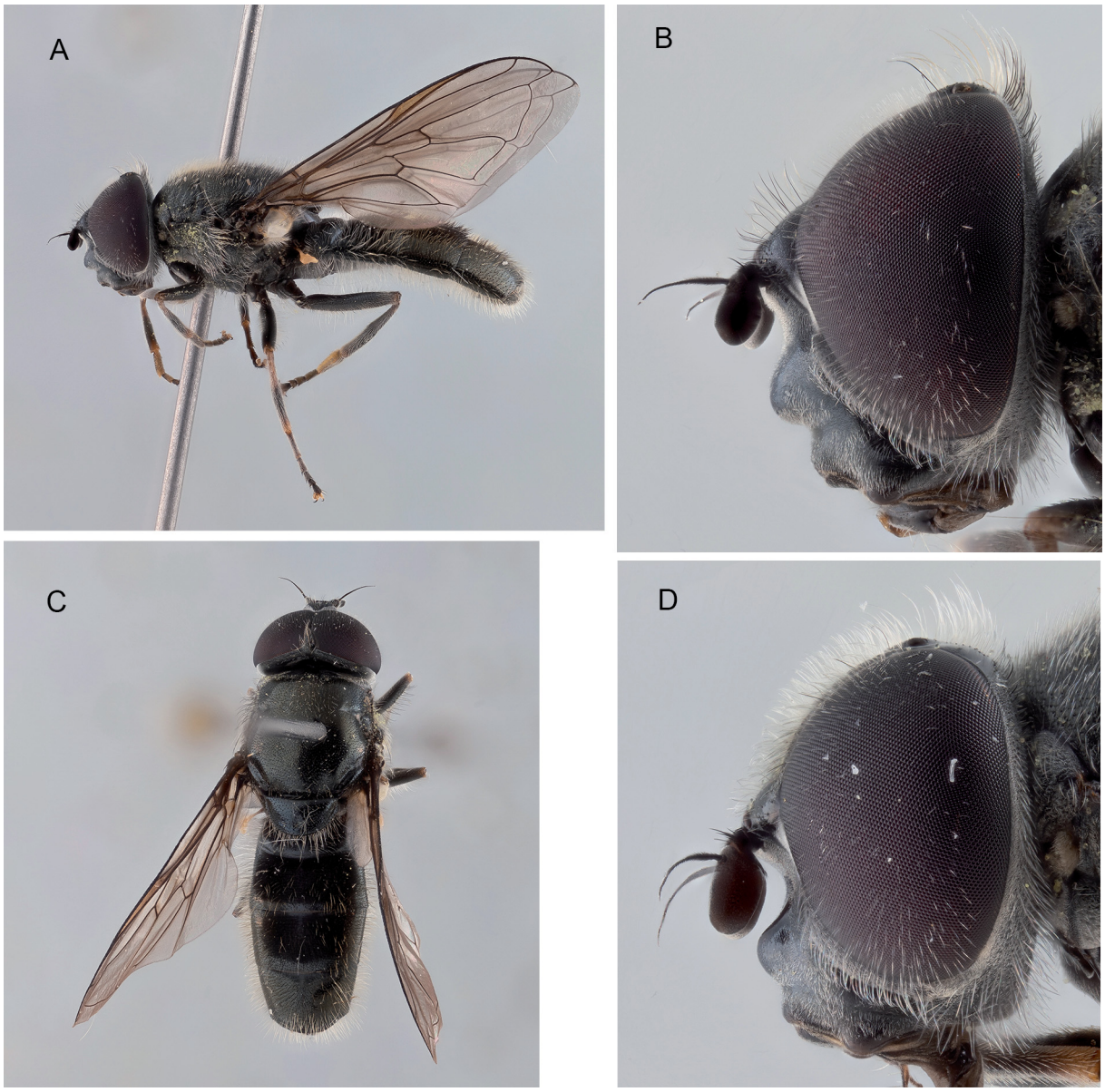

Fig. 3. *Cheilosia* (*Cheilosia*) *aerea* Dufour, 1848. Collected in Armenia. **A**. ♂ (ZFMK, ZFMK-TIS-8014627); habitus, lateral view; body length 8.9 mm. **B**. ♂ (ZFMK, ZFMK-TIS-8014627); head, lateral view; eye width 1.4 mm. **C**. ♂ (ZFMK, ZFMK-TIS-8014627); habitus, dorsal view; body length 8.9 mm. **D**. ♀ (ZFMK); head, lateral view; eye width 1.3 mm. Not to scale.

GEORGIA – **Samtskhe-Javakheti** • 2 ♀♀; Abastumani; 41.7772° N, 42.8372° E; 1368 m a.s.l.; 10–11 Jun. 2019; X. Mengual leg.; Malaise trap; ZFMK, ZFMK-DIP-00069437 = ZFMK-TIS-8009527, ZFMK-DIP-00013504 = ZFMK-TIS-8010111.

Genetics

All DNA barcodes of *C. aerea* are clustered together with high support (BS = 100%).

Biology

During our expeditions, collected between 16 May and 11 June at an altitude between 1368 and 2078 m a.s.l.

Distribution

Western Palaearctic, eastwards into Central Asia. Within the Caucasus reported from Armenia, Azerbaijan, Georgia and Russia.

Cheilosia* (*Cheilosia*) *albipila Meigen, 1838
Fig. 4

Cheilosia albipila Meigen, 1838: 125.

Cheilosia albipila – Stackelberg & Richter 1968: 244. — Stackelberg 1970: 61. — Tóth 1986: 92. — Peck 1988: 96. — Barkalov 1993: 718. — Mengual *et al.* 2020: 14.
Cheilosia albipina Meigen, 1822 [sic] – Gujabidze 2002: 246.

Differential diagnosis

The lack of setae along the posterior margin of the scutellum, in combination with a pilose eye, bare face, and bicoloured legs distinguishes *Cheilosia albipila* from many other *Cheilosia*. It can be confused with species from the subgenus *Montanocheila* Barkalov, 2002, but these species have a brown pattern on the wing (hyaline in *C. albipila*) and the male genitalia are different with the apical sclerite of distiphallus with two pairs (anterior and posterior) of lobes (the posterior lobes are missing in *C. albipila*). The pile on the eye is white, while they are black on the, otherwise, quite similar *C. aurantia* sp. nov. In particular, the male of *C. albipila* is similar to that of *C. megaclama* sp. nov. (the female of that species has the eye bare; pilose in *C. albipila*), but that species has the pile on anepimeron straight or with bent apex (with wavy apex in *C. albipila*), has the face wider, below antennae about as wide as an eye at the same height (in *C. albipila* below antennae about ⅔ as wide as an eye at the same height), and has parafacia shiny (pruinose in *C. albipila*). It differs from *C. grossa* (Fallén, 1817) by, amongst other characters, the predominantly orange postpedicel (entirely black in *C. grossa*).

Material examined

Not collected in 2018, but collected in 2019 and 2023.

GEORGIA – **Mtskheta-Mtianeti** • 2 ♂♂; Lutkhubi; 42.3797° N, 44.7969° E; 1463 m a.s.l.; 6 May 2023; S. Bot leg.; SBA, SB.002969, SB.002970 • 2 ♂♂; same data as for preceding; ZFMK, ZFMK-TIS-8027973, SB.002968 • 2 ♀♀; Lutkhubi; 42.3867° N, 44.79° E; 1580 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT • 1 ♀; same data as for preceding; ZFMK • 2 ♂♂; Lutkhubi; 42.3930° N, 44.7929° E; 1700 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, A004 = ZFMK-TIS-8028455, A027 • 1 ♀; same data as for preceding; WPR, A009 = ZFMK-TIS-8028454 • 2 ♂♂; Lutkhubi; 42.3989° N, 44.7995° E; 2100 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WPR. B003, B006 • 1 ♀; same data as for preceding; WOR, B007 • 2 ♂♂; Lutkhubi; 42.3984° N, 44.7996° E; 2068 m a.s.l.; 8 May 2023; S. Bot leg.; SBA, SB.002965 = ZFMK-TIS-8027983, SB.002966 • 1 ♂; same data as for preceding; ZFMK, ZFMK-

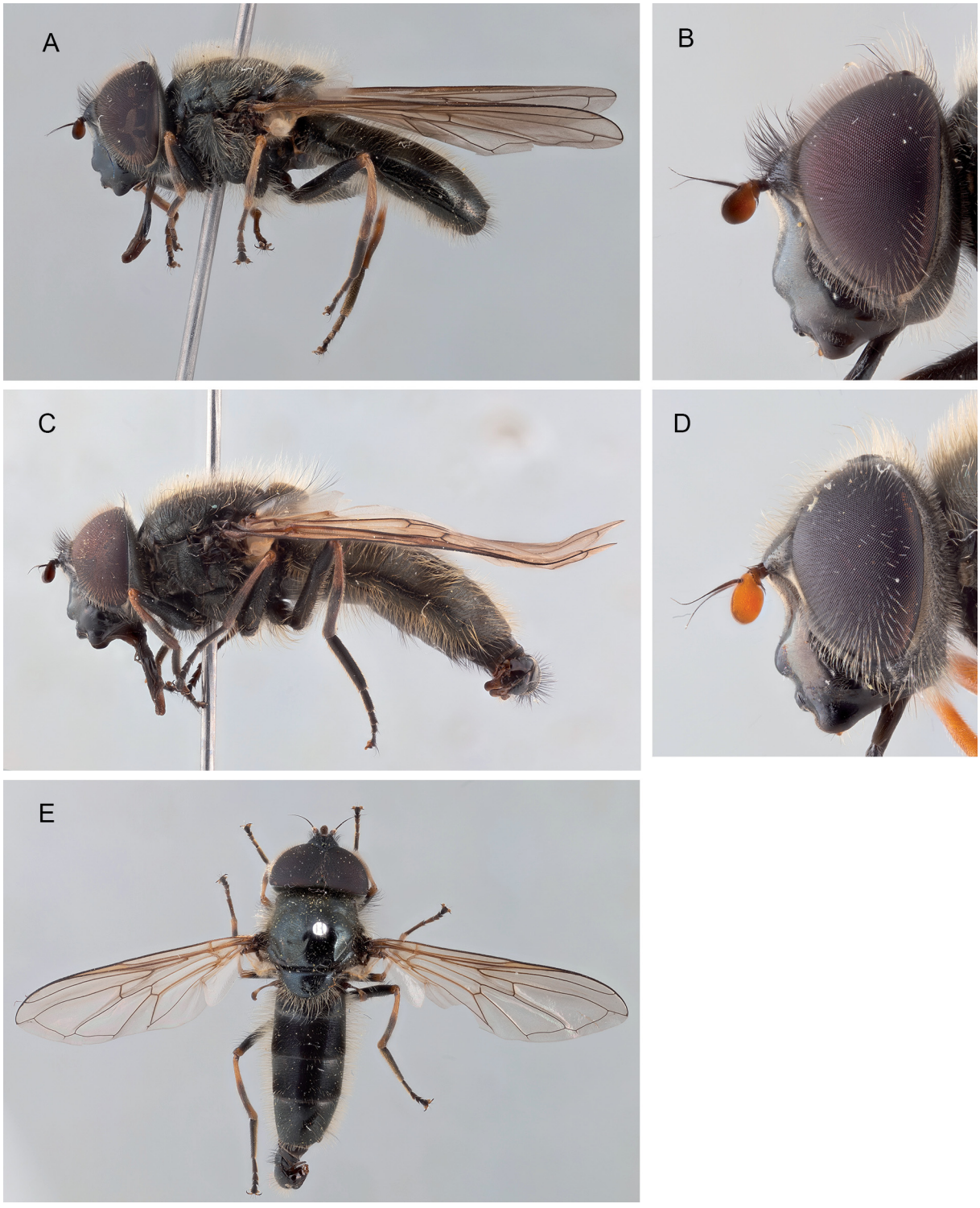

Fig. 4. *Cheilosia* (*Cheilosia*) *albipila* Meigen, 1838. Collected in Georgia. **A**. ♂ (FMT); habitus, lateral view; body length 10.4 mm. **B**. ♂ (SBA, SB.002970); head, lateral view; eye width 1.5 mm. **C**. ♂ (JSB, ZFMK-TIS-8009603); habitus, lateral view; body length 10.7 mm. **D**. ♀ (FMT); head, lateral view; eye width 1.2 mm. **E**. ♂ (SBA, SB.002969); habitus, dorsal view; body length 9.4 mm. Not to scale.

TIS-8027972 • 2 ♀♀; same data as for preceding; SBA, SB.002967 = ZFMK-TIS-8027996, SB.003042 • 6 ♂♂, 1 ♀; Lutkhubi; 42.3936° N, 44.7923° E; 1760 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT • 1 ♂, 1 ♀; Lutkhubi; 42.4006° N, 44.7956° E; 2130 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT • 2 ♂♂; Lutkhubi; 42.3930° N, 44.7929° E; 1734 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, C010, C027 • 1 ♂; Kodiani; 41.7305° N, 43.3537° E; 2160 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT, ZFMK-TIS-8027945 • 2 ♀♀; same data as for preceding; FMT, ZFMK-TIS-8027943, ZFMK-TIS-8027944. – **Samtskhe-Javakheti** • 1 ♂; Abastumani road pass; 41.83° N, 42.81° E; 2260 m a.s.l.; 10 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.889 = ZFMK-TIS-8009603 • 1 ♀; Sakire; 41.7301° N, 43.3306° E; 1820 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT.

Genetics

DNA barcodes of *C. albipila* are recovered into two clusters without high support (BS < 90%), together with the barcodes of *C. grossa* and *C. pseudogrossa*; although the cluster of specimens of the last two species receive high support in our analysis.

Remarks

The DNA barcodes of this species are grouped into two clusters, one for European individuals and another one for Caucasian specimens. At first glance, Caucasian specimens look different from European ones, for instance, they are smaller, have pale pile whitish instead of golden, and males have tibiae with a black ring in the middle. However, all these characters can be found in European populations as well, especially in some studied specimens from Greece and Bulgaria, which are genetically similar to other European populations. We did not find consistent morphological differences between European and Caucasian populations and the male genitalia show no differences either.

There is some morphological variation within the specimens collected in the Caucasus. The male collected in 2019 (Fig. 4C, ZFMK-TIS-8009603) looks different from most other Caucasian *C. albipila* by having long black setae on the posterior margin of the scutellum and being much darker overall: postpedicel dark brown becoming red ventrally, thorax with extensive black pile laterally, all tibiae with a distinct black ring, and wing veins dark grey.

Biology

During our expeditions, collected between 6 May and 10 June at an altitude between 1463 and 2260 m a.s.l., always near meadows and often feeding on *Salix* sp. catkins.

Distribution

Western and Central Palaearctic, up to Lake Baikal. Within the Caucasus known from Georgia and Russia.

Cheilosia* (*Cheilosia*) *albitarsis (Meigen, 1822)
Fig. 5

Syrphus albitarsis Meigen, 1822: 290.

Cheilosia albitarsis – Stackelberg & Richter 1968: 245. — Stackelberg 1970: 61. — Peck 1988: 96. — Barkalov 1993: 708. — Gujabidze 2002: 246. — Mengual *et al.* 2020: 14.

Differential diagnosis

Cheilosia albitarsis is relatively easily to identify: the male stands out, together with the extralimital *C. ranunculi* Doczkal, 2000, in having the proleg black, except tarsomeres 2–4 which are yellow (Fig. 5A). In other species of *Cheilosia* the proleg is either entirely black, or the yellow parts are at least also present on the tibia. In the female this character is sometimes less clear and the central tarsomeres

can be quite dark, but still distinguishable by the combination of a bare eye (pilose in the male), lunule with distinct medial arm separating acetabula (excluding the subgenus *Taeniochilosia* in which lunule lacks a medial arm and the acetabula are joined forming an antennal fossa) and yellow base of the wing. For differences with *C. ranunculi*, including drawings of the male genitalia, see Doczkal (2000).

Material examined

Collected in 2018, 2019, 2021, 2022 and 2023; see Mengual *et al.* (2020) for detailed records from 2018.

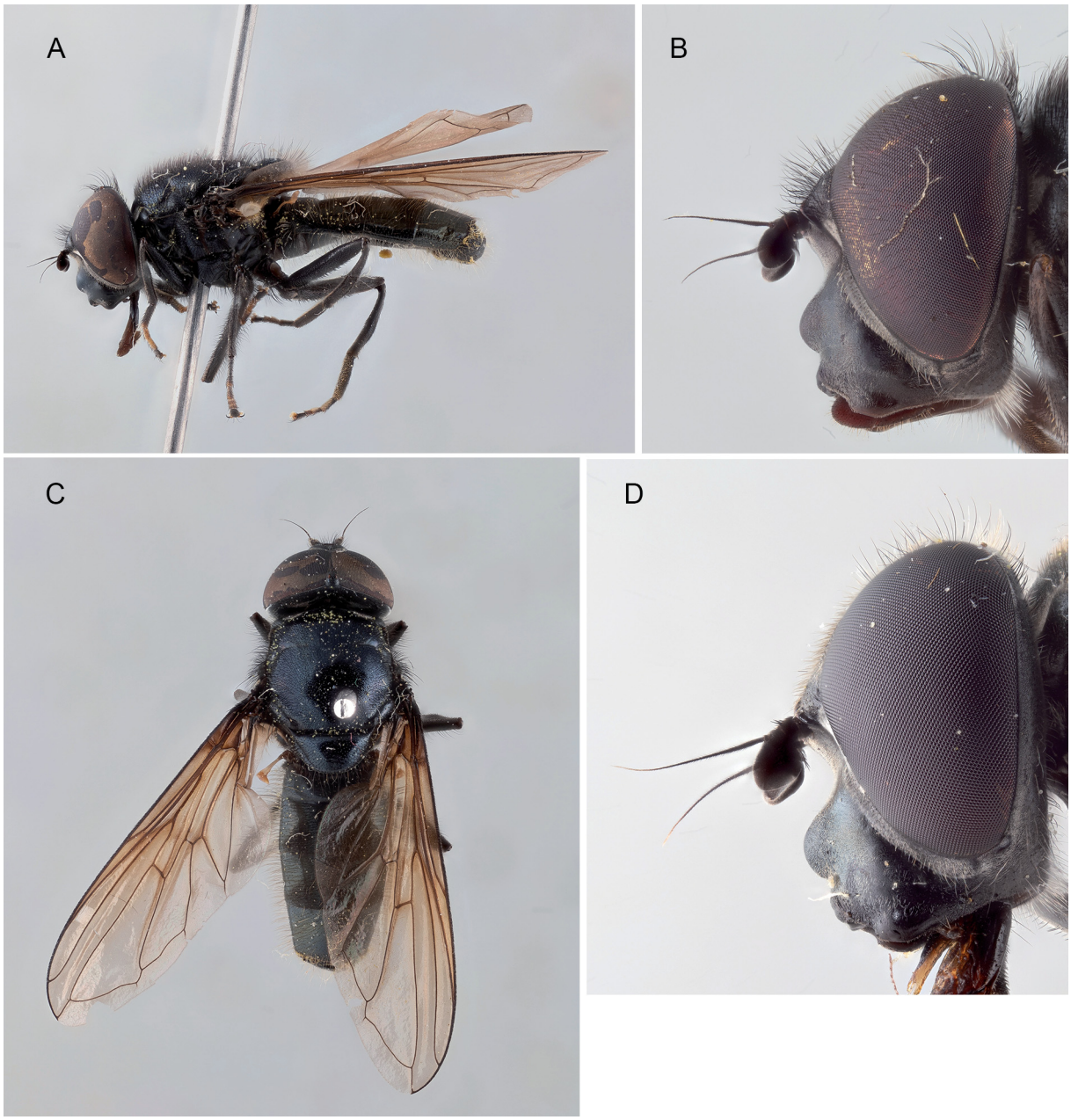

Fig. 5. *Cheilosia* (*Cheilosia*) *albitarsis* (Meigen, 1822). Collected in Georgia. **A**. ♂ (SBA, SB.002691); habitus, lateral view; body length 9.7 mm. **B**. ♂ (SBA, SB.002688); head, lateral view; eye width 1.3 mm. **C**. ♂ (SBA, SB.002691); habitus, dorsal view; body length 9.7 mm. **D**. ♀ (SBA, SB.002678); head, lateral view; eye width 1.3 mm. Not to scale.

Genetics

All DNA barcodes of *C. albitarsis* are resolved into a cluster with high support (BS = 100%).

Biology

During our expeditions, collected between 8 May and 12 July at an altitude between 1210 and 2327 m. As is usual for the species, encountered feeding on *Caltha palustris* or (most often) on *Ranunculus* sp.

Distribution

Holarctic, within the Caucasus, known from Armenia, Azerbaijan, Georgia and Russia.

Cheilosia* (*Taeniochilosia*) *armeniaca Stackelberg, 1960
Fig. 6

Cheilosia armeniaca Stackelberg, 1960: 439.
Cheilosia (*Taeniochilosia*) *circassica* Ståhls & Barkalov, 2017: 153. **Syn. nov.**

Cheilosia armeniaca – Stackelberg & Richter 1968: 245. — Peck 1988: 97. — Barkalov 1993: 712. — Ståhls & Barkalov 2017: 144. — Mengual *et al*. 2020: 25.
Cheilosia armeniaca Stackelberg, 1956 [sic] – Gujabidze 2002: 245.
Cheilosia (*Taeniochilosia*) *circassica* – Barkalov & Mutin 2018: 486.

Differential diagnosis

Cheilosia armeniaca belongs within *Taeniochilosia* to the *caerulescens* group identified by typically having both bicoloured legs and infuscate wing cross-veins. Within the *caerulescens* group, it can be distinguished by the combination of face with only slightly pruinosity, postpedicel dark orange to black (not bright orange), meso- and metafemur with yellow pile, terga with whitish pile only and acetabula confluent. Genetically indistinguishable from *C. longifacies* sp. nov., but morphologically very different. For a differential diagnosis between the two species, see the account of *C. longifacies*. The male genitalia are figured in Barkalov & Ståhls (1997).

Material examined

Collected in 2018, 2019 and 2021; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

DNA barcodes of *C. armeniaca* are resolved into a cluster with high support (BS = 100%) together with the barcodes of *C. longifacies* sp. nov. and *C. caerulescens*.

Remarks

Ståhls & Barkalov (2017) described *C. circassica* based on two males from Northern Caucasus. These two Caucasus endemic taxa, *C. circassica* and *C. armeniaca*, are very similar morphologically, with a single described difference: *C. armeniaca* has some bare areas of microtrichia in the wing cells bm and cua, whereas *C. circassica* has the wing completely microtrichose. However, this character is variable, as shown by a male collected in 2018 (Mengual *et al.* 2020) with an intermediate pattern (a single small area bare of microtrichia in wing cell bm). We thus consider *C. circassica* a junior synonym of *C. armeniaca*.

Biology

During our expeditions, collected between 24 June and 14 July at an altitude between 1836 and 2500 m a.s.l. Occurs in rather rocky, open environments, such as on glacier and river terraces or in rocky high alpine environments. Found feeding on low flowers, e.g., *Leucanthemum* sp.

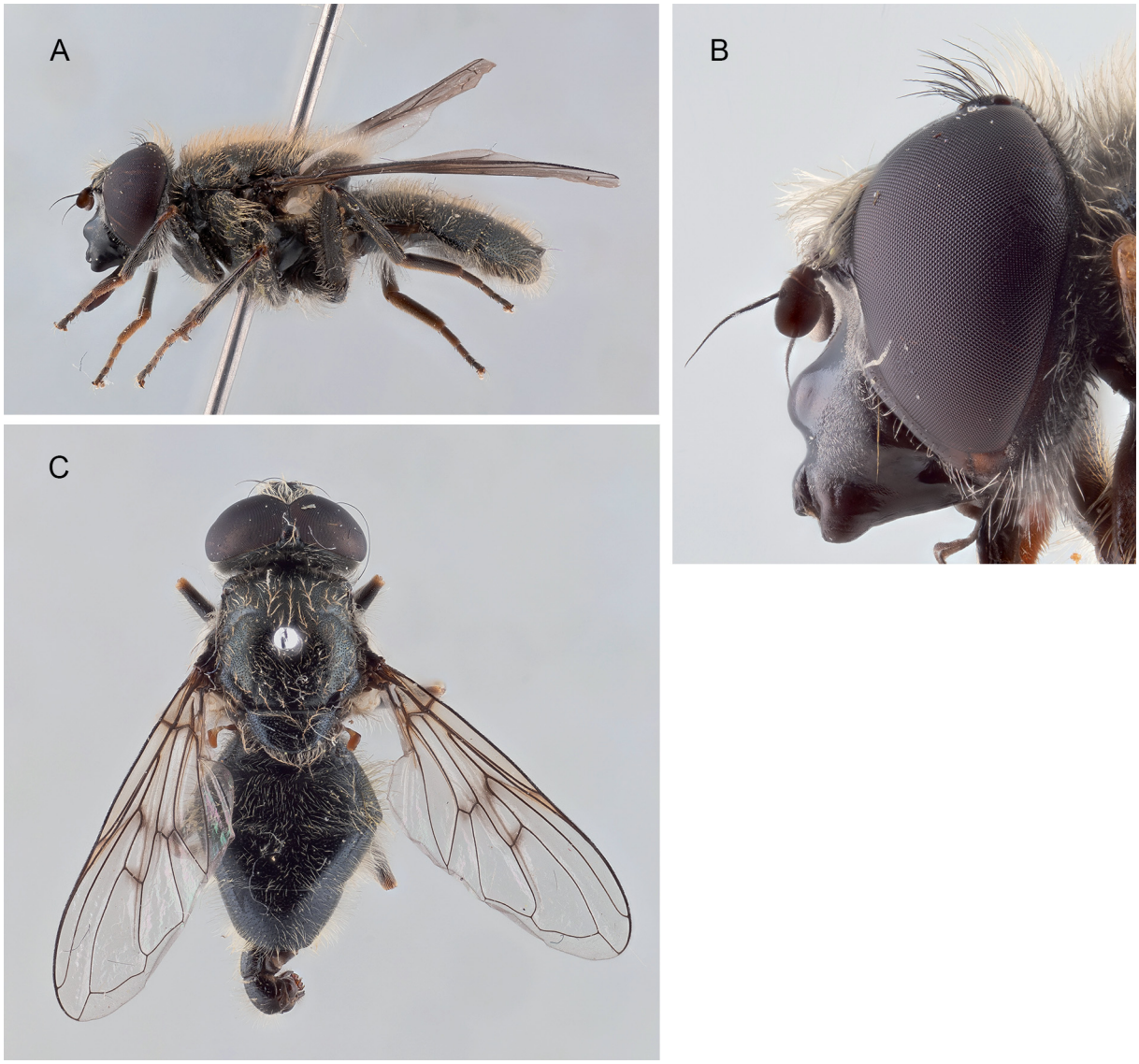

Fig. 6. *Cheilosia* (*Taeniochilosia*) *armeniaca* Stackelberg, 1960. Collected in Georgia. **A**. ♂ (SBA, SB.002239); habitus, lateral view; body length 8.7 mm. **B**. ♂ (SBA, SB.002237); head, lateral view; eye width 1.2 mm. **C**. ♂ (SBA, SB.002238); habitus, dorsal view; body length 8.7 mm. Not to scale.

Distribution

Caucasus: Armenia, Georgia and Russia.

Cheilosia* (*Cheilosia*) *atypica Barkalov, 1993
Fig. 7

Cheilosia atypica Barkalov, 1993: 703.

Cheilosia atypica – Barkalov & Mutin 2018: 482.

Differential diagnosis

This species is only known from the female holotype. In the female, the combination of a bare eye, bare face, bicoloured legs and wide parafacia can be found in a few species of *Cheilosia* only, sometimes

Fig. 7. *Cheilosia* (*Cheilosia*) *atypica* Barkalov, 1993. Holotype, ♀ (ZISP); habitus, dorsal view. Photo by Vladimir Neimorovets (http://www.zin.ru/collections).

called the *alba* group; for a diagnosis of the European species, see Vujić & Claussen (2000). In the Caucasus, this species may only be confused with *C. megaclama* sp. nov. but *C. atypica* has the tibiae with indistinct black ring (tibiae with distinct black ring in the middle in *C. megaclama*) and the tarsi are dorsally predominantly yellow instead of predominantly black as in *C. megaclama*.

Material examined

Species not collected.

Distribution

The only known specimen was collected on the summit of Belaya Mt, Russia, Northern Caucasus.

Cheilosia* (*Cheilosia*) *aurantia sp. nov.
urn:lsid:zoobank.org:act:7BF1EF77-0437-4956-9530-8792EA566192
Figs 8–9

Chilosia omissa Becker, 1894: 466. Syn. with *Cheilosia lenis* by Claussen & Speight (2007).

Chilosia omissa – Stackelberg & Richter 1968: 247. — Peck 1988: 112. — Barkalov 1993: 718. — Barkalov & Mutin 2018: 483.
Chilosia lenis Becker – Mengual *et al*. 2020: 18.

Differential diagnosis

Cheilosia aurantia sp. nov. is very similar to *C. lenis* Becker, 1894, sharing slightly elongated face, very long mainly black pile on eye, (partly) yellow legs, setae on posterior margin of scutellum absent or of reduced width, dorsal and ventral pile patches on katepisternum joined and sterna shiny. The male of *C. aurantia* is similar to that of *C. lenis* but: with a swollen frons (not swollen in *C. lenis*), scutum, scutellum and pleura with more extensive black pile (almost exclusively with yellow pile in *C. lenis*), protibia with a black marking on the posterior side only (with a continuously black mark, covering anterior and posterior part, in *C. lenis*), abdomen completely covered with long erect pile, also medially (*C. lenis* have shorter pile medially on the terga and more adpressed), and a much more extensive field of microtrichia on surstylus in *C. aurantia* (Fig. 9D) compared with the male genitalia of *C. lenis*. Females of *C. aurantia* are like those of *C. lenis* but easily distinguished by the entirely orange femora and tibiae (Fig. 8C) (in *C. lenis* females the femora are black except orange apex and the tibiae have a broad black ring medially) and the face is slightly more protruding downwards (Fig. 9B).

Etymology

The species name is derived from the Latin '*aurantium*' meaning 'orange' (Brown 1956: 112), and it refers to the almost entirely orange legs of the female. Species epithet is to be treated as an adjective.

Material examined

Holotype

GEORGIA • ♂; Samegrelo-Zemo Svaneti, near Ushguli, up to the ruins; 42.910° N, 43.007° E; 2295 m a.s.l.; 17 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8008829 = ZFMK-DIP-00066574.

Paratypes

ARMENIA – **Lori** • 2 ♂♂, 2 ♀♀; 30 Apr. 2011; T. Zeegers leg.; GPA.

GEORGIA – **Adjara** • 1 ♀; Kintrishi Nature Reserve; 41.7433° N, 42.0840° E; 1235 m a.s.l.; 1–15 Jun. 2018; GGBC-members leg.; Malaise trap, stored in alcohol; ZFMK, ZFMK-TIS-8010514 • 1 ♀; Kintrishi Nature Reserve; 41.75517° N, 42.11249° E; 2268 m a.s.l.; 2–16 Jun. 2018; GGBC-members leg.; Malaise trap, stored in alcohol; ZFMK, ZFMK-TIS-8010567. – **Kakheti** • 1 ♀; Lagodekhi N.P.; 41.8524° N, 46.2877° E; 665 m a.s.l.; 12–23 Apr. 2014; G. Japoshvili leg.; Malaise trap; CNC, CNC1449289 • 4 ♂♂; Lagodekhi N.P.; 41.8767° N, 46.2429° E; 615 m a.s.l.; 2 May 2023; S. Bot leg.; SBA, SB.003024 to SB.003027 • 5 ♂♂, 2 ♀♀; Lagodekhi N.P.; 41.8777° N, 46.2436° E; 625 m a.s.l.; 2 May 2023; F. Van de Meutter leg.; FMT • 2 ♂♂; Lagodekhi N.P.; 41.8747° N, 46.2415° E; 600 m a.s.l.; 2 May 2023; W. Opdekamp leg.; WOR, E013, E021. – **Mtskheta-Mtianeti** • 3 ♀♀; Tbilisi N.P.; 41.880° N, 45.023° E; 1289 m a.s.l.; 4 May 2023; S. Bot leg.; SBA, SB.003028 to SB.003030 • 5 ♂♂, 3 ♀♀; Tbilisi N.P.; 41.877° N, 45.0138° E; 1250 m a.s.l.; 4 May 2023; F. Van de Meutter leg.; FMT • 3 ♀♀; Tbilisi N.P.; 41.8802° N, 45.0220° E; 1279 m a.s.l.; 4 May 2023; W. Opdekamp leg.; WOR, A020, A034, A036 • 5 ♂♂; Lutkhubi; 42.3797° N, 44.7969° E; 1463 m a.s.l.; 6 May 2023; S. Bot leg.; SBA, SB.003031 to SB.003035 • 6 ♀♀; same data as for preceding; SBA, SB.003036 to SB.003041 • 1 ♂; same data as for preceding; L. Hofstee leg.; LHH • 2 ♂♂, 4 ♀♀; Lutkhubi; 42.3867° N, 44.79° E; 1580 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT • 3 ♀♀; Lutkhubi; 42.3930° N, 44.7929° E; 1700 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, A001, A015, A017 • 1 ♀; Lutkhubi; 42.3936° N, 44.7923° E; 1760 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; Tsinamkhari; 42.3914° N, 44.7562° E; 1200 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, B001 • 1 ♀; same data as for preceding; WOR, B010 • 1 ♂; Kithoki; 42.4147° N, 44.7548° E; 1240 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, A012 • 2 ♀♀; same data as for preceding; WOR, A003, A014 • 2 ♂♂; Lutkhubi; 42.3930° N, 44.7929° E; 1734 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, C007, C033. – **Racha-Lechkhumi and Kvemo Svaneti** • 1 ♂; Tsana; 42.909° N, 43.142° E; 1900 m a.s.l.; 29 Jun. 2018; S. Bot leg.; SBA, SB.002992

• 3 ♀♀; same data as for preceding; SBA, SB.002993 to SB.002995 • 2 ♂♂; Zeskho; 42.888° N, 43.233° E; 1900 m a.s.l.; 30 Jun. 2018, S. Bot leg.; SBA, SB.002996, SB.002997 • 1 ♀; same data as for preceding; SBA, SB.002998 • 2 ♀♀; Zeskho; 42.888° N, 43.233° E; 1900 m a.s.l.; 1 Jul. 2018; S. Bot leg.; SBA, SB.002999, SB.003000 • 1 ♀; Zeskho; 42.888° N, 43.233° E; 1900 m a.s.l.; 2 Jul. 2018; S. Bot leg.; SBA, SB.003001 • 3 ♀♀; Tsana; 42.913° N, 43.142° E; 1951 m a.s.l.; 18 Jun. 2019; L. Hofstee leg.; LHH • 2 ♂♂; Tsana; 42.90° N, 43.14° E; 1830 m a.s.l.; 18 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.897 = ZFMK-TIS-8009604, 2019-01.016 • 4 ♀♀; same data as for preceding; JSB, 2019-01.017–2019-01.020 • 1 ♂; near Tsana; 42.9011° N, 43.1422° E; 1835 m a.s.l.; 18 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066571 • 1 ♀; same data as for preceding; ZHMK, ZFMK-DIP-00066546 • 1 ♂; Tsana; 42.888° N, 43.143° E; 1760 m a.s.l.; 18 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066565 • 1 ♀; same data as for preceding; ZFMK, ZFMK-DIP-00066536 • 2 ♂♂; Tsana; 42.915° N, 43.143° E; 1969 m a.s.l.; 19 Jun. 2019; L. Hofstee leg.; LHH • 1 ♂, 1 ♀; Tsana; 42.9089° N, 43.1425° E; 1900 m a.s.l.; 19 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♂; Tsana; 42.916° N, 43.142° E; 1975 m a.s.l.; 19 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066564 • 2 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00066534, ZFMK-DIP-00066535. – **Samegrelo-Zemo Svaneti** • 2 ♂♂; Mestia; 43.080° N, 42.762° E; 1800 m a.s.l.; 22 Jun. 2018; S. Bot leg.; SBA, SB.003004, SB.003005 • 2 ♀♀; same data as for preceding; SBA, SB.002985, SB.002986 • 1 ♀; same data as for preceding; XLS, SB.002987 • 1 ♂; Ushguli; 42.914° N, 43.010° E; 2100 m a.s.l.; 23 Jun. 2018; S. Bot leg.; SBA, SB.002988 • 1 ♂; 42.955° N, 42.968° E; 2130 m a.s.l.; 26 Jun. 2018; S. Bot leg.; SBA, SB.002990 • 1 ♀; same data as for preceding; SBA, SB.002989 • 1 ♀; 42.912° N, 42.937° E; 2430 m a.s.l.; 27 Jun. 2018; S. Bot leg.; SBA, SB.002991 • 2 ♂♂; Mestia; 43.02° N, 42.89° E; 2600 m a.s.l.; 13 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.896, 2019-01.003 • 1 ♂; near Mestia; 43.0254° N, 42.8906° E; 2550 m a.s.l.; X. Mengual leg.; ZFMK, ZFMK-DIP-00066576 = ZFMK-TIS-8008830 • 2 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00066530, ZFMK-DIP-00066549 • 2 ♂♂, 2 ♀♀; Mestia; 2550 m a.s.l.; 43.0256° N, 42.8908° E; 13 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♂; E of Mestia; 43.02° N, 42.87° E; 2350 m a.s.l.; 13 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.004 • 1 ♀; same data as for preceding; JSB, 2019-01.005 • 1 ♀; 43.0259° N, 42.9103° E; 2863 m a.s.l.; 13 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386373 • 2 ♂♂; E of Mestia; 43.0283° N, 42.8787° E; 2345 m a.s.l.; 13 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066569, ZFMK-DIP-00066570 • 1 ♀; same data as for preceding; ZFMK, ZFMK-DIP-00066544 • 1 ♂; Mestia; 7.5 km N of Mestia, 43.1178° N, 42.7253° E; 1875 m a.s.l.; 14 Jun. 2019; F. Van de Meutter leg.; FMT • 2 ♀♀; Mestia, 43,1166° N, 42,7276° E; 1850 m a.s.l.; 14 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066542, ZFMK-DIP-00066543 = ZFMK-TIS-8008826 • 1 ♂; 43.1118° N, 42.7437° E; 1697 m a.s.l.; 14 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386473 • 1 ♂, 1 ♀; Ushguli; 42.948° N, 43.070° E; 2258 m a.s.l.; 15 Jun. 2019; L. Hofstee leg.; LHH • 2 ♀♀; Ushguli; 42.56° N, 43.04° E; 2260 m a.s.l.; 15 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.006, 2019-01.007 • 2 ♂♂; Ushguli; 42.9500° N, 43.0719° E; 2270 m a.s.l.; 15 Jun. 2019; F. Van de Meutter leg.; FMT • 2 ♀♀; Ushguli; 42.91° N, 43.01° E; 2100 m a.s.l.; 15 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.008, 2019-01.009 • 1 ♀; Ushguli; 42.909° N, 43.007° E; 2294 m a.s.l.; 16 Jun. 2019; S. Bot leg.; SBA, SB.003017 • 1 ♂, 1 ♀; 42.900° N, 42.934° E; 2700 m a.s.l.; 16 Jun. 2019; L. Hofstee leg.; LHH • 1 ♀; Ushguli; 42.9149° N, 43.0029° E; 2081 m a.s.l.; 16 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386643 • 1 ♂; Ushguli; 42.9370° N, 42.9061° E; 2615 m a.s.l.; 16 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♂; Ushguli; 42.91° N, 43.00° E; 2070 m a.s.l.; 16 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.010 • 1 ♀; same data as for preceding; JSB, 2019-01.011 • 1 ♂; Ushguli; 42.906° N, 42.937° E; 2615 m a.s.l.; 16 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066575 • 1 ♀; same data as for preceding; ZFMK, ZFMK-DIP-00066547 • 1 ♂, 1 ♀; Ushguli; 42.910° N, 43.000° E; 2120 m a.s.l.; 17 Jun. 2019; L. Hofstee leg.; LHH • 1 ♂; Ushguli; 2 km SW of Ushguli; 42.8986° N, 43.0052° E; 2550 m a.s.l.; 17 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♂; Ushguli; 42.90° N, 42.93° E; 2600 m a.s.l.; 17 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.012 • 2 ♂♂; Ushguli; 42.91° N, 42.93° E; 2290 m a.s.l.; 17 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.013, 2019-01.014 • 4 ♂♂; Ushguli; 42.910° N, 43.007° E; 2295 m a.s.l.; 17 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066568,

ZFMK-DIP-00066572, ZFMK-DIP-00066573, ZFMK-DIP-00066574 = ZFMK-TIS-8008829 • 1 ♀; same data as for preceding; ZFMK, ZFMK-DIP-00066545 • 3 ♂♂; Ushguli; 42.898° N, 43.008° E; 2601 m a.s.l.; 18 Jun. 2019; S. Bot leg.; SBA, SB.003018 to SB.003020 • 2 ♂♂, 1 ♀; Ushguli; 42.9370° N, 42.9061° E; 2550 m a.s.l.; 18 Jun. 2019; F. Van de Meutter leg.; FMT • 2 ♂♂; Ushguli; 42.8964° N, 43.0047° E; 2565 m a.s.l.; 18 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386811, CNC1386813 • 1 ♀; same data as for preceding; CNC, CNC1386810 • 1 ♂; Ushguli; 42.91° N, 43.09° E; 2585 m a.s.l.; 18 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.015 • 1 ♂; Tsana; 42.88° N, 43.15° E; 1900 m a.s.l.; 19 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.021 • 1 ♂; 42.820° N, 43.159° E; 1439 m a.s.l.; 20 Jun. 2019; L. Hofstee leg.; LHH • 1 ♀; near Shovi; 42.713° N, 43.701° E; 2022 m a.s.l.; 7 Jul. 2021; S. Bot leg.; SBA, SB.003021 • 1 ♂; near Shovi; 42.665° N, 43.656° E; 2203 m a.s.l.; 10 Jul. 2021; S. Bot leg.; SBA, SB.003022 • 1 ♀; same data as for preceding; SBA, SB.003023. – **Samtskhe-Javakheti** • 2 ♂♂; Borjomi N.P.; 41.857° N, 43.208° E; 1900 m a.s.l.; 18 Jun. 2018; S. Bot leg.; SBA, SB.002978, SB.002979 • 6 ♀♀; Borjomi N.P.; 41.867° N, 43.251° E; 2000 m a.s.l.; 18 Jun. 2018; S. Bot leg.; SBA, SB.002972 to SB.002977 • 1 ♂; Borjomi N.P.; 41.810° N, 43.119° E; 2050 m a.s.l.; 19 Jun. 2018; S. Bot leg.; XLS, SB.002983 • 3 ♀♀; Borjomi N.P.; 41.846° N, 43.145° E; 1800 m a.s.l.; 19 Jun. 2018; S. Bot leg.; SBA, SB.002980 to SB.002982 • 1 ♂; Borjomi N.P.; 41.777° N, 43.139° E; 1720 m a.s.l.; 20 Jun. 2018; S. Bot leg.; SBA, SB.002984 • 1 ♂; road from Sakire to Tsikhisjvari; 41.728° N, 43.364° E; 2327 m a.s.l.; 9 Jun. 2019; S. Bot leg.; SBA, SB.003008 • 4 ♀♀; same data as for preceding; SBA, SB.003002, SB.003003, SB.003006 = CNC databasing S. Bot 924, SB.003007 • 2 ♂♂, 4 ♀♀; same data as for preceding; L. Hofstee leg.; LHH • 3 ♂♂, 6 ♀♀; same data as for preceding; F. Van de Meutter leg.; FMT • 5 ♂♂; road from Sakire to Tsikhisjvari; 41.7299° N, 43.3684° E; 2245 m a.s.l.; 9 Jun. 2019; J.H. Skevington leg.; CNC, CNC1385954, CNC1385976, CNC1385997, CNC1386001, CNC1386039 • 5 ♀♀; same data as for preceding; CNC, CNC1385938, CNC1385984, CNC1386009, CNC1386025, CNC1386037 • 6 ♂♂; road from Sakire to Tsikhisjvari; 41.72° N, 43.36° E; 2250 m a.s.l.; 9 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.890 to 2019-00.892, 2019-00.980 to 2019-00.982 • 5 ♀♀; same data as for preceding; JSB, 2019-00.983 to 2019-00.987 • 6 ♂♂; road from Sakire to Tsikhisjvari; 41.7251° N, 43.3605° E; 2519 m a.s.l.; 9 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066553, ZFMK-DIP-00066554, ZFMK-DIP-00066555 = ZFMK-TIS-8008828, ZFMK-DIP-00066556 to ZFMK-DIP-00066558 • 6 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00066525 to ZFMK-DIP-00066529, ZFMK-DIP-00066548 • 1 ♀; road from Sakire to Tsikhisjvari; 41.7304° N, 43.3342° E; 1900 m a.s.l.; 9 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066524 • 6 ♂♂; Borjomi N.P.; 41.824° N, 42.848° E; 2165 m a.s.l.; 10 Jun. 2019; S. Bot leg.; SBA, SB.003009 to SB.003014 • 1 ♀; same data as for preceding; SBA, SB.003015 • 5 ♂♂, 2 ♀♀; same data as for preceding; L. Hofstee leg.; LHH • 2 ♂♂; Borjomi N.P.; 41.83° N, 42.81° E; 2260 m a.s.l.; 10 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.988, 2019-00.989 • 6 ♀♀; same data as for preceding; JSB, 2019-00.990 to 2019-00.995 • 4 ♀♀; same data as for preceding; X. Mengual leg.; ZFMK, ZFMK-DIP-00066520 to ZFMK-DIP-00066523 • 1 ♂, 1 ♀; Abastumani; 41.8242° N, 42.8472° E; 2150 m a.s.l.; 10 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♂; Borjomi N.P.; 41.86° N, 42.77° E; 1830 m a.s.l.; 10 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.996 • 4 ♀♀; same data as for preceding; JSB, 2019-00.997 to 2019-00.999, 2019-01.000 • 4 ♂♂; same data as for preceding; X. Mengual leg.; ZFMK, ZFMK-DIP-00066562, ZFMK-DIP-00066563, ZFMK-DIP-00066566, ZFMK-DIP-00066567 • 4 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00066537 to ZFMK-DIP-00066539, ZFMK-DIP-00066552 = ZFMK-TIS-8006833 • 1 ♀; Borjomi N.P.; 41.823° N, 42.841° E; 2049 m a.s.l.; 11 Jun. 2019; S. Bot leg.; SBA, SB.003016 • 3 ♂♂; Borjomi N.P.; 41.8181° N, 42.8316° E, 2004 m a.s.l.; 11 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386282, CNC1386296, CNC1386300 • 3 ♀♀; same data as for preceding; CNC, CNC1386250, CNC1386284, CNC1386290 • 2 ♀♀; Borjomi N.P.; 41.8697° N, 42.7923° E; 1683 m a.s.l., 11 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386348, CNC1386350 • 2 ♀♀; Borjomi N.P.; 41.82° N, 42.84° E; 2100 m a.s.l.; 11 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.001, 2019-01.002 • 5 ♂♂; Borjomi N.P.; 41.8245° N, 42.8482° E; 2165 m a.s.l.; 11 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386088, CNC1386093, CNC1386094, CNC1386107, CNC1386143

• 16 ♀♀; same data as for preceding; CNC, CNC1386087, CNC1386099, CNC1386100, CNC1386103, CNC1386108, CNC1386109, CNC1386122 to CNC1386125, CNC1386132, CNC1386136, CNC1386138 to CNC1386140, CNC1386145 • 3 ♂♂; Borjomi N.P.; 41.8234° N, 42.84° E, 2025 m a.s.l.; 11 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066559 to ZFMK-DIP-00066561 • 3 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00066531 = ZFMK-TIS-8008825, ZFMK-DIP-00066532, ZFMK-DIP-00066533 • 3 ♀♀; Borjomi N.P.; 41.863° N, 42.789° E; 1800 m a.s.l.; 11 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066540, ZFMK-DIP-00066541, ZFMK-DIP-00066550 = ZFMK-TIS-8008827 • 2 ♂♂; Sakire, 41.7301° N, 43.3306° E; 1820 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; Dviri, 41.7543° N, 43.2734° E; 1090 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT • 1 ♀; Kodiani; 41.7300° N, 43.3485° E; 2080 m a.s.l.; 10 May 2023; W. Opdekamp leg.; WOR, A027 • 1 ♂; Dviri; 41.7543° N, 43.2733° E; 1100 m a.s.l.; 10 May 2023; W. Opdekamp leg.; WOR, D011 • 2 ♂♂; Dviri; 41.7543° N, 43.2734° E; 1090 m a.s.l.; 12 May 2023; F. Van de Meutter leg.; FMT • 3 ♀♀; same data as for preceding; FMT, ZFMK-TIS-8028473 • 1 ♀; Borjomi; 41.8098° N, 43.3327° E; 850 m a.s.l.; 12 May 2023; W. Opdekamp leg.; WOR, A019 • 2 ♂♂; Dviri; 41.7543° N, 43.2733° E; 1100 m a.s.l.; 12 May 2023; W. Opdekamp leg.; WOR, B027, B029 • 1 ♀; same data as for preceding; WOR, B010.

TURKEY – **Rize** • 10 ♂♂; N side of Ovit Geçidi; 1800 m a.s.l.; 19 Jul. 1992; J.A.W. Lucas leg.; RMNH, ZMA.INS.1451007 to ZMA.INS.1451011, ZMA.INS.1451053 to ZMA.INS.1451057 • 18 ♀♀; same data as for preceding; NBC, ZMA.INS.1451012 to ZMA.INS.1451016, ZMA.INS.1451058 to ZMA.INS.1451070.

Description

Male

Length. Body 9–12.5 mm, wing 8.5–10.5 mm.

Head. Face bare, black, slightly protruding downwards, with facial tubercle, facial tubercle distinct, rounded and placed relatively low on the face, thick pruinose below lunule, facial tubercle shiny, area ventral of facial tubercle slightly pruinose or shiny, below lunule narrower than an eye. Mala black, shiny. Parafacia black, pruinose or shiny, white pilose, about 0.8 times as wide as postpedicel. Clypeus shiny or slightly pruinose, about twice as long as wide. Frontal triangle black, shiny, except narrowly pruinose along eye margin, swollen, with long black pile, sometimes with yellow pile intermixed, with medial frontal sulcus. Length of eye contiguity about 1.2 times the length of frons. Angle of approximation of eyes 90–110°. Vertical triangle black, shiny, ocellar triangle shiny, long black pilose. Occiput pruinose, short yellow and long black pilose. Lunule dark orange to blackish, with distinct medial arm, separating acetabula. Scape black, anteriorly with black setae; pedicel black at base, dark orange at apex, anteriorly with black setae; postpedicel bright orange, sometimes apicodorsal corner darkened, rounded, pruinose, about as heigh as wide or slightly wider as high; arista black, sometimes very base dark orange, with very short pile, pile much shorter than diameter of arista at base. Eye with long, black and dense pile.

Thorax. Scutum black, shiny, finely punctured, anteriorly with long erect pile, posteriorly with long erect and short erect pile, pile whitish or golden yellow except in anterolateral corners and posterior half with variable amount of black pile. Scutellum shiny, with long erect and denser short erect pile, pile black except long pile along posterior margin yellow, without black setae along posterior margin. Pleura black, slightly pruinose, pile yellowish except on anepisternum where predominantly black and on anepimeron where sometimes partly or predominantly black; metasternum with long whitish pile; dorsal and ventral pile patches on katepisternum connected by shorter pile. Haltere pedicellum orange, capitulum dark brown to blackish.

Wing. Wing including alula entirely microtrichose, hyaline except in some specimens where anterior and basal parts slightly yellow-brown infuscate, wing veins brown in the basal part and black in the apical part of the wing.

Legs. Coxae and trochanters black. Femora black except apices narrowly yellow; profemur anteriorly with short semi-adpressed golden pile, posteriorly with long black pile; mesofemur anteriorly with pile of decreasing length towards apex, predominantly golden at base, black at apex, posteriorly with long predominantly black pile; metafemur anteriorly and anteroventrally with row of, predominantly golden, long pile, ventrally with short semi-adpressed black pile, golden at base, posteriorly with short erect predominantly golden pile. Protibia orange except central fifth to half of posterior side with blackish marking, anteriorly with dense adpressed golden pile, posteriorly with semi-adpressed black pile; mesotibia orange with variable vaguely delimited blackish ring below the middle occupying a fifth to three-quarters of tibia length, with short black pile; metatibia orange at basal third and at very apex, in between with black ring or dark orange to blackish markings, sometimes black markings reduced to

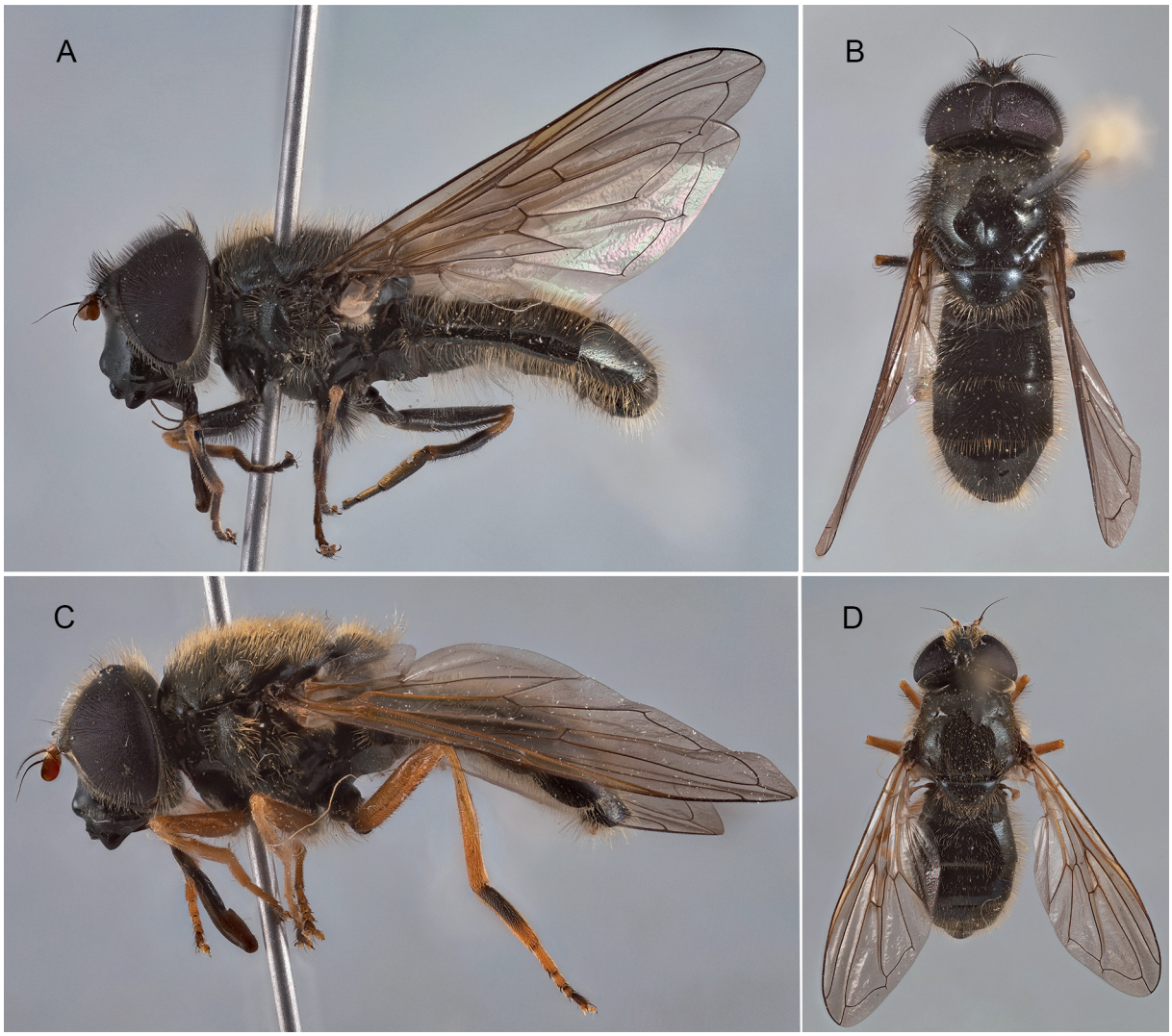

Fig. 8. *Cheilosia* (*Cheilosia*) *aurantia* sp. nov. **A–B**. Holotype, ♂ (ZFMK, ZFMK-DIP-00066574); habitus, lateral and dorsal views; body length 10.2 mm. **C–D**. Paratype, ♀ (ZFMK, ZFMK-DIP-00066543); habitus, lateral and dorsal views; body length 11.0 mm. Not to scale.

black smudge, ventrally with adpressed dense golden pile, most extensive at apex, anteriorly with semi-erect black pile, posteriorly with adpressed pile, basally for third to two thirds black, remainder golden; protarsus with basal four tarsomeres orange, dark orange or blackish dorsally, orange ventrally, tarsomere 5 black, with golden pile, except dorsally with black pile; mesotarsus with basal four tarsomeres dark orange or blackish dorsally, orange or dark orange ventrally, tarsomere 5 black, with black pile, ventrally with black setae; metatarsus black or blackish dorsally, ventrally basal four tarsomeres dark orange or blackish, tarsomere 5 black, with black pile, except basal three tarsomeres dorsally and posteriorly with dense adpressed golden pile, basitarsomere not swollen.

Abdomen. Terga I–IV with erect long golden pile, except posterior margin of terga II–IV where slightly adpressed, sometimes with narrow area of black pile along front margin of terga III and IV and with scattered black pile medially on posterior half of tergum III and in posterior corners of tergum IV; tergum I pruinose, tergum II and III slightly pruinose except shiny lateral margins, tergum IV anteriorly and medially with slight pruinosity, otherwise shiny. Sternum I pruinose, sometimes with median shiny stripe, with long erect yellow pile, becoming laterally shorter and more adpressed, sternum II shiny with long erect yellow pile, sternum III shiny, medially with short adpressed pile, laterally with long erect pile, sternum IV with very slight pruinosity, medially with short adpressed pile, laterally with long erect pile. Genitalia with surstylus ca 1.7 times as long as wide, with large keel, keel and area above keel with large field of microtrichia (Fig. 9D); dorsal lobe of postgonite short and wide with inwards facing tip (Fig. 9C).

Female

Length. Body 7.5–10 mm, wing 8–9.5 mm.

Similar to the male, except for normal sexual dimorphism and the following characters. Frons shiny except anterolateral corners with small triangular area of grey pruinosity, with erect golden pile, along lateral margins sometimes with few black pile, with wide paravertica. Pile on ocellar triangle variable, golden, black or intermixed golden and black. Dorsal third of occiput shiny along eye. Scape blackish to orange, anteriorly with black or yellow setae. Pedicel blackish to orange. Colour of pile on eye yellow or dorsal part brown or black, ventral part yellow. Scutum with erect dense golden or whitish pile, of two lengths on posterior part, short pile on posterior part sometimes with field of black pile. Scutellum shiny, with long golden pile and short golden pile or mixed golden and black pile. Pleura with yellow pile, sometimes with a few individual black pile on posterior anepisternum. Capitulum of haltere orange to brownish. Femora orange. Profemur posteriorly with long black or yellow or mixed pile. Mesofemur posteriorly with long predominantly yellow pile. Metafemur with yellow pile, sometimes with few black setae ventrally near apex. Tibia orange, with whitish pile, sometimes with few individual black pile. Protarsus with basal four tarsomeres orange, tarsomere 5 black, with yellow pile. Mesotarsus with basal four tarsomeres orange, tarsomere 5 black, with yellow pile. Metatarsus with tarsomere 1 dorsally black, ventrally orange, tarsomere 2 and 3 orange, with or without black base dorsally, tarsomere 4 dorsally black, ventrally orange, tarsomere 5 black. Terga I–IV completely covered with yellow pile, long and erect along lateral margins, adpressed and shorter medially. Terga II–IV shiny. Sternum IV shiny except posterior margin pruinose.

Morphological variation

There is a female (ZFMK-DIP-00066552 = ZFMK-TIS-8006833) with long pile on the face and another female has the femora predominantly black. Moreover, there is a male with the tibiae completely yellow.

Genetics

All DNA barcodes of *C. aurantia* sp. nov. are resolved into a cluster with high support (BS = 100%).

Remarks

This species has been named in the published literature as *C. lenis*. In fact, some paratypes collected in 2018 were identified as *C. lenis* by Mengual *et al.* (2020).

In 2023, the first author found a series of *C. aurantia* sp. nov. in the collection of the RMNH. The specimens were collected by J.A.W. Lucas in Turkey in 1992. The series was labelled in the box as "*Cheilosia pontica* sp. nov. Claussen & Lucas", but the species and the name were never published. We assembled the series of paratypes of *C. aurantia*. We would have been happy to adopt the working name of *C. pontica* of Claussen and Lucas, however, this name refers to the region in Turkey where these specimens were found, while we now know that the species has a much wider distribution, throughout the Caucasus.

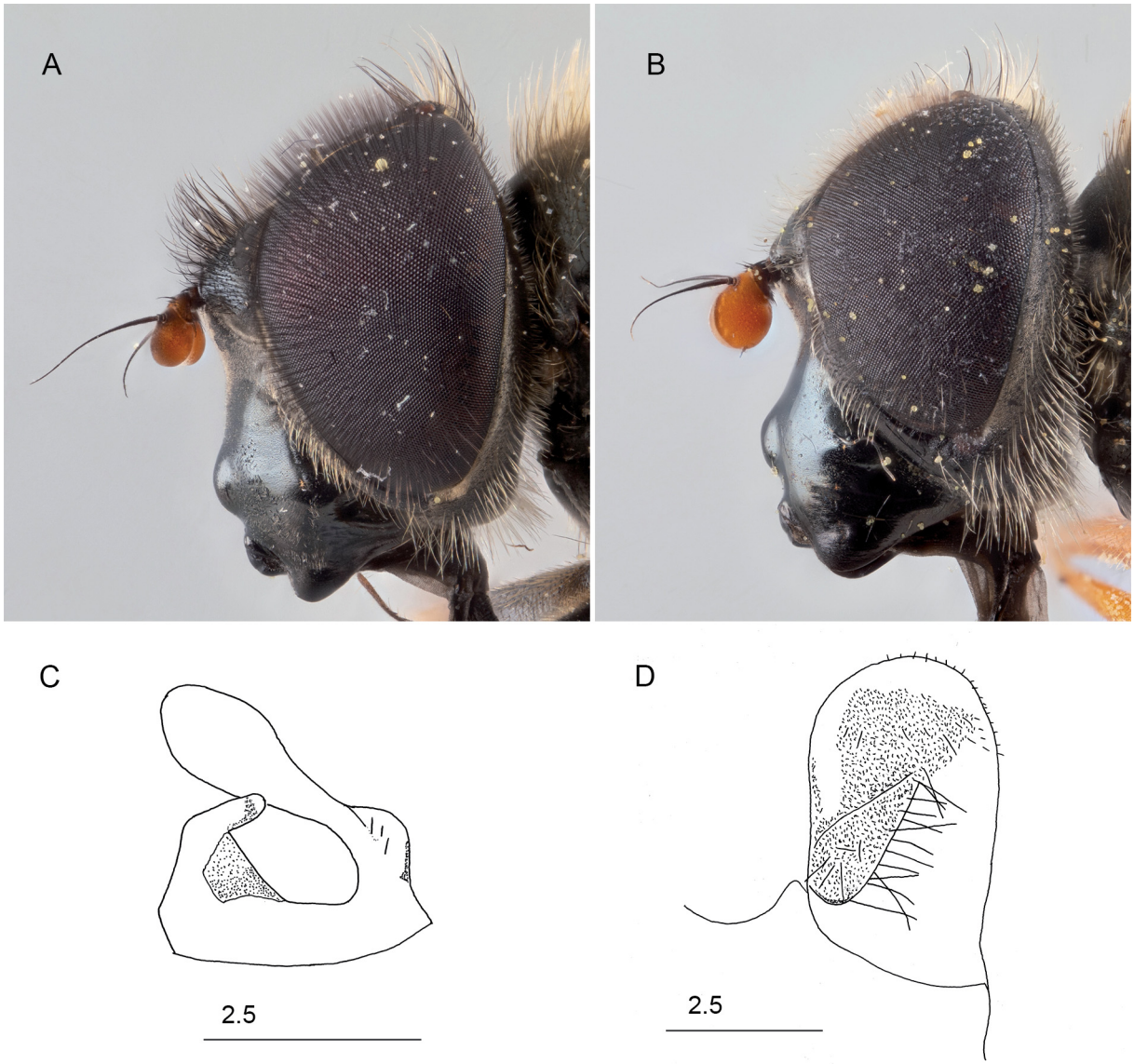

Fig. 9. *Cheilosia* (*Cheilosia*) *aurantia* sp. nov. **A.** Holotype, ♂ (ZFMK, ZFMK-DIP-00066574); head, lateral view; eye width 1.5 mm. **B**. Paratype, ♀ (ZFMK, ZFMK-DIP-00066531); head, lateral view; eye width 1.4 mm. **C**. Paratype, ♂ (SBA, SB.003018); surstylus, lateral view. **D**. Paratype, ♂ (SBA, SB.003018); postgonite, lateral view. Scale bars: A–B not to scale; C–D in µm.

Biology

Common, collected in mountains at altitudes between 612–2615 m a.s.l. Early in the season found on *Taraxacum* sp., *Salix* sp. catkins and flowering *Acer velutinum* Boiss., later on a variety of low flowers including *Ranunculus* sp. and *Caltha palustris*. Females have been observed to crawl downwards along the leafstem of *Caucasalia macrophylla* (M.Bieb.) B.Nord. which may indicate that this is the larval food plant.

Distribution

In Turkey only known from the high mountain pass Ovit Dağı Geçidi. Outside Turkey widespread in the Greater and Lesser Caucasus, known from Armenia, Georgia and Russia.

Cheilosia* (*Taeniochilosia*) *bakurianiensis Kuznetzov, 1987
Fig. 10

Cheilosia bakurianiensis Kuznetzov, 1987: 432.

Cheilosia bakurianiensis – Barkalov 1993: 708. — Barkalov & Ståhls 1997: 16. — Mengual *et al*. 2020: 25.

Differential diagnosis

Cheilosia bakurianiensis belongs to the subgenus *Taeniochilosia* by the combination of bare eye, black legs and the anterior process of lunula not broadly confluent with the face (Barkalov & Ståhls 1997). Within *Taeniochilosia* occurring in the Caucasus, the male can be identified by the combination of pruinose sterna and shiny parafacia. The female is easily separated from the other *Taeniochilosia* taxa occurring in the Caucasus by the wide face, broader than an eye at level of antennal base.

Material examined

Not collected in 2018, but collected in 2019, 2022 and 2023.

ARMENIA – **Kotayk Province** • 28 ♂♂; Tsaghkadzor area; 40.52837° N, 44.68951° E; 2220 m a.s.l.; 24 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093702 to ZFMK-DIP-00093709, ZFMK-DIP-00093711, ZFMK-DIP-00093712 = ZFMK-TIS-8014585, 8008756ZFMK-DIP-00093713 = ZFMK-TIS-8014582, ZFMK-DIP-00093714 to ZFMK-DIP-00093720, ZFMK-DIP-00093722 = ZFMK-TIS-8014583, ZFMK-DIP-00093723 to ZFMK-DIP-00093727, ZFMK-DIP-00093729 = ZFMK-TIS-8014584, ZFMK-DIP-00093784 to ZFMK-DIP-00093786 • 64 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00093730 to ZFMK-DIP-00093737, ZFMK-DIP-00093739 to ZFMK-DIP-00093744, ZFMK-DIP-00093746 to ZFMK-DIP-00093748, ZFMK-DIP-00093749 = ZFMK-TIS-8014586, ZFMK-DIP-00093750, ZFMK-DIP-00093752 to ZFMK-DIP-00093756, ZFMK-DIP-00093758, ZFMK-DIP-00093759, ZFMK-DIP-00093760 = ZFMK-TIS-8014587, ZFMK-DIP-00093761 to ZFMK-DIP-00093763, ZFMK-DIP-00093765 to ZFMK-DIP-00093769, ZFMK-DIP-00093771 to ZFMK-DIP-00093775, ZFMK-DIP-00093777 to ZFMK-DIP-00093783, ZFMK-DIP-00093787, ZFMK-DIP-00093788, ZFMK-DIP-00093790 to ZFMK-DIP-00093792, ZFMK-DIP-00093794, ZFMK-DIP-00093796 to ZFMK-DIP-00093806. – **Syunik Province** • 3 ♀♀; Spandaryan, small river; 39.621045° N, 45.910242° E; 1986 m a.s.l.; 19 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093194 = ZFMK-TIS-8014648, ZFMK-DIP-00093237, ZFMK-DIP-00093238.

GEORGIA • **Samtskhe-Javakheti** – 4 ♂♂; road from Sakire to Tsikhisjvari; 41.7251° N, 43.3605° E; 2519 m a.s.l.; 9 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066354 = ZFMK-TIS-8008759, ZFMK-DIP-00066355, ZFMK-DIP-00066356 = ZFMK-TIS-8008760, ZFMK-DIP-00066363 = ZFMK-TIS-8008756 • 6 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00066357, ZFMK-DIP-00066358,

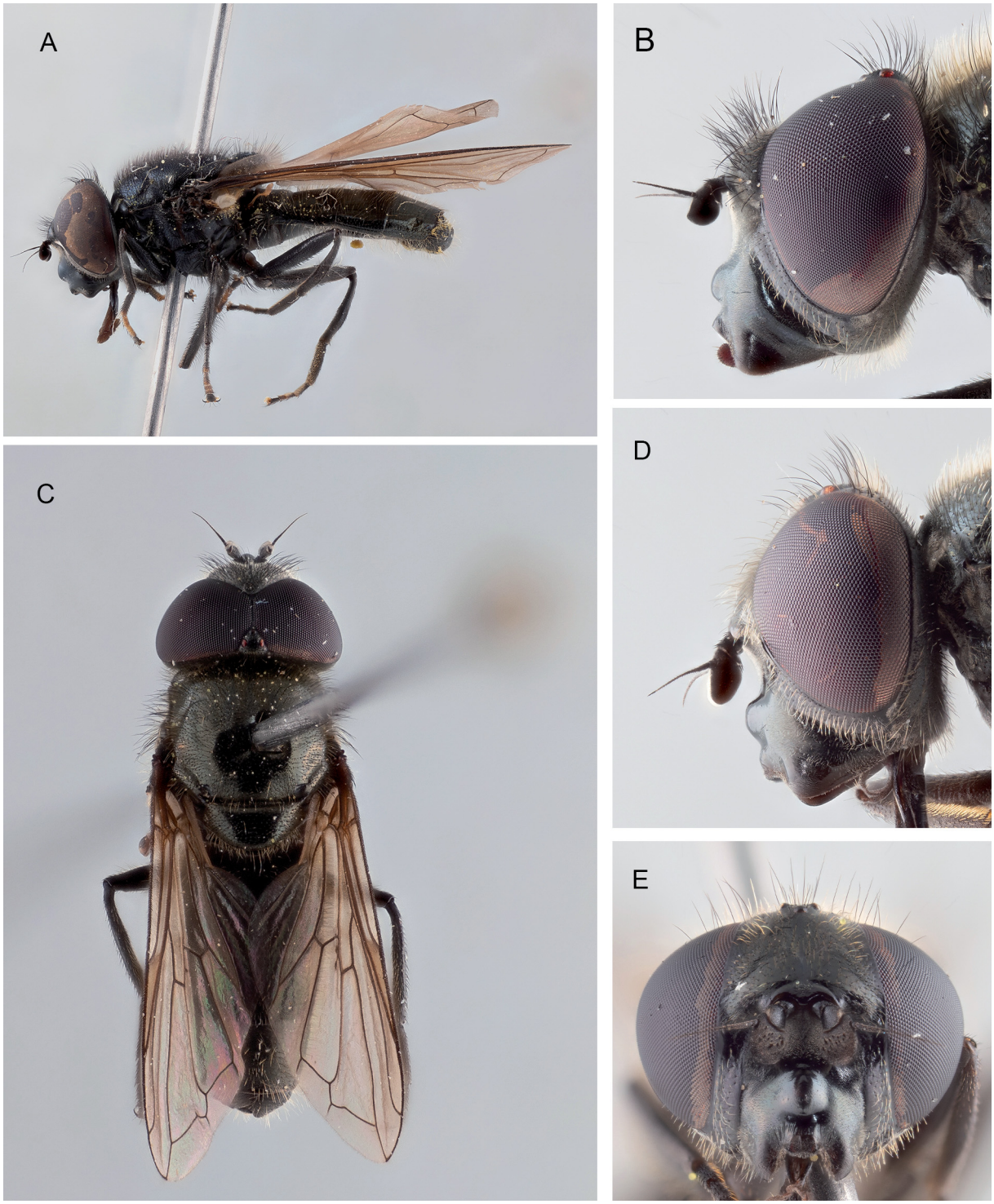

Fig. 10. *Cheilosia* (*Taeniochilosia*) *bakurianiensis* Kuznetzov, 1987. **A**. ♂ (FMT); habitus, lateral view; collected in Georgia; body length 7.0 mm. **B**. ♂ (FMT); head, lateral view; collected in Georgia; eye width 1.1 mm. **C**. ♂ (FMT); collected in Georgia; habitus, dorsal view; collected in Georgia; body length 7.3 mm. **D**. ♀ (FMT); head, lateral view; collected in Georgia; eye width 1.0 mm. **E**. ♀ (ZFMK, ZFMK-DIP-00093761); head, frontal view; collected in Armenia; facial width 2.1 mm. Not to scale.

ZFMK-DIP-00066359 = ZFMK-TIS-8008762, ZFMK-DIP-00066360 to ZFMK-DIP-00066362 • 8 ♂♂, 3 ♀♀; road from Sakire to Tsikhisjvari; 41.7251° N, 43.3605° E; 2519 m a.s.l.; 9 Jun. 2019; F. Van de Meutter leg.; FMT • 3 ♂♂, 2 ♀♀; Kodiani; 41.7305° N, 43.3537° E; 2160 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT • 1 ♀; Sakire; 41.7301° N, 43.3306° E; 1820 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT • 3 ♂♂; Kodiani; 41.7300° N, 43.3485° E; 2080 m a.s.l.; 10 May 2023; W. Opdekamp leg.; WOR, A013, A038, A043 • 2 ♀♀; same data as for preceding; WOR, A023, A048 • 5 ♂♂; Kodiani; 41.7268° N, 43.3490° E; 2150 m a.s.l.; 10 May 2023; W. Opdekamp leg.; WOR, B005, B008, B011, B013, B018 • 1 ♀; same data as for preceding; WOR, B010.

Genetics

All DNA barcodes of *C. bakurianiensis* are resolved into a cluster with high support (BS = 100%).

Remarks

This species has been reported from Georgia (Mengual *et al*. 2020). We provide the first records from Armenia.

Biology

During our expeditions, collected between 10 May and 9 June at an altitude between 1820 and 2519 m a.s.l. Almost all individuals were found feeding on *Caltha palustris* and *Ranunculus* sp. near wet seapages in alpine meadows.

Distribution

Caucasus (Armenia, Georgia). Presence in the Russian Caucasus doubtful (Barkalov & Mutin 2018).

Cheilosia* (*Montanocheila*) *balu Violovitsh, 1966
Fig. 11

Cheilosia balu Violovitsh, 1966: 54.

Differential diagnosis

The lack of setae along the posterior margin of the scutellum, in combination with a pilose eye, bare face, and bicoloured legs distinguishes *Cheilosia balu* from many other *Cheilosia*. As a member of the subgenus *Montanocheila*, it has a brown pattern on the wing and in the male the genitalia is distinct, apical sclerite of distiphallus with two pairs (anterior and posterior) of lobes, for drawings of the male genitalia, see Violovitsh (1966). Within *Montanocheila* it is distinguished from the other members of that subgenus occurring in the Caucasus by the black postpedicel (Fig. 11B, D) (at least basoventral corner of postpedicel orange in the other species); the male has black pile on scutum (Fig. 11A, predominantly or entirely yellow in the other species) and the female has a field of predominantly black pile medially on posterior half of scutum (entirely with yellow pile or with few scattered black pile only in the other species). Given the black postpedicel, *C. balu* is similar to *C. grossa*, but metafemur with black ring (Fig. 11A) (yellow in *C. grossa*), eye has yellowish or brown pile (black in *C. grossa*) and sterna are predominantly shiny (pruinose in *C. grossa*).

Material examined

GEORGIA – **Mtskheta-Mtianeti** • 1 ♂; Stepantsminda; 42.5317° N, 44.5183° E; 2772 m a.s.l.; 31 Jul. 2001; J.-H. Stuke leg.; ZFMK, ZFMK-DIP-00058266 • 3 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00058265, ZFMK-DIP-00058267, ZFMK-DIP-00058268.

Remarks

Reported from the Caucasus and Georgia, for the first time. Compared to specimens from the Altai, differences could be detected, e.g., face narrower (resulting in the male having angle of approximation of eyes < 90° instead of ca 90°), base of metafemur anteroventrally with scattered long pile shorter than width of metafemur (Altai specimens with scattered long pile longer than width of metafemur) and sterna II–IV shiny (dull in Altai specimens). Given that we lack genetic data from the Caucasus, that we could

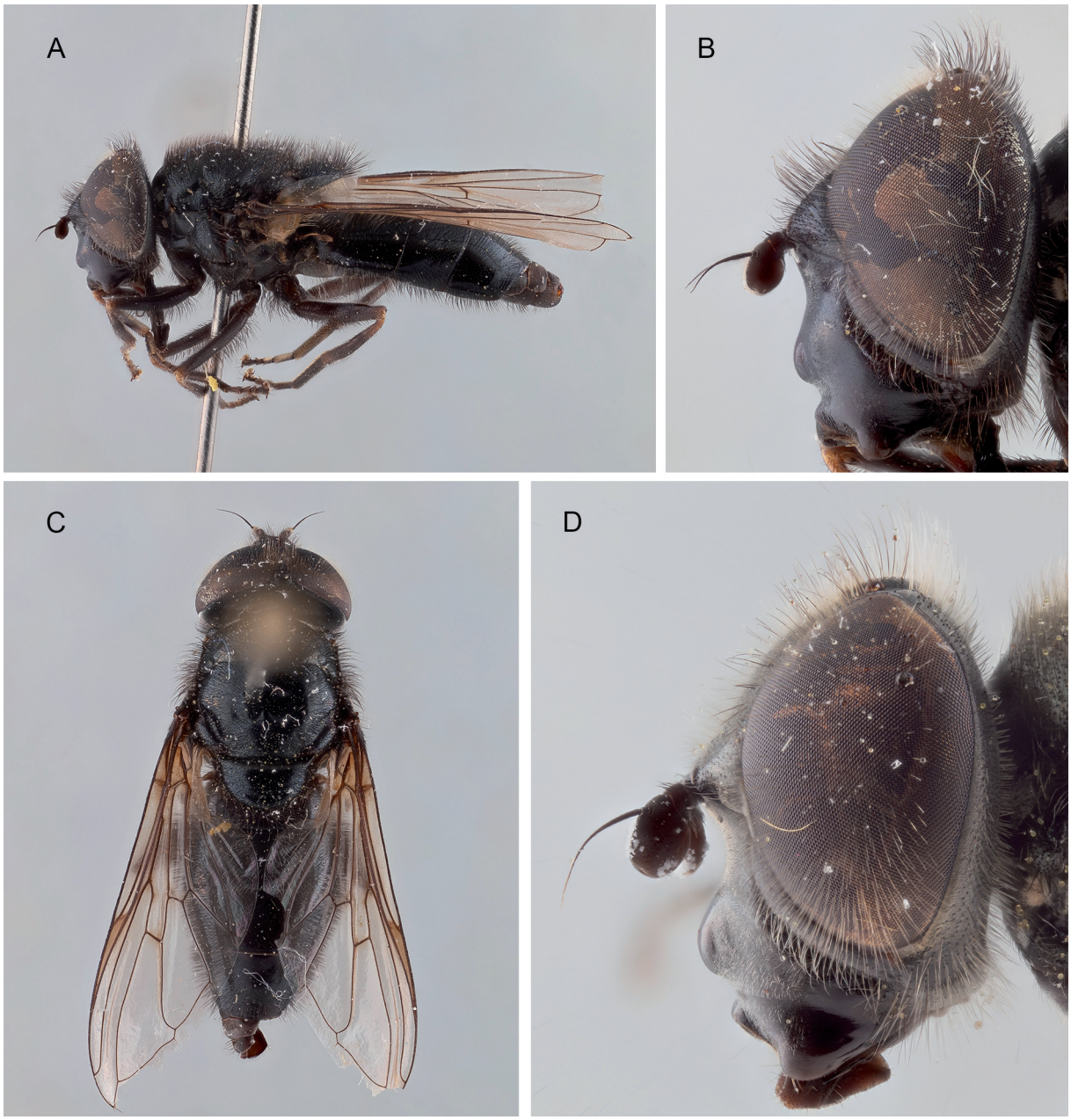

Fig. 11. *Cheilosia* (*Montanocheila*) *balu* Violovitsh, 1966. Collected in Georgia. **A**. ♂ (ZFMK, ZFMK-DIP-00058266); habitus, lateral view; body length 11.2 mm. **B**. ♂ (ZFMK, ZFMK-DIP-00058266); head, lateral view; eye width 1.3 mm. **C**. ♂ (ZFMK, ZFMK-DIP-00058266); habitus, dorsal view; body length 11.2 mm. **D**. ♀ (ZFMK, ZFMK-DIP-00058267); head, lateral view; eye width 1.3 mm. Not to scale.

not study subspecies *C. balu jugorica* Barkalov, 1993 from North Siberia, and that we have one male from the Caucasus only, we for now consider the differences to be variation within *C. balu*.

Distribution

Russia: Northern Siberia (westwards just into European Russia), Altai, the Caucasus in Georgia.

Cheilosia* (*Cheilosia*) *bergenstammi Becker, 1894
Fig. 12

Chilosia bergenstammi Becker, 1894: 462.

Chilosia bergenstammi – Stackelberg & Richter 1968: 245. — Peck 1988: 98. — Barkalov 1993: 721. — Barkalov & Mutin 2018: 482. — Mengual *et al*. 2020: 15.

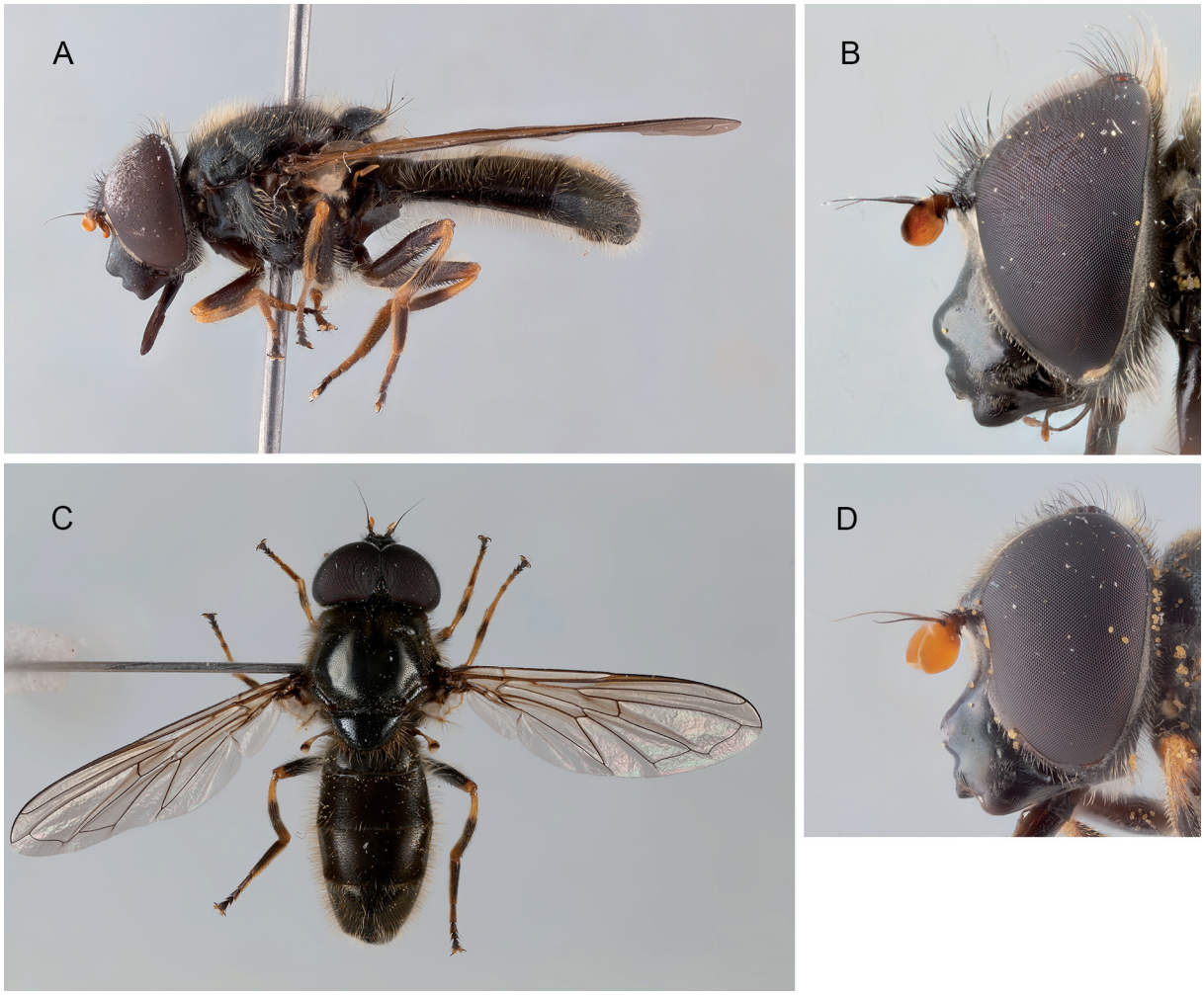

Fig. 12. *Cheilosia* (*Cheilosia*) *bergenstammi* (Becker, 1894). Collected in the Netherlands. **A**. ♂ (SBA, SB.004459); habitus, lateral view; body length 9.9 mm. **B**. ♂ (SBA, SB.004460); head, lateral view; eye width 1.4 mm. **C**. ♂ (SBA, SB.004462); habitus, dorsal view; body length 9.3 mm. **D**. ♀ (SBA, SB.004461); head, lateral view; eye width 1.4 mm. Not to scale.

Differential diagnosis

Cheilosia bergenstammi has a pilose eye, bare face, bicoloured legs, posterior margin of scutellum with setae and sterna shiny. Many species of *Cheilosia* have this combination of characters, but it can be distinguihed from most by the pilosity on the eye: dense in the dorsal half, sparse or bare in the ventral half. The trio *C. canicularis*, *C. himantopus* and *C. orthotricha* usually also have the ventral part of the eye bare or with sparse pilosity only, but these species are larger (12–15 mm vs 8–10 mm) and lack setae on posterior margin of scutellum. Very similar to extralimital *C. fraterna* Meigen, 1830, but metatibia medially with a distinct black ring (Fig. 12A) (entirely orange or with only vague black marking in *C. fraterna*). See also Prokhorov *et al.* (2020) for a key to distinguish *C. bergenstammi* from similar species.

Material examined

Species not collected.

Distribution

Western Palaearctic, within the Caucasus reported from Russia.

Cheilosia* (*Cheilosia*) *borjomi sp. nov.
urn:lsid:zoobank.org:act:9F6F0C3C-D0CF-43B9-8C32-C1777EEB3007
Figs 13–14

Cheilosia variabilis (Panzer, 1798) – Mengual *et al*. 2020: 21 (part, see Remarks).

Differential diagnosis

The combination of eye and face with pile and black legs of *Cheilosia borjomi* sp. nov. distinguish this new species from all other *Cheilosia* of the region, except for *C. melanopa*, *C. redi* and *C. variabilis*. *Cheilosia borjomi* is similar to *C. melanopa* and *C. redi* but larger (on average 11 mm vs 9 mm), with a more slender abdomen, legs all black (base and sometimes apex of tibiae yellow in *C. melanopa* and *C. redi*), in the male the ventral part of the metafemur has black setae (with short black pile in *C. melanopa* and *C. redi*) and in the female the metatibia has black pile anterolaterally (yellow in *C. redi*) and scutum with shorter semi-adpressed yellow and black pile and with sparse, longer, more erect black pile (Fig. 14B, with short erect yellow pile in *C. melanopa*).

This new species is also very similar to *C. variabilis*, in the male no differences in genitalia could be detected. In general, *C. borjomi* sp. nov. has denser body pruinosity, reflected in pruinose occiput and pleura in the female (occiput and pleura shiny in *C. variabilis*) and all pruinose scutum and scutellum in the male (in *C. variabilis* males the posterior part of scutum and scutellum have often shiny parts). Moreover, male differs in the pile on scutum and scutellum, with only long erect predominantly black pile in *C. borjomi* (Fig. 14A) (in *C. variabilis* at least posterior half of scutum and scutellum with both long and short pile), procoxa with anterior part usually with at least some black setae on apical half (Fig. 14C) (in most populations of *C. variabilis*, including those from the Caucasus, the male procoxa has yellow pile and setae only; although some populations of *C. variabilis*, for instance in the Pyrenees, males have sometimes a few black setae on the procoxa). Females of *C. borjomi* are best differentiated from *C. variabilis* females by pruinose pleura, although often only faintly so (in *C. variabilis* the ventral part of posterior anepisternum and dorsal part of katepisternum are brightly shiny, contrasting with pruinose nearby pleura), occiput often pruinose contrasting with adjacent shiny posterior part of the frons (in *C. variabilis* the occiput is shiny behind dorsal eye corner), pile on scutum variable, but often with dense semi-adpressed pile and sparse longer pile (Fig. 14B) (in *C. variabilis* females there is only

one type of short adpressed pile on scutum usually). The described differences in females are subject to some variation, making identification of some less typical individuals very difficult.

Etymology

The species is named after the town of Borjomi in the Lesser Caucasus, where most of the type series were collected in its vicinity. Species epithet to be treated as a noun in apposition.

Material examined

Holotype

GEORGIA • ♂; Imereti, road from Abastumani to Sairme; 41.8385° N, 42.8194° E; 2260 m a.s.l.; 10 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8006823 = ZFMK-DIP-00066260.

Paratypes

ARMENIA – **Kotayk Province** • 1 ♀; Tsaghkadzor, Y.S.U. Rest House; 40.533625° N, 44.703028° E; 1915 m a.s.l.; 23 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093664 = ZFMK-TIS-8014603. **Syunik Province** • 1 ♂; near Gorayk, Spandarian Reservoir; 39.684513° N, 45.777478° E; 2078 m a.s.l.; 19 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093268 = ZFMK-TIS-8014605. – **Vayots Dzor Province** • 1 ♂; W of Saravan; 39.718437° N, 45.63076° E; 1590 m a.s.l.; 19 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093416 = ZFMK-TIS-8014601.

GEORGIA – **Imereti** • 15 ♂♂; same data as for holotype; ZFMK, ZFMK-DIP-00066253, ZFMK-DIP-00066254 = ZFMK-TIS-8006821, ZFMK-DIP-00066255, ZFMK-DIP-00066256, ZFMK-DIP-00066258, ZFMK-DIP-00066259, ZFMK-DIP-00066261 to ZFMK-DIP-00066270 • 1 ♀; same data as for holotype; ZFMK, ZFMK-DIP-00066272 • 3 ♂♂; same data as for holotype; J. van Steenis leg.; JSB, 2019-00.844–2019-00.846 • 3 ♀♀; same data as for holotype; J. van Steenis leg.; JSB, 2019-00.847 to 2019-00.849 • 8 ♂♂; road from Abastumani to Sairme; 41.8245° N, 42.8482° E; 2165 m a.s.l.; 10 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386126, CNC1386130, CNC1386131, CNC1386134, CNC1386137, CNC1386141, CNC1386144, CNC1386147 • 1 ♀; road from Abastumani to Sairme; 41.86433° N, 42,77842° E; 1830 m a.s.l.; 10 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066271 = ZFMK-TIS-8006824 • 1 ♀; Abastumani, road Abastumani to Sairme; 41.8242° N, 42.8472° E; 2150 m a.s.l.; 10 Jun. 2019; F. Van de Meutter leg.; FMT. – **Kakheti** • 1 ♀; Dedoplis Tskaro; 41.488° N, 46.094° E; 780 m a.s.l.; 30 Apr. 2023; S. Bot leg.; SBA, SB.003078 = ZFMK-TIS-8027997 • 1 ♀; Dedoplis Tskaro; 41.4856° N, 46.0947° E; 750 m a.s.l.; 30 Apr. 2023; F. Van de Meutter leg.; FMT • 7 ♂♂; Lagodekhi N.P.; 41.8767° N, 46.2429° E; 615 m a.s.l.; 2 May 2023; S. Bot leg.; SBA, SB.003079 = ZFMK-TIS-8028004, SB.003080 = ZFMK-TIS-8028005, SB.003081 to SB.003085 • 2 ♂♂, 1 ♀; Lagodekhi N.P.; 41.8777° N, 46.2436° E; 625 m a.s.l.; 2 May 2023; F. Van de Meutter leg.; FMT • 7 ♂♂; Lagodekhi N.P.; 41.8747° N, 46.2415° E; 600 m a.s.l.; 2 May 2023; W. Opdekamp leg.; WOR, E009, E010, E022, E023, E025, E029, E030 • 1 ♂; Zemo Mskhaigori; 41.88° N, 46.1969° E; 530 m a.s.l.; 11 May 2023; F. Van de Meutter leg.; FMT. – **Mtskheta-Mtianeti** • 1 ♂; Tbilisi N.P.; 41.877° N, 45.0138° E; 1250 m a.s.l.; 4 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; Lutkhubi; 42.3930° N, 44.7929° E; 1734 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, C005. – **Racha-Lechkhumi and Kvemo Svaneti** • 1 ♂; near Shovi; 42.713° N, 43.701° E; 2022 m a.s.l.; 7 Jul. 2021; S. Bot leg.; SBA, SB.003077. – **Samegrelo-Zemo Svaneti** • 1 ♂; Ushguli; 42.950° N, 43.075° E; 2275 m a.s.l.; 24 Jun. 2018; S. Bot leg.; SBA, SB.003074 • 1 ♀; 42.897° N, 43.008° E; 2630 m a.s.l.; 28 Jun. 2018; S. Bot leg.; SBA, SB.003075 • 1 ♂; 42.9471° N, 43.0671° E; 2257 m a.s.l.; 15 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386512 • 1 ♂; 42.948° N, 43.070° E; 2258 m a.s.l.; 15 Jun. 2019; L. Hofstee leg.; LHH. – **Samtskhe-Javakheti** • 4 ♂♂; Borjomi N.P.; 41.867° N, 43.251° E; 2000 m a.s.l.; 18 Jun. 2018; S. Bot leg.; SBA, SB.003065 to SB.003068 • 1 ♀; Borjomi N.P.; 41.857° N, 43.208° E; 1900 m a.s.l.; 18 Jun. 2018; S. Bot leg.; SBA, SB.003069 • 1 ♂; Borjomi N.P.; 41.846° N, 43.145° E; 1800 m a.s.l.; 19 Jun. 2018; S. Bot leg.; SBA, SB.003072 • 1 ♂; same data as for preceding;

XLS, SB.003251 • 1 ♀; same data as for preceding; SBA, SB.003073 = CNC databasing S. Bot 936 • 1 ♂; Borjomi N.P.; 41.810° N, 43.119° E; 2050 m a.s.l.; 19 Jun. 2018; S. Bot leg.; SBA, SB.003070 • 1 ♀; same data as for preceding; SBA, SB.003071 • 1 ♂; Abastumani area; 41.82344° N, 42,84° E; 2025 m a.s.l.; 11 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066268 • 3 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00066273 = ZFMK-TIS-8006825, ZFMK-DIP-00066274, ZFMK-DIP-00066281 = ZFMK-TIS-8006820 • 1 ♀; Borjomi N.P.; 41.79° N, 42.82° E; 1515 m a.s.l.; 11 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.857 • 2 ♀♀; Borjomi N.P.; 41.82° N, 42.84° E; 2100 m a.s.l.; 11 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.853, 2019-00.881 • 1 ♀; Borjomi N.P.; 41.8210° N, 42.8340° E; 1992 m a.s.l.; 11 Jun. 2019; S. Bot leg.; SBA, SB.003076 • 2 ♂♂; Borjomi N.P.; 41.8697° N, 42.7923° E; 1683 m a.s.l.; 11 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386342, CNC1386362 • 2 ♀♀; Borjomi N.P.; 41.8181° N, 42.8316° E; 2004 m a.s.l.; 11 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386249, CNC1386287 • 1 ♀; Sakire; 41.7301° N, 43.3306° E; 1820 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT.

Description

Male

Length. Body 10–12 mm, wing 10–11 mm.

Head. Face black, with facial tubercle, with long mixed black and white pile, bare around facial tubercle; slightly pruinose, except more densely pruinose below lunule and facial tubercle bare. Parafacia black, about just over half to two-third as wide as postpedicel, pruinose, white pilose. Frontal triangle black, slightly swollen, pruinose, long black pilose, with medial frontal sulcus. Length of eye contiguity about as long as or slightly longer than the length of frons. Angle of approximation of eyes ca 90°. Vertex pruinose, long black pilose. Occiput pruinose, short yellow pilose, on dorsal margin with long black pile. Lunule dark orange to blackish, with distinct medial arm, separating acetabula. Scape and pedicel black with black setae; postpedicel rounded, about as high as wide, black, pruinose; arista black, black pilose, pile about as long as basal diameter of arista. Eye with dense yellow pile.

Thorax. Scutum black, pruinose, finely punctured, with erect long black and yellow pile. Scutellum black, pruinose, with erect long black and yellow pile, posterior margin with black setae, length of setae about as long as length of scutellum. Pleura black, pruinose, with yellow pile except posterior anepisternum, anepimeron and sometimes ventral part of katepisternum with black pile intermixed; katepisternum continuously pilose. Haltere pedicellum yellow or dark yellow, capitulum dark brown or black.

Wing. Wing including alula entirely microtrichose, with brown tinge, especially in anterior half. Veins black. Stigma brown.

Legs. Black. Pruinose. Procoxa with yellow pile, on anterior part with black setae on apical half. Profemur with long black posteroventral pile, mesofemur with long mixed black and yellow posteroventral pile, metafemur anteriorly and posteriorly with long white pile, ventrally with black setae. Metatibia anteriorly with black pile, posteriorly at least apical half with yellow pile.

Abdomen. Terga I–IV laterally with long erect pile, medially pile shorter and semi-adpressed; tergum I with white pile; pile on terga II and III yellow except posteriorly in center, black pile more extensive on tergum III; anterolateral corners of tergum IV with yellow pile, remainder with black pile; terga I–IV pruinose, medially most dense. Sterna I–IV densely pruinose, laterally with long erect pile, in center pile shorter and adpressed, pile on sterna I–IV yellow except few black adpressed pile along posterior margin of sternum IV and sometimes sternum III. Genitalia with surstylus about 1.3 times as long as wide (Fig. 14E); postgonite very long and narrow, sickle-shaped (Fig. 14D).

Female

Length. Body 9.5–13 mm, wing 10–11.5 mm.

Similar to the male, except for normal sexual dimorphism and the following characters. Face with entirely yellow pile. Frons with short yellow pile, with longer black pile intermixed. Scutum shiny except lateral margins widely slightly pruinose, with shorter semi-adpressed yellow and black pile and with sparse longer more erect black pile. Scutellum shiny, with pile of two lengths, variable black or yellow short pile and long black pile. Pleura with yellow pile. Procoxa usually with yellow pile and setae only. Femora with predominantly yellow pile, sometimes with a few black setae on ventral side on metafemur. Pile on terga shorter and black pile more extensive. Pile on sterna shorter, without black pile.

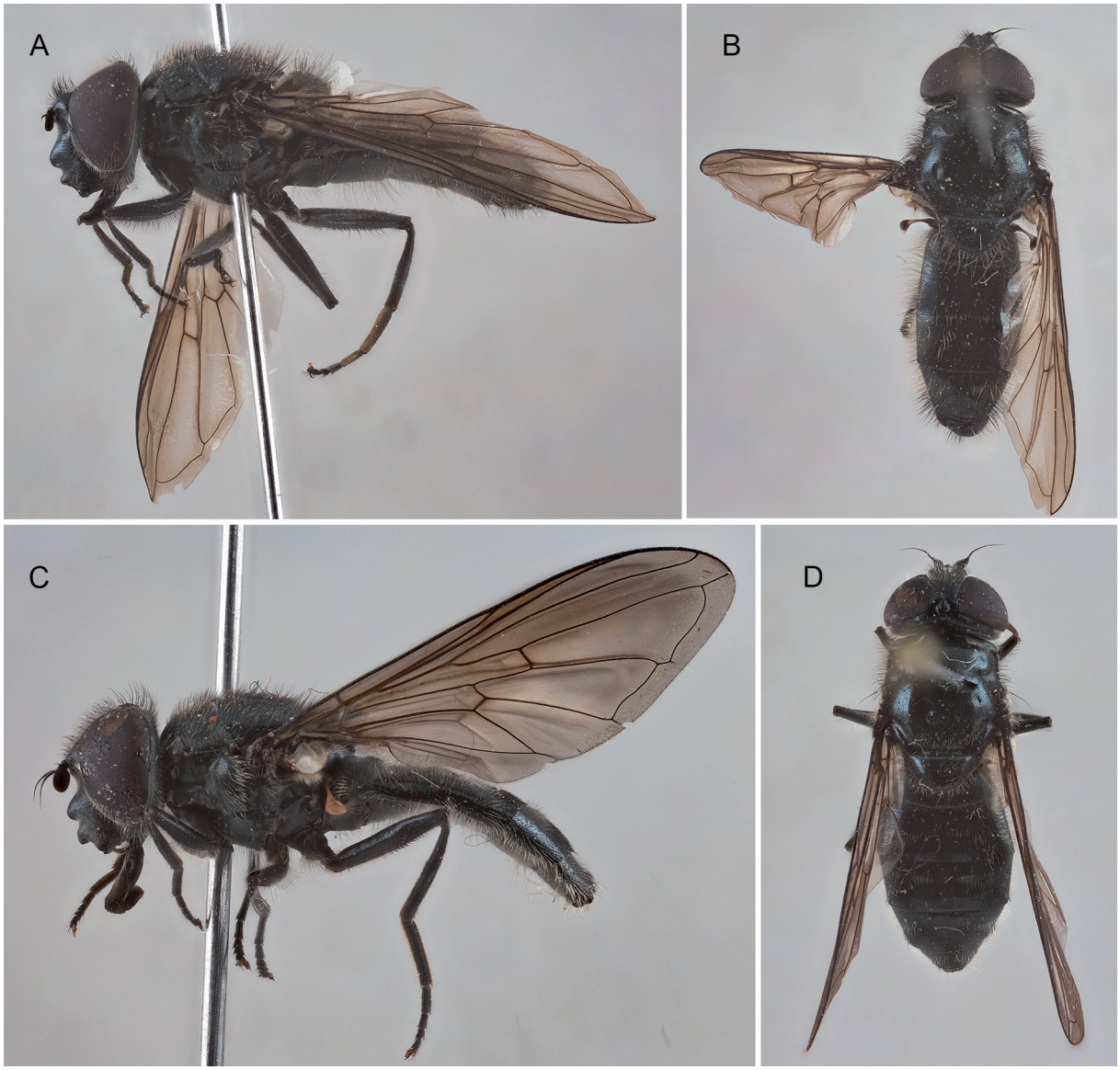

Fig. 13. *Cheilosia* (*Cheilosia*) *borjomi* sp. nov. **A–B**. Holotype, ♂ (ZFMK, ZFMK-DIP-00066260); habitus, lateral and dorsal views; body length 10.4 mm. **C–D**. Paratype, ♀ (ZFMK, ZFMK-DIP-00066271); habitus, lateral and dorsal views; body length 10.7 mm. Not to scale.

Morphological variation

One female (ZFMK-DIP-00093664 = ZFMK-TIS-8014603) is markedly different by having much less black pile in general, all pale pile very bright golden yellow instead of whitish, and tibiae yellow at both ends instead of tibiae black.

Genetics

All DNA barcodes of *C. borjomi* sp. nov. are resolved into one cluster without high support (BS < 90%).

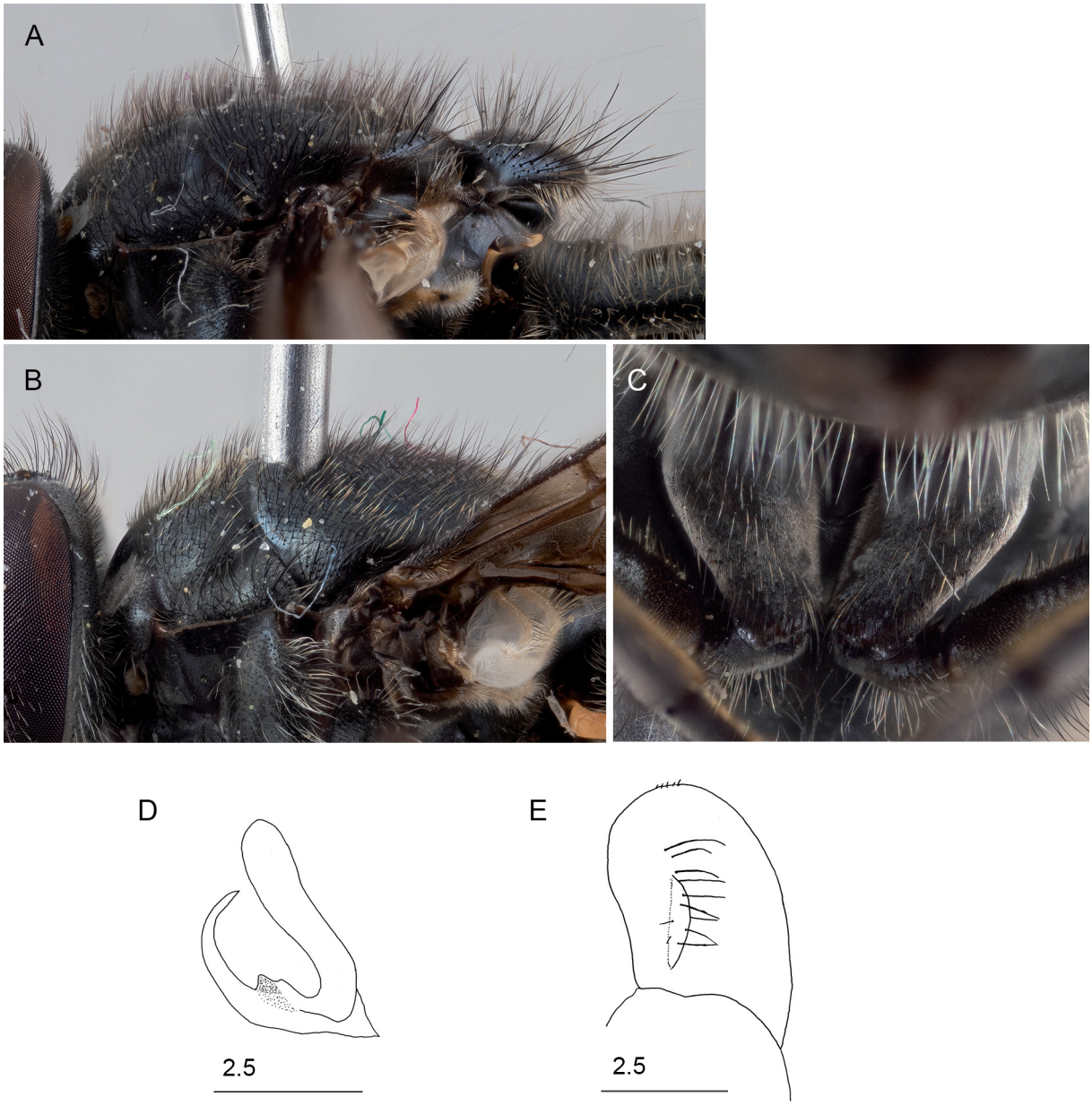

Fig. 14. *Cheilosia* (*Cheilosia*) *borjomi* sp. nov. **A**. Holotype, ♂ (ZFMK, ZFMK-DIP-00066260); scutum, lateral view; scutum length 3.0 mm. **B**. Paratype, ♀ (ZFMK, ZFMK-DIP-00066271); scutum, lateral view; scutum length 3.1 mm. **C**. Paratype, ♂ (ZFMK, ZFMK-DIP-00066254); fore coxae, anterior view; coxa length 1.2 mm. **D–E**. Paratype, ♂ (SBA, SB.003074). **D**. Postgonite, lateral view. **E**. Surstylus, lateral view. Scale bars: A–C not to scale; D–E in μm.

Remarks

Some records of *C. variabilis* in Mengual *et al.* (2020) actually represents *C. borjomi* sp. nov., and are reported here again as *C. borjomi*.

Biology

Collected between 530–2260 m a.s.l. on extensive grasslands and in or near forest, where it feeds on low flowers. This species can be found in sympatry with *C. variabilis* in Borjomi National Park.

Distribution

So far only known from the Lesser and Greater Caucasus in Armenia and Georgia. Mainly recorded in the Lesser Caucasus, with only a very few records from the Greater Caucasus.

Cheilosia* (*Cheilosia*) *bracusi Vujić & Claussen, 1994
Fig. 15

Cheilosia bracusi Vujić & Claussen, 1994: 137.

Cheilosia bracusi – Mengual *et al.* 2020: 15.

Fig. 15. *Cheilosia* (*Cheilosia*) *bracusi* Vujić & Claussen, 1994. Collected in Georgia. **A**. ♂ (FMT); habitus, lateral view; body length 10.0 mm. **B**. ♂ (FMT); head, lateral view; eye width 1.4 mm. **C**. ♂ (SBA, ZFMK-TIS-8027987); habitus, dorsal view; body length 9.8 mm. **D**. ♀ (FMT); head, lateral view; eye width 1.3 mm. Not to scale.

Differential diagnosis

Cheilosia bracusi has a pilose eye, bare face, bicoloured legs, posterior margin of scutellum with setae (although often short and yellow in the female) and sterna shiny. Many species of *Cheilosia* have this combination of characters, but it can be distinguished from most of them by the eye being entirely pilose (ventral part bare or nearly so in *C. bergenstammi*), arista black (orange in *C. chloris* (Meigen, 1823)) and body size at least 8 mm (in *C. vernalis* at most 8 mm). For differences with very similar extralimital *C. melanura* Becker, 1894, see Vujić & Claussen (1994). Within the Caucasus, it can be confused mainly with *C. confusa* sp. nov. A general distinct characteristic is the colour of the pale body pile, rufous in *C. bracusi*, whitish or yellow in *C. confusa*. Moreover, the metatibia in *C. bracusi* has a narrow or incomplete black ring covering less than half of metatibia (Fig. 15A) (with broad black ring covering ca half of tibia in *C. confusa*) and mesotarsus with basal two or three tarsomeres yellow (tarsi dorsally black in *C. confusa*). The male genitalia are figured in Vujić & Claussen (1994).

Material examined

Collected in 2018, 2019 and 2023; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

DNA barcodes of *C. bracusi* are placed into a cluster without high support (BS < 90%), grouped with some barcodes of *C. melanura*.

Biology

During our expeditions, collected between 6 May and 19 June at an altitude between 1090 and 2327 m a.s.l. Visits both low flowers (*Ranunculus* sp.) as flowering shrubs and trees (*Acer velutinum*, *Salix* sp., *Sorbus* sp.) in or at the edge of meadows, including dry slopes.

Distribution

Southern and Central Europe, Balkan Peninsula, and Caucasus. Within the Caucasus only reported from Georgia.

Cheilosia* (*Cheilosia*) *brunnipennis Becker, 1894
Fig. 16

Chilosia brunnipennis Becker, 1894: 417.
Chilosia sareptana Becker, 1894: 418. Syn. by Vujić (1996).

Chilosia brunnipennis – Barkalov & Mutin 2018: 482. — Mengual *et al.* 2020: 15.
Chilosia sareptana – Stackelberg & Richter 1968: 248. — Stackelberg 1970: 61. — Peck 1988: 116. — Barkalov 1993: 718.

Differential diagnosis

Cheilosia brunnipennis is similar to *C. flavipes*, *C. megaclama* sp. nov., and *C. nebulosa*, sharing a pilose eye (but eye bare in female *C. flavipes* and female *C. megaclama*), bare face, lack of setae on posterior margin of scutellum, bicoloured legs and dorsal and ventral pile patches on katepisternum widely separated. The male *C. brunnipennis* can immediately be identified from all three by the long postpedicel (Fig. 16B), ca two times as wide as high (rounded in the other three species). Moreover, the male of *C. brunnipennis* has basal three or four tarsomeres of protarsus yellow (Fig. 16C) (protarsus dorsally black in *C. megaclama*), arista black (at least the base extensively orange in *C. nebulosa*), and frons swollen (not swollen in *C. flavipes*). In the female the eye is pilose (bare in *C. flavipes* and

C. megaclama), arista black (at least the base extensively orange in *C. nebulosa*), postpedicel large and parafacia wide (postpedicel small and parafacia narrow in *C. nebulosa*).

Material examined

Not collected in 2018, but collected in 2023.

GEORGIA – **Mtskheta-Mtianeti** • 1 ♀; Tbilisi N.P.; 41.877° N, 45.0138° E; 1250 m a.s.l.; 4 May 2023; F. Van de Meutter leg.; FMT, ZFMK-TIS-8027947. – **Samtskhe-Javakheti** • 1 ♀; Borjomi; 41.8098° N, 43.3327° E; 850 m a.s.l.; 12 May 2023; W. Opdekamp leg.; WOR, A001 = ZFMK-TIS-8028456.

Genetics

DNA barcodes of this species are recovered into a cluster with high support (BS = 100%).

Biology

During our expeditions, collected between 4 May and 12 May at an altitude between 850 and 1250 m a.s.l., visiting *Ranunculus* sp. and *Salix* sp.

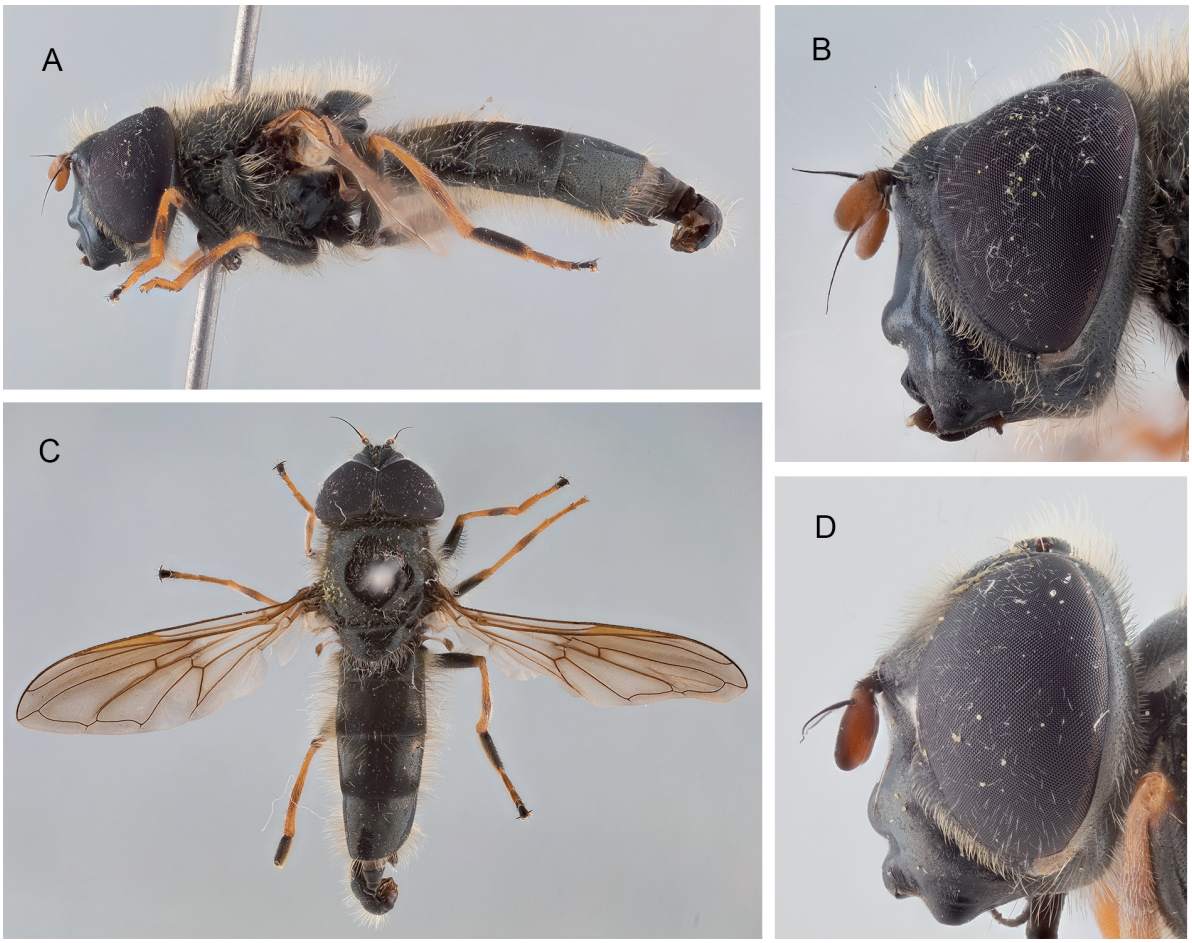

Fig. 16. *Cheilosia* (*Cheilosia*) *brunnipennis* Becker, 1894. **A**. ♂ (SBA, SB.004463); habitus, lateral view; collected in Greece; body length 9.5 mm. **B**. ♂ (SBA, SB.004463); head, lateral view; collected in Greece; eye width 1.4 mm. **C**. ♂ (SBA, SB.004463); habitus, dorsal view; collected in Greece; body length 9.5 mm. **D**. ♀ (FMT, ZFMK-TIS-8027947); head, lateral view; collected in Georgia; eye width 1.3 mm. Not to scale.

Distribution

Western Palaearctic. Within the Caucasus known from Armenia, Georgia and Russia.

Cheilosia* (*Cheilosia*) *canicularis (Panzer, 1801)
Fig. 17

Syrphus canicularis Panzer, 1801: 20.

Cheilosia canicularis – Radde 1899: 453. — Stackelberg & Richter 1968: 245. — Stackelberg 1970: 61. — Peck 1988: 99. — Barkalov 1993: 721. — Mengual *et al.* 2020: 15. — Żóralski 2022: 68.
Cheilosia canicularis Panzer, 1798 [sic] – Gujabidze 2002: 245.

Differential diagnosis

Cheilosia canicularis is a large *Cheilosia* (13–15 mm) that lacks setae on the posterior margin of the scutellum and has pilose eyes in the dorsal half, but only sparsely pilose or bare in the ventral half. This

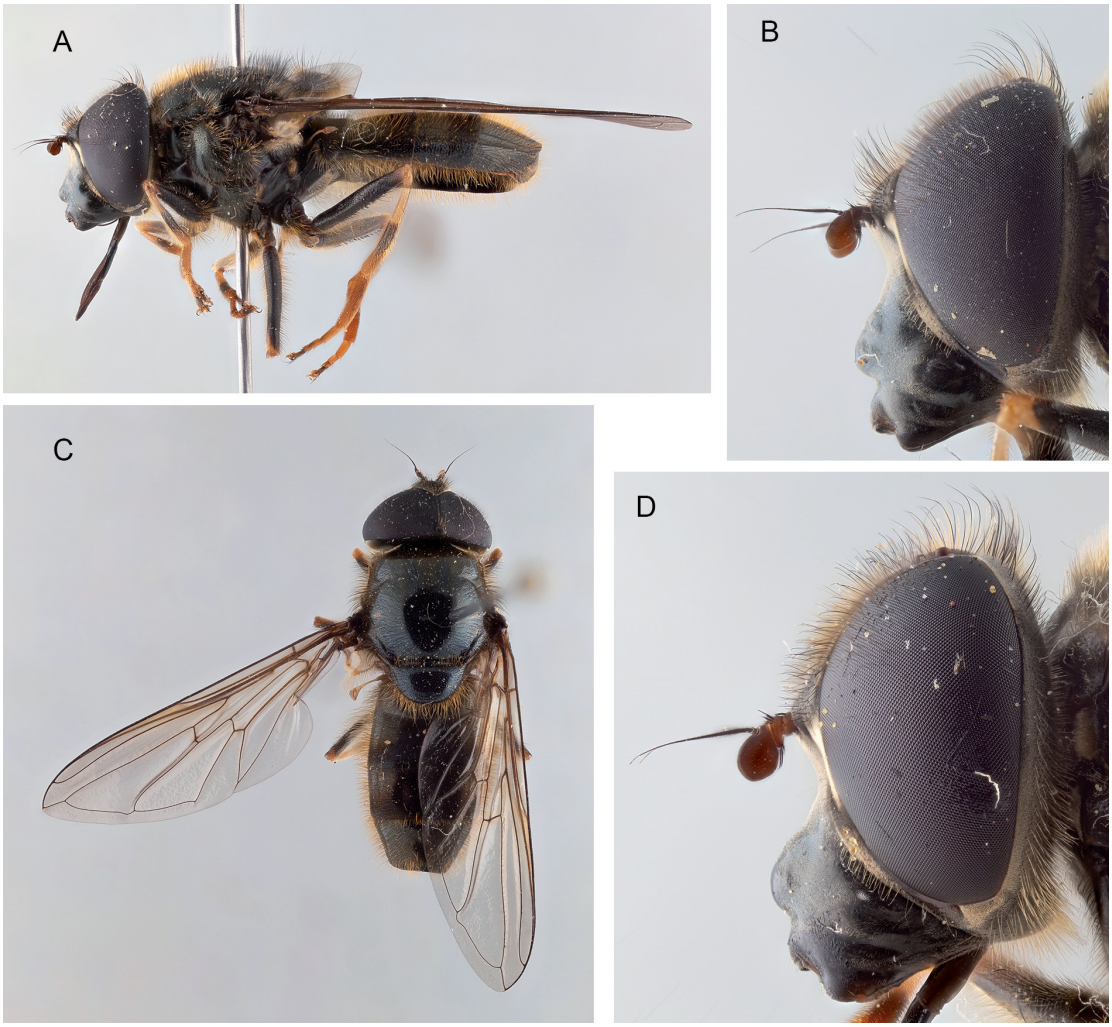

Fig. 17. *Cheilosia* (*Cheilosia*) *canicularis* (Panzer, 1801). Collected in Georgia. **A**. ♂ (SBA, SB.002251); habitus, lateral view; body length 13.8 mm. **B**. ♂ (SBA, SB.002263); head, lateral view; eye width 1.6 mm. **C**. ♂ (SBA, SB.002251); habitus, dorsal view; body length 14.1 mm. **D**. ♀ (SBA); head, lateral view; eye width 1.7 mm. Not to scale.

combination of characters can only be found in the morphologically very similar *C. himantopus*, and only relatively recently their identification and status was clarified (Stuke & Claussen 2000). *Cheilosia canicularis* is a species flying in summer, while *C. himantopus* occurs in spring, with some overlap in June. *Cheilosia canicularis* has pile on arista about as long as diameter of arista (half as long as diameter of arista in *C. himantopus*). In the male, usually (but not always) the fifth tarsomere is yellow (at least fifth tarsomere black in *C. himantopus*) and there are subtle differences in the genitalia, see Stuke & Claussen (2000). In the female, posterior margin of tergum III with complete band of dense, adpressed pile (with sparse, incomplete band of adpressed pile in *C. himantopus*) and posterior third of tergum IV with dense, adpressed pile (with scattered, semi-adpressed pile in *C. himantopus*). For differences with *C. orthotricha*, see Differential diagnosis under that species.

Material examined

Collected in 2018, 2019 and 2021; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

We recovered a cluster (BS = 99.8%) with the barcodes of *C. canicularis* and the sequences of *C. himantopus*. Although some structure can be seen in the arrangement of the molecular data, both species cannot be distinguished with certainty from DNA barcodes.

Biology

During our expeditions, collected between 27 June and 9 September at an altitude between 790 and 2887 m a.s.l. on meadows and in forest clearings.

Distribution

Central Europe, Turkey and the Caucasus. Within the Caucasus known from Armenia, Georgia and Russia.

Cheilosia* (*Cheilosia*) *caucasi sp. nov.
urn:lsid:zoobank.org:act:D45D45B8-84F8-4D18-A6DB-8ABAAEEDAE91
Figs 18–19

Differential diagnosis

Cheilosia caucasi sp. nov. most closely resembles *C. abagoensis*, *C. gemmula* sp. nov. and *C. rhynchops*. Both sexes look like *C. rhynchops* but face not protruding, facial tubercule not low on face (in *C. rhynchops* the face is protruding, with facial tubercle low on face), postpedicel black (Fig. 19A–B) (postpedicel usually orange basoventrally in *C. rhynchops*), pleura predominantly with black pile (with extensive yellow pile in *C. rhynchops*), dorsal and ventral pile patches on katepisternum widely separated (variable in *C. rhynchops*, but in the Caucasian populations these piles are connected by short pile medially). Male differs further from *C. rhynchops* in having parafacia wider, frons partly pruinose and not swollen (shiny and swollen in *C. rhynchops*), occiput dorsally with mixed black and yellow pile (black in *C. rhynchops*), eye with less dense, shorter and paler pile, scutum shiny (pruinose on anterior third in *C. rhynchops*), scutum with less extensive white pile (Fig. 18A) and surstylus with microtrichia on dorsal part (Fig. 19D) (without microtrichia in *C. rhynchops*). See the differential diagnosis of *C. gemmula* for differences between that species and *C. caucasi*. The new species *C. caucasi* is similar to *C. abagoensis* but thorax with black instead of blue-black shine, eye usually with sparser and partly yellow pile (eye with black and dense pile in *C. abagoensis*), scutum finely punctured (scutum coarsely punctured in *C. abagoensis*), pleura pruinose (largely shiny in *C. abagoensis*), wing hyaline (blackish infuscated in *C. abagoensis*, Fig. 1C), and sternum I largely or entirely pruinose (sternum I largely or entirely shiny in *C. abagoensis*). Males of *C. caucasi* can have sterna quite pruinose, in that case it may look like

C. teberdensis and *C. paragigantea*, however, the katepisternal pile patches are separated as mentioned above in our new species, but connected in *C. teberdensis* and *C. paragigantea*. In some cases, females of *C. caucasi* have bare eyes resembling females of the subgenus *Taeniochilosia*, but the anterior process of the lunule is broadly confluent with the face (anterior process missing in *Taeniochilosia*).

Etymology

The species name is derived from 'Caucasus' and can be translated as 'the *Cheilosia* of the Caucasus'. Species epithet to be treated as a noun in the genitive case.

Material examined

Holotype

GEORGIA • ♂; Samtskhe-Javakheti, road from Sairme to Tsikhisjvari, hilltop and surroundings; 41.7251° N, 43.3605° E; 2519 m a.s.l.; 9 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8008778 = ZFMK-DIP-00066397.

Paratypes

GEORGIA – **Imereti** • 1 ♂; road from Abastumani to Sairme; 41.8385° N, 42.8194° E; 2260 m a.s.l.; 10 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066400 = ZFMK-TIS-80087812 • 2 ♀♀; road from Abastumani to Sairme; 41.8385° N, 42.8194° E; 2260 m a.s.l.; 10 Jun. 2019; F. Van de Meutter leg.; FMT • 4 ♂♂; road from Abastumani to Sairme; 41.8245° N, 42.8482° E; 2165 m a.s.l.; 10 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386101, CNC1386104 to CNC1386106. – **Kakheti** • 1 ♂; Lagodekhi N.P.; 41.88273° N, 46.32185° E; 1841 m a.s.l.; 3 May 2014; G. Japoshvili leg.; CNC, CNC1547273 • 2 ♂♂; Batsara Nature Reserve; 42.286542° N, 45.242212° E; 2065 m a.s.l.; 29 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00094028 = ZFMK-TIS-8014638, ZFMK-DIP-00094029 = ZFMK-TIS-8014639 • 1 ♀; Batsara Nature Reserve; 42.264937° N, 45.259187° E; 1955 m a.s.l.; 29 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00094021 = ZFMK-TIS-8014637. – **Mtskheta-Mtianeti** • 1 ♂; Lutkhubi; 42.3930° N, 44.7929° E; 1700 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, A012 • 2 ♂♂; Lutkhubi; 42.3797° N, 44.7969° E; 1463 m a.s.l.; 6 May 2023; S. Bot leg.; SBA, SB.003115 = ZFMK-TIS-8027988, SB.003116 • 2 ♂♂, 4 ♀♀; Sno; 42.6156° N, 44.6148° E; 1850 m a.s.l.; 7 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; Lutkhubi; 42.3936° N, 44.7923° E; 1760 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; Lutkhubi; 42.3930° N, 44.7929° E; 1734 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, C006 • 1 ♂; Lutkhubi; 42.3936° N, 44.7923° E; 1760 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT. – **Racha-Lechkhumi and Kvemo Svaneti** • 2 ♀♀; 42.909° N, 43.142° E; 1900 m a.s.l.; 29 Jun. 2018; S. Bot leg.; SBA, SB.003087, SB.003088 • 2 ♀♀; 42.888° N, 43.233° E; 1900 m a.s.l.; 30 Jun. 2018; S. Bot leg.; SBA, SB.003096, SB.003097 • 1 ♀; 42.820° N, 43.159° E; 1400 m a.s.l.; 2 Jul. 2018; S. Bot leg.; SBA, SB.003105 • 1 ♂; near Shovi; 42.665° N, 43.656° E; 2203 m a.s.l.; 10 Jul. 2021; S. Bot leg.; SBA, SB.003110. – **Samegrelo-Zemo Svaneti** • 2 ♂♂; 42.950° N, 43.075° E; 2275 m a.s.l.; 24 Jun. 2018; S. Bot leg.; SBA, SB.003091, SB.003092 • 1 ♂; 42.948° N, 43.021° E; 2800 m a.s.l.; 25 Jun. 2018; S. Bot leg.; SBA, SB.003090 • 1 ♀; 42.897° N, 43.008° E; 2630 m a.s.l.; 28 Jun. 2018; S. Bot leg.; SBA, SB.003089 • 1 ♀; Ushguli; 42.916° N, 43.018° E; 2140 m a.s.l.; 29 Jun. 2018; S. Bot leg.; SBA, SB.003086 • 1 ♂; Mestia; 43.028° N, 42.910° E; 2834 m a.s.l.; 13 Jun. 2019; S. Bot leg.; SBA, SB.003106 • 1 ♀; same data as for preceding; SBA, SB.003107 • 2 ♂♂; 43.0254° N, 42.8906° E; 2550 m a.s.l.; 13 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066402 = ZFMK-TIS-8008783, ZFMK-DIP-00066403 • 3 ♂♂, 2 ♀♀; 43.0254° N, 42.8906° E; 2550 m a.s.l.; 13 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♀; 43.0265° N, 42.9100° E; 2860 m a.s.l.; 13 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066404 = ZFMK-TIS-8008784 • 1 ♀; 43.0259° N, 42.9103° E; 2871 m a.s.l.; 13 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386375 • 3 ♂♂; Mestia; 43.02° N, 42.89° E; 2600 m a.s.l.; 13 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.959, 2019-01.087, 2019-01.088 = ZFMK-TIS-8009607 • 1 ♀; 42.948° N, 43.070° E; 2258 m a.s.l.; 15 Jun. 2019; S. Bot leg.; SBA, SB.003108 • 1 ♂; 42.9471° N, 43.0671° E; 2257 m a.s.l.; 15 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386526 • 1 ♀; same data as for preceding; CNC, CNC1386527 • 1 ♂, 1 ♀; 42.9062° N, 42.9370° E; 2615 m a.s.l.; 16 Jun. 2019;

F. Van de Meutter leg.; FMT • 1 ♀; 42.900° N, 42.934° E; 2700 m a.s.l.; 17 Jun. 2019; S. Bot leg.; SBA, SB.003109 = CNC databasing S. Bot 922 = CNCTW077-21 = JSM13473 • 2 ♂♂; 2 km SW of Ushguli; 43.0052° N, 42,8986° E, 2550 m a.s.l.; 17 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♂; 42.9140° N, 43.0911° E; 2575 m a.s.l.; 18 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066401 = ZFMK-TIS-8008782 • 1 ♂; Zagarari Pass; 42.91° N, 43.09° E; 2585 m a.s.l.; 18 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.146 • 1 ♀; 42.9125° N, 43.0549° E; 2299 m a.s.l.; 11 Jul. 2021; S. Bot leg.; SBA, SB.003111 • 2 ♀♀; 42.9616° N, 43.0914° E; 2447 m a.s.l.; 12 Jul. 2021; S. Bot leg.; SBA, SB.003112, SB.003113. – **Samtskhe-Javakheti** • 1 ♂; Borjomi N.P.; 41.867° N, 43.251° E; 2000 m a.s.l.; 18 Jun. 2018; S. Bot leg.; SBA, SB003094 = CNC databasing S. Bot 921 = CNCTW076-21 = JSM13472 • 1 ♀; same data as for preceding; SBA, SB.003095 • 4 ♂♂; road from Sakire to Tsikhisjvari; 41.728° N, 43.364° E; 2327 m a.s.l.; 9 Jun. 2019; S. Bot leg.; SBA, SB.003098 = CNC databasing S. Bot 920, SB.003099 to SB.003101 • 3 ♀♀; same data as for preceding; SBA, SB.003102 to SB.003104 • 2 ♂♂, 5 ♀♀; road from Sakire to Tsikhisjvari; 41.7251° N, 43.3605° E; 2519m a.s.l.; 9 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♀; same data as for preceding; X. Mengual leg.; ZFMK, ZFMK-DIP-00066398 = ZFMK-TIS-8008779 • 1 ♀; Borjomi N.P.; 41.7280° N, 43.3640° E; 2327 m a.s.l.; 9 Jun. 2019; L. Hofstee leg.; LHH • 1 ♂; road from Sakire to Tsikhisjvari; 41.7299° N, 43.3684° E; 2245 m a.s.l.; 9 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386030 • 1 ♂; Borjomi; 41.72° N, 43.36° E; 2250 m a.s.l.; 9 Jun. 2019; J. van Steenis leg.; JSB 2019-01.022, ZFMK-TIS-8009606 • 1 ♀; same data as for preceding; JSB, 2019-01.073 • 1 ♂; Abastumani; 41.83° N, 42.81° E; 2260 m a.s.l.; 10 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.075 • 1 ♀; Borjomi N.P.; 41.823° N, 42.841° E; 2049 m a.s.l.; 11 Jun. 2019; S. Bot leg.; SBA, SB.003093 • 1 ♀; Borjomi N.P.; 41.8181° N, 42.8316° E; 2004 m a.s.l.; 11 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386260 • 1 ♀; Borjomi N.P.; 41.82° N, 42.84° E; 2100 m a.s.l.; 11 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.098, ZFMK-TIS-8009613 • 1 ♂; near Akhalkalak; 41.4672° N, 43.4337° E; 1476 m a.s.l.; 19 Jul. 2021; S. Bot leg.; SBA, SB.003114 • 21 ♂♂, 1 ♀; Kodiani; 41.7305° N, 43.3537° E; 2160 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT • 15 ♂♂; Kodiani; 41.7300° N, 43.3485° E; 2080 m a.s.l.; 10 May 2023; W. Opdekamp leg.; WOR, A004 to A007, A011, A012, A029 to A032, A036, A037, A042, A044, A046 • 3 ♀♀; same data as for preceding; WOR, A002, A008, A010.

RUSSIA – **North Ossetia-Alania** • 1 ♀; W of Digoria, Chefandzar mire in Urukh River valley; 42.9186° N, 43.5149° E; 2289 m a.s.l.; 2–3 Jun. 2018; A. Przhiboro leg.; yellow plates; ZFMK, ZFMK-DIP-00078663 = ZFMK-TIS-8009570. – **Kabardino-Balkaria** • 1 ♀; 2–3 km SE of vill. Verkhnyaya Balkaria; 43.0971° N, 43.4795° E; 1836 m a.s.l.; 7–8 Jun. 2018; A. Przhiboro leg.: yellow plates; ZFMK, ZFMK-DIP-00078650 = ZFMK-TIS-8009593 • 1 ♀; 2–3 km SE of vill. Verkhnyaya Balkaria; 43.0983° N, 43.4777° E; 1810 m a.s.l.; 7–8 Jun. 2018; A. Przhiboro leg.: yellow plates; DIP-00078655 = ZFMK-TIS-8009599.

Description

Male

Length. Body 8.5–11.5 mm, wing 6.5–9 mm.

Head. Face bare, black, with facial tubercle, slightly pruinose, densely pruinose below lunule, facial tubercle shiny. Parafacia black, pruinose, white pilose, about or almost as wide as length of postpedicel. Clypeus shiny or seldom slightly pruinose, 1.8 to 2.5 times as long as wide. Frontal triangle black, densely pruinose along eye margin and along face, otherwise slightly pruinose, with long black pile. Length of eye contiguity about as long as length of frons. Angle of approximation of eyes ca 90°. Vertical triangle black, shiny, ocellar triangle shiny, long black pilose, sometimes with small yellow pile intermixed. Occiput pruinose, short yellow and long black pilose. Lunule dark orange, with distinct medial arm, separating acetabula. Scape black, anteriorly with black setae; pedicel black, anteriorly with black setae; postpedicel black, rounded, pruinose, about as long as wide; arista black, basally with very short pile. Eyes with relatively sparse but long pile; colour of pile ranging from wholly dark yellow to black in dorsal part and yellow in ventral part.

Thorax. Scutum black, shiny except narrowly anteriorly, finely punctured, with long erect black pilosity, of two lengths in posterior part, anteriorly sometimes with some white pile. Scutellum shiny, with long and short black pile, sometimes also with short white pile, posterior margin with numerous black setae. Pleura black, slightly pruinose, with black pile except with white pile on proepisternum and metasternum and with white pile intermixed on katepisternum; dorsal and ventral pile patches on katepisternum widely separated. Haltere dark yellow to dark brown.

Wing. Wing including alula entirely microtrichose, ranging from hyaline to with brown tinge in basal anterior part, veins black.

Legs. Legs black, or in few specimens basal one-tenth of tibiae yellow. Coxae pruinose, procoxa with black pile, often intermixed with some yellow pile, anteriorly with black setae, sometimes intermixed with a few yellow setae; mesocoxa with black pile and setae, sometimes a few yellow pile or setae; metacoxa with mixed yellow and black pile, black pile often dominating. Trochanters black, with mixed black and yellow pile. Profemur with black pile except a few yellow pile anterolaterally; mesofemur

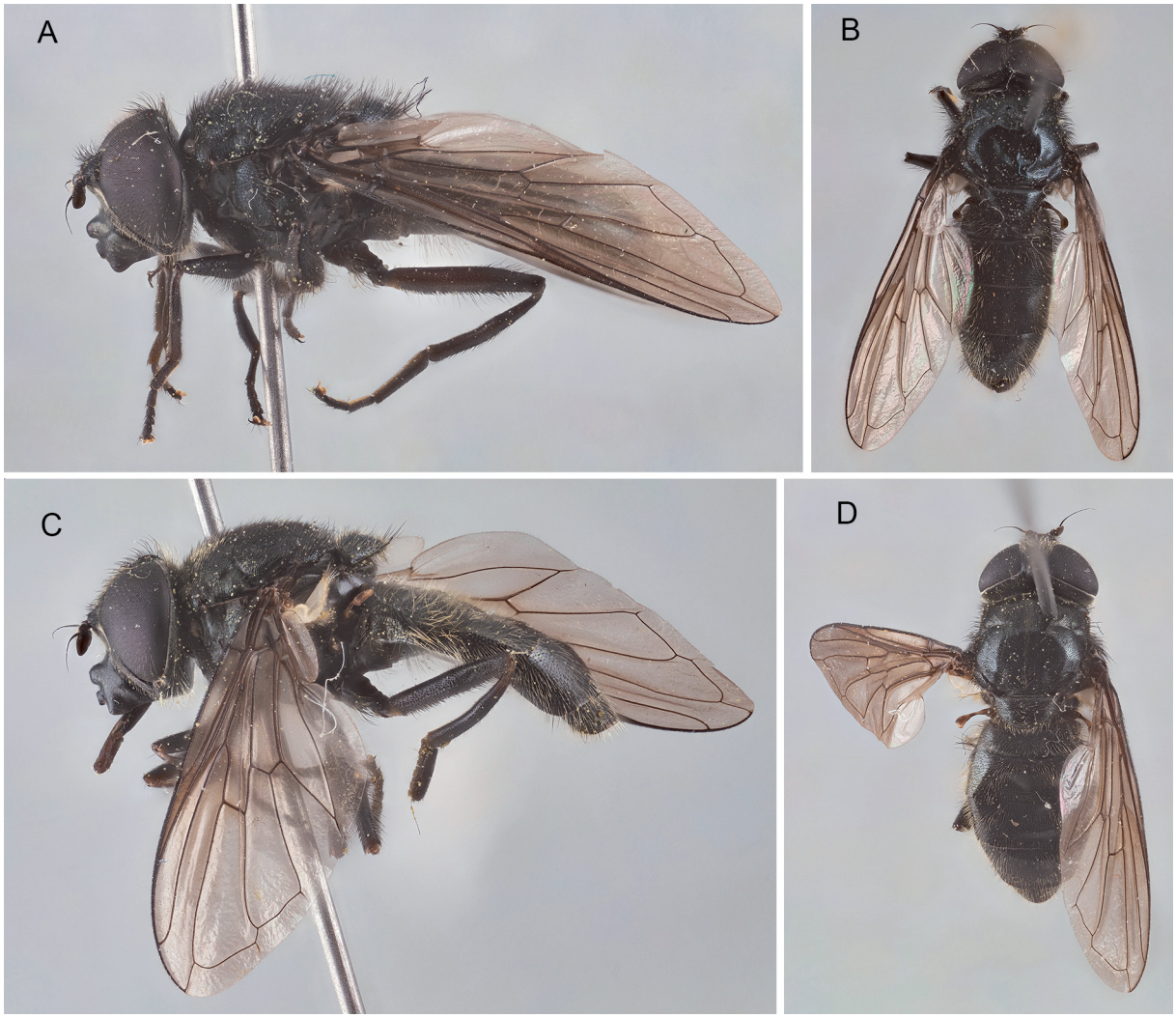

Fig. 18. *Cheilosia* (*Cheilosia*) *caucasi* sp. nov. **A–B**. Holotype, ♂ (ZFMK, ZFMK-DIP-00066397); habitus, lateral and dorsal views; body length 9.2 mm. **C–D**. Paratype, ♀ (ZFMK, ZFMK-DIP-00066398); habitus, lateral and dorsal views; body length 9.4 mm. Not to scale.

with black pile, basis antero- and posterolaterally with mixed black and yellow pile; metafemur black pilose, posterolaterally with yellow pile, anterolaterally with short black pile and scattered long pile, the basal part of the long pile yellow. Protibia black pilose, anterolaterally yellow pilose; mesotibia black pilose; metatibia black pilose, apical two third of anterolateral side yellow pilose. Protarsus dorsally and posterolaterally black pilose; ventrally and anterolaterally yellow pilose; mesotarsus black pilose; metatarsus dorsally black pilose, ventrally yellow pilose.

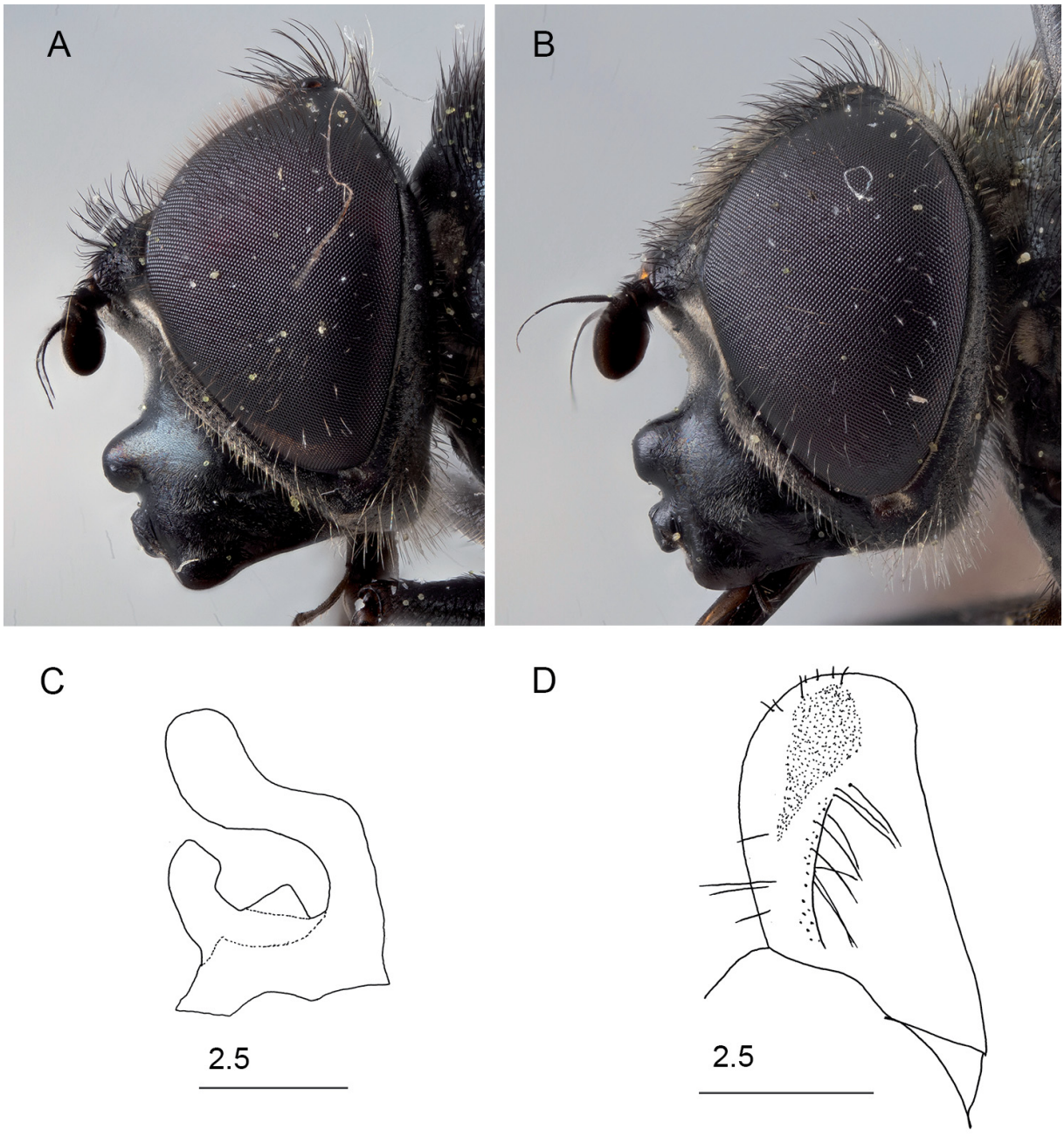

Fig. 19. *Cheilosia* (*Cheilosia*) *caucasi* sp. nov. **A**. Holotype, ♂ (ZFMK, ZFMK-DIP-00066397); head, lateral view; eye width 1.4 mm. **B**. Paratype, ♀ (ZFMK, ZFMK-DIP-00066398); head, lateral view; eye width 1.3 mm. **C–D**. Paratype, ♂ (SBA, SB.003090). **C**. Postgonite, lateral view. **D**. Surstylus, lateral view. Scale bars: A–B not to scale; C–D in µm.

Abdomen. Terga I–III medially pruinose, laterally shiny, tergum IV shiny except pruinose along anterior margin, medially slightly extending. Pile on terga long and erect, longest along lateral margins, medially adpressed on terga II–IV, colour variable, ranging from mainly yellow to mainly black, at least medially on terga II–III and laterally on tergum I and anterolaterally on tergum II predominantly black. Sternum I pruinose, with yellow pile; sternum II shiny or slightly pruinose, with long erect white pile and some long erect black pile medially; sternum III shiny, laterally and anterolaterally with erect white pile, otherwise with adpressed black or mixed yellow and black pile; sternum IV slightly pruinose, laterally with erect white or mixed black and white pile, medially with adpressed black or black and yellow pile. Genitalia with surstylus about 1.6 times as long as wide, on apical part with field of microtrichia (Fig. 19D). Ventral lobe of postgonite halfway bent inwards, longer than dorsal lobe, dorsal lobe short and blunt (Fig. 19C). Apical sclerite of aedeagus with wide and large anterior lobes, lacking posterior lobes.

Female

Length. Body 8–10 mm, wing 7–8 mm.

Similar to the male, except for normal sexual dimorphism and the following characters: frons with mixed yellow and black pile. Dorsal part of occiput shiny. Eye with sparse yellow pile, sometimes eye bare. Scutum with semi-adpressed black pile, sometimes mixed with yellow pile. Posterior margin scutellum with fewer and shorter setae. Terga 2–5 shiny. Terga predominantly with yellow pile except medially on terga II–III, where black.

Morphological variation

In one female specimen (ZFMK-DIP-00066552 = ZFMK-TIS-8006833) the face is pilose.

Genetics

We recovered a cluster (BS = 93.6%) with the single sequence of *C. carbonaria* Egger, 1860 and the barcodes of *C. caucasi* sp. nov., *C. cynocephala* Loew, 1840 and *C. abagoensis*. While DNA barcodes of *C. cynocephala* cluster together (BS < 90%), DNA sequences of *C. caucasi* are grouped into three different clusters (BS = 97.7–99.7%), except for three females which are resolved into a different cluster with the barcodes of *C. abagoensis* (BS = 99.6%).

Biology

Collected between 1400–2860 m a.s.l. on extensive grasslands. Most often found feeding on *Caltha palustris*, *Ranunculus* sp. and yellow crucifers.

Distribution

Only known from the Greater and Lesser Caucasus in Georgia and Russia.

Cheilosia* (*Montanocheila) chrysocoma (Meigen, 1822)
Fig. 20

Syrphus chrysocomus Meigen, 1822: 280.

Cheilosia chrysocoma – Gujabidze 2002: 246. — Mengual *et al.* 2020: 25.

Differential diagnosis

Cheilosia chrysocoma stands out amongst most other species of *Cheilosia* by usually having a furry, fox red body pile (Fig 20A, C). Within the subgenus *Montanocheila* the male can be identified by surstylus being ca five times as long as wide, with pointed tip (Fig. 20B, in the other species of *Montanocheila* occurring in the Caucasus, the surstylus is not longer than three times width). The female has the

posterior margin of tergum V rounded (in the other species of *Montanocheila* occurring in the Caucasus the posterior margin of tergum V is more angulated).

Material examined

Species not collected.

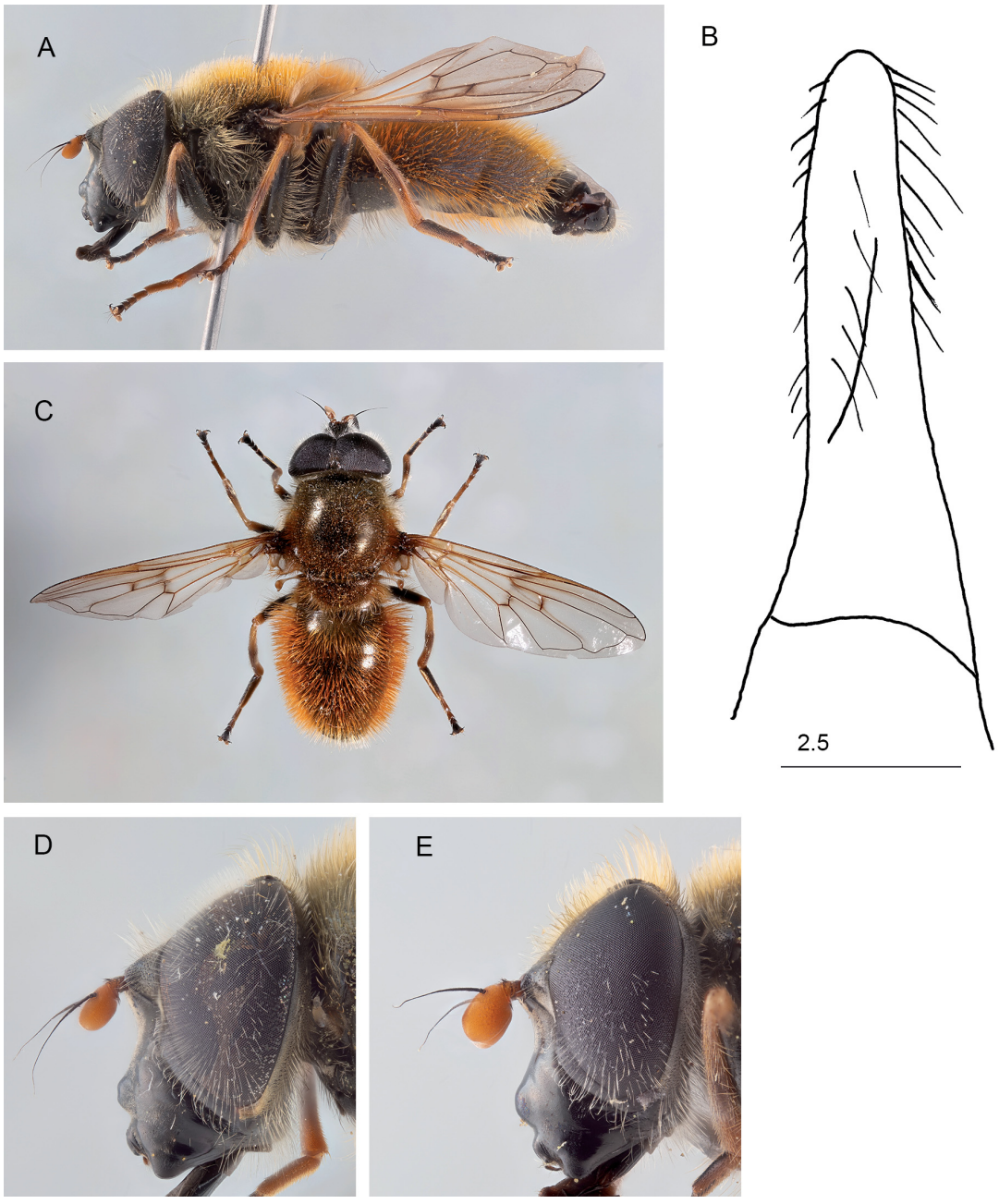

Fig. 20. *Cheilosia* (*Montanocheila*) *chrysocoma* (Meigen, 1822). **A**. ♂ (SBA, SB.004465); habitus, lateral view; collected in the Netherlands; body length 11.7 mm. **B**. (SBA); surstylus, lateral view; collected in the Netherlands. **C**. ♂ (SBA, SB.004464); habitus, dorsal view; collected in the Netherlands; body length 11.0 mm. **D**. ♂ (SBA, SB.004465); head, lateral view; collected in Belgium; eye width 1.3 mm. **E**. ♀ (SBA, SB.004466); head, lateral view; collected in Belgium; eye width 1.5 mm. Scale bars: A, C–D not to scale; B in µm.

Genetics

All DNA barcodes of *C. chrysocoma* from outside the Caucasus cluster together with a high support (BS = 99.1%).

Remarks

Gujabidze (2002) and Mengual *et al.* (2020) cite the records of this species from Mtskheta (Mtskheta-Mtianeti) included in an unpublished manuscript by Zaitsev; see references in Gujabidze (2002). The presence of this species in the Caucasus needs confirmation.

Distribution

Europe, European parts of Russia, and Siberia.

Cheilosia* (*Cheilosia*) *confusa sp. nov.
urn:lsid:zoobank.org:act:496C1281-0EE2-4CD0-8B09-F3411CE71C6F
Figs 21–22

Cheilosia melanura Becker, 1889 – Stackelberg & Richter 1968: 246. — Stackelberg 1970: 62. — Peck 1988: 109. — Barkalov 1993: 726. — Mengual *et al.* 2020: 18. — Speight 2020a: 42.
Cheilosia melanura Becker, 1921 [sic] – Gujabidze 2002: 245.

Differential diagnosis

Cheilosia confusa sp. nov. is confusingly similar to both *C. vernalis* and extralimital *C. melanura*, and we could not find differences in the male genitalia between the three species. The male is similar to that of *C. vernalis* but is larger (8.8–9.5 mm vs 5–8 mm), has the frons slightly swollen (Fig. 22A) (not swollen in *C. vernalis*), metasternum bare (usually pilose in *C. vernalis*), tarsi dorsally black (Fig. 21A) (in *C. vernalis* usually the two basal tarsomeres of the mesoleg are orange), and has the combination of scutum with mixed black and yellow pile and terga entirely yellow pilose (in *C. vernalis*, if the terga are yellow pilose, then the scutum is also mainly yellow pilose with black pilosity restricted to anterolateral corners). The male of *C. confusa* is also very similar to *C. melanura* but *C. confusa* is smaller (8.8–9.5 mm vs 9–12.5 mm) and has slenderer abdomen, pile on terga shorter and metasternum bare (usually pilose in *C. melanura*). The male can be confused with *C. cynocephala* but the body shines black or brown (bluish in *C. cynocephala*) and pile on scutum are predominantly yellow (predominantly black in *C. cynocephala*). The female is like *C. vernalis*, but it is on average larger (8 mm instead of 7 mm), pile on scutum erect instead of semi-adpressed, posterior anepisternum slightly pruinose instead of shiny, metasternum bare or with one or two pile only (usually more extensive pilose in *C. vernalis*), and tarsi dorsally black (Fig. 21C) (in *C. vernalis* usually the two basal tarsomeres of mesoleg are orange). The female of *C. confusa* is very similar to that of *C. melanura* but the posterior anepisternum is slightly pruinose instead of shiny and the metasternum is bare or with one or two pile only (usually more extensive pilose in *C. melanura*). The female can be mistaken for that of *C. cynocephala*, but the body shine is black or brown (bluish in *C. cynocephala*), wing hyaline (usually with faint, black cloud in *C. cynocephala*) and pile on scutum predominantly yellow (predominantly black in *C. cynocephala*).

Etymology

The species name *confusa* derives from the Latin word '*confusio*' for 'mixture, disorder' (Brown 1956: 227) and refers to the confusing morphology of this new species, in between the similar *C. vernalis* and *C. melanura*. Without DNA, this species would probably have gone unnoticed. Species epithet to be treated as adjective.

Material examined

Holotype

GEORGIA • ♂; Samtskhe-Javakheti, Kodiani; 41.7268° N, 43.3490° E; 2150 m a.s.l.; 10 May 2023; W. Opdekamp leg.; ZFMK, B016, ZFMK-TIS-8028459.

Paratypes

GEORGIA – **Adjara Region** • 1 ♂; Kintrishi Nature Reserve, Krummholtz Forest; 41.7553° N, 42.1128° E; 2280 m a.s.l.; 19 May–2 Jun. 2018; GGBC leg.; Malaise trap; ZFMK, ZFMK-TIS-8010426. – **Mtskheta-Mtianeti** • 1 ♀; Lutkhubi; 42.3984° N, 44.7996° E; 2068 m a.s.l.; 8 May 2023; S. Bot leg.; SBA, SB.003123 = ZFMK-TIS-8027995. – **Samtskhe-Javakheti** • 2 ♀♀; Borjomi N.P.; 41.824° N, 42.848° E; 2165 m a.s.l.; 10 Jun. 2019; S. Bot leg.; SBA, SB.003121, SB.003122 = CNC databasing S. Bot 927 • 2 ♀♀; Kodiani; 41.7300° N, 43.3485° E; 2080 m a.s.l.; 10 May 2023; W. Opdekamp leg.; WOR, A024 = ZFMK-TIS-8028462, A039 = ZFMK-TIS-8028461 • 1 ♀; Kodiani; 41.7268° N, 43.3490° E; 2150 m a.s.l.; 10 May 2023; W. Opdekamp leg.; ZFMK, B015 = ZFMK-TIS-8028460.

Description

Male

Length. Body 8.8–9.5 mm, wing 8 mm.

Head. Face bare, black, with facial tubercle, shiny, except laterally slightly pruinose and with dense pruinose band below lunule, below lunule narrower than an eye. Parafacia black, slightly pruinose, yellow pilose, about 0.8 times as wide as postpedicel. Frontal triangle black, slightly swollen, shiny, except pruinose along eye margin, with long black pile, with medial frontal sulcus. Length of eye contiguity equals the length of frons. Angle of approximation of eyes 80–90°. Vertical triangle and ocellar triangle shiny, long black or black and yellow pilose. Occiput pruinose, dorsally yellow or mixed black and yellow pilose. Lunule dark orange to blackish, with distinct medial arm, separating acetabula. Scape and pedicel black; postpedicel small, rounded, about as high as wide, dark brown, basoventral corner orange; arista black, bare, except basal third with very short pile, not exceeding half the width of arista at base. Eye with long dark brown pile.

Thorax. Scutum black, shiny, finely punctured, with long erect pile, pile mixed black and yellow, in posterior half with piles of two lengths, with a short erect black and yellow pile and a long erect black or black and yellow pile. Scutellum black, medially shiny, with long erect black and yellow and short erect black and yellow pile, with thin black setae along posterior margin. Pleura black, pruinose, with mixed black and yellow pile; dorsal and ventral pile patches on katepisternum widely separated; metasternum bare. Haltere pedicellum orange, capitulum dark brown to blackish.

Wing. Wing including alula entirely microtrichose, hyaline, veins dark brown to blackish.

Legs. Coxae, trochanters black. Femora black except apices narrowly yellow; with black and yellow pile; metafemur ventrally with seta-like hairs. Tibiae black except basal third and apical quarter yellow. Tarsi dorsally black, basitarsomere of metaleg not swollen, about 3 times as long as second tarsomere of metatarsus.

Abdomen. Terga I–IV with erect yellow pile, except medially on terga II–III where pile is adpressed; shiny except tergum I and terga II–III medially pruinose. Sterna yellow pilose, sternum I with long erect pile medially, laterally with shorter and semi-adpressed pile, sternum II with long erect pile, sterna III–IV medially with adpressed pile, laterally with semi-adpressed pile. Genitalia with surstylus 1.5 times as long as wide, with small keel, surface above keel with large field of microtrichia (Fig. 22D); dorsal lobe of postgonite short and wide with inwards facing tip (Fig. 22C).

Female

Length. Body 8–9 mm, wing 7.5–8.5 mm.

Similar to the male, except for normal sexual dimorphism and the following characters. Frons shiny except anterolateral corners along eye margin pruinose, with erect mixed black and yellow pile, with wide paravertica. Pile on vertex and ocellar triangle erect, predominantly black. Postpedicel variable, ranging from entirely black to predominantly orange. Colour of pile on eye variable, ranging from entirely yellow to only ventral half of eye with yellow pile, dorsal half with black pile. Scutum with erect pile, in posterior part also with sparse longer erect pile, colour of pile yellow, sometimes medially between wing bases mixed with some black pile. Colouration of tibiae as described in the male or sometimes only base yellow, apex black or only one tenth yellow. Pile on abdomen yellow, except sometimes anteromedially on terga II–III with black pile, pile on terga II–III medially adpressed, on tergum IV medially semi-adpressed.

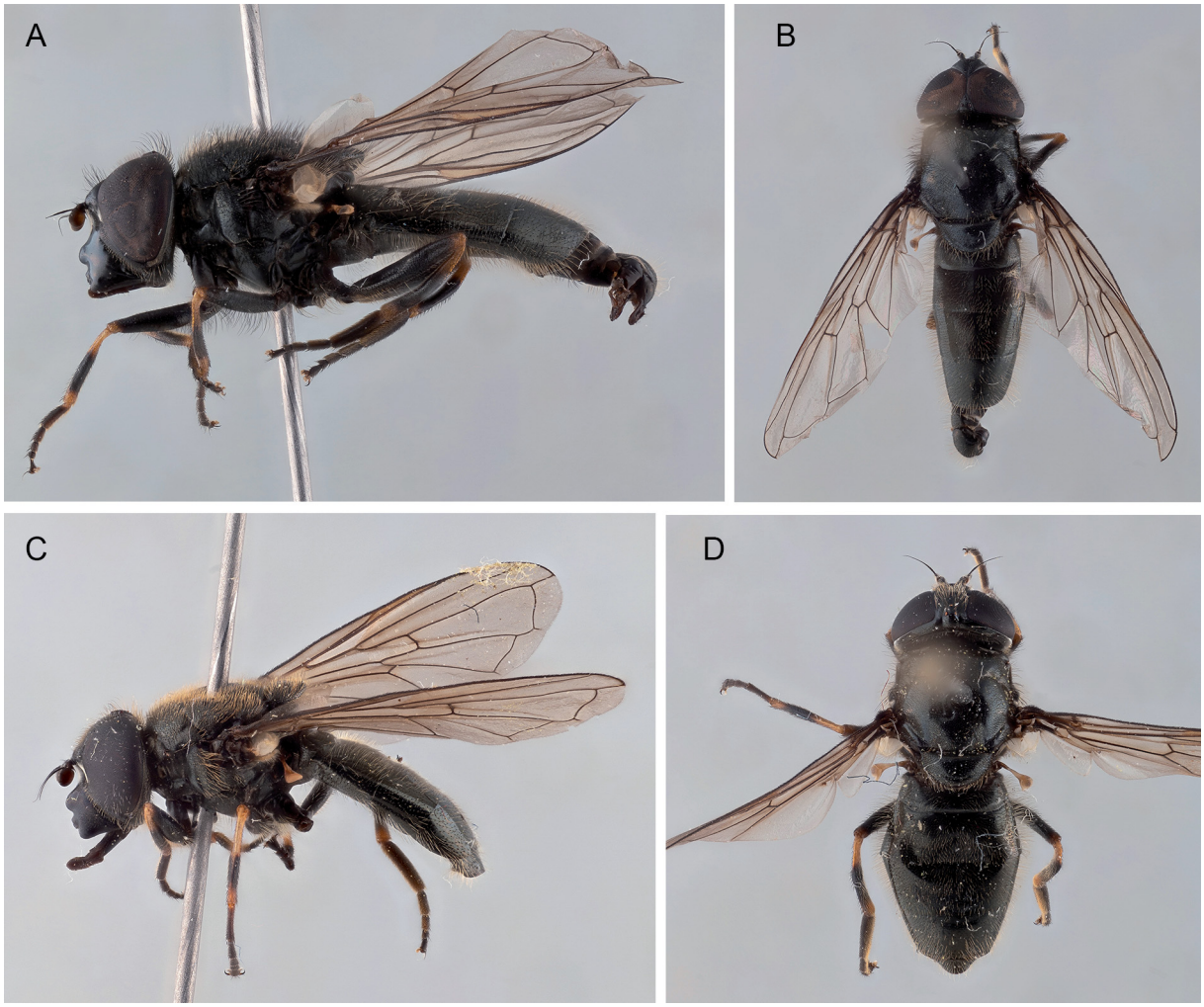

Fig. 21. *Cheilosia* (*Cheilosia*) *confusa* sp. nov. **A–B**. Holotype, ♂ (ZFMK, ZFMK-TIS-8028459); habitus, lateral and dorsal views; body length 9.5 mm. **C**. Paratype, ♀ (SBA, CNC databasing S Bot 927); habitus, lateral view; body length 8.2 mm. **D**. Paratype, ♀ (SBA, ZFMK-TIS-8027995); habitus, dorsal view; body length 8.4 mm. Not to scale.

Genetics

Molecular data for *C. triamilia* Ballester-Torres *et al*., 2024, *C. melanura*, *C. bracusi*, *C. gemmula* sp. nov., *C. vernalis* and *C. confusa* sp. nov. cluster together without high support (BS < 90%) and relatively low interspecific p-distance (< 0.022), except for the specimen of *C. vernalis* ZFMK-DIP-00093901 (= ZFMK-TIS-8014645) that reaches interspecific p-distances of 0.0285 (see Supp. file 3: Table S2). Nevertheless, all *C. confusa* barcodes cluster together (BS < 90%), the same for all DNA sequences of *C. gemmula* (BS < 90%).

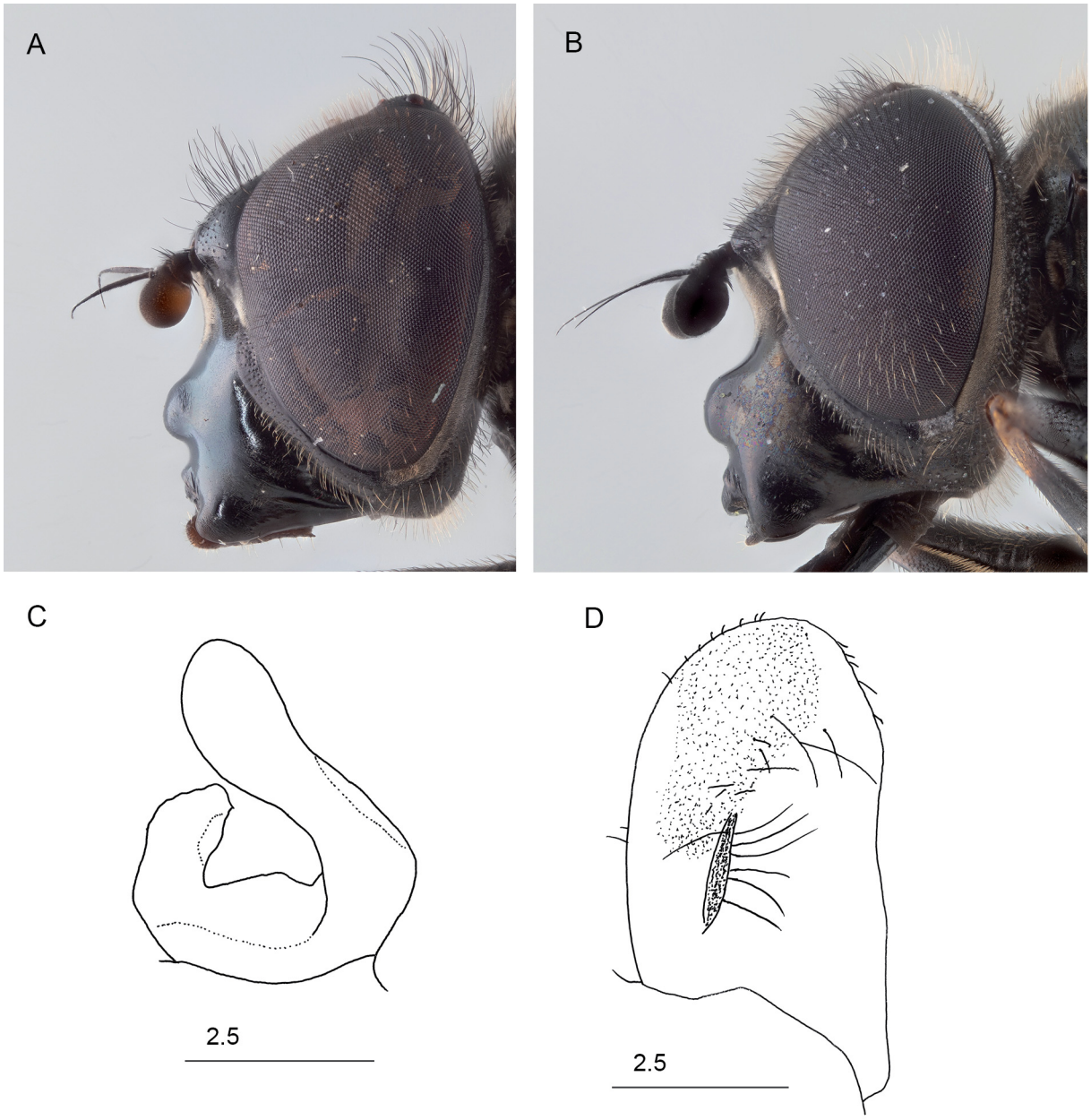

Fig. 22. *Cheilosia* (*Cheilosia*) *confusa* sp. nov. **A, C–D**. Holotype, ♂ (ZFMK, ZFMK-TIS-8028459). **A**. Head, lateral view; eye width 1.3 mm. **B**. Paratype, ♀ (WOR, ZFMK-TIS-8028461); head, lateral view; eye width 1.2 mm. **C**. Postgonite, lateral view. **D**. Surstylus, lateral view. Scale bars: A–B not to scale; C–D in µm.

Remarks

Specimens from the Caucasus published under the name *C. melanura* are considered to be records of *C. confusa* sp. nov.

Two specimens which look intermediate between *C. vernalis* and *C. confusa* sp. nov. end up in the molecular tree near *C. confusa* (ZFMK-TIS-8009292, ZFMK-DIP-00093672 = ZFMK-TIS-8014649), but forming a different cluster (BS < 90%). We leave these specimens unidentified.

Biology

Seemingly mainly a spring species with most records in May and the last date on 10 June. Collected in high mountains between 2068–2280 m a.s.l., specimens from May were found on flowering willow *Salix* sp. or on low flowers.

Distribution

Endemic to the Caucasus, known from Georgia and Russia.

Cheilosia* (*Montanocheila*) *contrasta sp. nov.
urn:lsid:zoobank.org:act:75901346-020B-4D7A-9179-B179BFC02085
Figs 23–24

Differential diagnosis

Cheilosia contrasta sp. nov. belongs to the subgenus *Montanocheila*. From all *Montanocheila* known from the Palaearctic Region (see Claussen 1998), the male differs by the following combination of characters: postpedicel predominantly orange (Fig. 24A), tibiae yellow at both ends (Fig. 23A), terga I–II with yellow pile contrasting with black pile on terga III–IV (Fig. 23A–B) and surstylus more than twice as long as wide, with pointed apex (Fig. 24D). In the male genitalia, the shape of the surstylus is very characteristic and only *C. pictipennis* Egger, 1860 has a similar looking surstylus; however, in *C. contrasta* sp. nov. the apex of the surstylus is more pointed (rounded in *C. pictipennis*). Moreover, both sexes can be distinguished from *C. pictipennis* by the uninterrupted long pilosity on anterior part of sternum II (in *C. pictipennis* the anterior part of sternum II is bare or short pilose medially) and by the characteristic bicoloured pilosity on abdomen, which is more variable in *C. pictipennis*. The female is very similar to that of *C. subpictipennis*, yet, the pile on terga III–V are long and black, while the pilosity on terga III–V is shorter and yellow in *C. subpictipennis*.

Etymology

The species name '*contrasta*' refers to a characteristic feature of the species: the predominantly yellow pile on terga I–II contrasting sharply with the predominantly black pile on terga III–IV. Species epithet to be treated as an adjective.

Material examined

Holotype

GEORGIA • ♂; Imereti, road from Abastumani to Sairme; 41.8380° N, 42.8183° E; 2260 m a.s.l.; 10 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8006786 = ZFMK-DIP-00066187.

Paratypes

ARMENIA – **Ararat Province** • 1 ♀; surroundings Geghard Monastery; 40.1385° N, 44.8172° E; 1720 m a.s.l.; 22 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093557 = ZFMK-TIS-8014524; ZFMK. – **Syunik Province** • 1 ♂; from Lichk to the Zvaravank Monastery; 39.0549° N, 46.1713° E; 1765 m a.s.l.; 16 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093035 = ZFMK-TIS-8014426.

GEORGIA – **Adjara** • 1 ♂; Kintrishi Nature Reserve; 41.75517° N, 42.11249° E; 2268 m a.s.l.; 2–16 Jun. 2018; GGBC-members leg.; Malaise trap, stored in alcohol; ZFMK, ZFMK-TIS-8010561. – **Kakheti** – 1 ♀; Lagodekhi N.P.; 41.8767° N, 46.2429° E; 615 m a.s.l.; 2 May 2023; S. Bot leg.; SBA, SB.003118 • 1 ♀; Lagodekhi N.P.; 41.8777° N, 46.2436° E; 625 m a.s.l.; 2 May 2023; F. Van de Meutter leg.; FMT. – **Mtskheta-Mtianeti** • 1 ♂; Lutkhubi; 42.3797° N, 44.7969° E; 1463 m a.s.l.; 6 May 2023; S. Bot leg.; SBA, SB.003117 • 4 ♂♂; Lutkhubi; 42.3936° N, 44.7923° E; 1760 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT. – **Samegrelo-Zemo Svaneti** • 1 ♂; Ushguli; 42.950° N, 43.075° E; 2275 m a.s.l.; 24 Jun. 2018; S. Bot leg.; SBA, SB.003119 = CNC databasing S. Bot 649 • 2 ♂♂; Mestia; 43.1178° N, 42.7251° E; 1875 m a.s.l.; 14 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♂; near Ushguli; 42.9498° N, 43.0718° E; 2270 m a.s.l.; 15 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066188 = ZFMK-TIS-8006787 • 1 ♀; Ushguli; 42.90° N, 42.93° E; 2600 m a.s.l.; 17 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.888 • 1 ♀; Ushguli; 42.898° N, 42.008° E; 2601 m a.s.l.; 18 Jun. 2019; S. Bot leg.; SBA, SB.003120 = CNC databasing S Bot 917. – **Samtskhe-Javakheti** • 1 ♀; Dviri; 41.7543° N, 43.2733° E; 1100 m a.s.l.; 12 May 2023; W. Opdekamp leg.; WOR, B028.

Description

Male

Length. Body 12–13.5 mm, wing 11.5–12 mm.

Head. Face slightly protruding downwards, bare, with facial tubercle, black, shiny except grey pruinose narrow strip along parafacia, on genae and a broad weakly delimited band directly below lunule. Parafacia black, broad, almost as wide as postpedicel, slightly pruinose, long white pilose. Frontal triangle black, shiny, except narrowly pruinose along eye margins and along face, long white pilose, with medial frontal sulcus. Length of eye contiguity about as long or slightly shorter than the length of frons. Angle of approximation of eyes 80–90°. Vertical triangle black, pruinose; ocellar triangle shiny and long yellow pilose. Occiput pruinose, yellow pilose. Lunule dark orange, with distinct medial arm, separating acetabula. Scape blackish, anteriorly with setae, inner setae yellow, outer setae black; pedicel blackish, becoming orange on outer third, anteriorly with black setae and yellow pile; postpedicel orange, sometimes darkened in dorsal outer corner, about as high as wide, rounded, pruinose; arista black, sometimes orange apically, almost bare. Eye long white pilose.

Thorax. Scutum black, finely punctured, with long erect yellow or orange pile, shiny except anteriorly narrowly pruinose and notopleuron slightly pruinose. Scutellum black, shiny, with long and short erect golden yellow pile, posterior margin without setae. Pleura black, pruinose, with yellow white pile; katepisternum continuously pilose. Haltere pedicellum yellow, capitulum dark brown or black.

Wing. Wing including alula entirely microtrichose, veins on outer two third of wing darkened dark brown (most so at veins m-cu, M_4 base, r-m, R_{2+3}, R_{4+5} and M_2), inner angle between veins M_1 and R_{4+5} equal to 90°, wing veins orange in the basal part and black in the apical part of the wing.

Legs. Coxae black, with yellow pile. Trochanters black. Femora black, very apex orange; profemur and mesofemur with yellow pile except ventrally on apical half with black pile; metafemur with yellow anterolateral pile, pile longer than width of metafemur, ventrally with scattered long yellow pile and short semi-adpressed mixed yellow and black setae, towards apex setae exclusively black. Tibiae yellow with vague black ring or smudge below middle; tibiae with yellow pile, sometimes mixed with black pile. Tarsi with mixed yellow and black pile; black, except ventrally orange on basal four tarsomeres and sometimes basal two tarsomeres of mesotibia dark orange dorsally.

Abdomen. Pile on terga I–IV long and erect, terga I–II with mainly yellow pile, terga III–IV with mainly black pile, tergum II in posterolateral corner with variable small black pile and posteriorly in center with

mixed black and yellow pile; tergum IV sometimes with a narrow band of yellow pile on anterior margin. Tergum I pruinose, tergum II pruinose in center and anteriorly, terga III–IV shiny. Sterna I–II with long erect golden pile, sterna III–IV with long erect black pile, shorter and adpressed in central part; sternum I pruinose; sternum II shiny but pruinose anteriorly and laterally, sternum III shiny and sternum IV shiny but pruinose posteriorly. Genitalia with surstylus about 2,9 times as long as wide (Fig. 24D); ventral lobe of postgonite more than twice as long as dorsal lobe of postgonite (Fig. 24C); sclerite of the distiphallus with two ventral spurs.

Female

Length. Body 11.5–13.5 mm, wing 11 mm.

Similar to the male, except for normal sexual dimorphism and the following characters. Face more extensively pruinose. Frons shiny, except a narrow strip along eye margin in anterior part. Lunule yellow. Scape, pedicel and postpedicel bright orange. Postpedicel larger than in the male. Capitulum of haltere orange. Pile on the central part of tergum II adpressed. Tergum V shiny, with long erect black pile. Sternum V with long erect black pile, shiny with pruinose posterior margin.

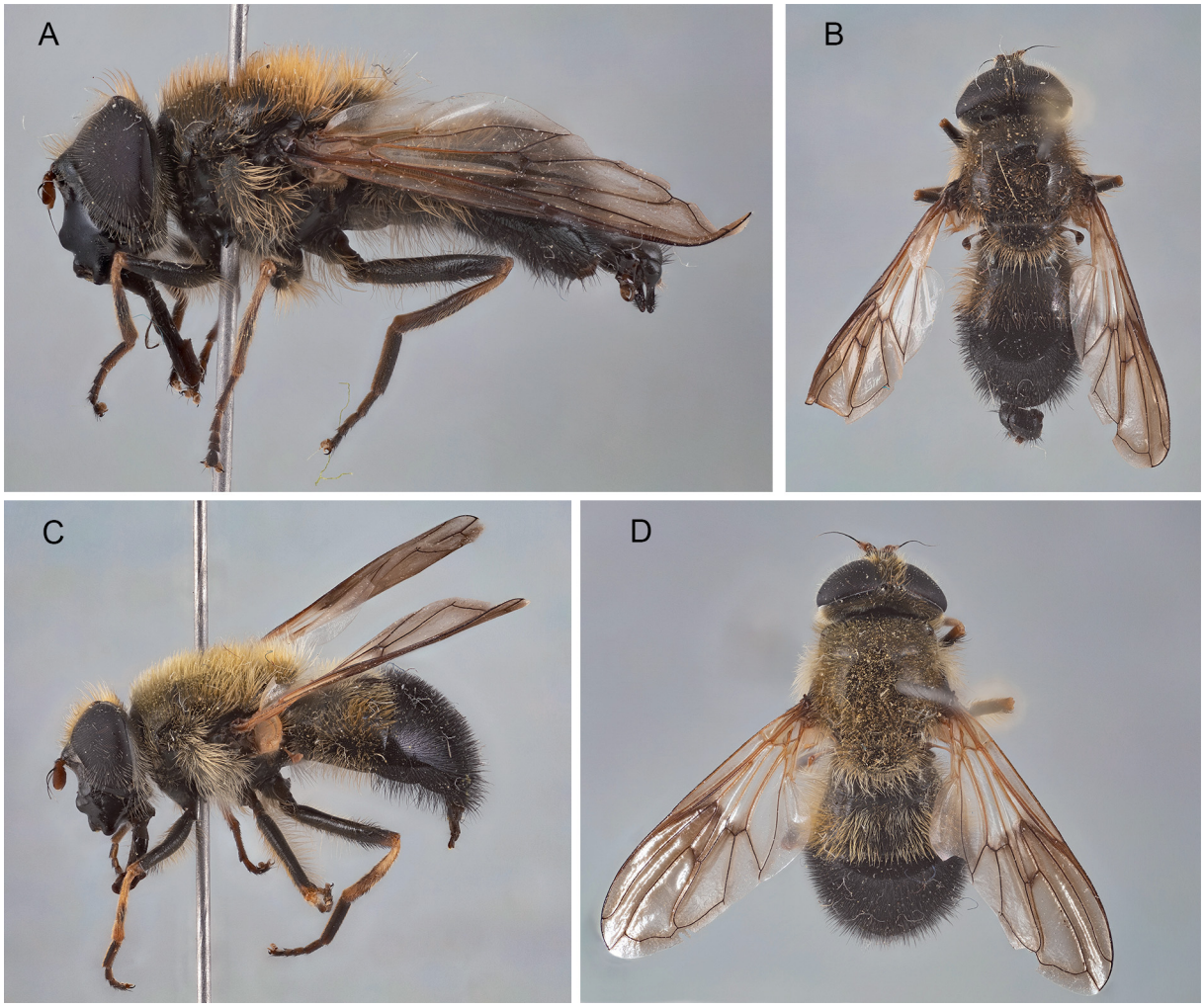

Fig. 23. *Cheilosia* (*Montanocheila*) *contrasta* sp. nov. **A–B**. Holotype, ♂ (ZFMK, ZFMK-DIP-00066187); habitus, lateral and dorsal views; body length 12.1 mm. **C–D**. Paratype, ♀ (SBA, CNC databasing S Bot 917); habitus, lateral and dorsal views; body length 12.9 mm. Not to scale.

Genetics

All DNA barcodes of *C. contrasta* sp. nov. group together without high support (BS < 90%).

Distribution

So far only known from the type locations in the Greater and Lesser Caucasus in Armenia and Georgia.

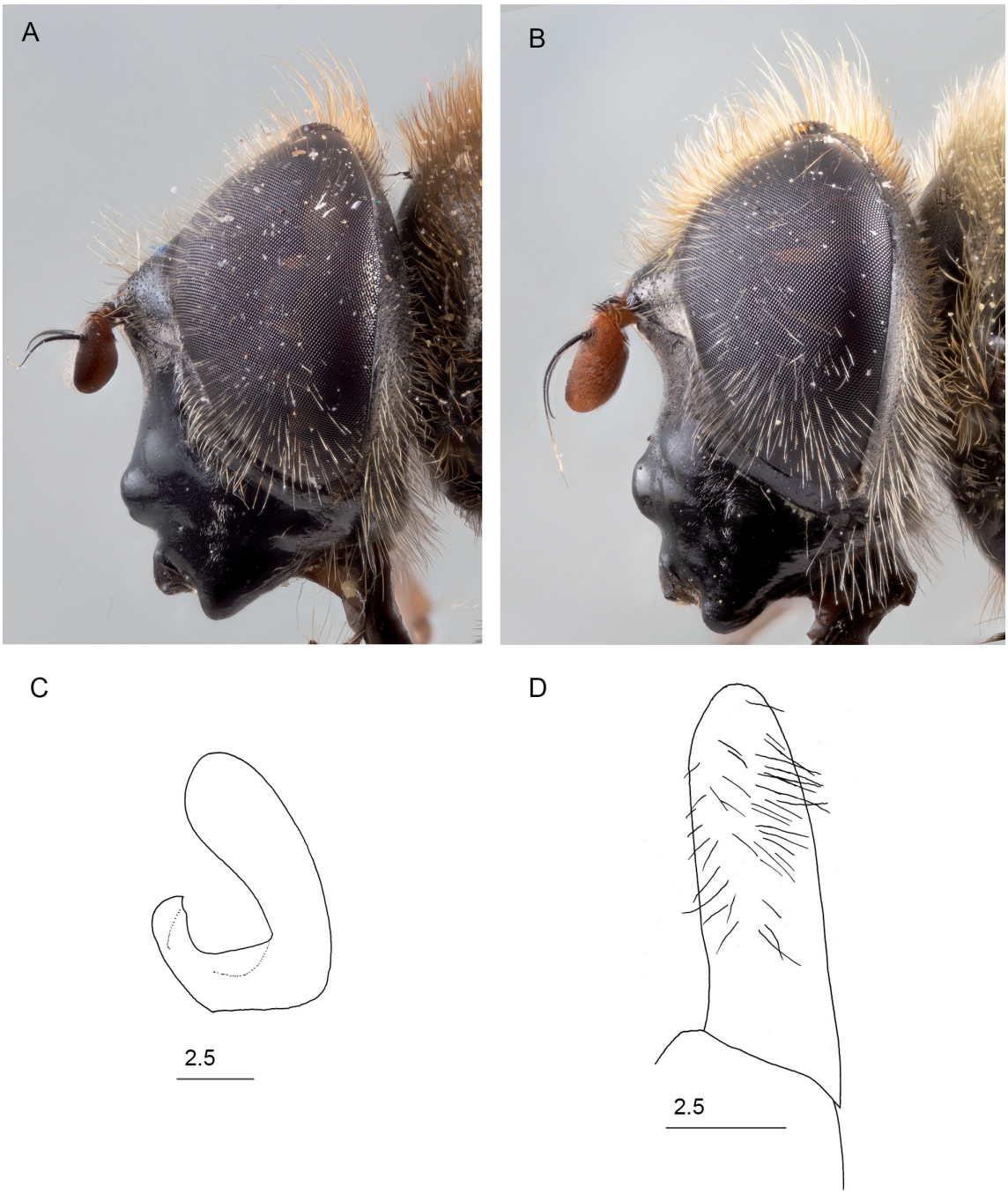

Fig. 24. *Cheilosia* (*Montanocheila*) *contrasta* sp. nov. **A**. Paratype, ♂ (SBA, CNC databasing S Bot 649); head, lateral view; eye width 1.4 mm. **B**. Paratype, ♀ (SBA, CNC databasing S Bot 917); head, lateral view; eye width 1.4 mm. **C–D**. Paratype, ♂ (SBA, SB.003117). **C**. Postgonite, lateral view. **D**. Surstylus, lateral view. Scale bars: A–B not to scale; C–D in µm.

Biology

Collected on forest clearings and on alpine meadows in mountains between 615 and 2601 m a.s.l. Males have been seen hovering in small groups at 1.5 m in the shelter of the last trees near a glacier, in forest clearings near the treeline, at the treeline and 0.5 m above the ground in wind-sheltered hollows along a small mountain stream. Males and females visit flowers of *Salix* sp. Females have been observed to crawl on and underneath *Heracleum* sp. leaf rozettes which may indicate that they oviposit here, and that larvae are associated with this plant.

Cheilosia* (*Convocheila*) *cumanica Szilády, 1938
Fig. 25

Cheilosia cumanica Szilády, 1938: 143.
Cheilosia verae Stackelberg, 1968: 229. Syn. with *Cheilosia cumanica* by Brădescu (1991).

Cheilosia verae – Stackelberg & Richter 1968: 249. — Stackelberg 1970: 62. — Peck 1988: 119. — Barkalov 1993: 712. — Barkalov & Mutin 2018: 484.
Cheilosia verae Stackelberg, 1956 [sic] – Gujabidze 2002: 246.
Cheilosia cumanica – Mengual *et al.* 2020: 22.

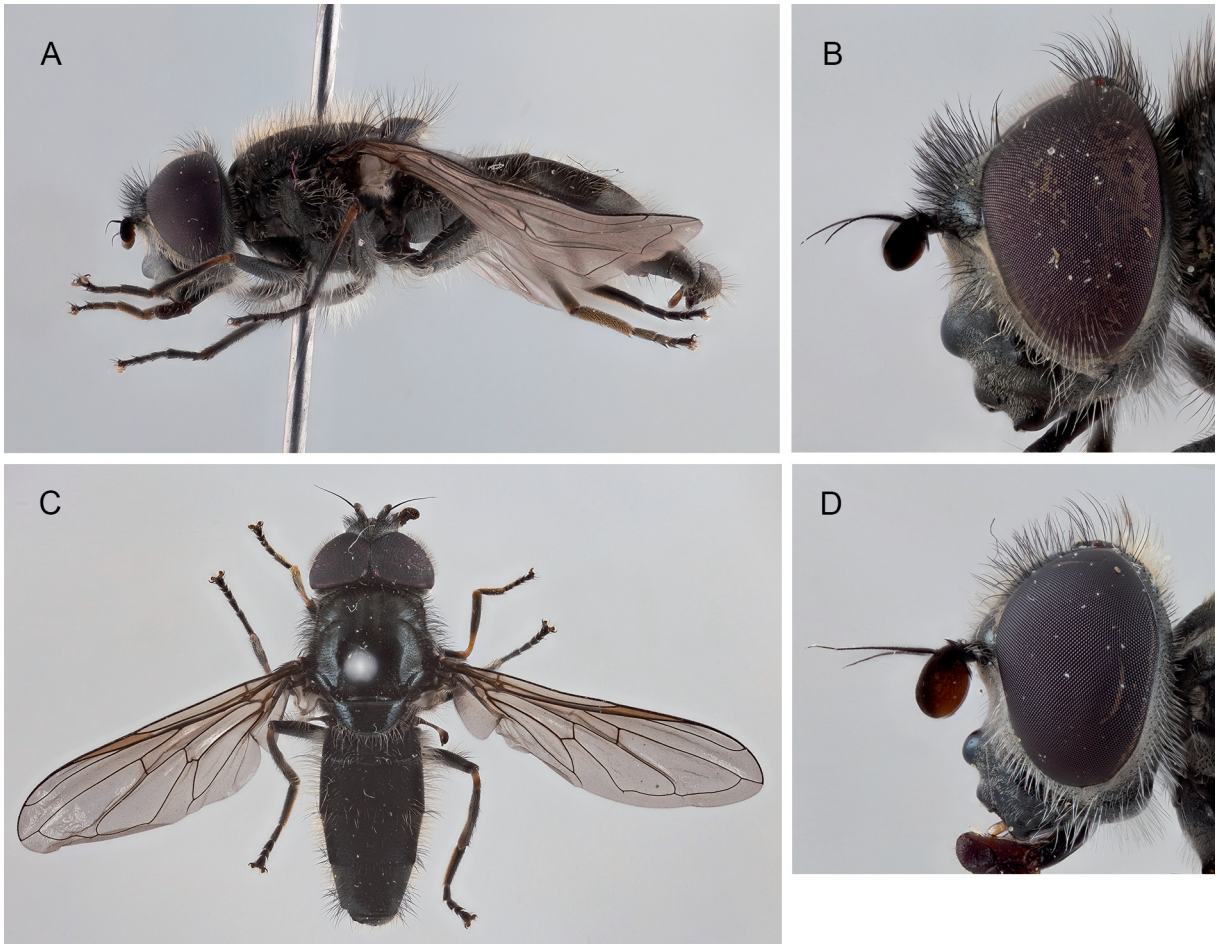

Fig. 25. *Cheilosia* (*Convocheila*) *cumanica* Szilády, 1938. Collected in Georgia. **A**. ♂ (SBA, SB.002275); habitus, lateral view; body length 8.4 mm. **B**. ♂ (SBA, SB.002284); head, lateral view; eye width 1.3 mm. **C**. ♂ (SBA, SB.002271); habitus, dorsal view; body length 8.4 mm. **D**. ♀ (SBA, SB.002299); head, lateral view; eye width 1.1 mm. Not to scale.

Differential diagnosis

Cheilosia cumanica belongs to the subgenus *Convocheila* Barkalov, 2002. One of the distinctive characters of the subgenus is the pilosity on the face: long pilose along paraface in dorsal one third of face. In the males of *Convocheila* the ventral lobe of the postgonite is sickle-shaped. Within the Caucasus, the only other member of the subgenus *Convocheila* is *C. laticornis*, and the male of *C. cumanica* can be easily distinguished from *C. laticornis* by the pilose eye (bare in *C. laticornis*), the female has few long black pile on the occiput, besides long yellow pile (with only long yellow pile in *C. laticornis*) and scutellum on posterior margin with robust black setae (with weak, yellow setae in *C. laticornis*). The male genitalia of *C. cumanica* are figured in Radenković *et al.* (2020).

Material examined

Collected in 2018, 2019, 2021, 2022 and 2023; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

All DNA barcodes of *C. cumanica* are recovered together with high support value (BS = 100%).

Remarks

In the Caucasus, this taxon is often reported under the name *C. verae*, but Brădescu (1991) synonymized *C. verae* under *C. cumanica*. Our genetic results (Supp. file 1: Fig. S1) support this synonymy as specimens from the Caucasus cluster together with specimens from Serbia.

Biology

During our expeditions, collected between 2 May and 19 July at an altitude between 625 and 2700 m a.s.l. Most common on alpine meadows where it feeds on the flowers of herbaceous plants.

Distribution

Balkan Peninsula, Carpathian Mountains, Iran, and Caucasus (Armenia, Georgia, Russia).

Cheilosia* (*Cheilosia*) *cynocephala Loew, 1840
Fig. 26

Chilosia cynocephala Loew, 1840: 32.

Differential diagnosis

Cheilosia cynocephala is especially similar to *C. confusa* sp. nov. and *C. vernalis*. It has a blue body shine; in contrast, in *C. confusa* and *C. vernalis* the body shine is black or brown. Usually, the female of *C. cynocephala* has faint, blackish cloud in the wing (but this characteristics is missing in the only Caucasian studied specimen), missing in the other two species. Another character to exclude *C. confusa* is the predominantly black pile on the scutum (predominantly yellow pilose in *C. confusa*). Other characters to exclude *C. vernalis* are: parafacia wide and pruinose in *C. cynocephala* (narrower and shiny in *C. vernalis*), scutum covered largely with black pile (in *C. vernalis* pile varying from yellow to black) and tarsus of mesoleg black (in *C. vernalis* often basal two tarsomeres orange).

Material examined

GEORGIA – **Samtskhe-Javakheti** • 1 ♀; Borjomi; 41.838° N, 43.337° E; 910 m a.s.l.; 2 Sep. 2019; J. Mortelmans leg.; FMT.

Genetics

All DNA barcodes of *C. cynocephala* (from Finland and Spain; see Ballester-Torres *et al*. 2024) are recovered together with low support value (BS < 90%).

Remarks

Reported from the Caucasus for the first time.

Distribution

Europe, Western Siberia and Caucasus (Georgia).

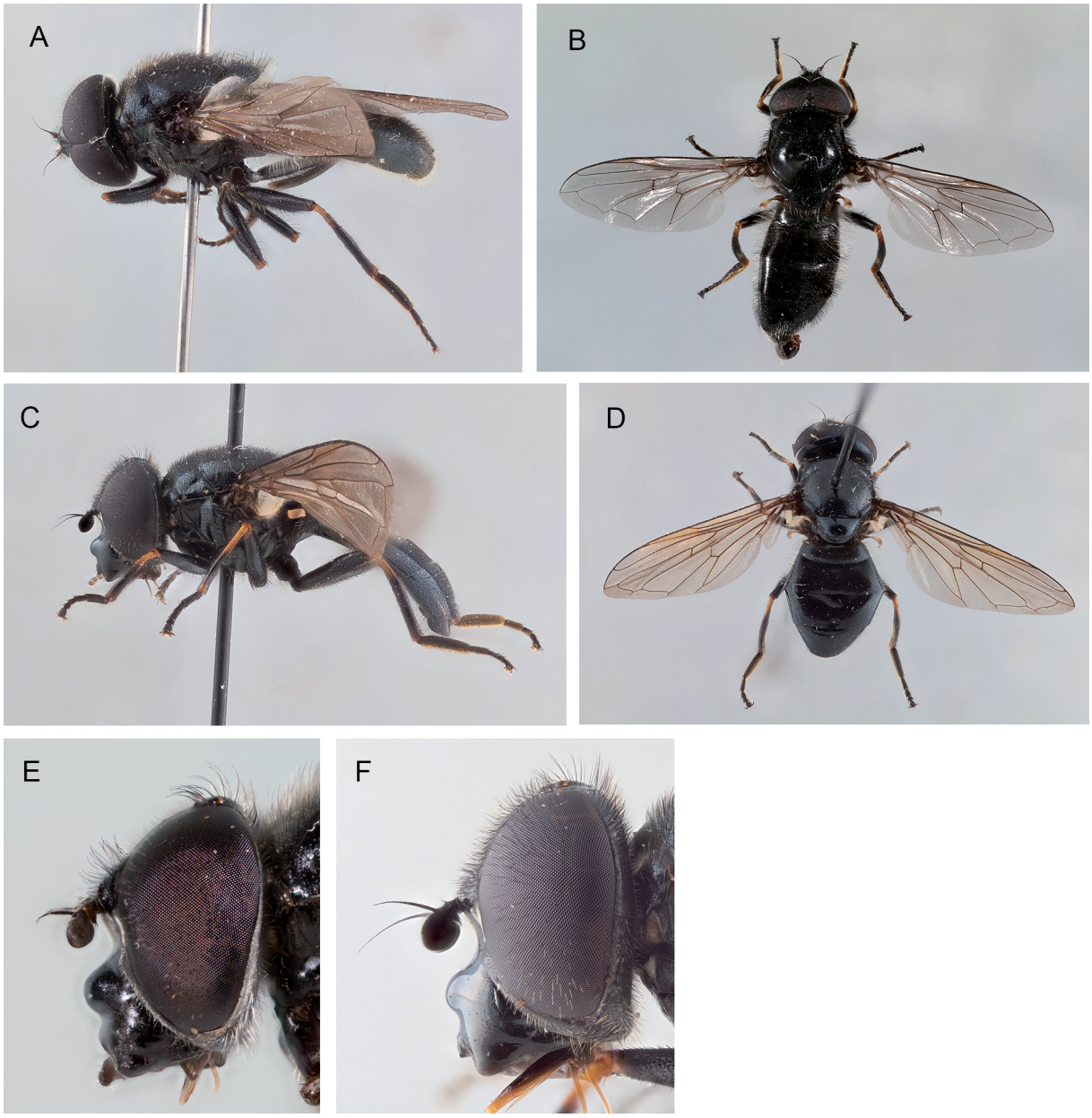

Fig. 26. *Cheilosia* (*Cheilosia*) *cynocephala* Loew, 1840. **A**. ♂ (SBA, SB.004468); habitus, lateral view; collected in Altai Republic, Russia; body length 9.9 mm. **B**. ♂ (FMT); habitus, dorsal view; collected in Belgium; body length 8.7 mm. **C**. ♀ (FMT); habitus, lateral view; collected in Georgia; body length 8.3 mm. **D**. ♀ (FMT); habitus, dorsal view; collected in Georgia; body length 8.3 mm. **E**. ♂ (FMB); head, lateral view; collected in Belgium; eye width 1.3 mm. **F**. ♀ (FMT); head, lateral view; collected in Georgia; eye width 1.2 mm. Not to scale.

Cheilosia* (*Cheilosia*) *flavipes (Panzer, 1798)
Fig. 27

Syrphus flavipes Panzer, 1797: 10.

Cheilosia flavipes – Stackelberg & Richter 1968: 245. — Peck 1988: 102. — Barkalov 1993: 705. — Barkalov & Mutin 2018: 483. — Mengual *et al.* 2020: 16.

Differential diagnosis

The male of *Cheilosia flavipes* has the combination of a bare eye, bare face, bicoloured legs, posterior margin of scutellum without setae and dorsal and ventral pile patches on katepisternum widely separated. These characters are shared with males of *C. brunnipennis*, *C. megaclama* sp. nov. and *C. nebulosa*. It has the basal three or four tarsomeres of the protarsus yellow (black in *C. megaclama*), arista black (with orange base in *C. nebulosa*), postpedicel ca 1.5 times as wide as high (ca two times as wide as high in *C. brunnipennis*) and angle of approximation of eyes less than 90° (100–110° in *C. brunnipennis*). Within the Caucasus, the female *C. flavipes* is easily identified by the combination of a bare eye and yellow femora.

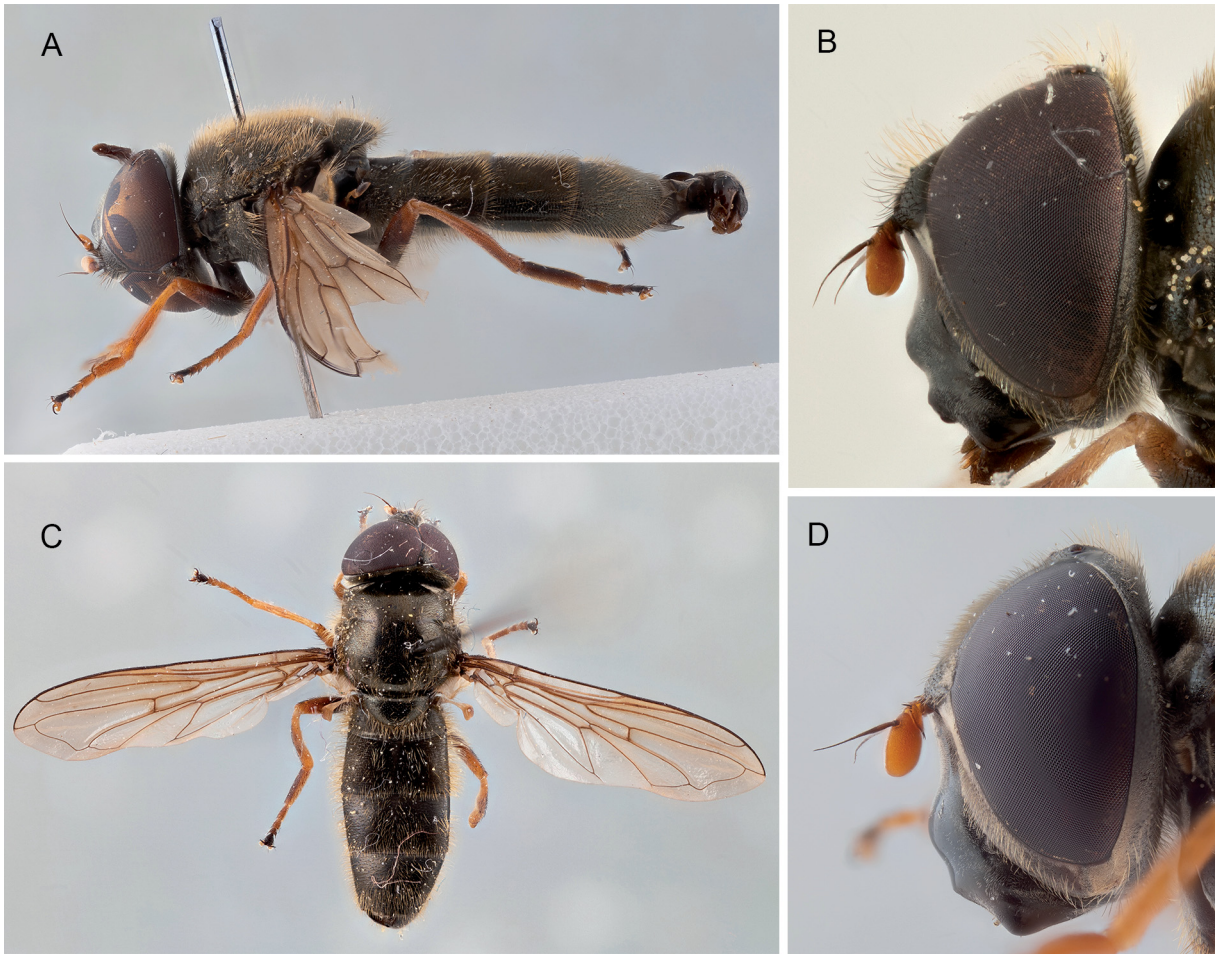

Fig. 27. *Cheilosia* (*Cheilosia*) *flavipes* (Panzer, 1798). **A**. ♂ (SBA); habitus, lateral view; collected in France; body length 11.1 mm. **B**. ♂ (JMG); head, lateral view; collected in Belgium; eye width 1.5 mm. **C**. ♂ (JMG); habitus, dorsal view; collected in Belgium; body length 10.7 mm. **D**. ♀ (SBA, SB.004469); head, lateral view; collected in Belgium; eye width 1.3 mm. Not to scale.

Material examined

Species not collected.

Genetics

All DNA barcodes of *C. flavipes* (all from Europe) are recovered together with high support value (BS = 100%).

Distribution

Western and Central Palaearctic, into Siberia. Within the Caucasus only reported from the Armenian Highlands.

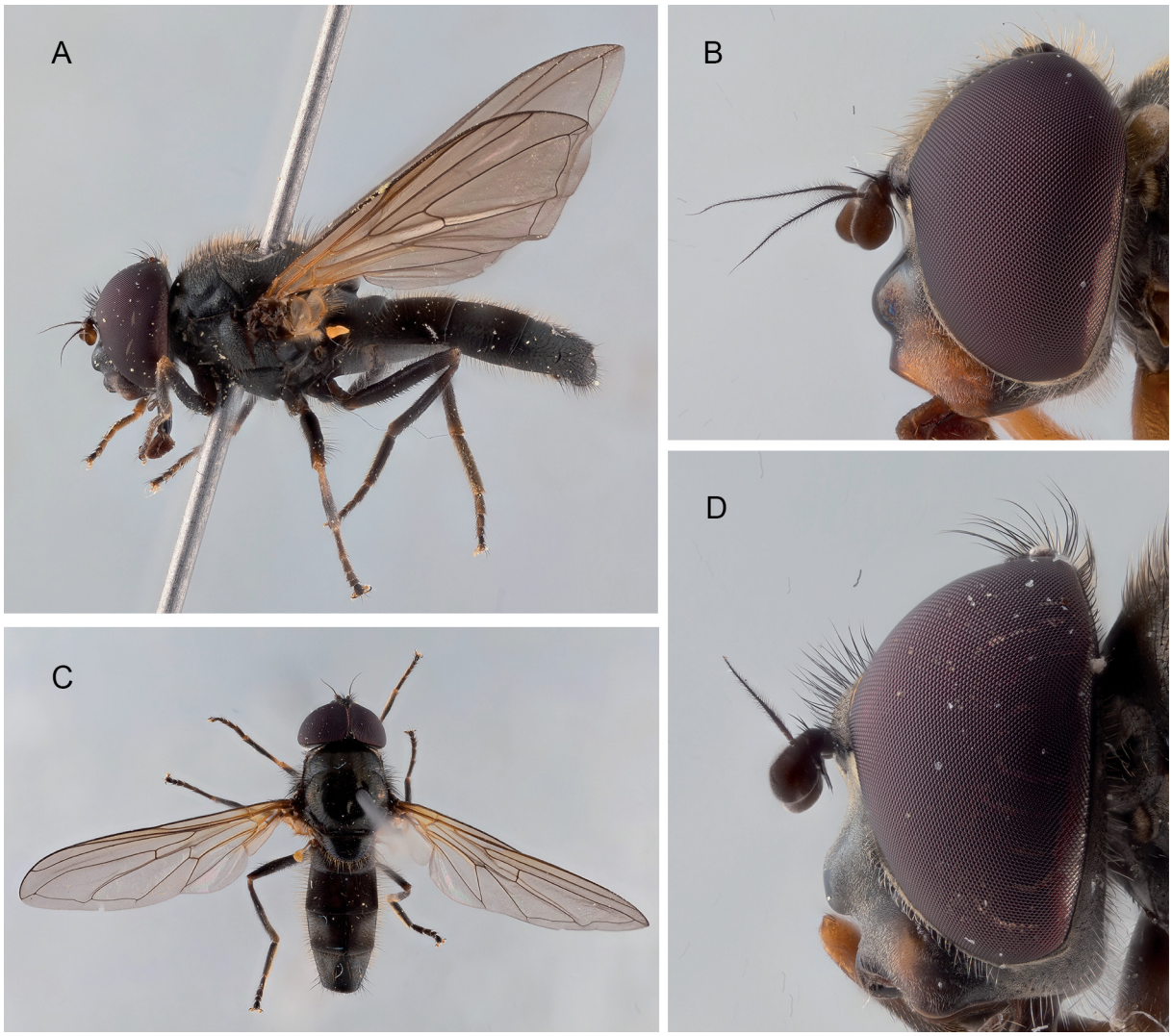

Fig. 28. *Cheilosia* (*Eucartosyrphus*) *flavissima* Becker, 1894. Collected in Finland. **A**. ♂ (SBA, SB.004470); habitus, lateral view; body length 8.0 mm. **B**. ♀ (SBA, SB.004473); head, lateral view; eye width 1.2 mm. **C**. ♂ (SBA, SB.004471); habitus, dorsal view; body length 8.1 mm. **D**. ♂ (SBA, SB.004472); head, lateral view; eye width 1.2 mm. Not to scale.

Cheilosia* (*Eucartosyrphus*) *flavissima Becker, 1894
Fig. 28

Chilosia flavissima Becker, 1894: 371.

Cheilosia pallipes Loew, 1863 – Stackelberg & Richter 1968: 247. — Peck 1988: 112.
Chilosia flavissima – Barkalov 1993: 712. — Mengual *et al*. 2020: 23.

Differential diagnosis

The male of *Cheilosia flavissima* is similar to that of *C. ruffipes* and *C. scutellata*, but more yellow: face and trochanter partly yellow and basal one third of wing with yellow veins, all black in *C. ruffipes* and *C. scutellata*. All males of the three species stand out amongst other *Cheilosia* in having a broad facial tubercle, but in *C. flavissima* this is less pronounced than in *C. ruffipes* and *C. scutellata*. The female is also very yellow, the only *Cheilosia* having the combination of yellow pro- and mesofemur and entirely yellow scutellum.

Material examined

Species not collected.

Genetics

All DNA sequences of *C. flavissima* group together with high support (BS = 100%).

Distribution

Palaearctic. Within the Caucasus, only reported from Azerbaijan.

Cheilosia* (*Cheilosia*) *gemmula sp. nov.
urn:lsid:zoobank.org:act:C749B7FD-EE67-4D7C-BACF-053E4C934C46
Figs 29–30

Differential diagnosis

Cheilosia gemmula sp. nov. has a combination of characters found only in a few other species: eye black pilose, face bare, legs black, scutellum with setae on posterior margin and sterna shiny. Nevertheless, our new species is smaller than all similar species (5.5–8.5 mm). It is similar to *C. vernalis* but it differs by black legs and black postpedicel (Fig. 30A–B) (in *C. vernalis* legs and usually also postpedicel bicoloured, black and orange), arista bare with thickened basis (without thickened basis in *C. vernalis*), face shinier and parafacia wider. *Cheilosia gemmula* is similar to *C. caucasi* sp. nov. but smaller (5.5–8.5 mm vs 8–11.5 mm), shinier, pile on eyes longer and black (Fig. 30A–B) (shorter and partly yellow in *C. caucasi*), face, frons and parafacia without pruinosity (more pruinose in *C. caucasi*), arista shorter and basis thicker (Fig. 30A–B) and wings hyaline (black infuscate in *C. caucasi*). Moreover, the female of *C. gemmula* differs from that of of *C. caucasi* by a long erect mixed black and white pile on the scutum instead of an adpressed predominantly black pile in *C. caucasi*.

Etymology

The species name '*gemmula*' is a diminutive of the Latin word '*gemma*' meaning 'gemstone' or 'jewel' (Brown 1956: 170) and it refers to the small and shiny appearance of the species. Species epithet to be treated as a noun in apposition.

Material examined

Holotype
GEORGIA • ♂; Samegrelo-Zemo Svaneti; 42.911° N, 42.938° E; 2480 m a.s.l.; 27 Jun. 2018; S. Bot leg.; ZFMK, SB.003124 = ZFMK-TIS-8009652.

Paratypes

GEORGIA – **Mtskheta-Mtianeti** • 7 ♂♂; Kazbegi Municipality, gravel area 3 km SSE of Kobi; 42.5201° N, 44.5153° E; 2913 m a.s.l.; 31 Jul. 2001; J.-H. Stuke leg.; ZFMK, ZFMK-DIP-00058271 to ZFMK-DIP-00058277 • 18 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00058278 to ZFMK-DIP-00058295 • 17 ♂♂; Kazbegi Municipality, glacier foot 6 km W of Stepantsminda; 42.6601° N, 44.5565° E; 2800–3000 m a.s.l.; 2 Aug. 2001; J.-H. Stuke leg.; ZFMK, ZFMK-DIP-00058296 to ZFMK-DIP-00058312 • 46 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00058313 to ZFMK-DIP-00058358 • 1 ♀; Kazbegi Municipality, slopes W of Stepantsminda; 42.6591° N, 44.6366° E; up to 2500 m a.s.l.; 2 Aug. 2001; J.-H. Stuke leg.; ZFMK, ZFMK-DIP-00058359. – **Samegrelo-Zemo Svaneti** • 4 ♀♀; 42.911° N, 42.938° E; 2480 m a.s.l.; 27 Jun. 2018; S. Bot leg.; SBA, SB.003125 = ZFMK-TIS-8009653, SB.003126 to SB.003128; SBA • 6 ♂♂; 43.028° N, 42.910° E; 2834 m a.s.l.; 13 Jun. 2019; S. Bot leg.; SBA, SB.003129 to SB.003134 • 3 ♀♀; same data as for preceding; SBA, SB.003135 = ZFMK-TIS-8009654, SB.003136, SB.003137 • 3 ♂♂, 2 ♀♀; 14 km E of Mestia; 43.0256° N, 42.8908° E; 2550 m a.s.l.; 13 Jun. 2019; F. Van de Meutter leg; FMT • 1 ♀; 43.0254° N, 42.8906° E; 2550 m a.s.l.; 13 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8008805 = ZFMK-DIP-00066468 • 1 ♂; 43.02° N, 42.89° E; 2600 m a.s.l.; 13 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.958 • 1 ♂; 43.0259° N, 42.9103° E; 2863 m a.s.l.; 13 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386376 • 1 ♀; same data as for preceding; CNC, CNC1386385 • 1 ♀; Latpari Pass; 42.8816° N, 42.9466° E; 2836 m a.s.l.; 13 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386706 • 1 ♂; 43.0275° N, 42.9115° E; 2887 m a.s.l.; 14 Jul. 2021; S. Bot leg.; SBA, SB.003138 • 9 ♀♀; same data as for preceding; SBA, SB.003139 to SB.003147 • 1 ♀; same data as for preceding; ZFMK, ZFMK-TIS-8011500. – **Samtskhe-Javakheti** • 1 ♂; Kodiani; 41.7300° N, 43.3485° E; 2080 m a.s.l.; 10 May 2023; W. Opdekamp leg.; WOR, A021.

Description

Male

Length. Body 6.5–8.5 mm, wing 5.5–7 mm.

Head. Face bare, black, shiny, with facial tubercle, pruinose below lunule, with facial tubercle, gena with small pruinose area. Parafacia black, shiny or slightly pruinose, white pilose, wide, about ¾ as wide as postpedicel. Frontal triangle black, shiny, very narrowly pruinose along eye margin, with long black pile. Length of eye contiguity about as long as length of frons. Angle of approximation of eyes ca 80–90°. Vertical triangle black, shiny, ocellar triangle shiny, long black pilose. Occiput pruinose, shiny on dorsal part, short yellow and long black pilose. Lunule dark orange to black, with distinct medial arm, separating acetabula. Scape black, anteriorly with black setae; pedicel black, anteriorly with black setae; postpedicel black, rounded, pruinose, about as wide as high; arista short, black, bare, basal one third thickened. Eye with long black pile.

Thorax. Scutum black, shiny, finely punctured, with long erect black pile, some variable yellow pile intermixed. Scutellum shiny, with erect long and short black pile, sometimes some variable yellow pile intermixed, posterior margin with black setae. Pleura black, slightly pruinose, with black pile, pile on proepisternum and metasternum white, pile intermixed white and black on katepisternum; dorsal and ventral pile patches on katepisternum widely separated. Haltere pedicellum dark yellow, capitulum black.

Wing. Wing hyaline, entirely microtrichose, veins dark brown to black.

Legs. Legs black. Coxae pruinose, with mixed yellow and black pile. Trochanters with mixed black and yellow pile. Profemur with black pile except a few yellow pile anterolaterally; mesofemur with black pile, basis antero- and posterolaterally with mixed black and yellow pile; metafemur black pilose; posterolaterally with mixed black and yellow pile; anterolaterally at basis with some yellow pile; ventrally with short black setae. Protibia black pilose, anterolateral yellow pilose; mesotibia black pilose; metatibia black pilose, apical half of anterolateral side yellow pilose. Protarsus dorsally and posterolaterally black pilose, ventrally and anterolaterally yellow pilose; mesotarsus black pilose; metatarsus dorsally black pilose, ventrally yellow pilose.

Abdomen. Terga I–III shiny, medially slightly pruinose; tergum IV shiny; terga I–IV laterally with long white pile except with black pile along tergum II and often black pile at posterolateral corners of terga I, III and IV, medially with adpressed black or mixed black and yellow pile. Sternum I pruinose, shiny in center; sterna II–III shiny; sternum IV shiny, posterior margin broadly slightly pruinose; sternum I with erect white pile, sternum II with long erect yellow pile, sometimes with a little black pile medially; sternum III–IV with adpressed mixed black and yellow pile. Genitalia with surstylus about 1.6 times as long as wide, on apical part with field of microtrichia (Fig. 30D). Ventral lobe of postgonite longer than dorsal lobe (Fig. 30C). Apical sclerite of aedeagus with wide and large anterior lobes, lacking posterior lobes.

Female

Length. Body 5.5–7 mm, wing 5–6 mm.

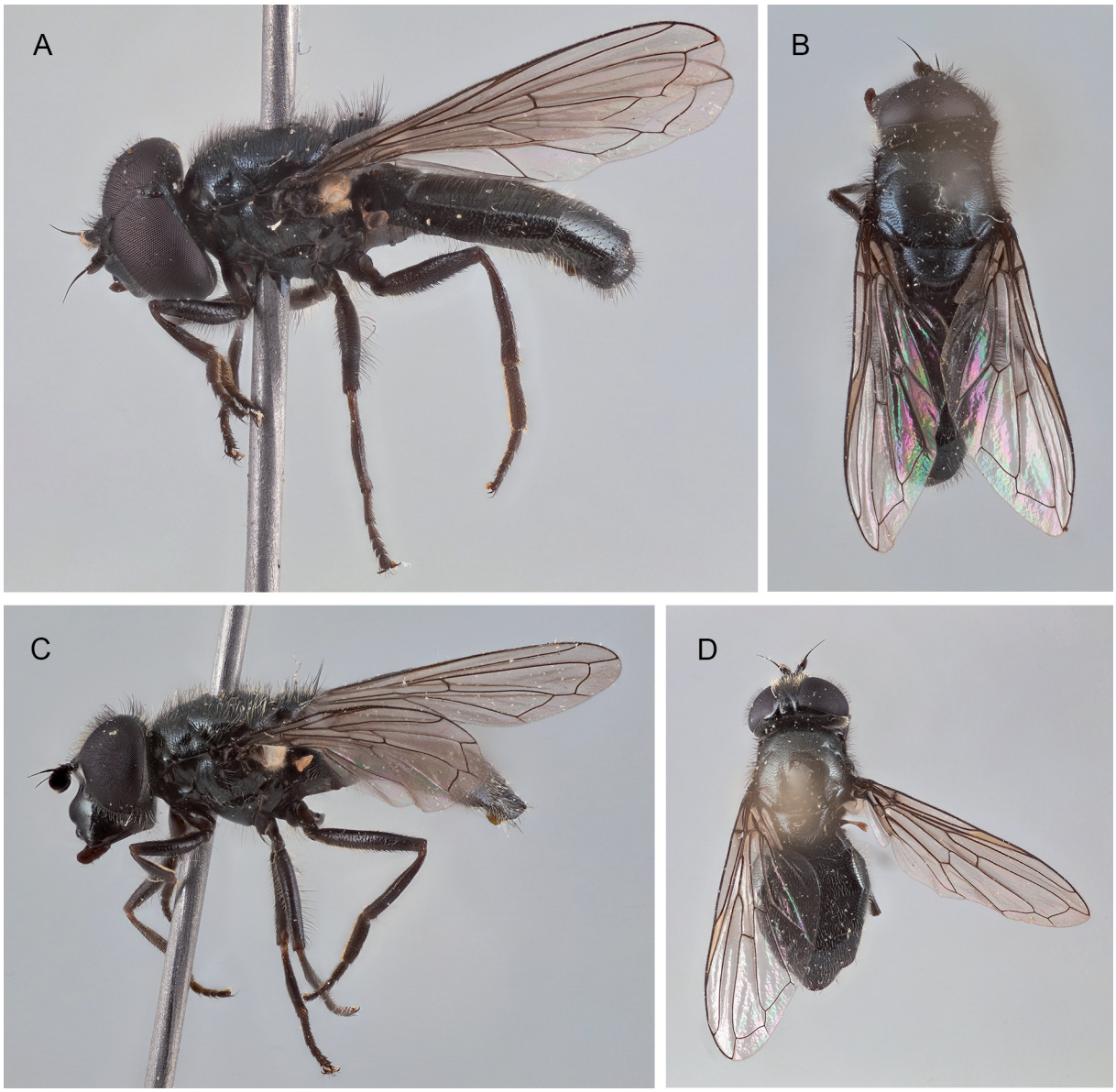

Fig. 29. *Cheilosia* (*Cheilosia*) *gemmula* sp. nov. **A–B**. Holotype, ♂ (ZFMK, ZFMK-TIS-8009652); habitus, lateral and dorsal views; body length 6.6 mm. **C–D**. Paratype, ♀ (SBA, ZFMK-TIS-8009653); habitus, lateral and dorsal views; body length 6.5 mm. Not to scale.

Similar to the male, except for normal sexual dimorphism and the following characters. Frons with mixed yellow and black pile. Scutum with long mixed black and yellow pile, yellow pile often dominating. Terga shinier, with larger proportion of white pile, laterally more often with exclusively white pile.

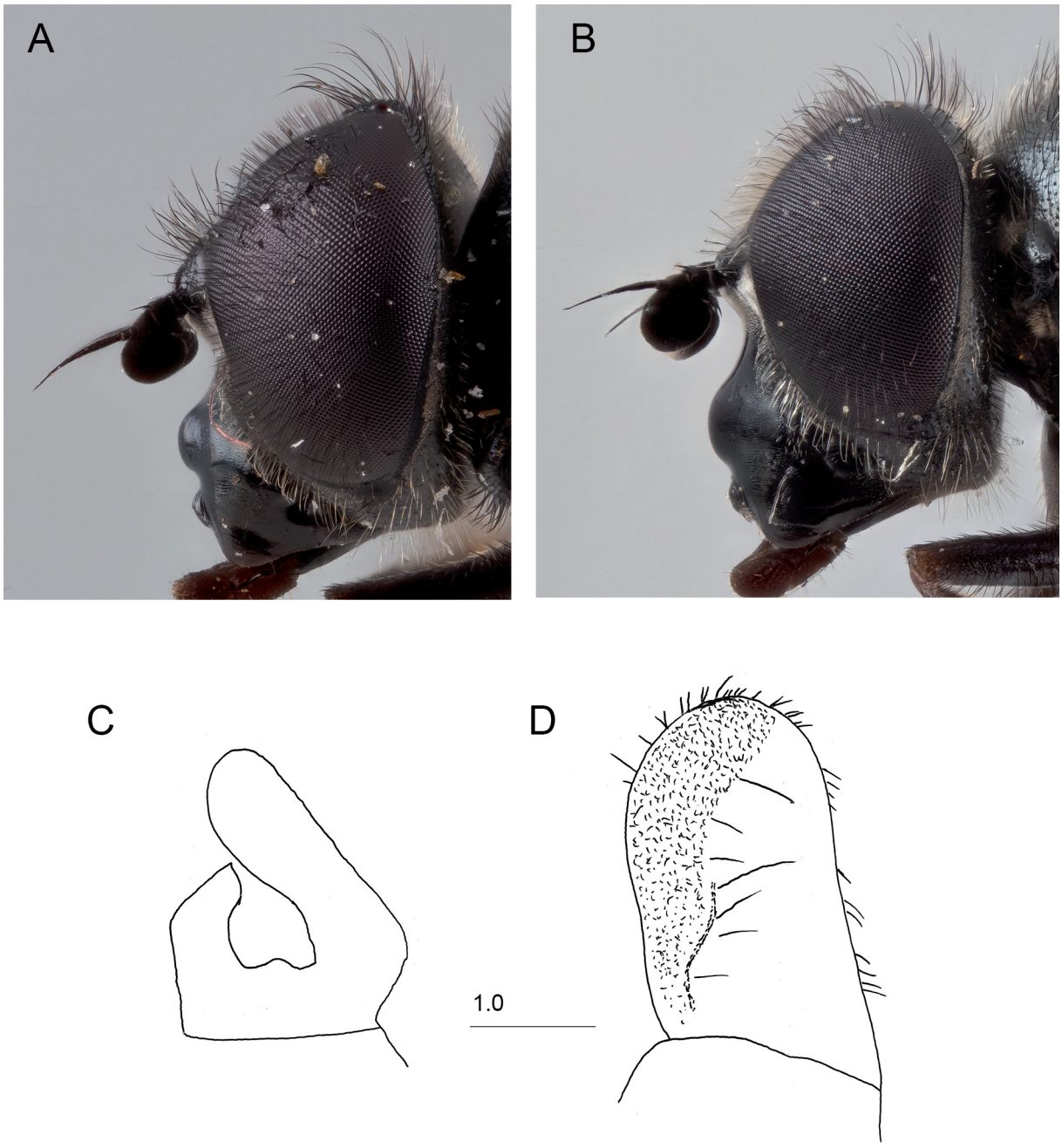

Fig. 30. *Cheilosia* (*Cheilosia*) *gemmula* sp. nov. **A**. Holotype, ♂ (ZFMK, ZFMK-TIS-8009652); head, lateral view; eye width 0.9 mm. **B**. Paratype, ♀ (SBA, ZFMK-TIS-8009653); head, lateral view; eye width 0.9 mm. **C–D**. Paratype, ♂ (SBA, SB.003133). **C**. Postgonite, lateral view. **D**. Surstylus, lateral view. Scale bars: A–B not to scale; C–D in μm.

Genetics

Our NJ tree has a cluster (BS < 90%) with all the DNA barcodes of *C. melanura*, *C. bracusi*, *C. triamilia*, *C. gemmula* sp. nov., *C. vernalis* and *C. confusa* sp. nov., which shows relatively low interspecific p-distance (maximum p-distance among all the cited species < 0.022), except for the specimen of *C. vernalis* ZFMK-DIP-00093901 (= ZFMK-TIS-8014645) that reaches interspecific p-distances of 0.0285 (see Supp. file 3: Table S2). All DNA sequences of *C. gemmula* cluster together.

Biology

Alpine zone species collected between 2080 and 3000 m a.s.l. in open, rocky areas. Flying low, visiting low flowers or sitting on rocks. A group of males has been observed sitting on an elevated part of an exposed road verge, performing swift short flights and returning to the same spot.

Distribution

Only known from the type localities in the Greater and Lesser Caucasus in Georgia.

Cheilosia* (*Cheilosia*) *gigantea (Zetterstedt, 1838)
Fig. 31

Eristalis gigantea Zetterstedt, 1838: 612.

Cheilosia gigantea – Stackelberg & Richter 1968: 245. — Stackelberg 1970: 62. — Peck 1988: 103. — Barkalov 1993: 724. — Barkalov & Mutin 2018: 483. — Mengual *et al.* 2020: 16. — Speight 2020a: 35.
Cheilosia gigantean [sic] – Gujabidze 2002: 245.

Differential diagnosis

Cheilosia gigantea is a member of a group of closely related species, called the *proxima* group (Vujić *et al.* 2013) in which the pilose eyes, posterior margin of scutellum with setae, usually partly yellow legs, continuously pilose katepisternum, pruinose sterna and the shape of postgonite are distinctive characters. For a full diagnosis of the *Cheilosia proxima* group see Vujić *et al.* (2013). Within the *proxima* group, *C. gigantea* is particularly similar to *C. ushguliensis* sp. nov. and *C. proxima*. The male genitalia of *C. gigantea* are figured in Vujić *et al.* (2013). The male can be identified from that of *C. ushguliensis* by having the abdomen usually partly with black pile (usually all yellow in *C. ushguliensis*) and by having the facial tubercle well-developed (poorly developed in *C. ushguliensis*). The male can be separated from that of *C. proxima* by on average larger body size (7–12 mm vs 7–9 mm), basal two thirds of metafemur with the anterodorsal pile as long as or shorter than the anteroventral pile (basal two thirds of metafemur with the anterodorsal pile longer than the anteroventral pile in *C. proxima*) and dorsal lobe of postgonite simple (with a more or less distinct hook on its dorsal margin in *C. proxima*). In the female *Cheilosia gigantea* differs from *C. ushguliensis* by the more extensive pruinose terga (shiny except pruinose along anterior margin of tergum III in *C. ushguliensis*) and pile on scutum often partly black and semi-adpressed (with erect golden pile in *C. ushguliensis*). The female can be separated from that of *C. proxima* by on average larger body size (7–12 mm vs 7–9 mm), basal two thirds of metafemur with the anteroventral pile long, usually obviously longer than diameter of metafemur (without anteroventral pile, occasionally with few individual pile anteroventrally which are shorter than, or rarely as long as, the diameter of the metafemur in *C. proxima*) and apex of metafemur ventrally with some black setae (usually absent in *C. proxima*).

Material examined

Collected in 2018, 2019, 2021 and 2023; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

DNA barcodes of *C. gigantea* from Europe and the Caucasus cluster together with high support (BS = 100%).

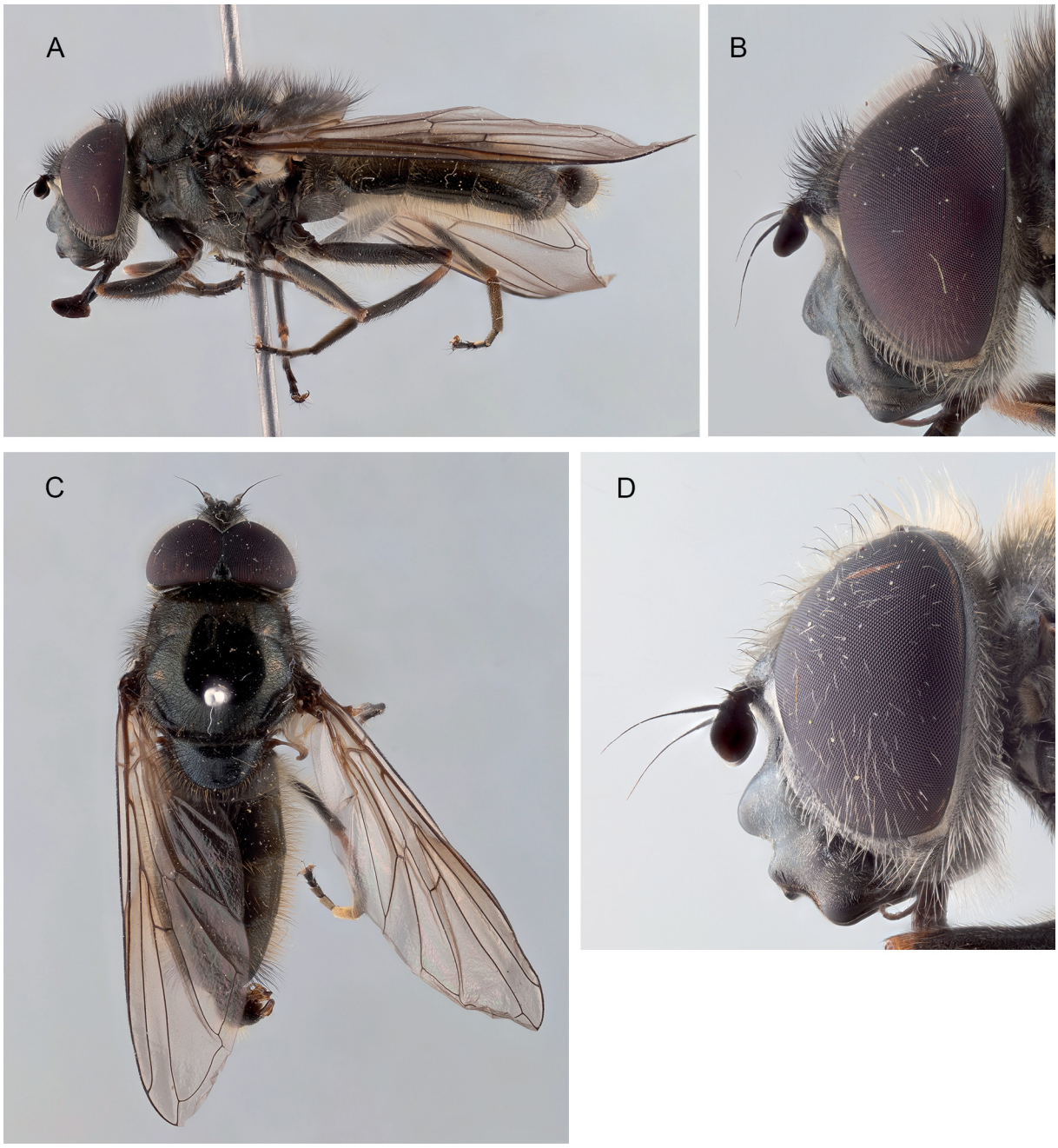

Fig. 31. *Cheilosia* (*Cheilosia*) *gigantea* (Zetterstedt, 1838). Collected in Georgia. **A**. ♂ (SBA, SB.002333); habitus, lateral view; body length 11.4 mm. **B**. ♂ (SBA, SB.002333); head, lateral view; eye width 1.4 mm. **C**. ♂ (SBA, SB.002333); habitus, dorsal view; body length 11.4 mm. **D**. ♀ (SBA, SB.002337); head, lateral view; eye width 1.3 mm. Not to scale.

Biology

During our expeditions, collected between 9 May and 13 July at an altitude between 1090 and 2807 m a.s.l. in montane, subalpine and alpine meadows.

Distribution

Palaearctic. Within the Caucasus known from Armenia, Georgia and Russia.

Cheilosia* (*Montanocheila*) *gorodkovi Stackelberg, 1963
Fig. 32

Cheilosia gorodkovi Stackelberg, 1963: 518.
Cheilosia kuznetzovae Skufjin, 1977: 58. Syn. with *Cheilosia gorodkovi* by Barkalov & Mutin (2018).

Differential diagnosis

As a member of the subgenus *Montanocheila*, males of *Cheilosia gorodkovi* can be identified from those of all other subgenera by the apical sclerite of distiphallus, having two pairs (anterior and posterior) of lobes. Within the subgenus, it is similar to *Cheilosia rufa* sp. nov. For differences with that species, see Differential diagnosis under *Cheilosia rufa*. Females can be more difficult to identify as a member of the subgenus *Montanocheila* given that the often-used character to do so, wing with brown pattern in the middle, is not always obvious in *C. gorodkovi*. However, it is still possible to separate it from similar looking females from other subgenera occurring in the Caucasus by the black femora with yellow apex (femora all yellow in *C. albipila* and *C. aurantia* sp. nov.). Within the subgenus *Montanocheila* occurring in the Caucasus, *C. gorodkovi* has a not protruding face (Fig. 32F) (protruding in the other species), short pile on scutellum (shorter than diameter of metafemur, longer than diameter of metafemur in the other species), metafemur anteroventrally with pile shorter than diameter of metafemur (longer than diameter of metafemur in the other species) and on average with shorter body length (on average 9.5 mm vs usually larger than 9.5 mm in other *Montanocheila*). The male genitalia of *C. gorodkovi* are figured in Claussen (1998).

Material examined

Cheilosia gorodkovi was collected in 2018, 2019, 2022 and 2023, but 2018 records not published in Mengual *et al.* (2020); hence, all records are reported here.

ARMENIA – **Kotayk Province** • 1 ♀; Tsaghkadzor area, towards Grand Palace Hotel; 40.53310° N, 44.69966° E; 1975 m a.s.l.; 24 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093688 = ZFMK-TIS-8014644.

GEORGIA – **Mtskheta-Mtianeti** • 10 ♂♂, 2 ♀♀; Lutkhubi; 42.3867° N, 44.79° E; 1580 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT • 5 ♂♂ 1 ♀; Lutkhubi; 42.3951° N, 44.7847° E; 2138 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT • 2 ♂♂; same data as for preceding; ZFMK • 2 ♂♂; Lutkhubi; 42.3984° N, 44.7866° E; 2180 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, C003, C005 • 14 ♂♂; Lutkhubi; 42.3823° N, 44.7856° E; 1500 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, D011, D013, D014, D020, D021, D023 to D027, D029, D031, D034, D039 • 6 ♂♂; Lutkhubi; 42.3938° N, 44.7857° E; 2120 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, E001, E009 to E011, E013, E015 • 1 ♂; Lutkhubi; 42.3930° N, 44.7929° E; 1734 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, C004 • 1 intersex; Lutkhubi; 42.3989° N, 44.7995° E; 2100 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, D003 • 3 ♂♂; Lutkhubi; 42.3984° N, 44.7996° E; 2068 m a.s.l.; 8 May 2023; S. Bot leg.; SBA, SB.002356 = ZFMK-TIS-8027993, SB.002339 = ZFMK-TIS-8028447, ZFMK-TIS-8028448 • 1 ♀; same data as for preceding; SBA, ZFMK-TIS-8027994 • 9 ♂♂, 1 ♀; Lutkhubi; 42.3936° N, 44.7923° E; 1760 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT. – **Samegrelo-Zemo Svaneti** • 1 ♂; S of

Ushguli; 42.888° N, 42.978° E; 2900 m a.s.l.; 28 Jun. 2018; S. Bot leg.; CNC, CNC databasing S. Bot 750 • 1 ♀; 42.9062° N, 42.9370° E; 2615 m a.s.l.; 16 Jun. 2019; F. Van de Meutter leg.; FMT, ZFMK-TIS-8009614 • 1 ♂; Ushguli; 42.900° N, 42.934° E; 2700 m a.s.l.; 17 Jun. 2019; S. Bot leg.; SBA, CNC databasing S. Bot 923 = SB.002338. – **Samtskhe-Javakheti** • 1 ♀; Kodiani; 41.7305° N, 43.3537° E; 2160 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT, ZFMK-TIS-8027946 • 2 ♀♀; Kodiani; 41.7268° N, 43.3490° E; 2150 m a.s.l.; 10 May 2023; W. Opdekamp leg.; WOR, B004, B006.

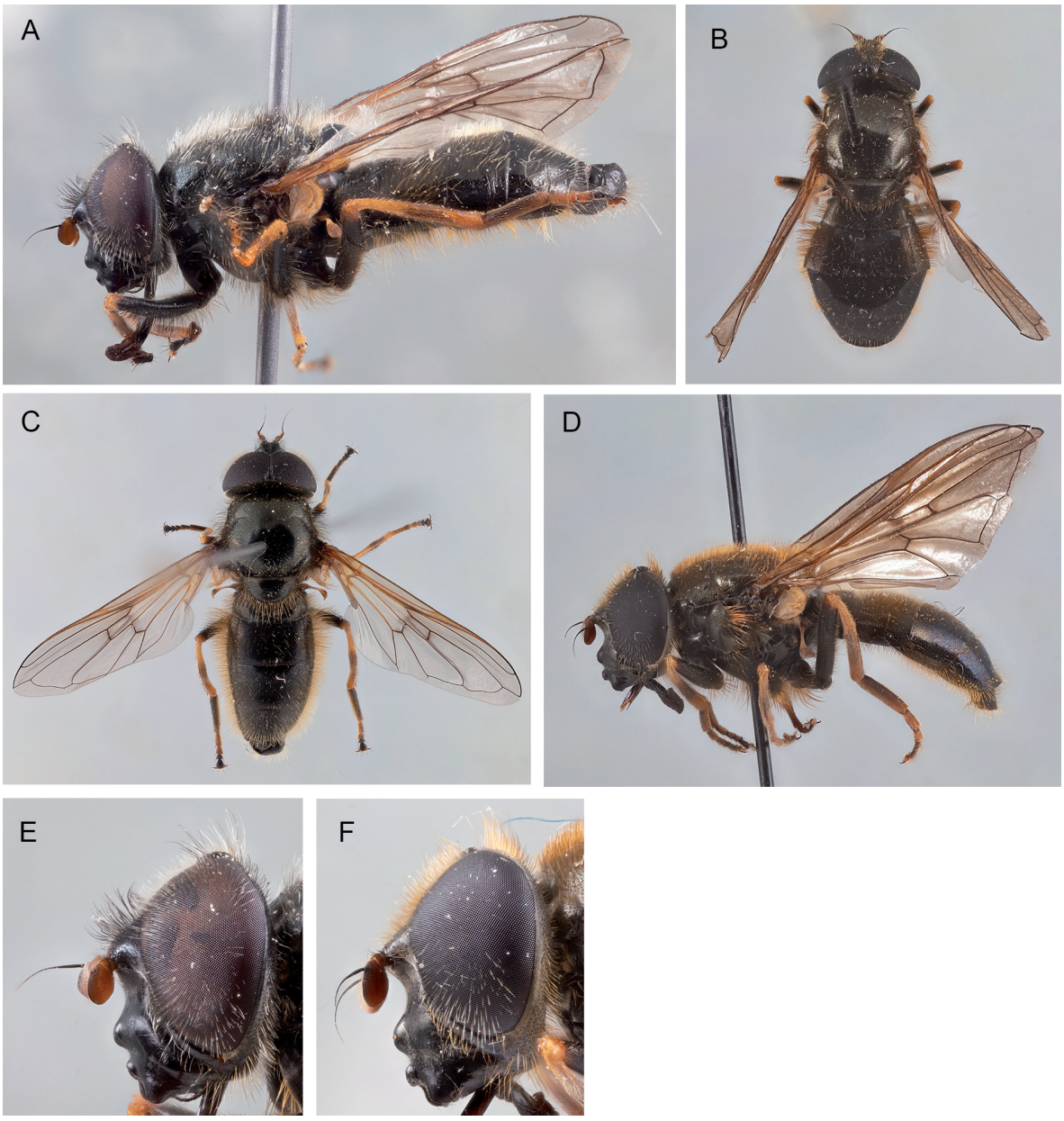

Fig. 32. *Cheilosia* (*Montanocheila*) *gorodkovi* Stackelberg, 1963. Collected in Georgia. **A**. ♂ (SBA, CNC databasing S. Bot 750); habitus, lateral view; body length 9.0 mm. **B**. ♀ (FMT, ZFMK-TIS-8009614); habitus, dorsal view; body length 9.1 mm. **C**. ♂ (SBA, SB.002339); habitus, dorsal view; body length 10.9 mm. **D**. ♀ (FMT, ZFMK-TIS-8009614); habitus, lateral view; body length 9.1 mm. **E**. ♂ (SBA, CNC databasing S. Bot 750); head, lateral view; eye width 1.5 mm. **F**. ♀ (SBA, FMT, ZFMK-TIS-8009614); head, lateral view; eye width 1.3 mm. Not to scale.

Genetics

All DNA sequences of *C. gorodkovi* group together with high support (BS = 98.9%).

Remarks

Stackelberg (1963) described this species from East-Siberia (Irkutsk Region) and Barkalov & Mutin (2018) synonymized *Cheilosia kuznetzovae* Skufjin, 1977 with it after studying the types, also reporting the species from European parts of Russia, Siberia and northern Far East. Reported from the Caucasus for the first time. We compared the specimens of the Caucasus with two males collected in Siberia, and found them to be morphologically identical, including genitalia.

Biology

During our expeditions, collected between 6 May and 28 June at an altitude between 1500 and 2900 m a.s.l. on open subalpine and alpine meadows. Males hover in groups at tree tops, or at protruding ridges on the mountain slope. Visits a variety of mainly low flowers, including *Ranunculus* sp. and white and yellow crucifers.

Distribution

Europe (Poland and European parts of Russia), Caucasus (Armenia and Georgia), east through Siberia up to the Far East (Magadan Region, Yakutia).

Cheilosia* (*Cheilosia*) *grossa (Fallén, 1817)
Fig. 33

Eristalis grossa Fallén, 1817: 53.

Cheilosia grossa Meigen, 1822 [sic] – Gujabidze 2002: 246.
Cheilosia grossa – Barkalov 1993: 718. — Mengual *et al.* 2020: 17.

Differential diagnosis

Cheilosia grossa is a large species (11–12 mm) with dense body pile, pilose eye, bare face, bicoloured legs and posterior margin of scutellum without setae. Identified from other species occurring in the Caucasus having this set of characters except *C. balu* by the black postpedicel (at least basoventrally orange in the others). Easily distinguished from *C. balu* by the yellow metafemur (with black ring in *C. balu*), black pile on eye (brown or yellow in *C. balu*; Fig. 11B, D), scutum with yellow pile (in the male of *C. balu* with black pile, in the female with field of black pile in posterior part) and pruinose sterna (predominantly shiny in *C. balu*). Very similar to *C. pseudogrossa*, but face bare (pilose in *C. pseudogrossa*). For more differences, see at the Differential diagnosis of *C. pseudogrossa*.

Material examined

Not collected in 2018, but collected in 2023.

GEORGIA – **Samtskhe-Javakheti** • 2 ♀♀; Sakire; 41.7301° N, 43.3306° E; 1820 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT, ZFMK-TIS-8027941.

Genetics

In our NJ tree we recover a cluster of three species with high support (BS = 100%), *C. albipila*, *C. grossa* and *C. pseudogrossa*. The two DNA sequences of *C. pseudogrossa* group together with high support (BS = 99.7%), as well as the barcodes of *C. grossa* (BS = 100%), except for three (Scandinavian) sequences that are placed within the *C. albipila* cluster. The study of the available photographs in BOLD of those three specimens of *C. grossa* (KWi-089, KWi-090 and NORSY471) do not question their identification.

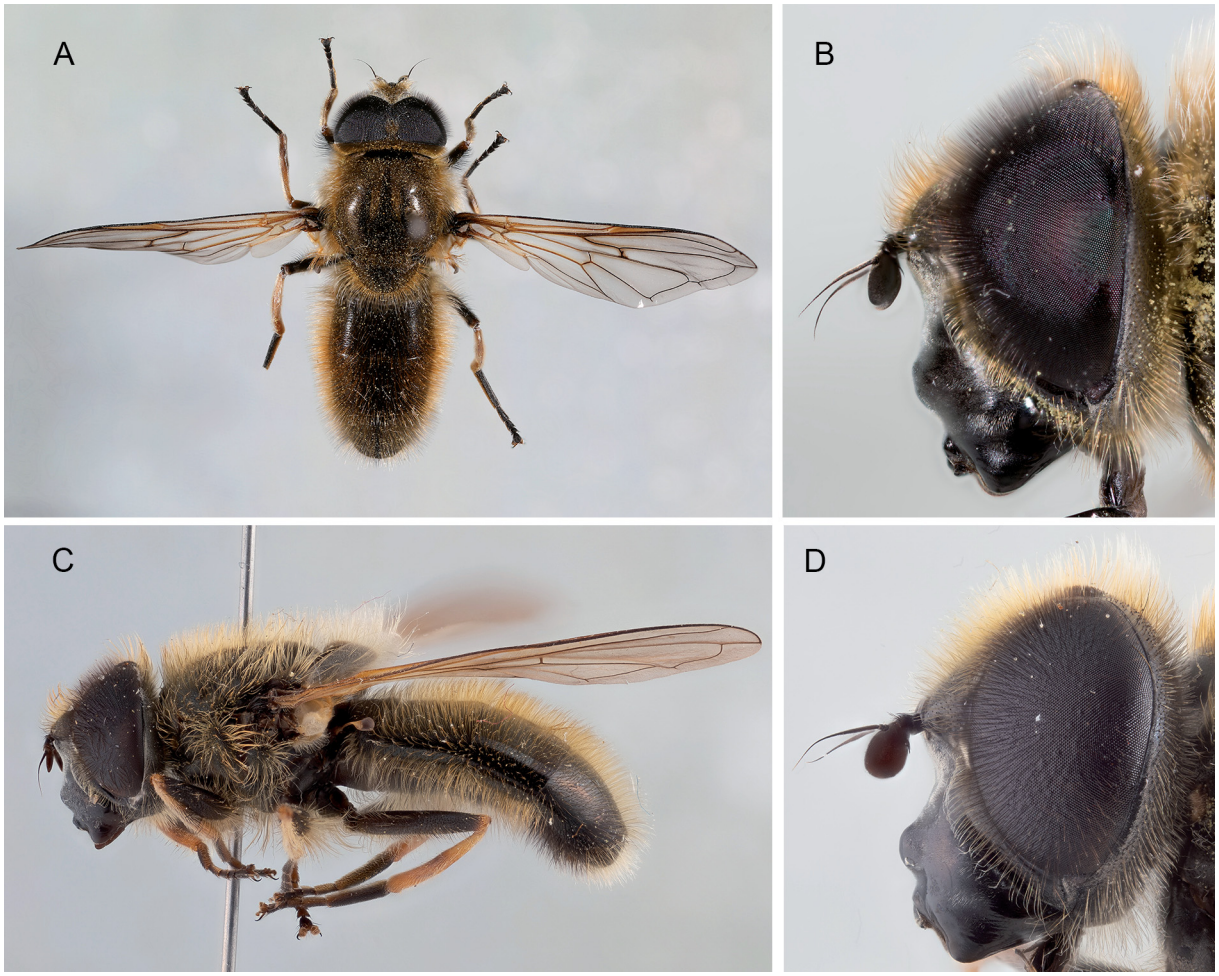

Fig. 33. *Cheilosia* (*Cheilosia*) *grossa* (Fallén, 1817). **A**. ♂ (SBA, SB.004478); habitus, dorsal view; collected in the Netherlands; body length 13.0 mm. **B**. ♂ (SBA, SB.004478); head, lateral view; collected in the Netherlands; eye width 1.6 mm. **C**. ♂ (SBA, SB.004479); habitus, lateral view; collected in the Netherlands; body length 14.7 mm. **D**. ♀ (FMT); head, lateral view; collected in Georgia; eye width 1.5 mm. Not to scale.

Distribution

Palaearctic and Uttah Pradesh in northern India. Within the Caucasus reported from Georgia for the first time.

Cheilosia* (*Cheilosia*) *himantopus (Panzer, 1798)
Fig. 34

Syrphus himantopus Panzer, 1797: 9.

Differential diagnosis

Cheilosia himantopus is very similar to *C. canicularis*, but it flies in spring rather than in summer. For morphological differences, see the Differential diagnosis under *C. canicularis*. Similar to *C. orthotricha*, which on average flies earlier in spring. *C. himantopus* differs from *C. orthotricha* by having ventral half

of eye bare (at most ventral one third bare in *C. orthotricha*), pile on posterior anepisternum with wavy apex (with straight apex in *C. orthotricha*) and face slightly pruinose (shiny in *C. orthotricha*).

Material examined

Cheilosia himantopus was not collected in 2018, but collected in 2019 and 2022.

GEORGIA – **Imereti** • 1 ♂; Abastumani, road Abastumani to Sairme; 41.8242° N, 42.8472° E; 2150 m a.s.l.; 10 Jun. 2019; F. Van de Meutter leg.; FMT. – **Kakheti** • 1 ♀; Kobadze; 41.861393° N, 45.301954° E; 1430 m a.s.l.; 1 Jun. 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00094142 = ZFMK-TIS-8014588. – **Samtskhe-Javakheti** • 1 ♀; road from Sakire to Tsikhisjvari; 41.7250° N, 43.3606° E; 2519 m a.s.l.; 9 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♂; Borjomi N.P.; 41.7280° N, 43.3640° E; 2327 m a.s.l.; 9 Jun. 2019; L. Hofstee leg.; LHH • 2 ♀♀; road from Sakire to Tsikhisjvari; 41.7251° N, 43.3605° E; 2519 m a.s.l.; 9 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066518 = ZFMK-

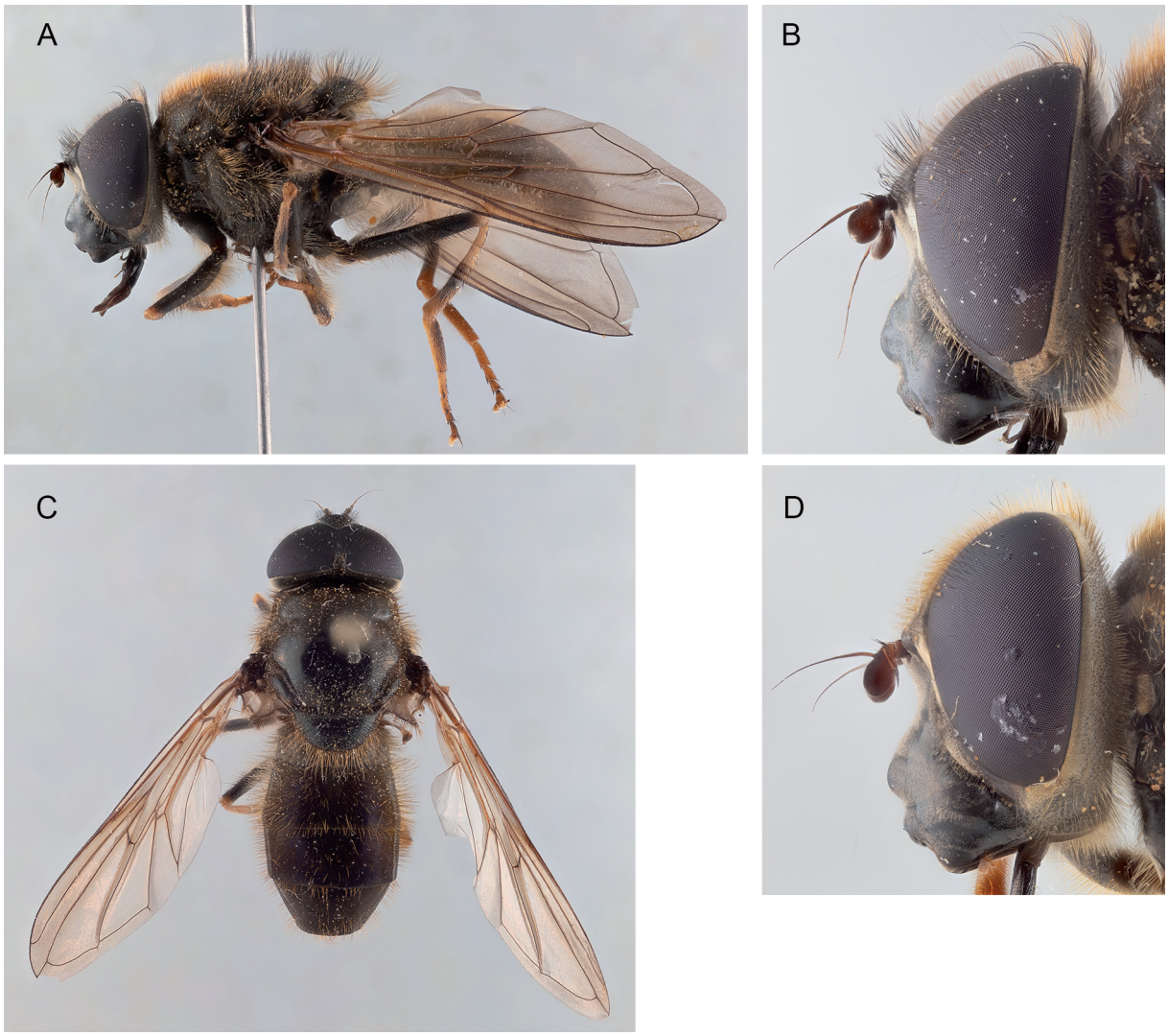

Fig. 34. *Cheilosia* (*Cheilosia*) *himantopus* (Panzer, 1798). Collected in Georgia. **A**. ♂ (LHH); habitus, lateral view; body length 14.4 mm. **B**. ♂ (LHH); head, lateral view; eye width 1.7 mm. **C**. ♂ (LHH); habitus, dorsal view; body length 14.7 mm. **D**. ♀ (SBA, SB.002961); head, lateral view; eye width 1.7 mm. Not to scale.

TIS-8008823, ZFMK-DIP-00066519 = ZFMK-TIS-8008824 • 1 ♀; Borjomi N.P.; 41.8210° N, 42.8340° E; 1992 m a.s.l.; 11 Jun. 2019; S. Bot leg.; SBA, SB.002961 • 3 ♀♀; Abastumani; 41.79° N, 42.82° E; 1515 m a.s.l.; 11 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.800 to 2019-00.802

Genetics

In our NJ tree we recover a cluster (BS = 99.8%) with the barcodes of *C. himantopus* and the sequences of *C. canicularis*. Although certain structure can be seen in the arrangement of the molecular data, both species cannot be distinguished unmistakenly with DNA barcodes.

Remarks

Reported from the Caucasus for the first time. Maybe the species was overlooked before given that several references for the Caucasus predate Stuke & Claussen (2000) in which the identification and status of *C. himantopus* were clarified.

Biology

During our expeditions, collected between 1 June and 11 June at an altitude between 1430 and 2519 m a.s.l.

Distribution

Europe, Caucasus (Georgia).

Cheilosia* (*Floccocheila*) *illustrata portschinskiana Stackelberg, 1960
Fig. 35

Cheilosia portschinskiana Stackelberg, 1960: 441.

Cheilosia oestracea (Linnaeus, 1761) [sic] var. *b*, *c*, *d*, *e*, *f* – Portschinsky 1877: 161.
Cheilosia oestracea (Linnaeus, 1758) – Radde 1899: 453.
Cheilosia portschinskiana – Stackelberg & Richter 1968: 248. — Stackelberg 1970: 61.
Cheilosia illustrata portschinskiana – Peck 1988: 105. — Barkalov 1993: 718. — Claussen 1998: 385; Barkalov & Mutin 2018: 485. — Mengual *et al.* 2020: 23.
Cheilosia portschinskiana Stackelberg, 1956 [sic] – Gujabidze 2002: 246.
Cheilosia oestracae (Linnaeus, 1758) [sic] – Gujabidze 2002: 246.

Differential diagnosis

Cheilosia illustrata portschinskiana is a very distinctive species, easily identified from other species of *Cheilosia* in the Caucasus by the combination of dense body pile, pilose eye, bare face, posterior margin of scutellum without setae and alternating pattern on body of black and pale (white and/or yellow and/or orange) pile bands (Fig. 35A, C). Very similar to extralimital nominal *C. illustrata*, but face bare (almost always pilose in nominal *C. illustrata*) and postpedicel regularly orange to some extent (usually black or dark brown in nominal *C. illustrata*, but much overlap). In some specimens in the Caucasus, all pile on tergum II black instead of whitish.

Material examined

Collected in 2018, 2019, 2021 and 2022, see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

All DNA barcodes of *C. illustrata illustrata* from Europe and *C. illustrata portschinskiana* from the Caucasus cluster together with high support (BS = 100%). The single DNA barcode of *Cheilosia*

motodomariensis Matsumura, 1916 from Russian Far East in our dataset is resolved embedded within the cluster of *C. illustrata*.

Remarks

This taxon was first described as a new species by Stackelberg (1960). It is very similar to *C. illustrata* (Harris, 1779) and therefore regarded as a subspecies of *C. illustrata* since Barkalov (1981). According to Barkalov (1993), *C. illustrata portschinskiana* is the only subspecies of *C. illustrata* occurring in the Caucasus. Our genetic research confirms the close relationship with *C. illustrata* and *C. motodomariensis*, since they are genetically indistinguishable (Supp. file 1: Fig. S1).

Biology

During our expeditions, collected between 18 June and 3 August at an altitude between 1476 and 2900 m a.s.l. as well as on herbaceous flowers as on flowering trees (*Sorbus* sp.).

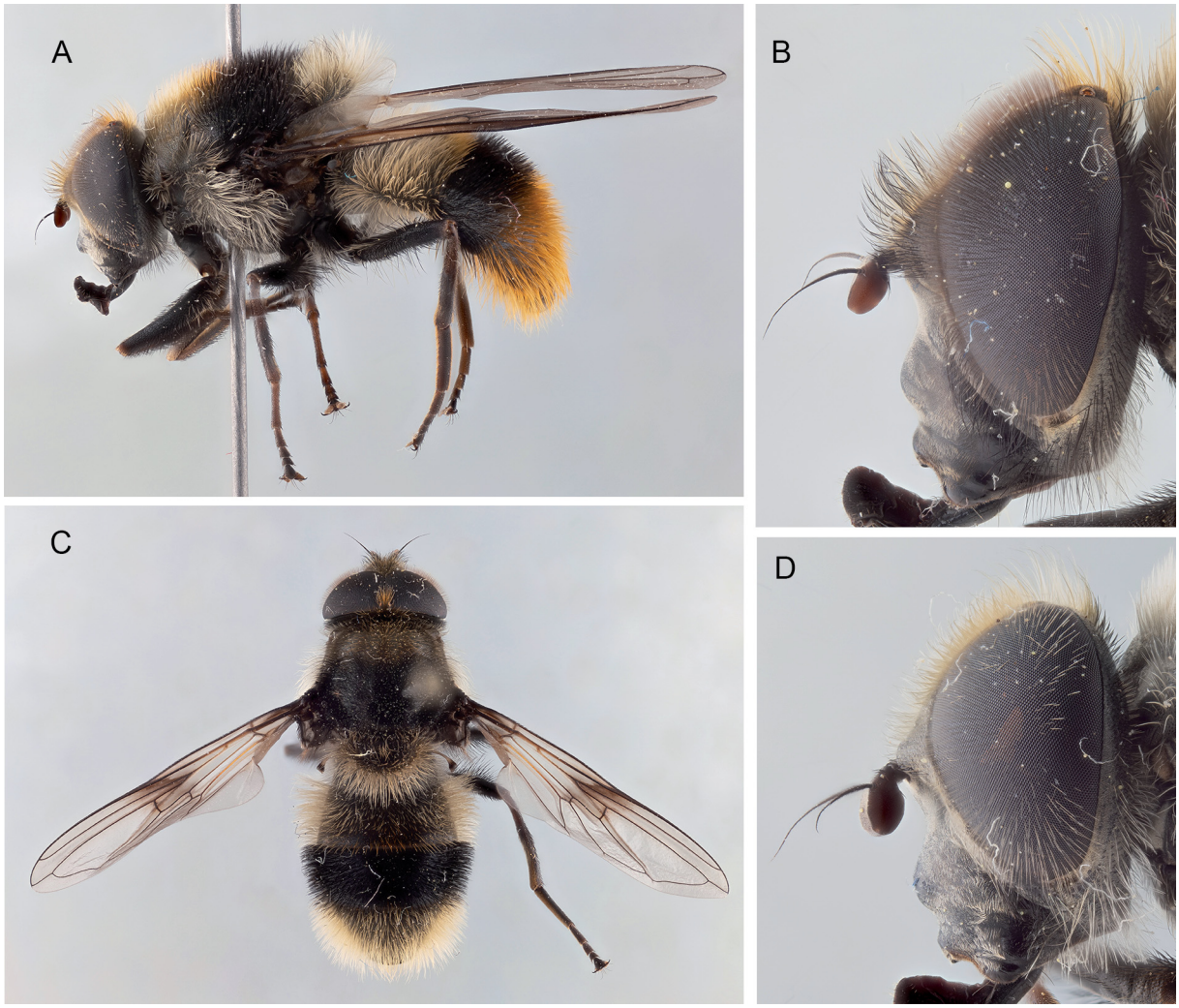

Fig. 35. *Cheilosia* (*Floccocheila*) *illustrata portschinskiana* Stackelberg, 1960. Collected in Georgia. **A**. ♂ (SBA, SB.002354); habitus, lateral view; body length 12.7 mm. **B**. ♂ (SBA, SB.002352); head, lateral view; eye width 1.6 mm. **C**. ♂ (SBA, SB.002352); habitus, dorsal view; body length 15.5 mm. **D**. ♀ (SBA, SB.002373); head, lateral view; eye width 1.6 mm. Not to scale.

Distribution

Caucasus (Armenia, Georgia, Russia).

Cheilosia* (*Cheilosia*) *inarmata sp. nov.
urn:lsid:zoobank.org:act:EB32D55D-8523-49C6-B67E-5C8DE02A0455
Figs 36–37

Cheilosia impressa Loew, 1840 – Stackelberg & Richter 1968: 246 (Caucasian records). — Stackelberg 1970: 61 (Caucasian records). — Peck 1988: 105 (Caucasian records). — Barkalov 1993: 724 (Caucasian records). — Mengual *et al*. 2020: 17. — Speight 2020a: 37 (Caucasian records).
Cheilosia impressa Loew, 1848 [sic] – Gujabidze 2002: 245.

Differential diagnosis

Cheilosia inarmata sp. nov. is similar to *C. impressa* Loew, 1840 and *C. schnabli*, but these two species are unique among all European *Cheilosia* in possessing a distinct, knob-like basolateral projection on the external surface of the procoxae (Fig. 37C) (Vujić *et al*. 1998; Speight 2020a). This diagnostic projection is absent in *C. inarmata* (Fig. 37B). Given the large morphological variation within both *C. inarmata* and *C. impressa*, other differences between *C. inarmata* and *C. impressa* could not be found, except for the frontal triangle in the male usually pruinose in our new species (male frontal triangle usually shiny in *C. impressa*). Besides the absence of the projection on the fore coxa, differences with *C. schnabli* include the rough and densely punctured scutum in *C. inarmata* (in *C. schnabli* the scutum is finely punctured), tergum III in male with a dull area in anterior half never reaching the posterior margin (in *C. schnabli* male tergum III with dull area extending to posterior margin), and the dorsal lobe of postgonite of the male genitalia broadened below apex (Fig. 37F) and sclerite of the distiphallus asymmetric (Fig. 37E, dorsal lobe of postgonite narrow and elongated in apical part and sclerite of the distiphallus symmetric in *C. schnabli*). Females of *C. inarmata* have a short and adpressed pile on scutum, while females of *C. schnabli* have a semi-adpressed short pile mixed with some longer pile on scutum.

Etymology

The species name derives from the Latin prefix '*in-*' meaning 'without' (Brown 1956: 436) and the Latin word '*armatus*' meaning 'furnished with weapons' (Brown 1956: 806), and it refers to the lack of a knob-like projection on the fore coxae. Species epithet is to be treated as an adjective.

Material examined

Holotype

GEORGIA • ♂; Samtskhe-Javakheti, 41.8234° N, 42.8400° E; 2025 m a.s.l.; 11 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066425 = ZFMK-TIS-8008794.

Paratypes

GEORGIA – **Adjara Region** • 1 ♀; Kintrishi Nature Reserve; 41.7553° N, 42.1129° E; 2280 m a.s.l.; 14–28 Jul. 2018; GGBC-members leg.; ZFMK, ZFMK-TIS-8010475 • 1 ♂; Kintrishi Nature Reserve; 41.7344° N, 41.9888° E; 458 m a.s.l.; 20 Jul. 2018; X. Mengual leg.; ZFMK, ZFMK-DIP-00053910 = ZFMK-TIS-8005513 • 1 ♀; same data as for preceding; ZFMK, ZFMK-DIP-00053911 = ZFMK-TIS-8005520 • 1 ♀; Mtirala National Park, Mount Mtirala; 41.7990° N, 41.6576° E; 1318 m a.s.l.; 25 Jul. 2018; A. Reimann leg.; MTD, Dip-AR-4545 = ZFMK-TIS-8002677. – **Imereti** • 1 ♀; road from Abastumani to Sairme; 41.86433° N, 42,77842° E; 1830 m a.s.l.; 10 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066415. – **Kakheti** • 2 ♂♂; Lagodekhi N.P.; 41.8635° N, 46.3412° E; 1851 m a.s.l.; 2 Jul. 2021; S. Bot leg.; SBA, SB.003170, SB.003171 • 2 ♀♀; same data as for preceding; SBA, SB.003172, SB.003173 • 1 ♀; same data as for preceding; ZFMK, ZFMK-TIS-8011515 • 1 ♀; Lagodekhi N.P.; 41.877° N, 46.384° E; 2652 m a.s.l.; 3 Jul. 2021; S. Bot leg.; SBA, SB.003169 • 2 ♀♀; Lagodekhi N.P.;

41.9032° N, 46.3876° E; 2807 m a.s.l.; 4 Jul. 2021; S. Bot leg.; SBA, SB.003167, SB.003168. – **Mtskheta-Mtianeti** • 2 ♀♀; Stepantsminda; 42.6591° N, 44.6366° E; 1740–2500 m a.s.l.; 3 Aug. 2001; J.-H. Stuke leg.; ZFMK, ZFMK-DIP-00058257, ZFMK-DIP-00058258 • 1 ♂, 1 ♀; Kazbeg, Dzhuta; 42.564° N, 44.735° E; 2183 m a.s.l.; 11 Jul. 2012; Th. Zeegers leg.; GPA • 2 ♀♀; Tbilisi National Park; 41.879° N, 45.016° E; 22 Jun. 2019; 1251 m a.s.l.; S. Bot leg.; SBA, SB.003175, SB.003176 • 1 ♀; Tbilisi N.P.; 41.8808° N, 45.0203° E; 1270 m a.s.l.; 22 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066405 = ZFMK-TIS-8008785 • 1 ♂; Stepantsminda; 42.6722° N, 44.6113° E; 2070 m a.s.l.; 4 Jul. 2019; A. Reimann leg.; MTD, ZFMK-TIS-8002827 • 1 ♀; same data as for preceding; MTD, Dip-AR-5259 = ZFMK-TIS-8002826 • 1 ♀; Stepantsminda; 44,6492° N, 42.6546° E; 1825 m a.s.l.; 6–12 Jul. 2019; A. Ssymank leg.; Malaise trap; ASW, ZFMK-DIP-00069439 = ZFMK-TIS-8009526 • 1 ♀; Gveleti, road to waterfall; 44.6200° N, 42.7053° E; 1560 m a.s.l.; 6 Jul. 2019; A. Reimann leg.; MTD, Dip-AR-4749 = ZFMK-TIS-8002801 • 1 ♂; Juta, 42.5794° N, 44.7433° E; 2150 m a.s.l.; 10 Jul. 2019; A. Ssymank leg.; ASW • 1 ♂; Stepantsminda; 42.7047° N, 44.6210° E; 1540 m a.s.l.; 12 Jul. 2019; A. Ssymank leg.; ASW, Ssy9506-03 = ZFMK-TIS-8009417 • 3 ♂♂; Gergeti; 42.6669° N, 44.6127° E; 2175 m a.s.l.; 13 Jul. 2019; A. Ssymank leg.; ASW • 1 ♀; Gergeti; 42.6616° N, 44.6155° E; 2080 m a.s.l.; 13 Jul. 2019; A. Ssymank leg.; ASW • 1 ♀; Stepantsminda; 42.6577° N, 44.6568° E; 1950 m a.s.l.; 17 Jul. 2019; A. Ssymank leg.; ASW, Ssy9523-02 = ZFMK-TIS-8009418; ASW • 1 ♀; Tbilisi N.P.; 41.880° N, 45.023° E; 1289 m a.s.l.; 4 May 2023; S. Bot leg.; SBA, SB.003157 • 2 ♂♂, 1♀; Tbilisi N.P.; 41.877° N, 45.0138° E; 1250 m a.s.l.; 4 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; Kithoki; 42.4147° N, 44.7549° E; 1240 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT • 2 ♀♀; Tbilisi N.P.; 41.8770° N, 45.0137° E; 1248 m a.s.l.; 9 May 2023; S. Bot leg.; SBA, SB.003158, SB.003159. – **Racha-Lechkhumi and Kvemo Svaneti** • 4 ♂♂; Tsana; 42.909° N, 43.142° E; 1900 m a.s.l.; 29 Jun. 2018; S. Bot leg.; SBA, SB.003199 to SB.003202 • 1 ♂; Zeskho; 42.888° N, 43.233° E; 1900 m a.s.l.; 30 Jun. 2018, S. Bot leg.; SBA, SB.003195 • 2 ♀♀; same data as for preceding; SBA, SB.003196, SB.003197 • 1 ♂; Zeskho; 42.888° N, 43.233° E; 1900 m a.s.l.; 1 Jul. 2018; S. Bot leg.; SBA, SB.003193 • 1 ♀; same data as for preceding; SBA, SB.003194 • 1 ♂; Tsana; 42.90° N, 43.14° E; 1830 m a.s.l.; 18 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.061 • 2 ♂♂; Tsana; 42.8887° N, 43.1429° E; 1757 m a.s.l.; 18 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066432, ZFMK-DIP-00066440 • 1 ♂; Tsana; 42.915° N, 43.143° E; 1969 m a.s.l.; 19 Jun. 2019; S. Bot leg.; SBA, SB.003178 • 1 ♀; same data as for preceding; SBA, SB.003177 • 1 ♂; same data as for preceding; L. Hofstee leg.; LHH • 6 ♂♂; Tsana; 42.916° N, 43.142° E; 1975 m a.s.l.; 19 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066428, ZFMK-DIP-00066429 = ZFMK-TIS-8008795, ZFMK-DIP-00066430, ZFMK-DIP-00066431, ZFMK-DIP-00069433 = ZFMK-TIS-8009513, ZFMK-DIP-00066436 • 3 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00066416, ZFMK-DIP-00066438, ZFMK-DIP-00069441 = ZFMK-TIS-8009511 • 2 ♂♂; Tsana; 42.8862° N, 43.1563° E; 2252 m a.s.l.; 19 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386850, CNC1386878 • 1 ♀; same data as for preceding; CNC, CNC1386883 • 1 ♀; 42.82111° N, 43.16069° E; 1450 m a.s.l.; 20 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066417 = ZFMK-TIS-8008789 • 1 ♀; near Adishi; 42.9986° N, 42.9088° E; 2140 m a.s.l.; 11 Sep. 2019; J. Mortelmans leg.; FMT • 1 ♂; above Glola; 42.668° N, 43.630° E; 2598 m a.s.l.; 9 Jul. 2021; S. Bot leg.; SBA, SB.003160 • 1 ♂; same data as for preceding; XLS, SB.003161 • 1 ♀; same data as for preceding; ZFMK, ZFMK-TIS-8011487. – **Samegrelo-Zemo Svaneti** • 1 ♂; Mestia; 43.080° N, 42.762° E; 1800 m a.s.l.; 22 Jun. 2018; S. Bot leg.; SBA, SB.003214 • 2 ♀♀; Ushguli; 42.914° N, 43.010° E; 2100 m a.s.l.; 23 Jun. 2018; S. Bot leg.; SBA, SB.003212, SB.003213 • 1 ♂; Ushguli; 42.950° N, 43.075° E; 2275 m a.s.l.; 24 Jun. 2018; S. Bot leg.; SBA, SB.003209 • 2 ♀♀; same data as for preceding; SBA, SB.003210, SB.003211 • 1 ♂; 42.948° N, 43.021° E; 2800 m a.s.l.; 25 Jun. 2018; S. Bot leg.; SBA, SB.003207 • 1 ♀; same data as for preceding; SBA, SB.003208 • 2 ♂♂; 42.963° N, 42.990° E; 2300 m a.s.l.; 26 Jun. 2018; S. Bot leg.; SBA, SB.003203, SB.003204 • 2 ♀♀; same data as for preceding; SBA, SB.003205, SB.003206 • 1 ♀; Ushguli; 42.916° N, 43.018° E; 2140 m a.s.l.; 29 Jun. 2018; S. Bot leg.; SBA, SB.003198 • 1 ♂; Mestia; 43.042° N, 42.768° E; 1473 m a.s.l.; 13 Jun. 2019; S. Bot leg.; SBA, SB.003182 • 1 ♀; Mestia; 43.0424° N, 42.7681° E; 1473 m a.s.l.; 13 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386425 • 2 ♂♂; 42.948° N, 43.070° E; 2258 m a.s.l.; 15 Jun. 2019; S. Bot leg.; SBA,

SB.003180, SB.003181 • 3 ♂♂; 42.9437° N, 43.0539° E; 2220 m a.s.l.; 15 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066433, ZFMK-DIP-00066434 = ZFMK-TIS-8008796, ZFMK-DIP-00066441 • 1 ♀; same data as for preceding; ZFMK, ZFMK-DIP-00066437 • 3 ♂♂; 42.9142° N, 43.0076° E; 2082m a.s.l.; 15 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066435, ZFMK-DIP-00066439 = ZFMK-TIS-8008797, ZFMK-DIP-00066442 • 4 ♂♂; Ushguli; 42.56° N, 43.04° E; 2260 m a.s.l.; 15 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.043 to 2019-01.046 • 1 ♀; same data as for preceding; JSB, 2019-01.047 • 3 ♂♂; Ushguli; 42.91° N, 43.01° E; 2100 m a.s.l.; 15 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.048 to 2019-01.050 • 2 ♀♀; same data as for preceding; JSB, 2019-01.051, 2019-01.052 • 1 ♂; Ushguli; 42.94° N, 43.05° E; 2220 m a.s.l.; 15–17 Jun. 2019; J. van Steenis leg; Malaise trap; JSB, 2019-01.058 • 1 ♀; same data as for preceding; JSB, 2019-01.059 • 1 ♂; 42.9471° N, 43.0671° E; 2257 m a.s.l.; 15 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386559 • 1 ♀; Ushguli; 42.909° N, 43.007° E; 2294 m a.s.l.; 16 Jun. 2019; S. Bot leg.; SBA, SB.003179 • 1 ♂; Ushguli; 42.56° N, 43.04° E; 2260 m a.s.l.; 16 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.908 = ZFMK-TIS-8009608 • 1 ♀; same data as for preceding; JSB, 2019-01.055 • 1 ♀; Ushguli; 42.94° N, 43.07° E; 2300 m a.s.l.; 16 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.056 • 2 ♀♀; Ushguli; 42.91° N, 43.01° E; 2135 m a.s.l.; 16 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.053, 2019-01.054 • 1 ♂; Ushguli; 42.910° N, 43.000° E; 2120 m a.s.l.; 17 Jun. 2019; L. Hofstee leg.; LHH • 1 ♀; near Ushguli, up to the ruins; 42.910° N, 43.007° E; 2295 m a.s.l.; 17 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066418 = ZFMK-TIS-8008790 • 1 ♂; Ushguli; 42.91° N, 42.93° E; 2290 m a.s.l.; 17 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.057 • 1 ♂; near Shovi; 42.713° N, 43.701° E; 2022 m a.s.l.; 7 Jul. 2021; S. Bot leg.; SBA, SB.003166 • 2 ♀♀; same data as for preceding; SBA, SB.003164, SB.003165 • 1 ♂; near Chiora; 42.7625° N, 43.5540° E; 2027 m a.s.l.; 8 Jul. 2021; S. Bot leg.; SBA, SB.003162 • 1 ♀; same data as for preceding; SBA, SB.003163; SBA • 2 ♂♂; 42.9125° N, 43.0549° E; 2299 m a.s.l.; 11 Jul. 2021; S. Bot leg.; SBA, SB.003152, SB.003153 • 1 ♂; same data as for preceding; ZFMK, ZFMK-TIS-8011554 • 1 ♀; same data as for preceding; ZFMK, ZFMK-TIS-8011555 • 1 ♀; 42.9159° N, 43.0191° E; 2151 m a.s.l.; 12 Jul. 2021; S. Bot leg.; SBA, SB.003154 • 1 ♂; 42.9616° N, 43.0914° E; 2447 m a.s.l.; 12 Jul. 2021; S. Bot leg.; SBA, SB.003155 • 2 ♂♂; 42.9091° N, 43.0031° E; 2166 m a.s.l.; 13 Jul. 2021; S. Bot leg.; SBA, SB.003149, SB.003150 • 1 ♂; same data as for preceding; ZFMK, ZFMK-TIS-8011494 • 1 ♀; same data as for preceding; SBA, SB.003151 • 1 ♀; 43.0275° N, 42.9115° E; 2887 m a.s.l.; 14 Jul. 2021; S. Bot leg.; SBA, SB.003156. – **Samtskhe-Javakheti** • 1 ♀; Borjomi N.P.; 41.831° N, 43.268° E; 1780 m a.s.l.; 17 Jun. 2018; S. Bot leg.; SBA, SB.003215 • 2 ♂♂; Borjomi N.P.; 41.824° N, 42.848° E; 2165 m a.s.l.; 10 Jun. 2019; S. Bot leg.; SBA, SB.003187, SB.003188 • 4 ♀♀; same data as for preceding; SBA, SB.003189 to SB.003192 • 3 ♂♂, 2 ♀♀; same data as for preceding; L. Hofstee leg.; LHH • 4 ♂♂; Borjomi N.P.; 41.86° N, 42.77° E; 1830 m a.s.l.; 10 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.023, 2019-01.027 = ZFMK-TIS-8009609, 2019-01.028, 2019-01.029 • 3 ♀♀; same data as for preceding; JSB, 2019-01.030 to 2019-01.032 • 1 ♀; Borjomi N.P.; 41.864° N, 42.789° E; 1798 m a.s.l.; 11 Jun. 2019; S. Bot leg.; SBA, SB.003186 • 4 ♂♂; Borjomi N.P.; 41.8234° N, 42.84° E; 2025 m a.s.l.; 11 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066423 = ZFMK-TIS-8008793, ZFMK-DIP-00066424, ZFMK-DIP-00066426, ZFMK-DIP-00066427 • 11 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00066406 = ZFMK-TIS-8008786, ZFMK-DIP-00066409, ZFMK-DIP-00066410 = ZFMK-TIS-8008788, ZFMK-DIP-00066411 to ZFMK-DIP-00066414, ZFMK-DIP-00066419, ZFMK-DIP-00066420 = ZFMK-TIS-8008792, ZFMK-DIP-00066421 • 1 ♂; Borjomi N.P.; 41.863° N, 42.789° E; 1800 m a.s.l.; 11 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066443 = ZFMK-TIS-8008798 • 1 ♂; Borjomi N.P.; 41.82° N, 42.84° E; 2100 m a.s.l.; 11 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.033 • 6 ♀♀; same data as for preceding; JSB, 2019-01.034 to 2019-01.039 • 1 ♀; Abastumani; 41.79° N, 42.82° E; 1515 m a.s.l.; 11 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.041 • 1 ♂; Borjomi N.P.; 41.8181° N, 42.8316° E; 2004 m a.s.l.; 11 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386312 • 4 ♀♀; same data as for preceding; CNC, CNC1386258, CNC1386259, CNC1386261, CNC1386275 • 1 ♂; Borjomi N.P.; 41.8224° N, 42.8444° E, 2098 m a.s.l.; 11 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386170 • 1 ♀; Borjomi N.P.; 41.8697° N, 42.7923° E; 1683 m a.s.l., 11 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386364 • 2 ♂♂; Borjomi N.P.; 41.823° N, 42.841° E; 2049 m a.s.l.; 11 Jun.

2019; S. Bot leg.; SBA, SB.003183, SB.003184 • 1 ♀; same data as for preceding; SBA, SB.003185 • 1 ♂; Borjomi N.P.; 41.8312° N, 43.2686° E; 1773 m a.s.l.; 28 Jun. 2021; S. Bot leg.; SBA, SB.003174.

Description

Male

Length. Body 6–9 mm, wing 6–8 mm.

Head. Face bare, black, with facial tubercle, pruinose except facial tubercle, area under antenna more densely pruinose, below lunule narrower than an eye. Mala black, pruinose except ventrally and anteriorly where bordering clypeus. Parafacia black, pruinose, white or black and white pilose, about half as wide as postpedicel. Clypeus pruinose, ranging from as wide as long to 1.5 times as long as wide measured from the midline. Frontal triangle black, pruinose, most densely along eye margins, with long black pile. Length of eye contiguity about 1.2 to 1.5 times as long as frons. Angle of approximation of eyes 90–110°. Vertical triangle black, slightly pruinose, ocellar triangle long black pilose. Occiput pruinose, dorsally long black pilose. Lunule dark orange to blackish, with distinct medial arm, separating acetabula. Scape black, anteriorly with black setae; pedicel black, anteriorly with black setae; postpedicel black, sometimes predominantly orange or basoventral corner orange, squarish, about as high as wide

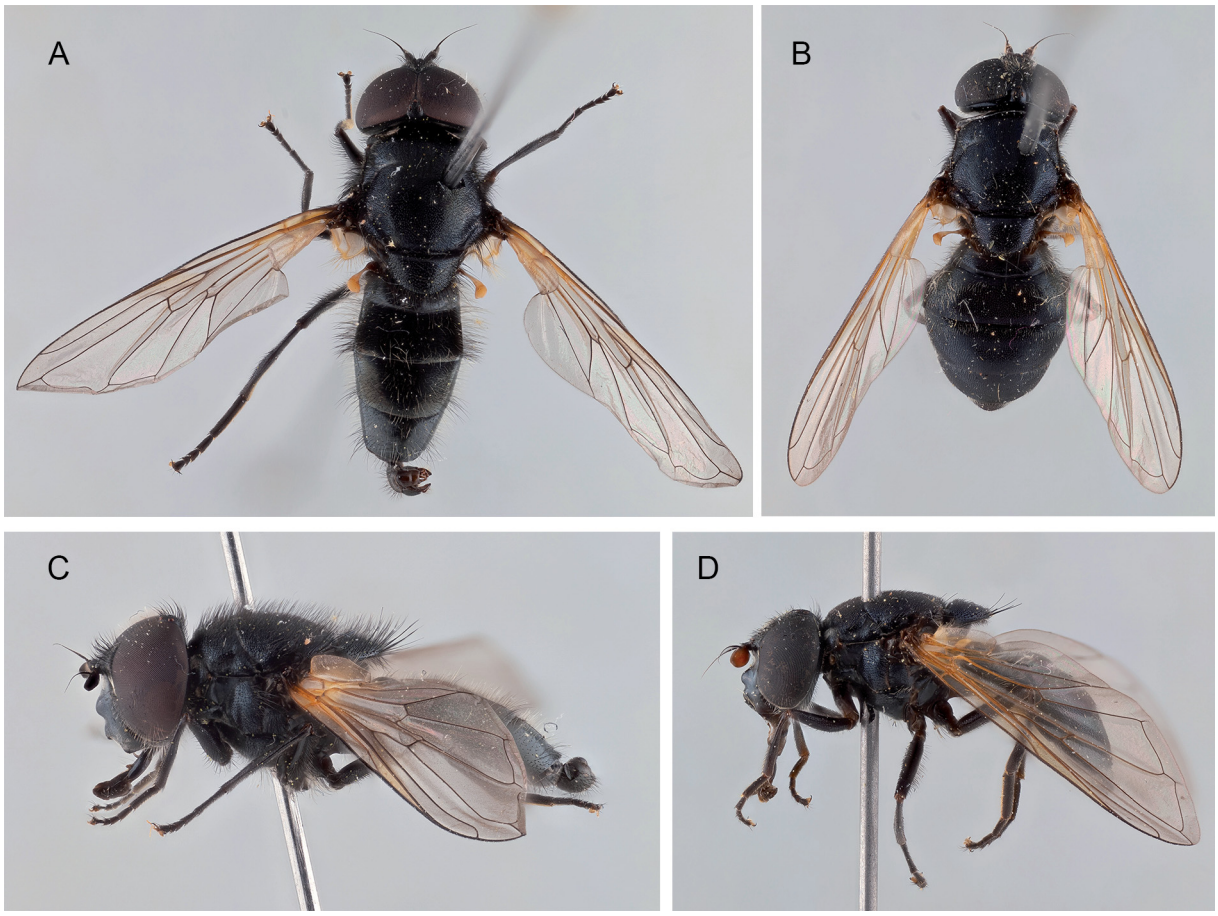

Fig. 36. *Cheilosia* (*Cheilosia*) *inarmata* sp. nov. **A, C**. Holotype, ♂ (ZFMK, ZFMK-TIS-8008794). **B, D**. Paratype, ♀ (ZFMK, ZFMK-DIP-00053911) **A**. Habitus, dorsal view; body length 8.1 mm. **B**. Habitus, dorsal view; body length 8.5 mm. **C**. Habitus, lateral view; body length 8.1 mm. **D**. Habitus, lateral view; body length 8.5 mm. Not to scale.

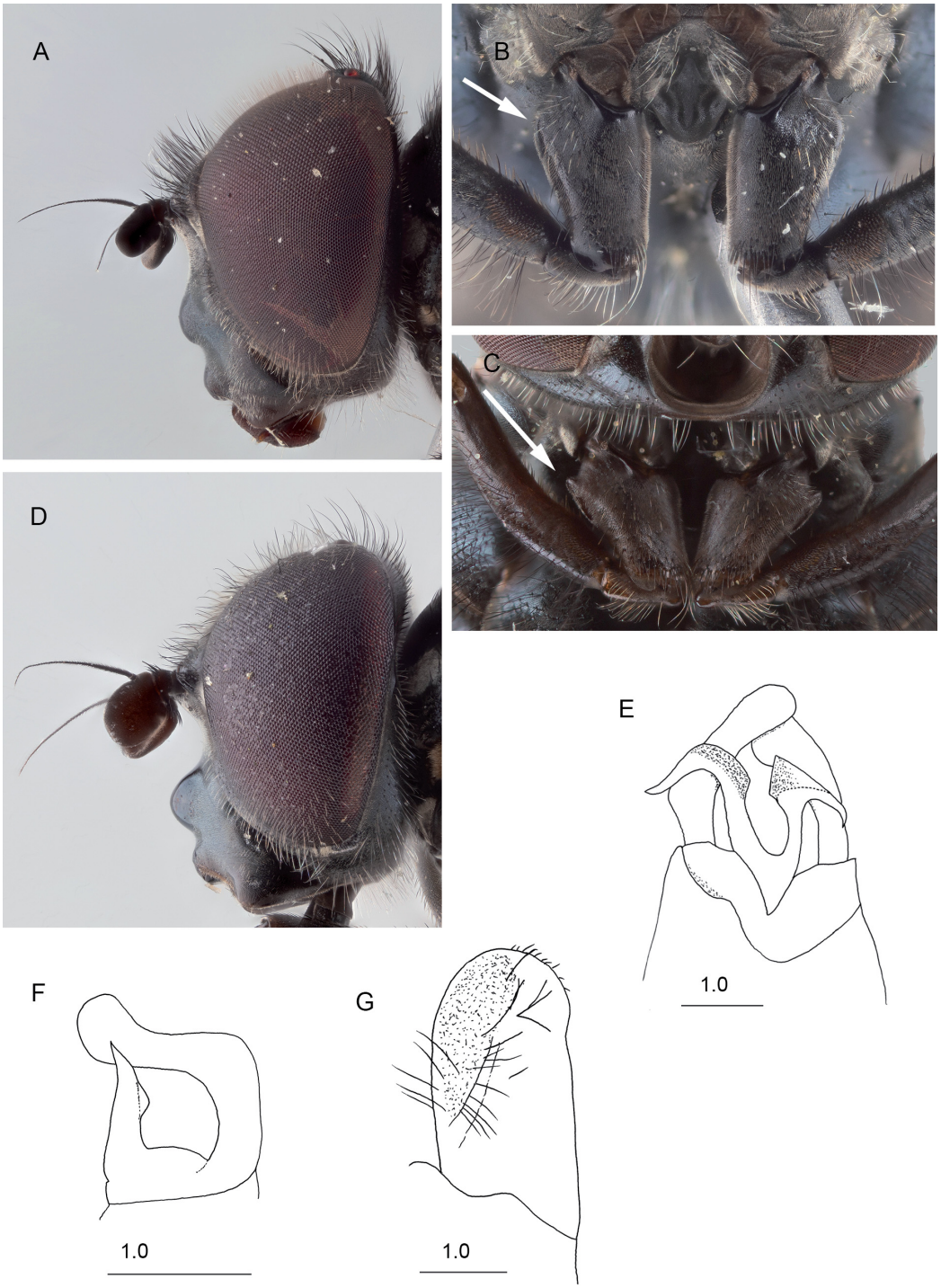

Fig. 37. A–B, D–G. *Cheilosia* (*Cheilosia*) *inarmata* sp. nov. **C**. *Cheilosia* (*Cheilosia*) *impressa* Loew, 1840. **A**. Paratype, ♂ (SBA, SB.003209); head, lateral view; eye width 1.2 mm. **B**. Paratype, ♂ (SBA, SB.003174); fore coxae, anterior view, white arrow indicating absence of knob-like projection; coxa length 0.9 mm. **C**. ♂ (SBA, SB.004480); fore coxae, anterior view, white arrow indicating knob-like projection; coxa length 0.9 mm. **D**. Paratype, ♀ (SBA, SB.003158); head, lateral view; eye width 1.3 mm. **E**. Paratype, ♂ (SBA); distal part of hypandrium, ventral view. **F**. Paratype, ♂ (SBA); postgonite, lateral view. **D**. Paratype, ♂ (SBA); surstylus, lateral view. Scale bars: A–D not to scale; E–G in µm.

or slightly wider than high, pruinose; arista black, with pile, pile shorter than diameter of arista at base. Eye with pile, colour of pile variable, yellow, brown or black.

Thorax. Thorax black. Scutum shiny, coarsely punctured, with short dense black erect to semi-adpressed pile and long black almost erect pile, sometimes anteriorly with portion of pile yellow instead of black, laterally with some long black setae. Anterior part of notopleuron pruinose. Scutellum shiny, with long black erect and denser short black erect pile, with black setae along posterior margin. Pleura slightly pruinose, with black pile except ventral part of katepisternum with long white pile and metasternum usually bare, but sometimes with few white pile; dorsal and ventral pile patches on katepisternum connected. Haltere pedicellum and capitulum yellow.

Wing. Wing including alula entirely microtrichose. Pterostigma yellow-brown. Veins brown to black, except at wing base, where veins are yellow and contrasting with remainder dark veins.

Legs. With black and yellow pile. Coxae and trochanters black, procoxa without basolateral knob-like projection on the external surface. Femora black, sometimes the apex dark orange. Tibiae black, sometimes the base dark orange. Tarsi black.

Abdomen. Abdomen black. Tergum I with long white pile, longest along lateral margins, terga II–IV with long white pile, medially shorter and more adpressed, posterior margin with black pile, most abundant in posterolateral corners, in rare cases pile on II–IV black; tergum I pruinose, tergum II pruinose except lateral margins shiny, tergum III pruinose anteromedially, pruinosity decreasing posteriorly, lateral margins and posterior margin shiny, tergum IV pruinose anteromedially, extending medially in decreasing width, V-shaped, not reaching posterior margin. Sterna II–IV pruinose; sternum I white pilose, length of pilosity increasing from anterolaterally short to long medially, medially pile bent posteriorly in apical half, sternum II with erect long white pile, sterna III–IV laterally with long erect white pile, medially in anterior part with short adpressed white pile, in posterior part with short adpressed black pile. Genitalia with surstylus 1.5 to 1.7 times as long as wide, with keel, area above keel with field of microtrichia (Fig. 37G); dorsal lobe of postgonite broadened below apex; sclerite of the distiphallus asymmetric with right apical extension longer than left apical extension (Fig. 37E).

Female

Length. Body 6–9 mm, wing 6–8.5 mm.

Similar to the male, except for normal sexual dimorphism and the following characters. Frons shiny except anterolateral corners with small triangular area of grey pruinosity, anteriorly with erect yellow, black or mixed yellow and black pile, posteriorly with longer black pile, with paravertica. Occiput dorsally wide and shiny. Pile on eye yellow. Scutum and scutellum with short adpressed pile, colour variable, black, golden-yellow or mixed golden-yellow and black. Colour pile on pleura variable, black, yellow or mixed yellow and black. Terga II–V shiny except tergum II anteromedially pruinose. Sterna yellow pilose.

Genetics

We recover a cluster in our NJ tree with the DNA barcodes of *C. impressa* and *C. inarmata* sp. nov., together with three barcodes of *C. transcaucasica* (BS = 99.7%). Although all included sequences of *C. impressa* cluster together (BS < 90%), DNA barcodes of *C. inarmata* are placed in a group with the three sequences of *C. transcaucasica* and another barcode of *C. inarmata* (ZFMK-TIS-8009609) is resolved sister to all other barcodes in this large cluster.

Remarks

We consider all published records of *C. impressa* from the Caucasus as belonging to *C. inarmata* sp. nov. and therefore *C. impressa* itself is removed from the Caucasus checklist.

Biology

Collected in mountains between 980–2887 m a.s.l. Behaviour similar to that of *C. impressa*.

Distribution

Common in the Caucasus, known from Armenia, Georgia and Russia.

Cheilosia* (*Cheilosia*) *lasiopa Kowarz, 1885
Fig. 38

Cheilosia lasiopa Kowarz, 1885: 206.

Cheilosia honesta Rondani, 1868 – Tóth 1986: 92. — Barkalov 1993: 699.
Cheilosia lasiopa – Mengual *et al*. 2020: 17.

Differential diagnosis

Cheilosia lasiopa has face and eye pilose and legs black, except base of tibiae yellow. It is similar to *C. borjomi* sp. nov., *C. melanopa*, *C. redi* and *C. variabilis*, but it has short setae on posterior margin

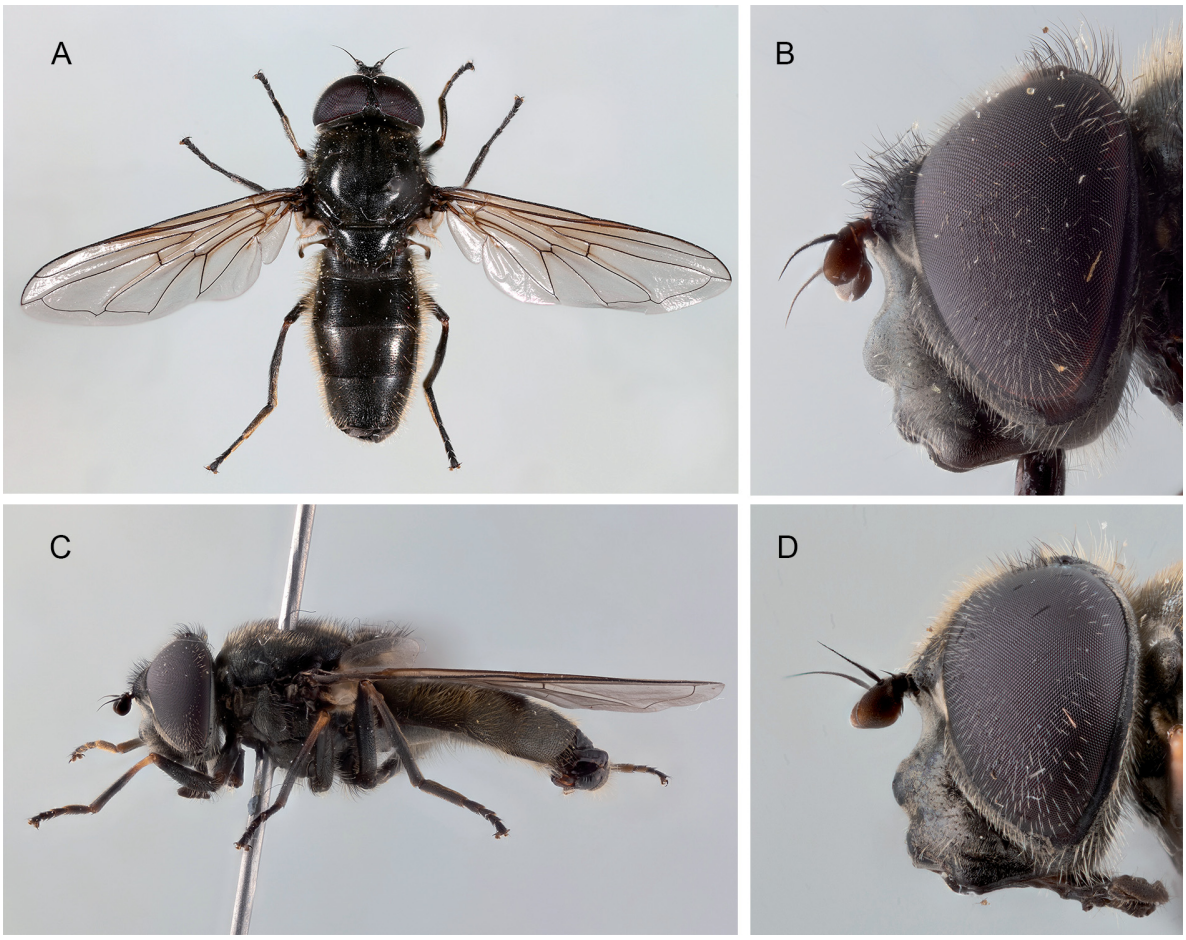

Fig. 38. *Cheilosia* (*Cheilosia*) *lasiopa* Kowarz, 1885. Collected in the Netherlands. **A**. ♂ (SBA); habitus, dorsal view; body length 9.3 mm. **B**. ♂ (SBA, SB.004481); head, lateral view; eye width 1.1 mm. **C**. ♂ (SBA, SB.004482); habitus, lateral view; body length 9.7 mm. **D**. ♀ (SBA, SB.004483); head, lateral view; eye width 1.3 mm. Not to scale.

of scutellum, shorter than scutellum length (longer in the other species), tibiae black with yellow base (Fig. 38C) (usually either all black or with yellow base and apex in the other species) and in the male the dorsal lobe of the postgonite is as long as the ventral lobe (shorter than ventral lobe in the other species, see Francuski *et al.* (2009) for drawings of the male genitalia).

Material examined

Species not collected.

Genetics

The four DNA barcodes of *C. lasiopa* from Europe cluster together with high support (BS = 100%).

Distribution

Europe, Caucasus (Abkhazia), West and Central Siberia, Kazakhstan and Mongolia.

Cheilosia* (*Convocheila*) *laticornis Rondani, 1857
Fig. 39

Cheilosia laticornis Rondani, 1857: 160.
Cheilosia latifacies Loew, 1858: 593. Syn. by Claussen & Thompson (1996).

Cheilosia latifacies – Stackelberg & Richter 1968: 246. — Stackelberg 1970: 58. — Peck 1988: 107. — Barkalov 1993: 712.
Cheilosia latifacies Loew, 1846 [sic] – Gujabidze 2002: 246.
Cheilosia laticornis – Barkalov & Mutin 2018: 484. — Mengual *et al.* 2020: 22. — Speight 2020a: 39.

Differential diagnosis

Cheilosia laticornis belongs to the subgenus *Convocheila*. One of the distinctive characters of the subgenus is the pilosity on the face: long pilose along parafacia in dorsal one third of face. In the males of *Convocheila* the ventral lobe of the postgonite is sickle-shaped (the male genitalia of *C. laticornis* are figured in Radenković *et al.* 2020). Within the Caucasus, the only other member of the subgenus *Convocheila* is *C. cumanica*. The male of *C. laticornis* can be easily distinguished from that of *C. cumanica* by the bare eye (eye pilose in *C. cumanica*), the female has the occiput with long white pile only (besides white pile, also with few long black pile in *C. cumanica*) and scutellum on posterior margin with weak yellow setae (with robust black setae in *C. cumanica*).

Material examined

Species not collected.

Genetics

The DNA barcodes of *C. laticornis* from Europe cluster together with high support (BS = 100%).

Remarks

The name *Cheilosia latifacies* Loew usually appears in the literature as published in 1857. Claussen & Thompson (1996) explain the evidence to date this work in 1858 and, consequently, argue the precedence of *C. laticornis* Rondani as a senior synonym.

Distribution

Western and Central Europe, Caucasus (Armenia, Azerbaijan).

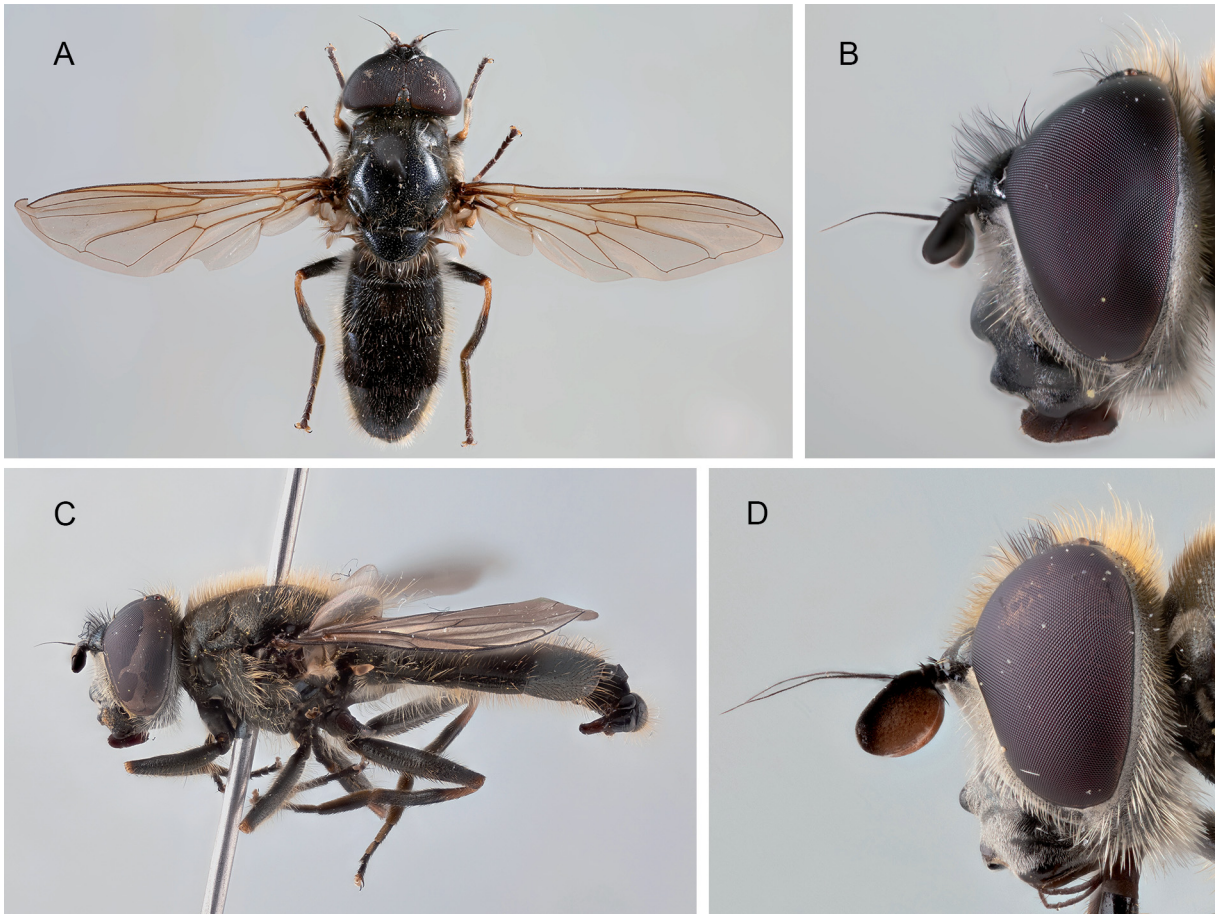

Fig. 39. *Cheilosia* (*Convocheila*) *laticornis* Rondani, 1857. **A**. ♂ (NBC); habitus, dorsal view; collected in Italy; body length 9.3 mm. **B**. ♂ (SBA); head, lateral view; collected in France; eye width 1.2 mm. **C**. ♂ (SBA, SB.001047); habitus, lateral view; collected in Italy; body length 8.9 mm. **D**. ♀ (SBA, SB.004467); head, lateral view; collected in France; eye width 1.1 mm. Not to scale.

Cheilosia* (*Cheilosia*) *latifrons (Zetterstedt, 1843)
Fig. 40

Eristalis latifrons Zetterstedt, 1843: 811.
Cheilosia intonsa Loew, 1858: 588. Syn. by Speight & Lucas (1992).

Cheilosia intonsa – Stackelberg & Richter 1968: 246. — Stackelberg 1970: 59. — Peck 1988: 105. — Barkalov 1993: 714.
Cheilosia latifrons – Mengual *et al.* 2020: 17.

Differential diagnosis

The female of *Cheilosia latifrons* has the combination of a pilose face and bare eye, unique amongst Caucasian species of *Cheilosia*. In the male, the combination of a pilose face, pilose eye and posterior margin of scutellum without setae is, within the Caucasus, only shared with *C. pseudogrossa*. The male *C. latifrons* differs from that of *C. pseudogrossa* by being much smaller (body length 7–9 mm vs 12–13 mm), parafacia broad (narrow in *C. pseudogrossa*) and eye with white sparse pile (with dense black pile in *C. pseudogrossa*).

Material examined

ARMENIA – **Kotayk Province** • 1 ♂; Tsaghkadzor, Y.S.U. Rest House; 40.533625° N, 44.703028° E; 1915 m a.s.l.; 23 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093658 = ZFMK-TIS-8014607.

GEORGIA – **Mtskheta-Mtianeti** • 1 ♀; Tbilisi N.P.; 41.880° N, 45.023° E; 1289 m a.s.l.; 4 May 2023; S. Bot leg.; SBA, SB.002371 = ZFMK-TIS-8028020.

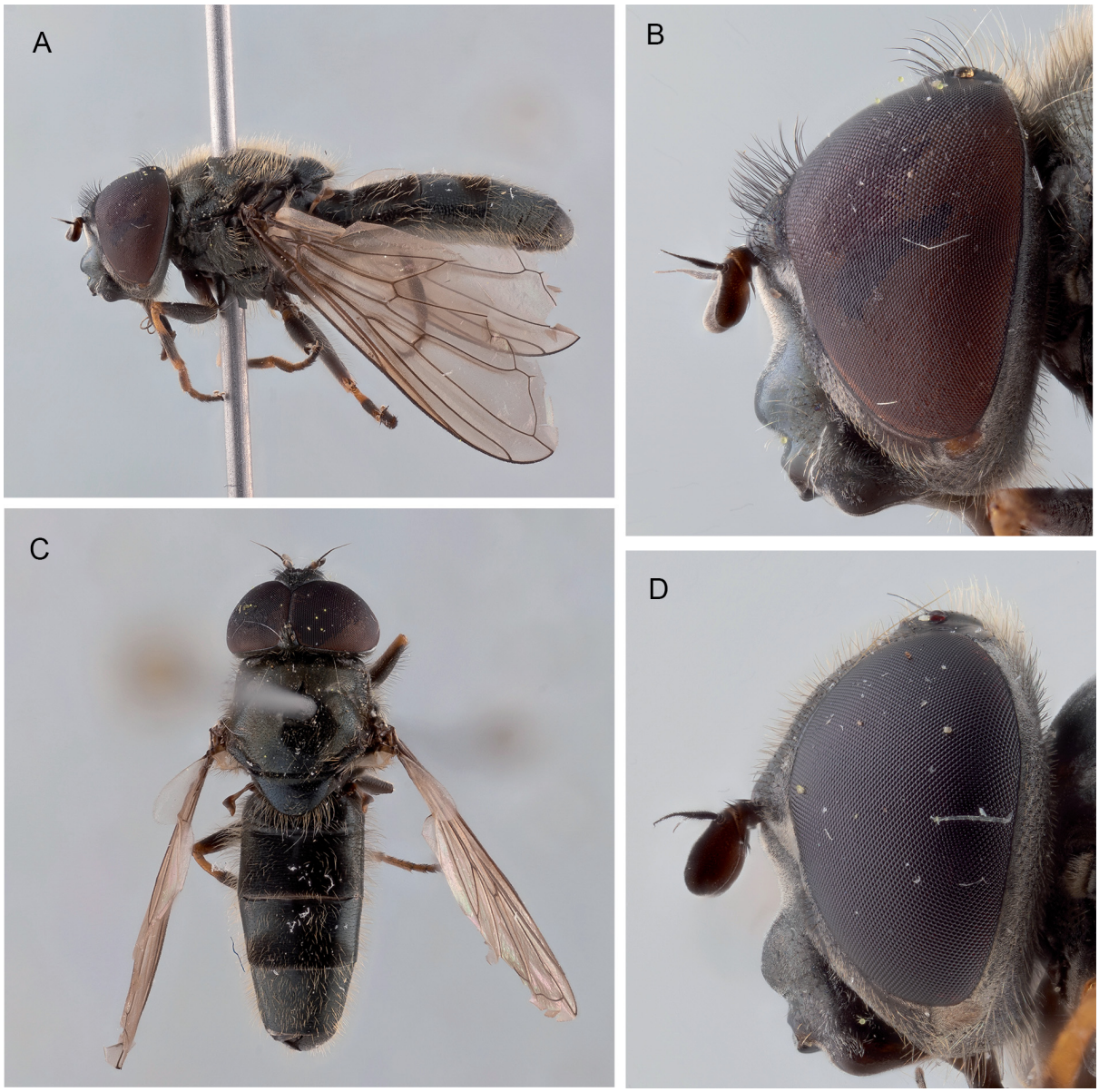

Fig. 40. *Cheilosia* (*Cheilosia*) *latifrons* (Zetterstedt, 1843). **A–C**. ♂ (ZFMK, ZFMK-TIS-8014607); collected in Armenia; body length 9.2 mm. **A**. Habitus, lateral view. **B**. Head, lateral view; eye width 1.3 mm. **C**. Habitus, dorsal view. **D**. ♀ (SBA, ZFMK-TIS-8028020); head, lateral view; collected in Georgia; eye width 1.1 mm. Not to scale.

Genetics

The DNA barcodes of Caucasian specimens cluster together with sequences from Europe with high support (BS = 100%).

Remarks

Stackelberg & Richter (1968) reported this species as *C. intonsa* from two localities in Armenia. We are not aware of any other published records from the Caucasus. Thus, we provide the first record of this species for Georgia and new records for Armenia after more than five decades.

Biology

During our expeditions, collected between 4 May and 23 May at an altitude between 1289 and 1915 m a.s.l.

Distribution

Palaearctic. Within the Caucasus known from Armenia and Georgia.

Cheilosia* (*Taeniochilosia*) *longifacies sp. nov.
urn:lsid:zoobank.org:act:58001D28-B9E4-4B31-8542-B846D4B3993E
Fig. 41

Differential diagnosis

Cheilosia longifacies sp. nov. belongs to the *caerulescens* species group within the subgenus *Taeniochilosia*. This species group is recognized by typically having bicoloured legs (yellow and black) and infuscate wing cross-veins. The *caerulescens* species group has recently been revised (Ståhls & Barkalov 2017) and when using their key, *C. longifacies* keys out to *C. circassica*, which also occurs in the Caucasus (but is synonymized in this publication with *C. armeniaca*). Compared to *C. armeniaca*, *C. longifacies* has a larger body size (8.5–11 mm vs 8.5–9 mm) and the face further protruding, with the facial tubercle much lower relative to the ventral side of the eye, giving a snout-like appearance (Fig. 41B) (in *C. armeniaca* the face is less protruding; Fig. 6B), face with lateral stripe less pruinose, parafacia shiny except for the dorsal corners pruinose (in *C. armeniaca* parafacia has the dorsal half pruinose), eye contiguity ca 0.8 times as long as frons in *C. longifacies* (ca 0.6 times in *C. armeniaca*), frontal triangle shiny in *C. longifacies* instead of pruinose in *C. armeniaca*, frontal triangle with predominantly erect pile (in *C. armeniaca* frontal triangle with short erect pile only medially, laterally with dense forwardly directed pile with wavy apex Fig. 6B), dorsal margin of occiput with long yellow pile and some sparse black pile intermixed (only with yellow pile in *C. armeniaca* Fig. 6B), scutum with black pile intermixed with yellow pile (scutum with yellow pile in *C. armeniaca*), on body pile wavy apices more pronounced and more commonly occurring in *C. armeniaca* (e.g., on frons, posterior part of scutum and posterior katepisternum), tibiae with narrower black ring in *C. longifacies* (Fig. 41A) leaving apex of metafemur distinctly yellow (black ring reaching apex in *C. armeniaca*), tarsi paler with tarsomeres 2–4 of proleg dorsally yellow (protarsus dorsally dark brown to black in *C. armeniaca*), short ventral pile on metafemur black except for the yellow pile on basal 1/5 (in *C. armeniaca* metafemur with ventral pile yellow, except for the apical 1/4 with black pile), terga II–III partly pruinose (entirely shiny in *C. armeniaca*), abdomen more elongated, less oval compared to *C. armeniaca*, pile on sternum III medially predominantly adpressed (*C. armeniaca* has pile on sternum III medially predominantly erect) and surstylus with a less distinct kink halfway on the ventral margin. Although *C. longifacies* keys out to *C. armeniaca* in the identification key provided by Ståhls & Barkalov (2017), it is morphologically closer to *C. caerulescens* (Meigen, 1822), but it differs in several ways including more protruding and less pruinose face and tergum III with yellow pile only (tergum III partly black pilose in *C. caerulescens*).

Etymology

The species name is derived from the Latin word '*longus*' meaning 'long' (Brown 1956: 494) and the Latin word '*facies*' meaning 'face' (Brown 1956: 313) and it refers to its distinctly protruding face. Species epithet to be treated as a noun in apposition.

Material examined

Holotype

GEORGIA • ♂; Mtskheta-Mtianeti, Lutkhubi; 42.3984° N, 44.7996° E; 2068 m a.s.l.; 8 May 2023; S. Bot leg.; ZFMK, SB.003148 = ZFMK-TIS-8027991.

Paratypes

GEORGIA – **Mtskheta-Mtianeti** • 1 ♂; Lutkhubi; 42.3936° N, 44.7923° E; 1760 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT, ZFMK-TIS-8027953.

Description

Male

Length. Body 8.5–11 mm, wing 7–8.5 mm.

Head. Face bare, with facial tubercle, black, protruding downwards, shiny except for a pruinose band below antennae and slightly pruinose oblique stripe at lateral parts of face. Mala shiny. Parafacia black, at widest point ca 0.8 times as wide as width of postpedicel, shiny except dorsal corners, with yellow pile. Length of eye contiguity ca 0.8 times as long as frons. Angle of approximation of eyes ca 95°. Frontal triangle black, shiny, long yellow pilose, with medial frontal sulcus. Ocellar triangle with ca anterior ⅔ black pilose, ca posterior ⅓ yellow pilose. Dorsal margin of occiput with long yellow pile and some sparse black pile intermixed. Lunule black, medial arm on lunule absent, antennal fossa present. Scape black with predominantly yellow setae; pedicel basally black, apically dark orange, with predominantly yellow setae; postpedicel about as high as wide, rounded, entirely orange or basally orange, apically dark orange. Arista black, with short pile, pile 0.5 times as long as width of arista at base. Eye bare.

Thorax. Scutum black, shiny, finely punctured, with long erect yellow pile, medially and in between wing bases intermixed with sparse black pile; lateral margin of scutum with some black setae, postalar callus with or without black setae. Scutellum black, shiny, entirely with yellow pile, posterior margin with yellow not so strong setae. Pleura black, slightly pruinose, with yellow pile, dorsal and ventral pile patches on katepisternum connected. Haltere with pedicellum yellow, capitulum dark or orange.

Wing. Wing including alula entirely microtrichose; veins black, all cross-veins infuscated; stigma yellow-brown; vein R_{4+5} not distinctly curved.

Legs. Coxae and trochanters black. Femora black except apical 1/10 yellow. Tibiae black except ca basal 1/3 and apical 1/5 yellow. Tarsi yellow except basitarsomere and fourth tarsomere dorsally brown and fifth tarsomere black. Legs mainly yellow pilose, metafemur ventrally with long and short pile; of short pile, basal 1/5 yellow, remainder of pile predominantly black.

Abdomen. Terga I–IV with erect yellow pile, pile laterally longer, terga I–IV shiny except medial half of terga I–II and tergum III anteromedially pruinose. Sternum I pruinose, sterna II–IV shiny, sterna I–II with erect yellow pile, sterna III–IV with yellow erect pile laterally, pile medially adpressed and yellow, except posteromedial on sternum IV where also with black adpressed pile. Genitalia with surstylus longer than wide, tapering. Dorsal lobes of postgonite pointed, ventral lobes rounded.

Genetics

DNA barcodes of *C. longifacies* sp. nov. were resolved into a cluster with high support (BS = 100%) together with the barcodes of *C. armeniaca* and *C. caerulescens*. All sequences of *C. caerulescens* cluster together, while *C. longifacies* barcodes are grouped with those of *C. armeniaca*.

Remarks

Genetically indistinguishable from *C. armeniaca*, despite the many consistent distinct morphological differences between the two species.

Biology

In mountains between 1760–2068 m a.s.l. The holotype was collected with a hand net when flying through a flowering willow along a mountain stream just below the snow line, the paratype was feeding on male willow catkins a bit lower along the same mountain stream.

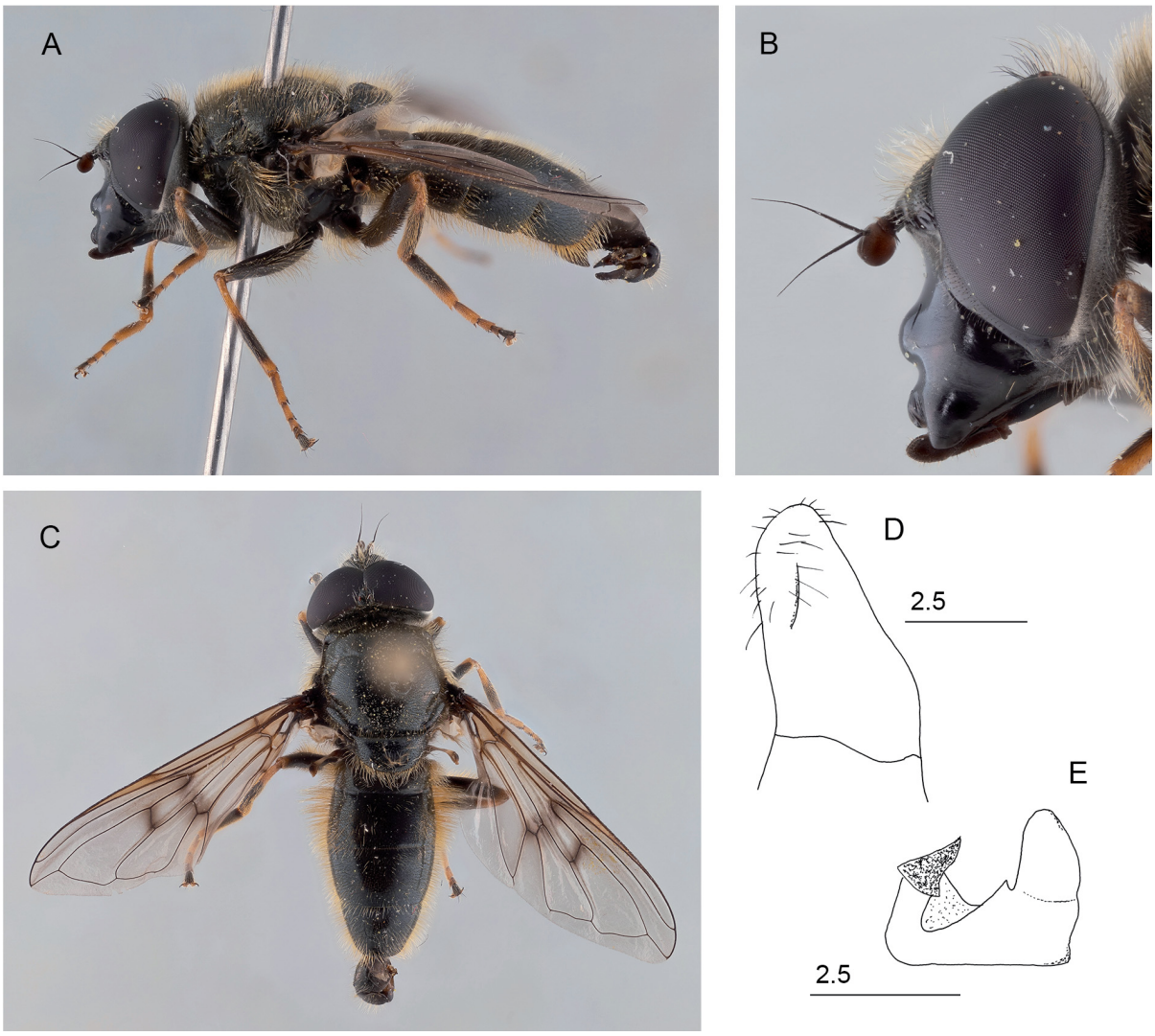

Fig. 41. *Cheilosia* (*Taeniochilosia*) *longifacies* sp. nov., holotype, ♂ (ZFMK, ZFMK-TIS-8027991). **A**. Habitus, lateral view; body length 8.5 mm. **B**. Head, lateral view; eye width 1.3 mm. **C**. Habitus, dorsal view; body length 8.5 mm. **D**. Surstylus, lateral view. **E**. Postgonite, lateral view. Scale bars: A–C not to scale; D–E in µm.

Distribution

So far only known from the type locality in the Greater Caucasus.

Cheilosia* (*Eucartosyrphus*) *longula (Zetterstedt, 1838)
Fig. 42

Eristalis longula Zetterstedt, 1838: 613.

Cheilosia longula – Barkalov 1993: 712.

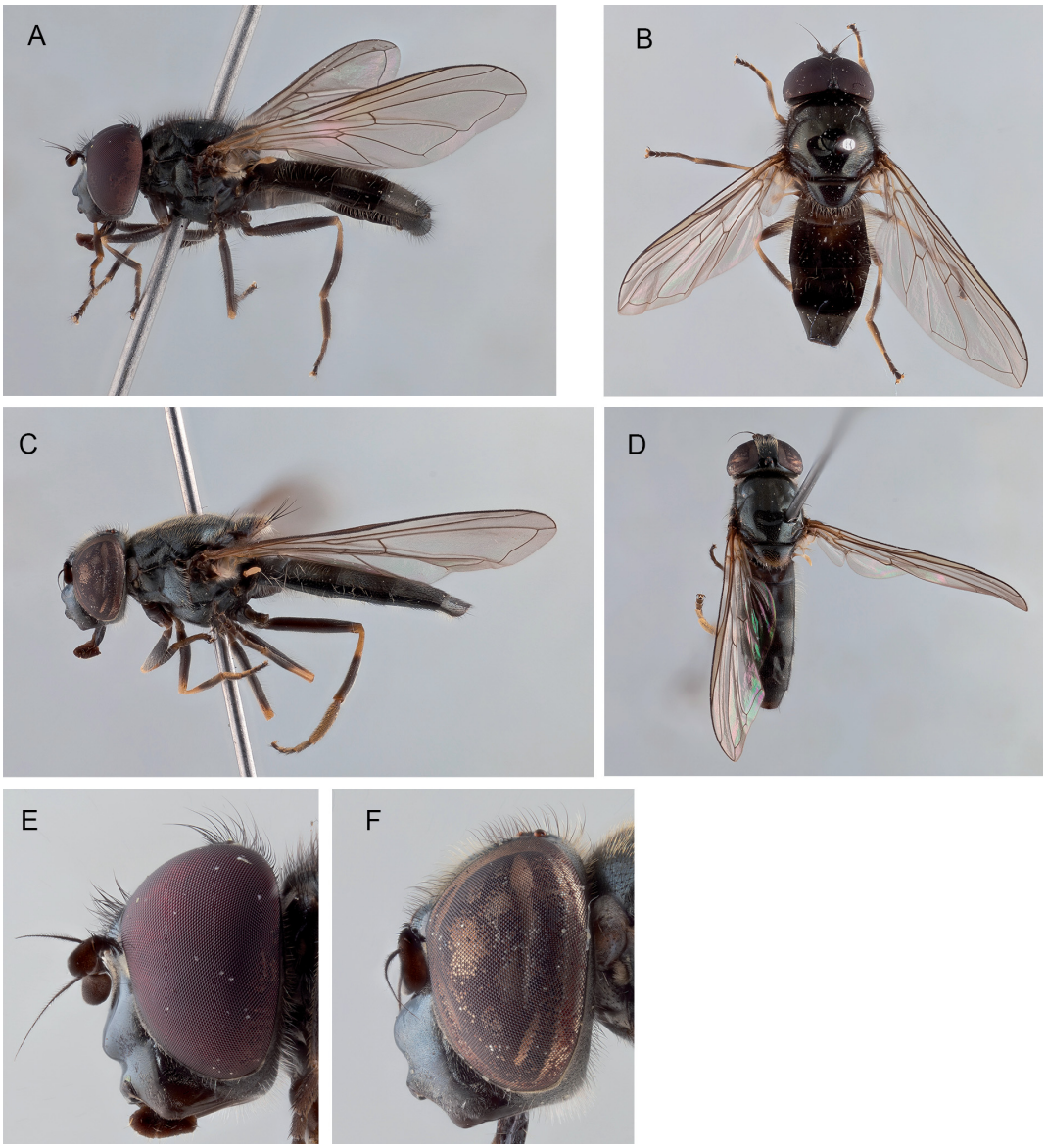

Fig. 42. *Cheilosia* (*Eucartosyrphus*) *longula* (Zetterstedt, 1838). **A**. ♂ (SBA, SB.004474); habitus, lateral view; collected in Finland; body length 6.9 mm. **B**. ♂ (SBA, SB.004475); habitus, dorsal view; collected in the Netherlands; body length 7.8 mm. **C–D**. ♀ (ASW, ZFMK-TIS-8009291); collected in Georgia; body length 7.4 mm. **C**. Habitus, lateral view. **D**. Habitus, dorsal view. **E**. ♂ (SBA, SB.004476); head, lateral view; collected in Norway; eye width 1.2 mm. **F**. ♀ (ZFMK-TIS-8009291; ASW); head, lateral view; collected in Georgia; eye width 1.0 mm. Not to scale.

Differential diagnosis

Cheilosia longula is a small (body length: 6–9 mm), slender species, characterized by a bare face, bare eye, bicoloured legs, hyaline wings and lunule with reduced medial arm. Similar to *C. ruffipes* and *C. scutellata*, but these species have a broad facial tubercle, semicircular in dorsal view, while in *C. longula* the facial tubercle is narrow, almost conical in dorsal view. Like *C. flavissima*, but that species is paler, in the male the face is partly yellow, and the wing base is yellow (black in *C. longula*) and in the female the pro- and mesofemur and scutellum are completely yellow (pro- and mesofemur black with narrow yellow apices and scutellum at least along anterior margin black in *C. longula*).

Material examined

GEORGIA – **Mtskheta-Mtianeti** • 1 ♀; 42.6669° N, 44.6127° E; 2139 m a.s.l.; 13 Jul. 2019; A. Ssymank leg.; ASW, ZFMK-TIS-8009291.

Genetics

DNA barcodes of *C. longula* from Europe, Russian Far East and the Caucasus cluster together with high support (BS = 99.9%).

Remarks

Reported from Georgia for the first time.

Distribution

Europe, Caucasus, eastwards to eastern Siberia. Within the Caucasus, occurrence in countries other than Georgia uncertain. Barkalov (1993) reports it from the Greater Caucasus without specifying the country. Not reported from the Russian Caucasus in the Russian Checklist (Barkalov & Mutin 2018).

Cheilosia* (*Taeniochilosia*) *lukashovae Barkalov, 1993
Fig. 43

Cheilosia lukashovae Barkalov, 1993: 702.

Cheilosia lukashovae – Barkalov & Ståhls 1997: 40. — Barkalov & Mutin 2018: 486.

Differential diagnosis

Cheilosia lukashovae belongs to the subgenus *Taeniochilosia* by the combination of bare eye, black legs and the anterior process of lunula not broadly confluent with the face (Barkalov & Ståhls 1997). The male *C. lukashovae* is easily distinguishable amongst those of the other *Taeniochilosia* occurring in the Caucasus by the combination of the pruinose parafacia, scutum and sterna, and the long surstylus ca three times as long as wide (at most two times as long as wide in the other species). The female is the only *Taeniochilosia* in the Caucasus with the combination of a narrow face (at level of antennal base narrower than eye) and scutum with erect yellow pile, with longer black pile intermixed (vs scutum with adpressed pile in the other species).

Material examined

Collected in 2018, 2019, 2021 and 2023, but 2018 records were not published in Mengual *et al.* (2020). Hence, all records are reported here.

GEORGIA – **Imereti** • 8 ♂♂; Abastumani, road Abastumani to Sairme; 41.8245° N, 42.8482° E; 2165 m a.s.l.; 10 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386098, CNC1386110 to CNC1386113, CNC1386115, CNC1386116, CNC1386120 • 1 ♀; same data as for preceding; CNC, CNC1386117

• 1 ♂, 1 ♀; road Abastumani to Sairme; 41.8242° N, 42.8472° E; 2150 m a.s.l.; 10 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♂; road from Abastumani to Sairme; 41.8385° N, 42.8194° E; 2260 m a.s.l.; 10 Jun. 2020; X. Mengual leg.; ZFMK, ZFMK-DIP-00066342 = ZFMK-TIS-8008755 • 1 ♀; road from Abastumani to Sairme; 41.8643° N, 42.7784° E; 1830 m a.s.l.; 10 Jun. 2020; X. Mengual leg.; ZFMK, ZFMK-DIP-00066347. – **Kakheti** • 5 ♂♂; Batsara Nature Reserve; 42.26493° N, 45.25918° E; 1955 m a.s.l.; 29 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00094022 = ZFMK-TIS-8014590, ZFMK-DIP-00094023 to ZFMK-DIP-00094025, ZFMK-DIP-00094027 • 1 ♂; Batsara Nature Reserve; 42.28654° N, 45.24221° E; 2065 m a.s.l.; 29 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00094031 = ZFMK-TIS-8014591 • 1 ♀; same data as for preceding; ZFMK, ZFMK-DIP-00094032 = ZFMK-TIS-8014592. – **Mtskheta-Mtianeti** • 1 ♀; Kobi; 42.5052° N, 44.4991° E; 2860 m a.s.l.; 14 Jul. 2019; A. Ssymank leg.; ASW, ZFMK-TIS-8009290 • 2 ♀♀; Tbilisi N.P.; 41.880° N, 45.023° E; 1289 m a.s.l.; 4 May 2023; S. Bot leg.; SBA, SB.002395, SB.002396 • 5 ♂♂, 1 ♀♀; Tbilisi N.P.; 41.877° N, 45.0138° E; 1250 m a.s.l.; 4 May 2023; F. Van de Meutter leg.; FMT • 2 ♂♂; Tbilisi N.P.; 41.8802° N, 45.0220° E; 1279 m a.s.l.; 4 May 2023; W. Opdekamp leg.; WOR, A015, A053 • 2 ♀♀; same data as for preceding; WOR, A037, A038 • 2 ♀♀; Tbilisi N.P.; 41.8787° N, 45.0288° E; 1316 m a.s.l.; 9 May 2023; S. Bot leg.; SBA, SB.002393, SB.002394. – **Racha-Lechkhumi and Kvemo Svaneti** • 1 ♂; 42.8880° N, 43.2330° E; 1900 m a.s.l.; 30 Jun. 2018; S. Bot leg.; SBA, SB.002383. – **Samegrelo-Zemo Svaneti** • 3 ♂♂; 42.9480° N, 43.0200° E; 2800 m a.s.l.; 25 Jun. 2018; S. Bot leg.; SBA, SB.002379 • 3 ♀♀; same data as for preceding; SBA, SB.002380, SB.002381 • 7 ♂♂, 5 ♀♀; 14 km E of Mestia; 43.0256° N, 42.8908° E; 2550 m a.s.l.; 13 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♂, 1 ♀; 43.0259° N, 42.9103° E; 2863 m a.s.l.; 13 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386386, CNC1386387 • 1 ♂; 43.0254° N, 42.8906° E; 2550 m a.s.l.; 13 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066341 • 7 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00066344, ZFMK-DIP-00066345 = ZFMK-TIS-8008757, ZFMK-DIP-00066346, ZFMK-DIP-00066348 to ZFMK-DIP-00066351 • 7 ♂♂; Mestia; 43.02° N, 42.87° E; 2350 m a.s.l.; 13 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.912 to 2019-00.918 • 5 ♀♀; same data as for preceding; JSB, 2019-00.919 to 2019-00.923 • 1 ♂; 43.0260° N, 42.8900° E; 2566 m a.s.l.; 13 Jun. 2019; S. Bot leg.; SBA, SB.002385 • 1 ♀; same data as for preceding; SBA, SB.002386 • 1 ♂; 43.0280° N, 42.9100° E; 2834 m a.s.l.; 13 Jun. 2019; S. Bot leg.; SBA, SB.002387 • 3 ♂♂; 42.9471° N, 43.0671° E; 2257 m a.s.l.;15 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386539, CNC1386555, CNC1386556 • 5 ♀♀; same data as for preceding; CNC, CNC1386520, CNC1386530, CNC1386536, CNC1386540, CNC1386553 • 2 ♀♀; Ushguli; 42.94° N, 43.05° E; 2220 m a.s.l.;15–17 Jun. 2019; J. van Steenis leg.; Malaise trap; JSB, 2019-00.924, 2019-00.925 • 3 ♂♂, 1 ♀; hilltop 7 km W of Ushguli; 42.9370° N, 42.9061° E; 2615 m a.s.l.; 16 Jun. 2019; F. Van de Meutter leg.; FMT • 2 ♂♂; 42.9062° N, 42.9370° E; 2615 m a.s.l.; 16 Jun. 2020; X. Mengual leg.; ZFMK, ZFMK-DIP-00066339, ZFMK-DIP-00066340 = ZFMK-TIS-8008753 • 1 ♀; Ushguli; 42.94° N, 43.07° E; 2300 m a.s.l.; 16 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.926 • 1 ♀; S of Davberi; 42.90° N, 42.93° E; 2600 m a.s.l.; 17 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.927 • 1 ♂; 42.8980° N, 43.0080° E; 2601 m a.s.l.; 18 Jun. 2019; S. Bot leg.; SBA, SB.002382 • 2 ♀♀; pass from Ushguli to Tsana; 42.9142° E, 43.0911° N; 2575 m a.s.l.; 20 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♂; 43.0275° N, 42.9115° E; 2887 m a.s.l.; 14 Jul. 2021; S. Bot leg.; SBA, SB.002384. – **Samtskhe-Javakheti** • 5 ♀♀; Borjomi N.P.; 41.7280° N, 43.3640° E; 2327 m a.s.l.; 9 Jun. 2019; S. Bot leg.; SBA, SB.002388 to SB.002392 • 1 ♂; road from Sakire to Tsikhisjvari; 41.7251° N, 43.3605° E; 2519 m a.s.l.; 9 Jun. 2020; X. Mengual leg.; ZFMK, ZFMK-DIP-00066343 • 2 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00066352, ZFMK-DIP-00066353 • 1 ♂; Borjomi; 41.7299° N, 43.3684° E; 2245 m a.s.l.; 9 Jun. 2019; J.H. Skevington leg.; CNC, CNC1385983 • 5 ♂♂; Borjomi; 41.72° N, 43.36° E; 2250 m a.s.l.; 9 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.898 to 2019-00.902 • 5 ♀♀; same data as for preceding; JSB, 2019-00.903 to 2019-00.907 • 6 ♂♂, 4 ♀♀; road from Sakire to Tsikhisjvari; 41.7251° N, 43.3605° E; 2519 m a.s.l.; 9 Jun. 2019; F. Van de Meutter leg.; FMT • 2 ♂♂; Abastumani; 41.83° N, 42.81° E; 2260 m a.s.l.; 10 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.908, 2019-00.909 • 1 ♀; same data as for preceding; JSB, 2019-00.910 • 1 ♂; Abastumani; 41.82° N, 42.84° E; 2100 m a.s.l.; 11 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.911 • 10 ♂, 7 ♀♀; Kodiani;

41.7305° N, 43.3537° E; 2160 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT • 3 ♂♂; Sakire; 41.7301° N, 43.3306° E; 1820 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT • 7 ♂♂; Kodiani; 41.7300° N, 43.3485° E; 2080 m a.s.l.; 10 May 2023; W. Opdekamp leg.; WOR, A014, A020, A026, A028, A040, A045, A047 • 4 ♀♀; same data as for preceding; WOR, A001, A017, A034, A041 • 2 ♂♂; Kodiani; 41.7268° N, 43.3490° E; 2150 m a.s.l.; 10 May 2023; W. Opdekamp leg.; WOR, B007, B014 • 1 ♀; same data as for preceding; WOR, B012.

RUSSIA – **North Ossetia-Alania** • 2 ♂♂; W of Digoria, Chefandzar mire in Urukh River valley; 43.5149° N, 42.9186° E; 2289 m a.s.l.; 2–3 Jun. 2018; A. Przhiboro leg.; yellow plates; ZFMK, ZFMK-

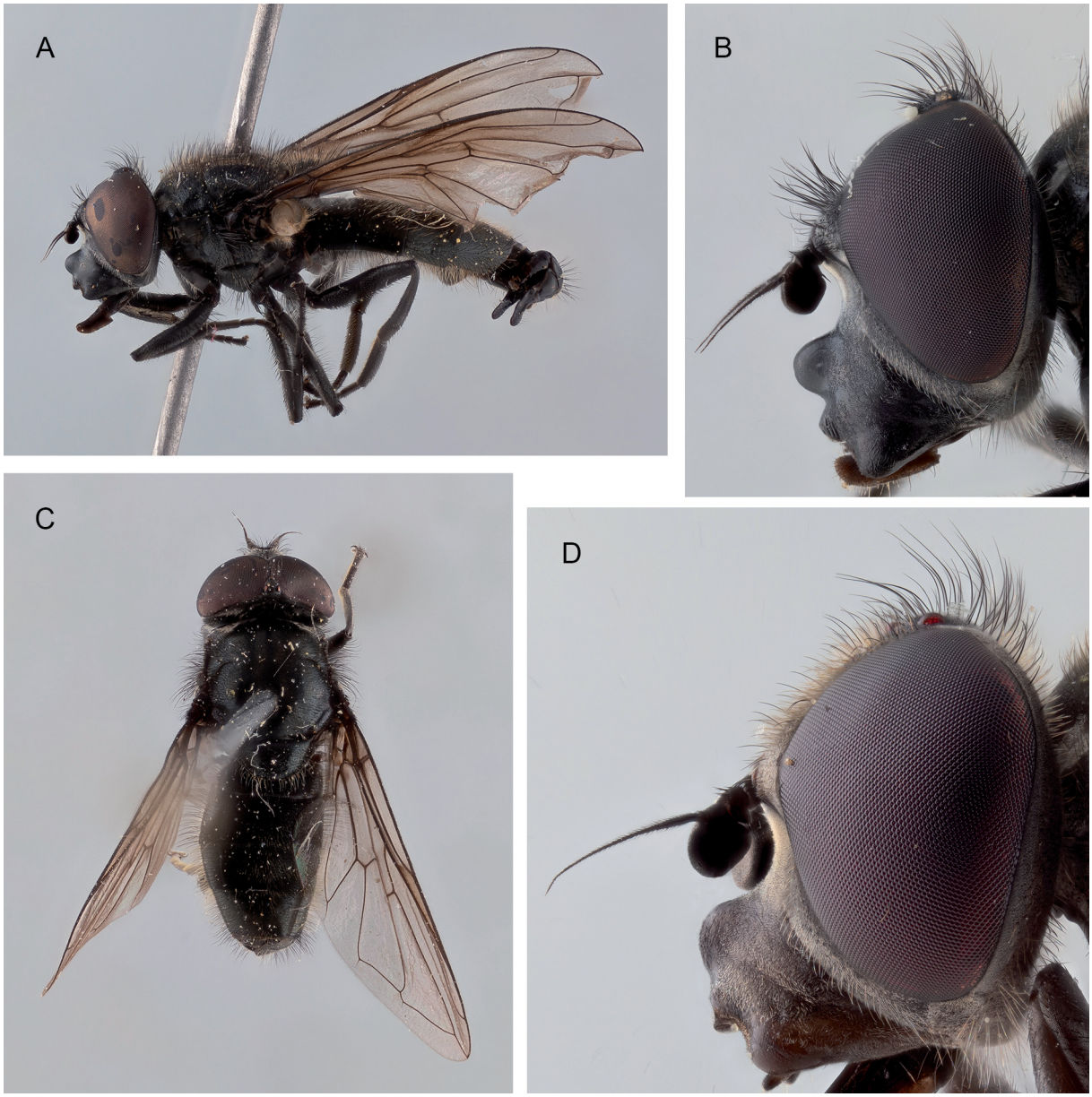

Fig. 43. *Cheilosia* (*Taeniochilosia*) *lukashovae* Barkalov, 1993. Collected in Georgia. **A**. ♂ (SBA, SB.002385); habitus, lateral view; body length 6.7 mm. **B**. ♂ (SBA, SB.002384); head, lateral view; eye width 0.9 mm. **C**. ♂ (SBA, SB.002383); habitus, dorsal view; body length 6.5 mm. **D**. ♀ (SBA, SB.002396); head, lateral view; eye width 1.1 mm. Not to scale.

DIP-00078666 = ZFMK-TIS-8009573, ZFMK-DIP-00078670 = ZFMK-TIS-8009577 • 7 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00078661 = ZFMK-TIS-8009568, ZFMK-DIP-00078662 = ZFMK-TIS-8009569, ZFMK-DIP-00078664 = ZFMK-TIS-8009571, ZFMK-DIP-00078665 = ZFMK-TIS-8009572, ZFMK-DIP-00078667 = ZFMK-TIS-8009574, ZFMK-DIP-00078668 = ZFMK-TIS-8009575, ZFMK-DIP-00078669 = ZFMK-TIS-8009576.

Genetics

All DNA barcodes of C. *lukashovae* are resolved in a group with high support (BS = 100%).

Remarks

Reported from Georgia for the first time.

Biology

During our expeditions, collected between 4 May and 20 June at altitudes between 1250 and 2860 m a.s.l. Males have been found hovering and sitting on the ground near hilltops and at the upper margin of sloping meadows near forest. Both sexes visit flowers of *Caltha palustris* and *Ranunculus* sp.

Distribution

Northern Caucasus (Russia) and Georgia.

Cheilosia* (*Cheilosia*) *megaclama sp. nov.
urn:lsid:zoobank.org:act:1F1630DC-842F-4C5E-81C8-754C8C524F99
Figs 44–45

Differential diagnosis

Cheilosia megaclama sp. nov. belongs to the subgenus *Cheilosia*. In the Caucasus, the male can be confused with those of *C. aurantia* sp. nov. and *C. albipila*. It is best distinguished from that of *C. aurantia* by the yellow pile on the eye (Fig. 44B) (longer and black in *C. aurantia* Fig. 9A**)** and it can be separated from that of *C. albipila* by the wider face, below the antenna about as wide as an eye (Fig. 44D) (about half as wide as an eye in *C. albipila*) and the katepisternal hair patches that are separated or only narrowly connected by short pile (katepisternal hair patches connected broadly by long pile in *C. albipila*). Because the eyes are bare in the female, contrary to the male, the female of *C. megaclama* can be confused with those of *C. uviformis* and *C. atypica*, but it differs from the former by the truly bare eye (some short scattered pile on eye in *C. uviformis*) and wider parafacia (Fig. 45D), and it can be distinguished from the latter by the darker legs: tibiae with black ring and tarsi mainly black (tibiae with indistinct ring and tarsi dorsally mostly yellow, except first, fourth and fifth segments of protarsus and fifth segment of mesotarsus black in *C. atypica*). *Cheilosia megaclama* is especially similar to the extralimital *C. clama* Claussen & Vujić, 1995 occurring in Central Europe. The male of *C. megaclama* differs from that of *C. clama* by a larger body size (average 10.5 mm instead of maximum 8.8 mm in *C. clama*), slightly narrower face, shiny parafacia (parafacia pruinose in *C. clama*), longer eye contiguity (0.8 times the length of frons in *C. megaclama* vs 0.5 to 0.55 in *C. clama*), angle of approximation of eyes smaller (90° vs 100–110° in *C. clama*), wing veins blackish in basal half in *C. megaclama* instead of yellow in *C. clama*, metafemur ventrally with predominantly orange instead of black setae in *C. clama*, and differences in the male genitalia: postgonite with ventral lobe shorter and dorsal lobe longer. The female of *C. megaclama* differs from that of *C. clama* by larger size (on average over 9 mm vs around 7 mm), the longer body pile (pile much longer on, e.g., scutum, pleura and abdomen in *C. megaclama*) and by wing veins blackish in basal half in *C. megaclama* instead of yellow in *C. clama*.

Etymology

The species name derives from the Greek prefix '*mega*-' meaning 'large' (Brown 1956: 517) applied to the name *clama* to mean 'large *clama*' and it refers to the general similar appearance of our new species to *C. clama* and the difference in size. Species epithet to be treated as a noun in apposition.

Material examined

Holotype

GEORGIA • ♂; Mtskheta-Mtianeti, Lutkhubi; 42.3984° N, 44.7996° E; 2068 m a.s.l.; 8 May 2023; S. Bot leg.; ZFMK, SB.003216 = ZFMK-TIS-8027979.

Paratypes

GEORGIA – **Mtskheta-Mtianeti** • 1 ♂; Lutkhubi; 42.3984° N, 44.7996° E; 2068 m a.s.l.; 8 May 2023; S. Bot leg.; SBA, SB.003217 • 1 ♀; same data as for preceding; SBA, SB.003218 = ZFMK-TIS-8027980 • 1 ♂; Lutkhubi; 42.3936° N, 44.7923° E; 1760 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT • 1 ♀; same data as for preceding; ZFMK • 1 ♂; Lutkhubi; 42.3989° N, 44.7995° E; 2100 m a.s.l.; 8 May 2023; W. Opdekamp leg.; ZFMK, D004. – **Samegrelo-Zemo Svaneti** • 1 ♀; Ushguli, close to river Inguri; 42.9500° N, 43.0719° E; 2270 m a.s.l.; 15 Jun. 2019; F. Van de Meutter leg.; FMT, ZFMK-TIS-8012674. – **Samtskhe-Javakheti** • 1 ♂; Kodiani; 41.7268° N, 43.3490° E; 2150 m a.s.l.; 10 May 2023; W. Opdekamp leg.; WOR, B002.

Description

Male

Length. Body 10.5–11 mm, wing 8–8.5 mm.

Head. Face black, bare, with facial tubercle, thick pruinose below lunule, slightly pruinose, except facial tubercle and mouth edge shiny and with dense pruinose band below lunule, below lunule slightly less wide than an eye. Parafacia black, shiny or slightly pruinose, white pilose, about 0.8 times as wide as postpedicel. Clypeus shiny, about 1.5 to 1.9 times as long as wide measured from the midline. Frontal triangle black, pruinose, swollen, with long black and yellow pile, black pile usually dominating, with medial frontal sulcus. Length of eye contiguity about 0.8 times the length of frons. Angle of approximation of eyes 90°. Vertical triangle black, ocellar triangle long black and yellow pilose. Occiput pruinose, short yellow and long black pilose. Lunule dark orange to blackish, with distinct medial arm, separating acetabula. Scape black; pedicel black or dark orange; postpedicel orange, sometimes dorsal outer corner darkened, 1.25 to 1.5 times as wide as high; arista black, thickened in basal one third, with very short pile, pile much shorter than diameter of arista at base. Eye entirely covered with yellow pile.

Thorax. Scutum black, shiny, finely punctured, with erect yellow-white pile, with a few black pile intermixed near wing base, on postalar callus and in anterolateral corners. Scutellum shiny or slightly pruinose, with long erect yellow-white pile, without setae along posterior margin. Pleura black, slightly pruinose, with yellow pile; metasternum with long whitish pile; dorsal and ventral pile patches on katepisternum narrowly separated but usually connected by shorter pile. Haltere pedicellum orange, capitulum dark brown.

Wing. Wing including alula entirely microtrichose, hyaline except in anterior half where slightly dark brown infuscated, wing veins brown in the basal part and black in the apical part of the wing.

Legs. With black and yellow piles. Coxae, trochanters black. Femora black except apices narrowly yellow, with black and yellow piles; metafemur ventrally with orange semi-adpressed setae, with a few black ones intermixed. Tibiae orange except with black ring below the middle occupying one third of pro- and mesotibia and 40% of metatibia. Protarsus black except basal three tarsomeres ventrally orange;

mesotarsus black except basal four tarsomeres ventrally orange and basal two tarsomeres dorsally dark orange to blackish; metatarsus black except basal four tarsomeres ventrally orange.

Abdomen. Entirely with yellow-white pile. Terga I–IV medially pruinose and with adpressed short pile, laterally shiny and with long erect pile. Sternum I medially shiny, laterally pruinose, with long erect pile,

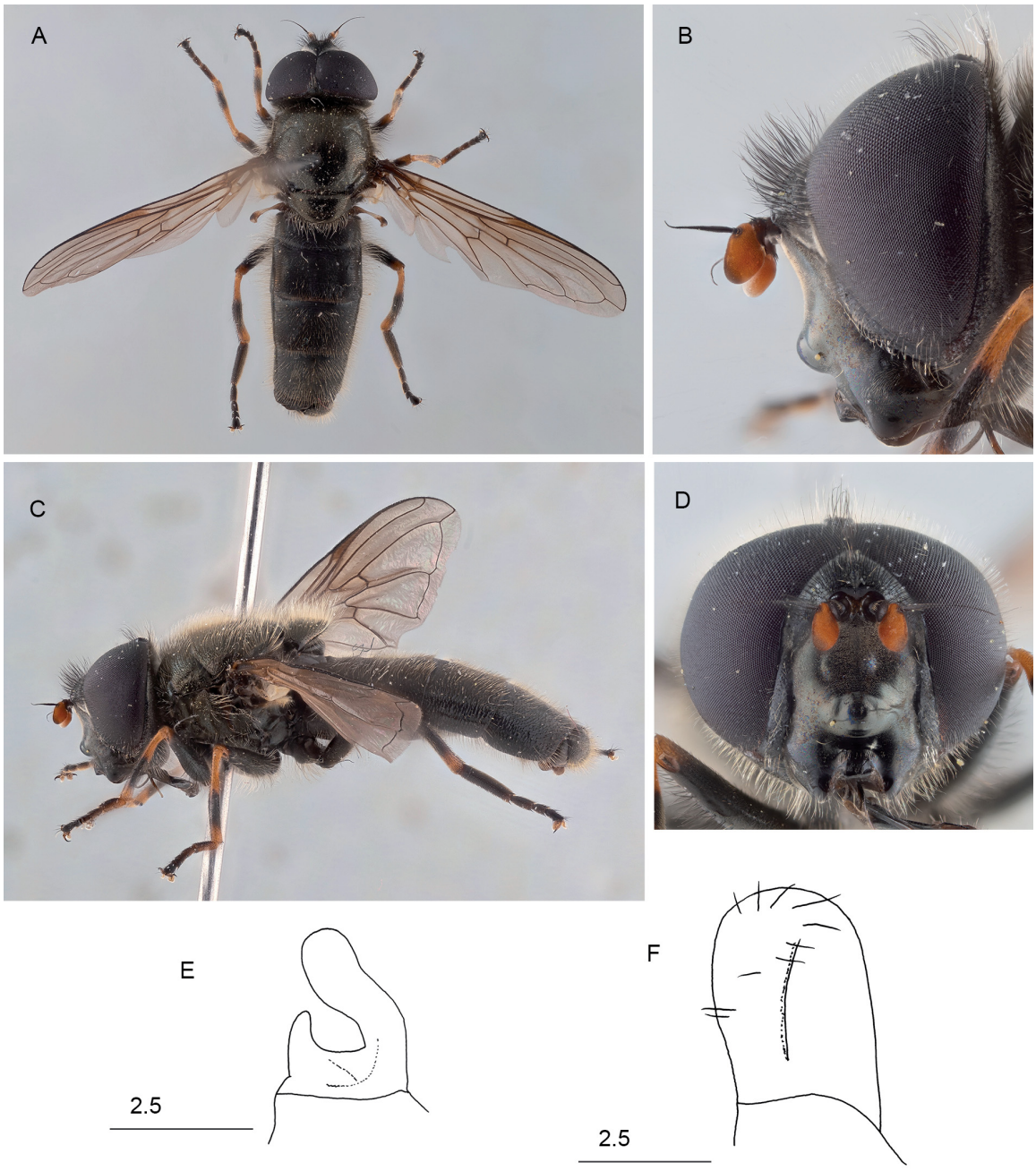

Fig. 44. *Cheilosia* (*Cheilosia*) *megaclama* sp. nov., paratype, ♂ (SBA, SB.003217); body length 10.5 mm. **A**. Habitus, dorsal view. **B**. Head, lateral view; eye width 1.4 mm. **C**. Habitus, lateral view. **D**. Head frontal view; head width 2.5 mm. **E**. Postgonite, lateral view. **F**. Surstylus, lateral view. Scale bars: A–D not to scale; E–F in µm.

sternum II slightly pruinose, except with shiny median longitudinal stripe, with long erect pile, sterna III–IV slightly pruinose, medially with short adpressed pile, laterally with long erect pile. Genitalia with surstylus 1.3 to 1.5 times as long as wide, with keel (Fig. 44F); dorsal lobe of postgonite roughly triangular (Fig. 44E).

Female

Length. Body 8.5–10 mm, wing 7–8.2 mm.

Similar to the male, except for normal sexual dimorphism and the following characters. Face more extensively shiny, also sides of face shiny. Frons shiny, with erect yellow pile, with wide paravertica. Pile ocellar triangle yellow. Dorsal third of occiput shiny along eye. Eye bare. Scutum with erect dense yellow pile, without black pile intermixed in anterolateral part. Capitulum of haltere yellow to brownish. Metafemur ventrally with orange pile. Terga I–IV completely covered with yellow pile, long and erect along lateral margins, adpressed and shorter medially. Terga II–IV shiny. Sternum IV shiny except posterior margin pruinose.

Genetics

DNA barcodes of *C. megaclama* sp. nov. are resolved together with high support (BS = 100%).

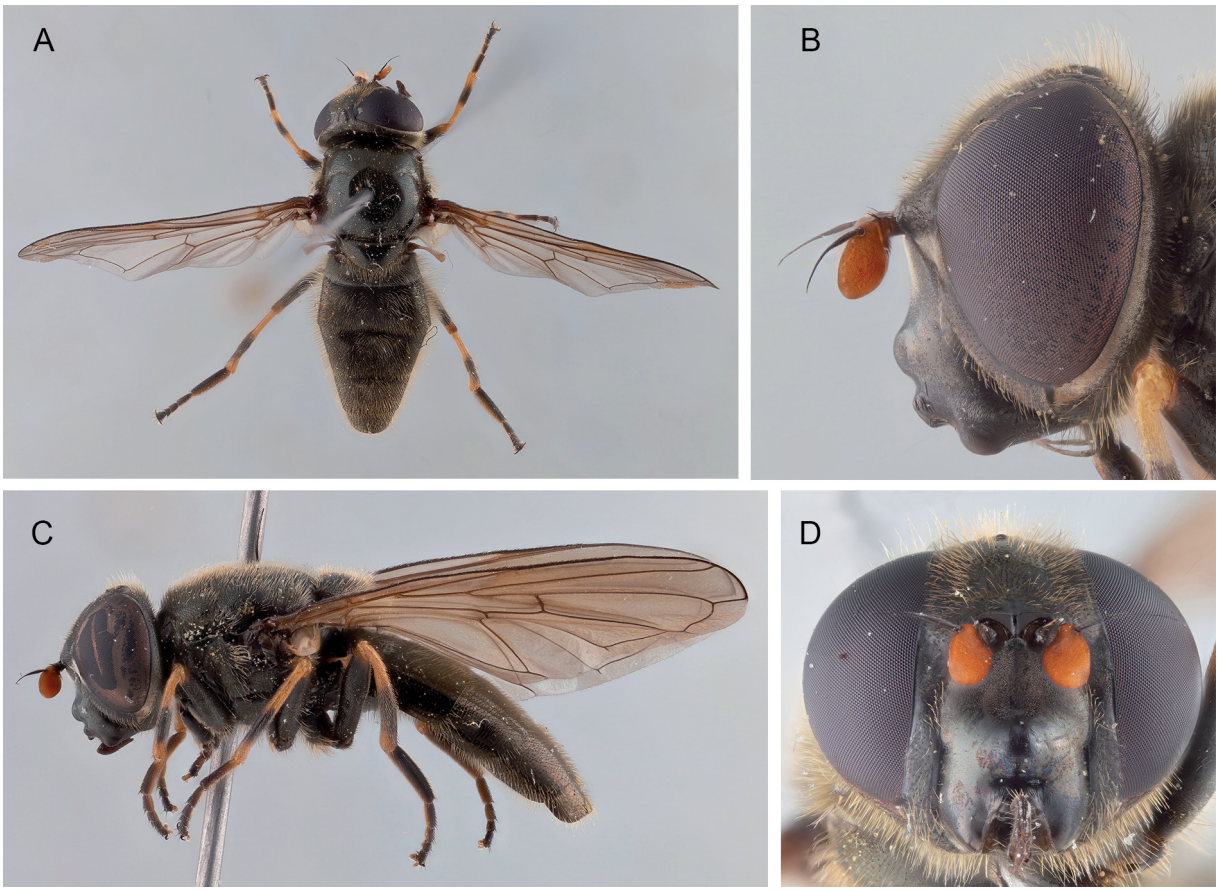

Fig. 45. *Cheilosia* (*Cheilosia*) *megaclama* sp. nov., ♀. **A**. Paratype (SBA, ZFMK-TIS-8027980); habitus, dorsal view; body length 8.8 mm. **B**. Paratype (FMT, ZFMK-TIS-8012674); head, lateral view; eye width 1.3 mm. **C**. Paratype (FMT); habitus, lateral view; body length 8.8 mm. **D**. Paratype (SBA, ZFMK-TIS-8027980); head, frontal view; head width 2.5 mm. Not to scale.

Biology

All specimens but one collected in early May on flowering *Salix* sp. at the snow line between 1760–2150 m a.s.l. One female collected in June at 2270 m a.s.l. in a U-shaped valley on flowering *Salix* sp.

Distribution

So far only known from the localities of the type series in the Greater and Lesser Caucasus in Georgia.

Cheilosia* (*Cheilosia*) *melanopa (Zetterstedt, 1843)
Fig. 46

Eristalis melanopa Zetterstedt, 1843: 807.

Cheilosia melanopa – Barkalov 1993: 714. — Mengual *et al.* 2020: 18 (part, see Remarks in *C. redi*).

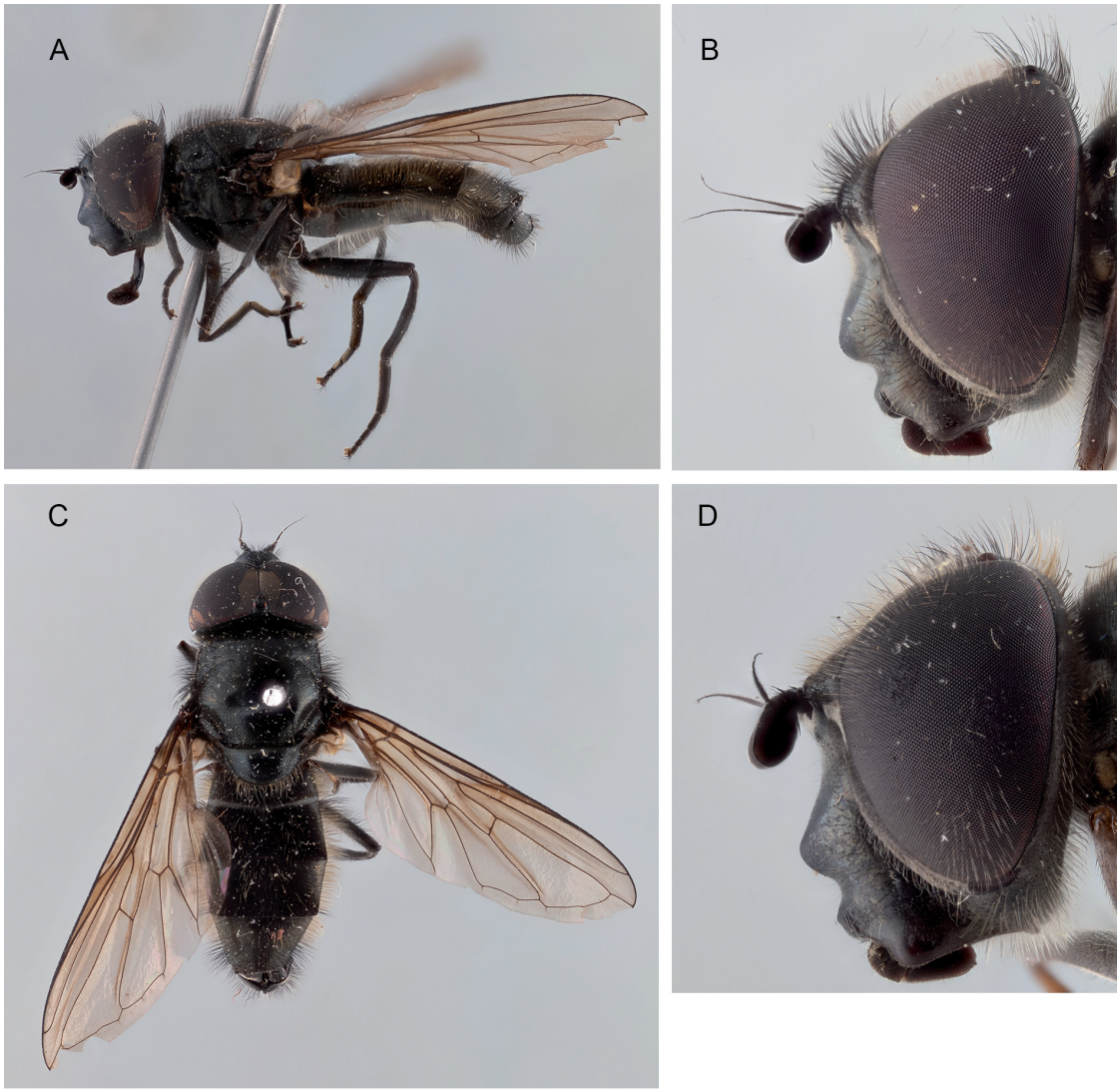

Fig. 46. *Cheilosia* (*Cheilosia*) *melanopa* (Zetterstedt, 1843). Collected in Georgia. **A**. ♂ (SBA, SB.002410); habitus, lateral view; body length 9.1 mm. **B**. ♂ (SBA, SB.002420); head, lateral view; eye width 1.4 mm. **C**. ♂ (SBA, SB.002410); habitus, dorsal view; body length 9.1 mm. **D**. ♀ (SBA, SB.002415); head, lateral view; eye width 1.3 mm. Not to scale.

Differential diagnosis

Given the pilose face and eye, almost entirely black legs and in the male a sickle-shaped dorsal lobe of the postgonite, *C. melanopa* is easily confused with *C. borjomi* sp. nov., *C. lasiopa*, *C. redi* and *C. variabilis* (see Francuski *et al.* 2009 for drawings of the male genitalia of these species). It differs from *C. lasiopa* by longer setae on posterior margin of scutellum and the male by shorter sickle-shaped dorsal lobe of postgonite. Similar to *C. borjomi* and *C. variabilis* but on average with smaller body size (8–10 mm vs 10–12 mm), stockier abdomen, tibiae usually narrowly yellow at base (usually all black in *C. borjomi* and *C. variabilis*), and in the male by the absence of black setae on ventral part of metafemur (present in males *C. borjomi* and *C. variabilis*). Females of *C. melanopa* have the posterior anepisternum pruinose (shiny in those of *C. variabilis*) and scutum with short erect predominantly yellow pile and with longer erect sparse black pile intermixed (with short semi-adpressed pile, this pile usually predominantly black and with longer erect sparse black pile intermixed in *C. borjomi*). Very similar to *C. redi*; see Differential diagnosis of that species.

Material examined

Collected in 2018, 2019 and 2021; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

COI sequences of *C. melanopa* from the Caucasus and other Palaearctic locations group together in our NJ tree with high support (BS = 98.1%).

Biology

During our expeditions, collected between 10 June and 31 July at an altitude on alpine meadows between 1900 and 2887 m a.s.l.

Distribution

Holarctic, including the Caucasus (Armenia, Georgia, Northern Caucasus).

Cheilosia* (*Cheilosia*) *mutabilis (Fallén, 1817)
Fig. 47

Eristalis mutabilis Fallén, 1817: 54.
Syrphus ruralis Meigen, 1822: 293. Syn. by Claussen & Speight (1999).

Cheilosia mutabilis – Radde 1899: 453. — Stackelberg & Richter 1968: 247. — Tóth 1986: 94. — Stackelberg 1970: 62. — Peck 1988: 109. — Barkalov 1993: 712. — Gujabidze 2002: 246. — Barkalov & Mutin 2018: 483. — Mengual *et al.* 2020: 19.
Cheilosia ruralis – Stackelberg & Richter 1968: 248. — Stackelberg 1970: 64. — Barkalov 1993: 721. — Gujabidze 2002: 246.
Cheilosia ruralis Meigen, 1822 [sic] – Gujabidze 2002: 246.

Differential diagnosis

Cheilosia mutabilis is a small (body size 7–8.5 mm) and slender species, easily confused with *C. urbana* and *C. psilophthalma*. Best distinguished from those by the black metaleg, with only base of metatibia yellow (Fig. 47A) (in the other two the metatibia with distinct orange base and apex) and arista with long pilosity, longer than or almost equal to the width of arista at base (in the other two species shorter than the width of arista at base).

Material examined

Collected in 2018, 2019, 2021, 2022 and 2023; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

All DNA barcodes of *C. mutabilis* from Europe and Caucasus are grouped together with high support (BS = 100%). Within the group there are two clusters and a single male from France. The two clusters differ morphologically, for instance, the specimens in the cluster in which the Armenian specimens are, are larger (body size on average 8.5 mm vs 7–7.5 mm), the face is wider, the parafacia is wider and the facial tubercle is better developed. However, all these differences appear to be subtle or overlapping, so for now we leave them as one species, but future research, with sampling in a larger range, could give more insight in the relations of these clusters.

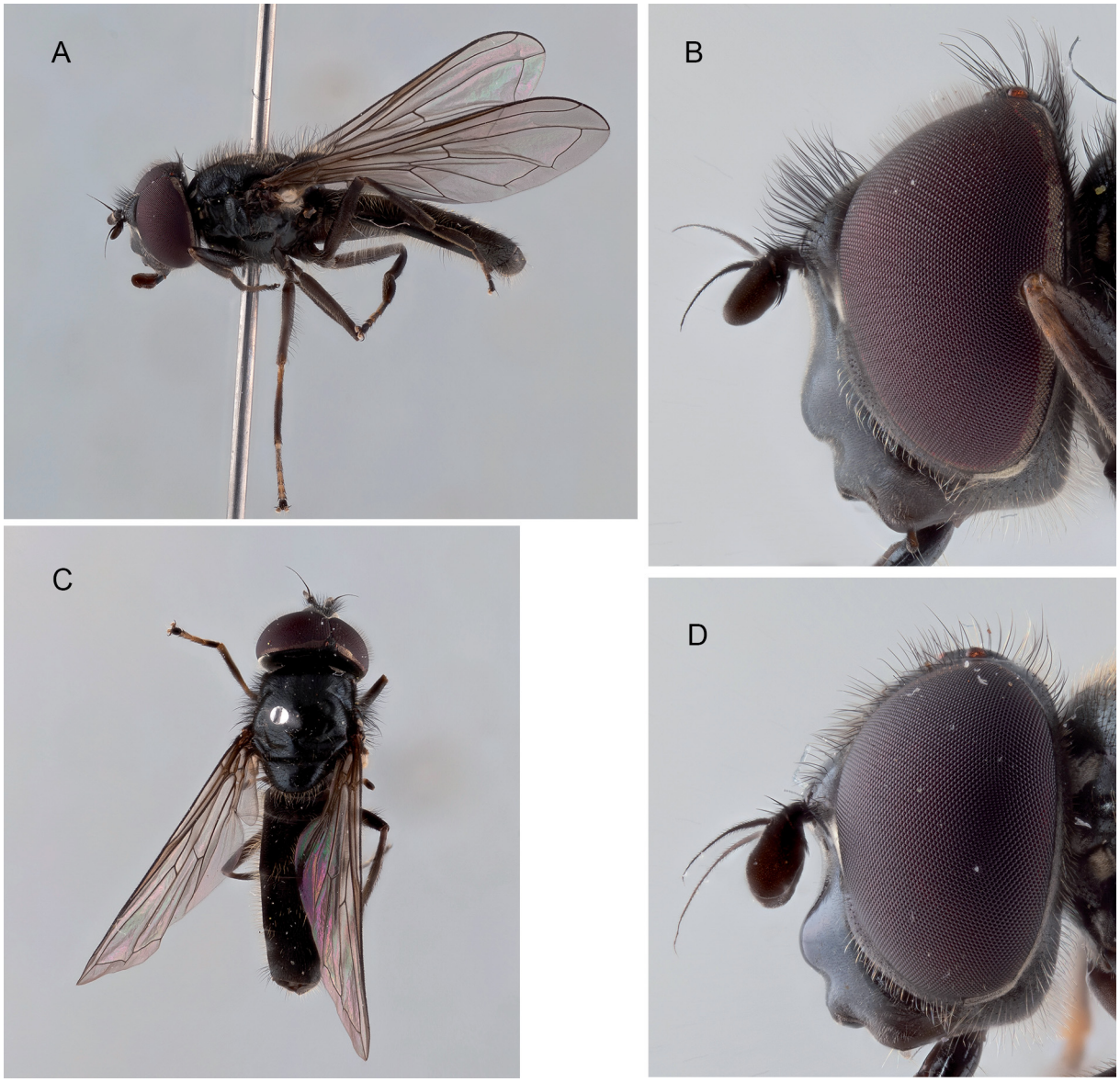

Fig. 47. *Cheilosia* (*Cheilosia*) *mutabilis* (Fallén, 1817). Collected in Georgia. **A**. ♂ (FMT); habitus, lateral view; body length 7.4 mm. **B**. ♂ (FMT); head, lateral view; eye width 0.9 mm. **C**. ♂ (FMT); habitus, dorsal view; body length 6.7 mm. **D**. ♀ (FMT); head, lateral view; eye width 1.0 mm. Not to scale.

Remarks

Claussen & Speight (1999) synonymized *Syrphus ruralis* Meigen, 1822 with *C. mutabilis*.

Biology

During our expeditions, collected between 9 May and 3 August at an altitude between 840 and 2500 m a.s.l.

Distribution

Western and Central Palaearctic, into western Siberia. Armenia, Georgia.

Cheilosia* (*Cheilosia*) *nebulosa Verrall, 1871
Fig. 48

Chilosia nebulosa Verrall, 1871: 201.

Differential diagnosis

Cheilosia nebulosa has the combination of a pilose eye, bare face, posterior margin of scutellum without bristles and legs bicoloured. Distinguished from most other species of *Cheilosia* possessing the same characters by having the ventral and dorsal pile patches on the katepisternum not connected (connected in, e.g., the otherwise similar *C. albitarsis*). The wing is brown and infuscate, but this can be indistinct. Best separated from *C. megaclama* sp. nov. by having basal tarsomeres of protarsus dorsally orange (protarsus black in *C. megaclama*) and from *C. flavipes* and *C. brunnipennis* by orange base of arista (black in the other two taxa).

Material examined

Cheilosia nebulosa was not collected in 2018, but collected in 2023.

GEORGIA – **Mtskheta-Mtianeti** • 8 ♂♂; Lutkhubi; 42.3797° N, 44.7969° E; 1463 m a.s.l.; 6 May 2023; S. Bot leg.; SBA, SB.002507 = ZFMK-TIS-8027984, SB.002508 = ZFMK-TIS-8027985, SB.002509 to SB.002513 • 1 ♂; same data as for preceding; ZFMK, SB.002505 • 5 ♀♀; same data as for preceding; SBA, SB.002515 to SB.002519 • 2 ♀♀; same data as for preceding; ZFMK, ZFMK-TIS-8027976, SB.002506 • 3 ♂♂; Lutkhubi; 42.3951° N, 44.7847° E; 2138 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT • 27 ♂♂, 9 ♀♀; Lutkhubi; 42.3867° N, 44.79° E; 1580 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT • 1 ♀; same data as for preceding; ZFMK • 7 ♂♂; Lutkhubi; 42.3930° N, 44.7929° E; 1700 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, A003, A010, A013, A016, A018, A020, A025 • 4 ♀♀; same data as for preceding; WOR, A005, A006, A021, A024 • 1 ♂; Lutkhubi; 42.3989° N, 44.7995° E; 2100 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, B005 • 2 ♀♀; same data as for preceding; WOR, B002, B004 • 1 ♂; Lutkhubi; 42.3984° N, 44.7866° E; 2180 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, C002 • 9 ♂♂; Lutkhubi; 42.3823° N, 44.7856° E; 1500 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, D003, D007, D016, D017, D022, D028, D033, D036, D037 • 2 ♂♂; Lutkhubi; 42.3938° N, 44.7857° E; 2120 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, E012, E018 • 5 ♂♂; Lutkhubi; 42.3984° N, 44.7996° E; 2068 m a.s.l.; 8 May 2023; S. Bot leg.; SBA, SB.002500 to SB.002504 • 2 ♀♀; same data as for preceding; SBA, SB.002521, SB.002522 • 9 ♂♂, 1 ♀; Lutkhubi; 42.3936° N, 44.7923° E; 1760 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; same data as for preceding; ZFMK • 9 ♂♂; Lutkhubi; 42.3930° N, 44.7929° E; 1734 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, C001, C002, C012, C014, C016, C024, C031, C034, C035 • 1 ♀; same data as for preceding; WOR, C020 • 1 ♀; Tbilisi N.P.; 41.8787° N, 45.0288° E; 1316 m a.s.l.; 9 May 2023; S. Bot leg.; SBA, SB.002520.

Genetics

DNA sequences for European and Caucasian specimens of *C. nebulosa* cluster together with high support (BS = 100%).

Remarks

Reported from the Caucasus for the first time.

Biology

During our expeditions, collected between 6 May and 9 May at an altitude between 1316 and 2180 m a.s.l. Locally abundant with several hundreds seen on alpine meadows, feeding on *Salix* sp. and males hovering at hilltops.

Distribution

Europe, Caucasus, eastward to West and Central Siberia.

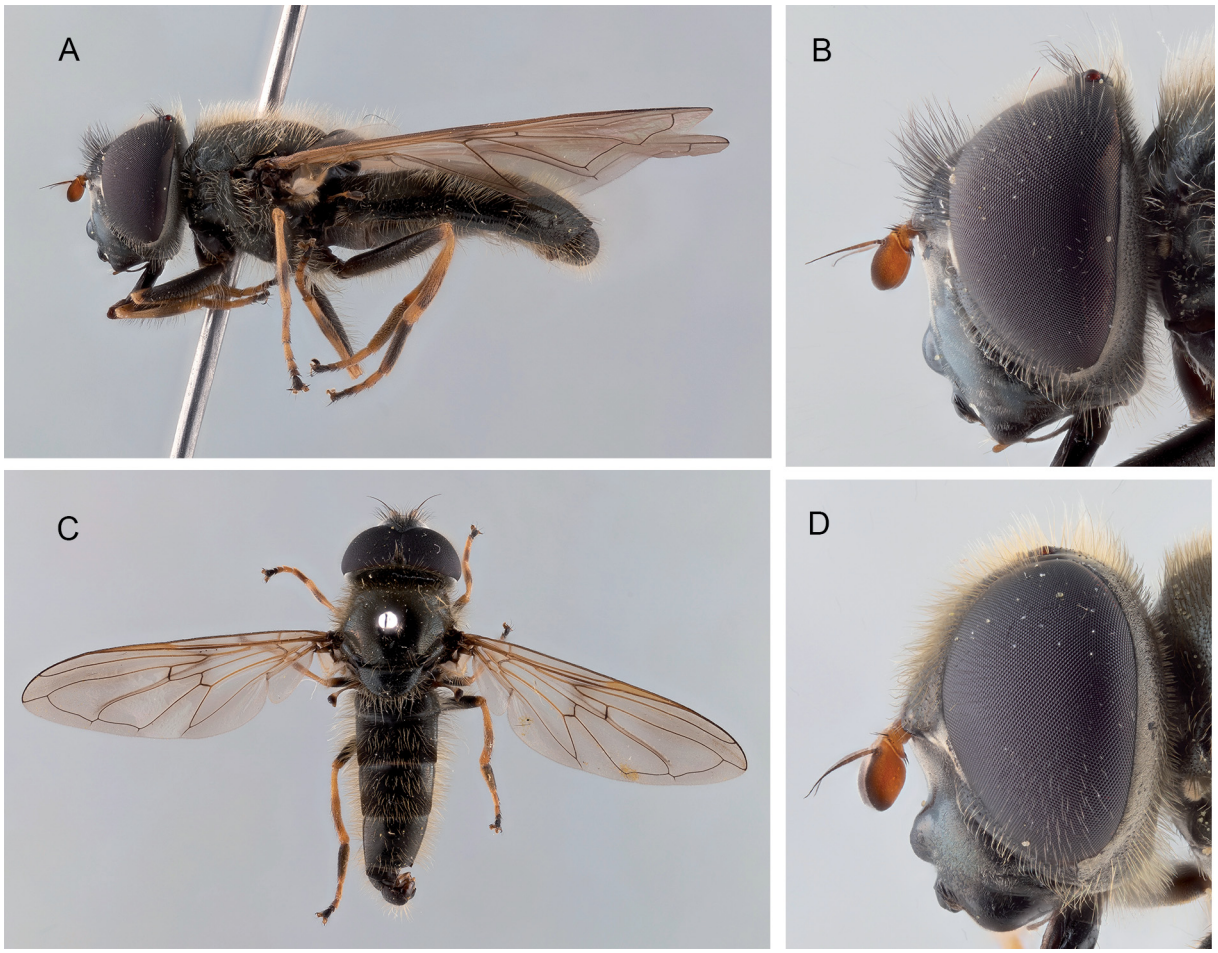

Fig. 48. *Cheilosia* (*Cheilosia*) *nebulosa* Verrall, 1871. Collected in Georgia. **A**. ♂ (SBA, SB.002501); habitus, lateral view; body length 8.2 mm. **B**. ♂ (SBA, SB.002501); head, lateral view; eye width 1.1 mm. **C**. ♂ (SBA, SB.002514); habitus, dorsal view; body length 9.3 mm. **D**. ♀ (SBA); head, lateral view; eye width 0.9 mm. Not to scale.

Cheilosia* (*Taeniochilosia*) *nigripes (Meigen, 1822)
Fig. 49

Syrphus nigripes Meigen, 1822: 282.

Cheilosia nigripes – Stackelberg & Richter 1968: 247. — Stackelberg 1970: 58. — Tóth 1986: 94. — Peck 1988: 110. — Barkalov 1993: 708. — Barkalov & Ståhls 1997: 70, fig. 41. — Gujabidze 2002: 245. — Mengual *et al.* 2020: 26.

Differential diagnosis

Cheilosia nigripes belongs to the subgenus *Taeniochilosia* by the combination of bare eye, black legs and the anterior process of lunula not broadly confluent with the face (Barkalov & Ståhls 1997). Within *Taeniochilosia* occurring in the Caucasus it can be easily identified by the shiny sterna II–IV (pruinose in all other *Taeniochilosia* in the Caucasus). *Cheilosia nigripes* from the Caucasus is morphologically slightly different from specimens studied from Europe and the Russian Far East: the male is more extensively pruinose, with the frons, posterior anepisternum and katepisternum pruinose and the pruinosity on anterior part of scutum reaches lateral margin; the scutum is slightly less coarsely punctured; pile on lateral margin of tergum IV longer, more erect and usually yellow; and pile on lateral part of sternum III longer. Females from the Caucasus are also more pruinose on the posterior anepisternum and katepisternum, and the pruinosity on anterior part of scutum reaches the lateral margins of the scutum. Due to the more extensive pruinosity, the Caucasian individuals are very similar to extralimital *C. vicina* (Zetterstedt, 1849), although the pruinosity in *C. nigripes* from the Caucasus is less dense and the clypeus shorter (in the mid-line, at the most 1.25 times as long as its maximum width vs 1.75–2 times as long as its maximum width). The male genitalia are figured in Barkalov & Ståhls (1997).

Material examined

Collected in 2018, 2019, 2021, 2022 and 2023, but 2018 records were not published in Mengual *et al.* (2020). Thus, all our records are reported here.

ARMENIA – **Ararat Province** • 1 ♂; surroundings Geghard Monastery; 40.13859° N, 44.81728° E; 1720 m a.s.l.; 22 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093547. – **Gegharkunik Province** • 18 ♂♂; Sevan N.P.; 40.56383° N, 45.01303° E; 1963 m a.s.l.; 23 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093607 = ZFMK-TIS-8014580, ZFMK-DIP-00093608 to ZFMK-DIP-00093612, ZFMK-DIP-00093614 to ZFMK-DIP-00093618, ZFMK-DIP-00093620 to ZFMK-DIP-00093624, ZFMK-DIP-00094163, ZFMK-DIP-00094165 • 10 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00093625 to ZFMK-DIP-00093631, ZFMK-DIP-00093633, ZFMK-DIP-00093634, ZFMK-DIP-00094166 • 1 ♂; same data as for preceding; A. and G. Lehmann leg.; ZFMK, ZFMK-DIP-00094162. – **Kotayk Province** • 20 ♂♂; Tsaghkadzor, Y.S.U. Rest House; 40.53362° N, 44.70302° E; 1915 m a.s.l.; 23 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093650 = ZFMK-TIS-8014581, ZFMK-DIP-00093644 to ZFMK-DIP-00093649, ZFMK-DIP-00093652 to ZFMK-DIP-00093656, ZFMK-DIP-00093659, ZFMK-DIP-00093660, ZFMK-DIP-00094509, ZFMK-DIP-00093661, ZFMK-DIP-00093662, ZFMK-DIP-00093678, ZFMK-DIP-00093679, ZFMK-DIP-00093680 • 7 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00093665, ZFMK-DIP-00093668 to ZFMK-DIP-00093671, ZFMK-DIP-00093675, ZFMK-DIP-00093677 • 1 ♂; Tsaghkadzor, Y.S.U. Rest House; 40.53362° N, 44.70302° E; 1915 m a.s.l.; 23 May 2022; T. Salden leg.; yellow pan trap; ZFMK, ZFMK-DIP-00094334 • 5 ♂♂; Tsaghkadzor area, towards Grand Palace Hotel; 40.53310° N, 44.69966° E; 1975 m a.s.l.; 24 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093684, ZFMK-DIP-00093689, ZFMK-DIP-00093693 to ZFMK-DIP-00093695 • 4 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00093696, ZFMK-DIP-00093697, ZFMK-DIP-00093699, ZFMK-DIP-00093700. – **Syunik Province** • 2 ♂♂; from Lichk to the Zvaravank Monastery; 39.05497° N, 46.17135° E; 1765 m a.s.l.; 16 May 2022; X. Mengual

leg.; ZFMK, ZFMK-DIP-00093044 = ZFMK-TIS-8014428, ZFMK-DIP-00093046 • 3 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00093042 = ZFMK-TIS-8014430, ZFMK-DIP-00093038 = ZFMK-TIS-8014435, ZFMK-DIP-00093039 • 23 ♂♂; 20 km N of Meghri; 39.07882° N, 46.17894° E; 1865 m a.s.l.; 17 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093105 to ZFMK-DIP-00093127 • 6 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00093099 to ZFMK-DIP-00093103, ZFMK-DIP-00093129 • 1 ♀; near Gorayk, Spandarian Reservoir; 39.68451° N, 45.77747° E; 2078 m a.s.l.; 19 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093346 • 4 ♂♂; Spandaryan, small river; 39.621045° N, 45.910242° E; 1986 m a.s.l.; 19 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093160, ZFMK-DIP-00093162, ZFMK-DIP-00093193, ZFMK-DIP-00093236 • 2 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00093166, ZFMK-DIP-00093253. – **Vayots Dzor Province** • 1 ♀; W of Saravan; 39.71843° N, 45.63076° E; 1590 m a.s.l.; 19 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093442. – **Yerevan Province** • 1 ♂; Yerevan Botanical Garden; 40.21197° N, 44.55889° E; 1237 m a.s.l.; 14–21 May 2022; B. Rulik, B. Müller leg.; Malaise trap; ZFMK, ZFMK-DIP-00094194 • 3 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00094192, ZFMK-DIP-00094195, ZFMK-DIP-00094196 • 6 ♂♂; Yerevan Botanical Garden; 40.213077° N, 44.55978° E; 1244 m a.s.l.; 21 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093504 to ZFMK-DIP-00093508, ZFMK-DIP-00094493 • 3 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00093509 to ZFMK-DIP-00093511.

GEORGIA – **Kakheti** • 1 ♀; Lagodekhi N.P.; 41.877° N, 46.384° E; 2652 m a.s.l.; 3 Jul. 2021; S. Bot leg.; SBA, SB.002471 • 1 ♂; Lagodekhi N.P.; 41.9223° N, 46.3726° E; 2758 m a.s.l.; 4 Jul. 2021; S. Bot leg.; SBA, SB.002466 • 1 ♂; Batsara Nature Reserve; 42.22238° N, 45.30352° E; 806 m a.s.l.; 28 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093956 • 1 ♀; same data as for preceding; ZFMK, ZFMK-DIP-00093971 • 3 ♂♂; near Tetri Tsklebi; 41.86354° N, 45.31890° E; 1317 m a.s.l.; 1 Jun. 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00094095, ZFMK-DIP-00094097, ZFMK-DIP-00094101 • 1 ♀; same data as for preceding; ZFMK, ZFMK-DIP-00094104 • 7 ♂♂; Dedoplis Tskaro; 41.4848° N, 46.0947° E; 750 m a.s.l.; 30 April 2023; S. Bot leg.; SBA, SB.002449 to SB.002455 • 6 ♀♀; same data as for preceding; SBA, SB.002479 to SB.002484 • 7 ♂♂, 6 ♀♀; Dedoplis Tskaro; 41.4856° N, 46.0947° E; 750 m a.s.l.; 30 April 2023; F. Van de Meutter leg.; FMT • 3 ♂♂; Dedoplis Tskaro; 41.4852° N, 46.0950° E; 750 m a.s.l.; 30 April 2023; W. Opdekamp leg.; WOR, C001, C010, C017 • 3 ♀♀; same data as for preceding; WOR, C008, C009, C023 • 2 ♂♂; Dedoplis Tskaro; 41.4845° N, 46.0928° E; 800 m a.s.l.; 30 April 2023; W. Opdekamp leg.; WIR, B012, B014 • 4 ♀♀; same data as for preceding; WOR, B004, B005, B008, B015. – **Mtskheta-Mtianeti** • 1 ♂; Juta; 42.5838° N, 44.7486° E; 2190 m a.s.l.; 10 Jul. 2019; A. Ssymank leg.; ASW, ZFMK-TIS-8009286 • 3 ♂♂; Tbilisi N.P.; 41.8808° N, 45.0203° E; 1270 m a.s.l.; 27 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093887, ZFMK-DIP-00093890, ZFMK-DIP-00093891 • 3 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00093897, ZFMK-DIP-00093898, ZFMK-DIP-00093900 • 9 ♂♂; Tbilisi N.P.; 41.8811° N, 45.02080° E; 1275 m a.s.l.; 27 May–1 Jun. 2022; X. Mengual leg.; Malaise trap; ZFMK, ZFMK-DIP-00094274, ZFMK-DIP-00094317, ZFMK-DIP-00094370, ZFMK-DIP-00094372, ZFMK-DIP-00094373, ZFMK-DIP-00094375, ZFMK-DIP-00094467 to ZFMK-DIP-00094469 • 7 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00094267, ZFMK-DIP-00094268, ZFMK-DIP-00094309, ZFMK-DIP-00094382, ZFMK-DIP-00094449, ZFMK-DIP-00094450, ZFMK-DIP-00094457 • 1 ♀; Tbilisi N.P.; 41.8808° N, 45.0203° E; 1270 m a.s.l.; 1 Jun. 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00094161 • 10 ♂♂; Tbilisi N.P.; 41.880° N, 45.023° E; 1289 m a.s.l.; 4 May 2023; S. Bot leg.; SBA, SB.002456 to SB.002465; SBA • 4 ♀♀; same data as for preceding; SBA, SB.002475 to SB.002478 • 23 ♂♂, 6 ♀♀; Tbilisi N.P.; 41.877° N, 45.0138° E; 1250 m a.s.l.; 4 May 2023; F. Van de Meutter leg.; FMT • 6 ♂♂; Tbilisi N.P.; 41.8802° N, 45.0220° E; 1279 m a.s.l.; 4 May 2023; W. Opdekamp leg.; WOR, A013, A016, A026, A041, A048, A049 • 3 ♀♀; same data as for preceding; WOR, A019, A024, A042 • 5 ♂♂, Lutkhubi; 42.3797° N, 44.7969° E; 1463 m a.s.l.; 6 May 2023; S. Bot leg.; SBA, SB.002443 to SB.002447 • 1 ♀; same data as for preceding; SBA, SB.002474 • 1 ♂; Lutkhubi; 42.3938° N, 44.7857° E; 2120 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, E002 • 2 ♂♂, 2 ♀♀; Lutkhubi; 42.3936° N,

44.7923° E; 1760 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; Lutkhubi; 42.4147° N, 44.7549° E; 1240 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; Tsinamkhari; 42.3914° N, 44.7562° E; 1200 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, B011 • 1 ♀; Lutkhubi; 42.3930° N, 44.7929° E; 1734 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, C013 • 1 ♂; Lutkhubi; 42.3930° N, 44.7929° E; 1734 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, C023 • 1 ♂; Tbilisi N.P.; 41.8787° N, 45.0288° E; 1316 m a.s.l.; 9 May 2023; S. Bot leg.; SBA, SB.002448 • 1 ♂, 1 ♀; Tbilisi, Mamkoda; 41.8339° N, 44.8763° E; 920 m a.s.l.; 9 May 2023; F. Van de Meutter leg.; FMT. – **Racha-Lechkhumi and Kvemo Svaneti** – • 1 ♀; near Shovi; 42.713° N, 43.701° E; 2022 m a.s.l.; 7 Jul. 2021; S. Bot leg.; SBA, SB.002470 • 2 ♀♀; above Glola; 42.668° N, 43.630° E; 2598 m a.s.l.; 9 Jul. 2021; S. Bot leg.; SBA, SB.002468, SB.002469. – **Samegrelo-Zemo Svaneti** • 1 ♀; Samegrelo-Zemo Svaneti, Mestia; 43.080° N, 42.762° E; 1800 m a.s.l.; 22 Jun. 2018; S. Bot leg.; SBA, SB.002472 = ZFMK-TIS-8009288 • 1 ♀; 42.9989° N, 42.6501° E; 1273 m a.s.l.; 13–14 Jun. 2019; X. Mengual leg.; Malaise trap; ZFMK, ZFMK-DIP-00078732 = ZFMK-TIS-8010120 • 1 ♀; 43.1112° N, 42.7434° E; 1683 m a.s.l.; 14 Jun. 2019; F. Van de Meutter leg.; FMT • 1♂; same data as for preceding; FMT, ZFMK-TIS-8009615. – **Samtskhe-Javakheti** • 1 ♀; Borjomi N.P.; 41.857° N, 43.208° E; 1900 m a.s.l.; 18 Jun. 2018; S. Bot leg.; SBA, SB.002473 = ZFMK-TIS-8009287 1 ♂; Sakire-Tsikhisjvari; 41.72° N, 43.36° E; 2250 m a.s.l.;

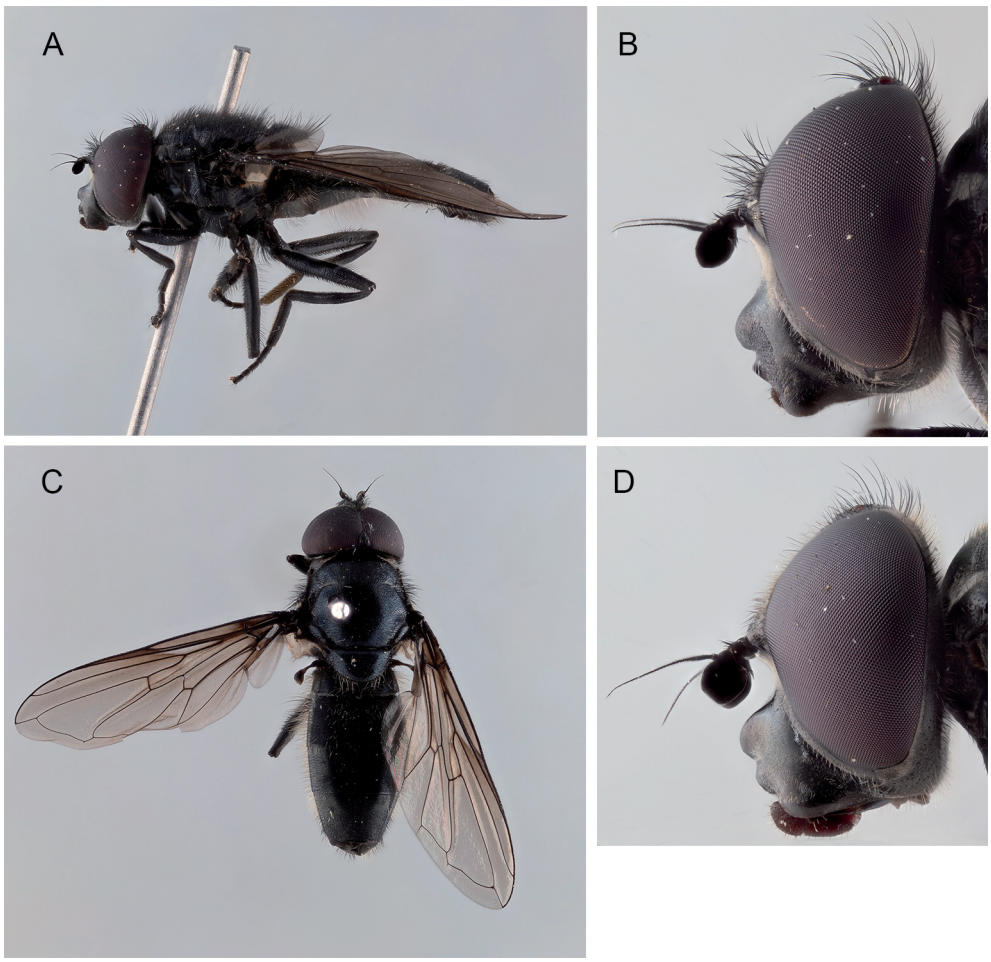

Fig. 49. *Cheilosia* (*Taeniochilosia*) *nigripes* (Meigen, 1822). Collected in Georgia. **A**. ♂ (SBA, SB.002449); habitus, lateral view; body length 8.8 mm. **B**. ♂ (SBA, SB.002465); head, lateral view; eye width 1.0 mm. **C**. ♂ (SBA, SB.002449); habitus, dorsal view; body length 8.8 mm. **D**. ♀ (SBA, SB.002477); head, lateral view; eye width 1.1 mm. Not to scale.

9 Jun. 2019; J. van Steenis leg; JSB • 1 ♂; 41.7304° N, 43.3342° E; 1900 m a.s.l.; 9 Jun. 2019; F. Van de Meutter leg.; FMT, ZFMK-TIS-8009616 • 1 ♀; 41.7251° N, 43.3605° E; 2519 m a.s.l.; 9 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066338 = ZFMK-TIS-8008754 • 1 ♂; Saimre; 41.86° N, 42.77° E; 1830 m a.s.l.; 10 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.956 = ZFMK-TIS-8009605 • 3 ♀♀; 41.7772° N, 42.8372° E; 1368 m a.s.l.; 10–11 Jun. 2019; X. Mengual leg.; Malaise trap; ZFMK, ZFMK-DIP-00078648 = ZFMK-TIS-8009655, ZFMK-DIP-00069422 = ZFMK-TIS-8009528, ZFMK-DIP-00069440 = ZFMK-TIS-8009520 • 1 ♀; Abastumani, Otskhe river; 41.77° N, 42.83° E; 1360 m a.s.l.; 10–11 Jun. 2019; J. van Steenis leg; Malaise trap; JSB, 2019-01.097 • 1 ♂; Borjomi N.P.; 41.864° N, 42.789° E; 1798 m a.s.l.; 11 Jun. 2019; S. Bot leg.; SBA, SB.002467 = ZFMK-TIS-8009289 • 1 ♂; Sakire; 41.7301° N, 43.3306° E; 1820 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT • 3 ♂♂, 1 ♀; Borjomi; 41.8098° N, 43.3327° E; 840 m a.s.l.; 12 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; Borjomi; 41.8098° N, 43.3327° E; 850 m a.s.l.; 12 May 2023; W. Opdekamp leg.; WOR, A026.

Genetics

In our NJ tree we have a cluster with high support (BS = 99.9%) comprising the barcodes of *C. vicina*, *C. sahlbergi* Becker, 1894, *C. impudens* Becker, 1894, and *C. nigripes*. Within this cluster, all sequences of *C. nigripes* from Europe and Caucasus are grouped together with one barcode of *C. impudens*.

Biology

During our expeditions, collected between 30 April and 9 July at an altitude between 750 and 2758 m a.s.l. *C. nigripes* was seen feeding on low herbaceous plants as *Ranunculus* sp.

Distribution

Palaearctic. Within the Caucasus known from Azerbaijan, Armenia, Georgia and Russia.

Cheilosia* (*Cheilosia*) *orthotricha Vujić & Claussen, 1994
Fig. 50

Cheilosia orthotricha Vujić & Claussen, 1994: 261.

Differential diagnosis

Cheilosia orthotricha is quite a large species (12–15 mm) characterized by the combination of a bare face, pilose eye, bicoloured legs and posterior margin of scutellum without bristles. It can be distinguished from most other *Cheilosia* with the same set of characters by the bare or sparsely pilose ventral part of the eye (entirely pilose in similar species). It forms a similar-looking trio with *C. canicularis* and *C. himantopus*, but generally in *C. orthotricha* pile on the pleura straight, unlike pile in *C. canicularis* and *C. himantopus*, which is wavy at apex, the pile on posterior anepisternum have straight apex (with wavy apex in the other two species) and face predominantly shiny (slightly pruinose in the other two species). The male genitalia are figured in Vujić & Claussen (1994).

Material examined

Cheilosia orthotricha was not collected in 2018, but collected in 2023.

GEORGIA – **Mtskheta-Mtianeti** • 2 ♂♂; Tbilisi N.P.; 41.880° N, 45.023° E; 1289 m a.s.l.; 4 May 2023; S. Bot leg.; SBA, SB.002715 = ZFMK-TIS-8028449, SB.002714 = ZFMK-TIS-8028450 • 2 ♀♀; same data as for preceding; SBA, SB.002712 = ZFMK-TIS-8028009, SB.002713 = ZFMK-TIS-8028010 • 4 ♂♂, 6 ♀♀; Tbilisi N.P.; 41.877° N, 45.0138° E; 1250 m a.s.l.; 4 May 2023; F. Van de Meutter leg.; FMT • 1 ♂, 1 ♀; same data as for preceding; ZFMK • 1 ♂; Tbilisi National Park; 41.8802° N, 45.0220° E; 1279 m a.s.l.; 4 May 2023; W. Opdekamp leg.; WOR, A051 • 6 ♀♀; same data as for preceding; WOR,

A009, A011, A025, A043, A054, A055 • 1 ♀; Lutkhubi; 42.3930° N, 44.7929° E; 1700 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, A022 • 2 ♀♀; Lutkhubi; 42.3936° N, 44.7923° E; 1760 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; Lutkhubi; 42.3930° N, 44.7929° E; 1700 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, C032 • 1 ♂; Tbilisi N.P.; 41.8770° N, 45.0137° E; 1248 m a.s.l.; 9 May 2023; S. Bot leg.; SBA, SB.002710 • 1 ♀; same data as for preceding; SBA, SB.002711.

Genetics

All DNA barcodes of *C. orthotricha* are clustered together with high support (BS = 99%). Within this cluster, two barcodes from Germany group together (BS = 100%) and five barcodes from Georgia cluster together (BS = 100%).

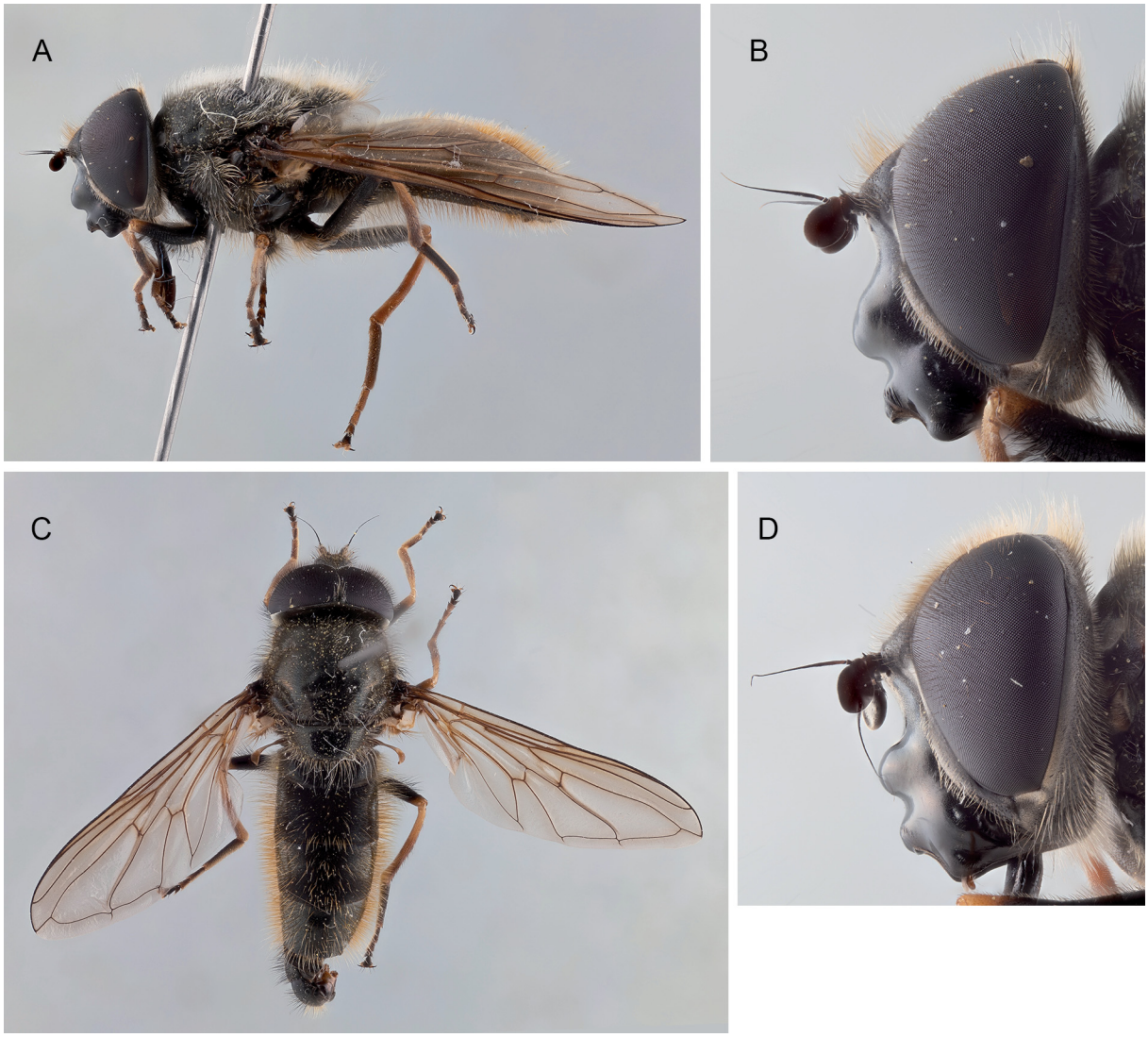

Fig. 50. *Cheilosia* (*Cheilosia*) *orthotricha* Vujić & Claussen, 1994. Collected in Georgia. **A**. ♂ (SBA, SB.002710); habitus, lateral view; body length 13.5 mm. **B**. ♂ (SBA, SB.002710); head, lateral view; eye width 1.6 mm. **C**. ♂ (SBA, ZFMK-TIS-8028450); habitus, dorsal view; body length 14.1 mm. **D**. ♀ (SBA, SB.002711); head, lateral view; eye width 1.5 mm. Not to scale.

Remarks

Reported from the Caucasus, and Georgia, for the first time.Georgian individuals of *C. orthotricha* are genetically different from European populations (2.43–2.55%). We also found small morphological differences between populations in both regions. Our sample size for populations in both areas is too small to understand this variation, and for now we consider all populations belonging to one species.

Biology

During our expeditions, collected between 4 May and 9 May at an altitude between 1248 and 1760 m a.s.l. Nearly always found in close vicinity of its food plant *Petasites hybridus* L. Both sexes sit on leaves of the plant.

Distribution

Europe, Caucasus (Georgia).

Cheilosia* (*Taeniochilosia*) *ouwehandae Bot sp. nov.
urn:lsid:zoobank.org:act:71A92808-13A0-4110-999C-5638704D54BF
Fig. 51

Differential diagnosis

Cheilosia ouwehandae sp. nov. is only known from the male holotype, thus the differential diagnosis applies to males only. *Cheilosia ouwehandae* belongs to the subgenus *Taeniochilosia* by the combination of bare eye, black legs and the anterior process of lunula not broadly confluent with the face (Barkalov & Ståhls 1997). Genetically similar to *C. aenigmatosa*, it differs morphologically as follows: smaller (body size 6.5 mm vs 8–9.5 mm), face and parafacia slightly pruinose (more densely pruinose in *C. aenigmatosa*), facial tubercle better developed, projecting well beyond mouth edge (Fig. 51B) (less developed, less protruding, not beyond mouth edge in *C. aenigmatosa*; Fig. 2C), postpedicel basoventrally orange (black in *C. aenigmatosa*), frontal triangle with black pile (with large proportion of pile yellow in *C. aenigmatosa*), pile on scutum whitish instead of golden, posterior margin of scutellum with black setae instead of black pile and abdomen with more dense pruinosity. *Cheilosia ouwehandae* can be confused with extralimital *C. sahlbergi* and *C. vangaveri* Timon-David, 1937. It differs from *C. sahlbergi* and *C. vangaveri* by dense pruinose frons (slightly pruinose or shiny in *C. sahlbergi*, shiny in *C. vangaveri*), pruinose parafacia (shiny in *C. sahlbergi* and *C. vangaveri*), abdomen with completely yellow pile (partly with black pile in *C. sahlbergi*), terga II–IV completely pruinose (lateral margins shiny in *C. sahlbergi* and *C. vangaveri*) and sterna III–IV with mainly adpressed yellow pile (laterally with erect pile in *C. sahlbergi* and *C. vangaveri*).

Etymology

This species is named after Janne Ouwehand, the beloved wife of the author of the species, who together with her husband collected the holotype. Species epithet to be treated as a noun in the genitive case.

Material examined

Holotype

GEORGIA • ♂; Samegrelo-Zemo Svaneti, Ushguli; 42.911° N, 42.938° E; 2480 m a.s.l.; 27 Jun. 2018; S. Bot leg.; ZFMK, SB.003219 = CNC databasing S. Bot 755.

Description

Male

Length. Body 6.5 mm, wing 5.5 mm.

Head. Face bare, with facial tubercle, black, slightly pruinose, more densely pruinose below lunule. Mala pruinose. Parafacia black, wide, about as wide as postpedicel, pruinose, white pilose. Length of eye contiguity slightly shorter than the length of frons. Angle of approximation of eyes 95°. Frontal triangle black, pruinose, long black pilose, with narrow yellow pile anteriorly, with medial frontal sulcus. Ocellar triangle shiny, long black pilose. Occiput pruinose, with short yellow and long black pile. Lunule black, medial arm on lunule absent, antennal fossa present. Scape and pedicel black with black setae; postpedicel rounded, about as wide as high, basoventrally orange, otherwise black. Arista black, basal quarter thickened, short pilose, longest pilosity half as long as width of arista at base. Eye bare.

Thorax. Scutum black, shiny except narrowly anteriorly and notopleuron slightly pruinose, finely punctured, with short erect whitish and sparser long erect black pile. Scutellum black, shiny, anteriorly narrowly pruinose, with short whitish pile and sparse black pile, posterior margin with black setae, length of setae just shorter than length of scutellum. Pleura black, pruinose, with yellow pile, except posterior

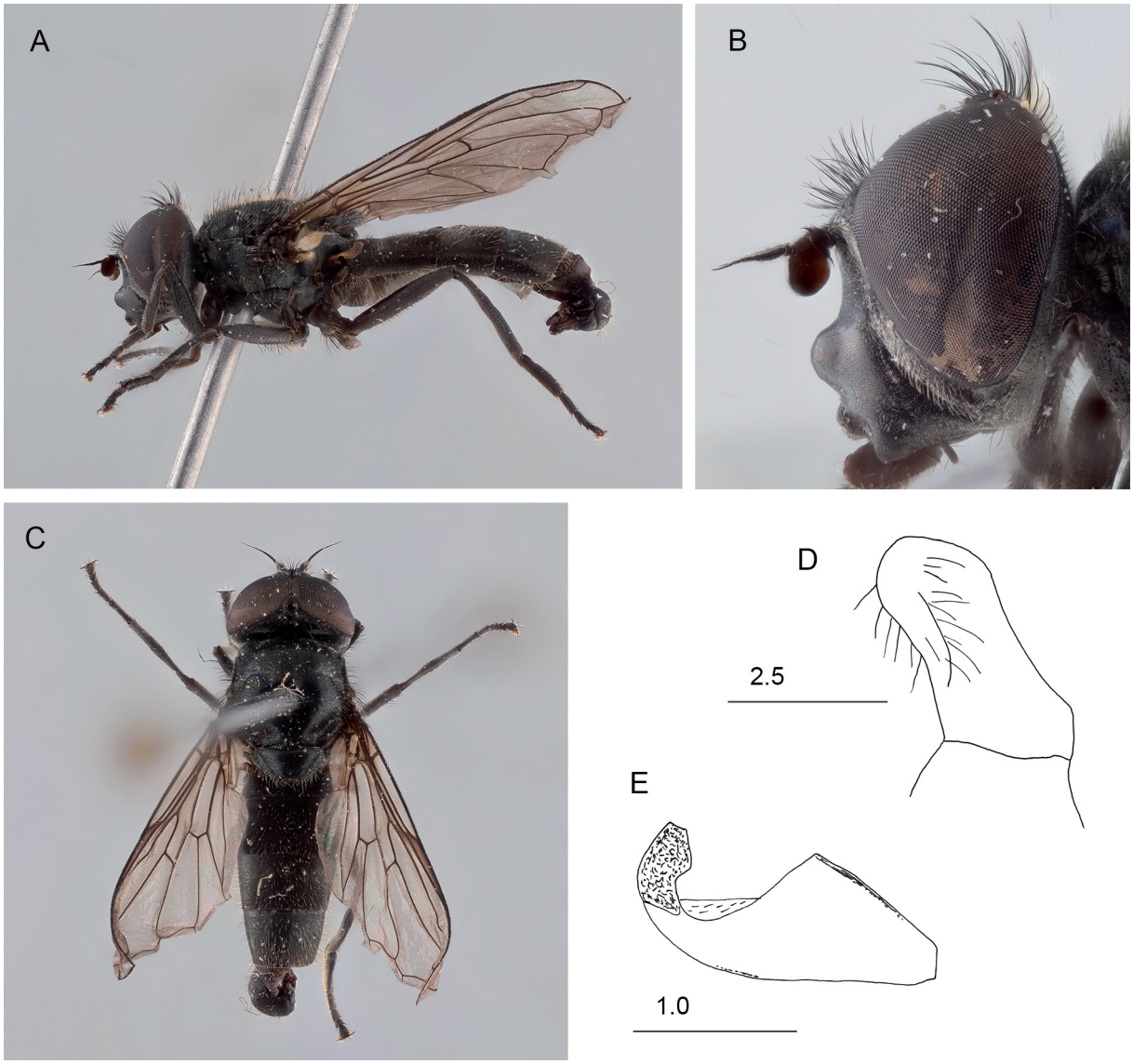

Fig. 51. *Cheilosia* (*Taeniochilosia*) *ouwehandae* Bot sp. nov., holotype, ♂ (ZFMK, SB.003219). **A, C**. Habitus, lateral and dorsal views; body length 6.5 mm. **B**. Head, lateral view; eye width 1.0 mm. **D**. Surstylus, lateral view. **E**. Postgonite, lateral view. Scale bars: A–C not to scale; D–E in µm.

anepisternum with mixed yellow and black pile, dorsal and ventral pile patches on katepisternum widely separated. Haltere with pedicellum yellow, capitulum dark brown to black.

Wing. Wing including alula entirely microtrichose; veins black; stigma brown.

Legs. Coxae and trochanters black. Femora, tibiae and tarsi black, pruinose. Profemur and mesofemur ventrally and anterolaterally with long mixed yellow and black pile; metafemur ventrally with short yellow pile and some black setae. Tibia with short adpressed yellow and black pile. Tarsi dorsally with black pile, ventrally yellow and black pilose.

Abdomen. Terga I–IV laterally with long erect yellow pile, in center with short adpressed yellow pile; tergum I pruinose, terga II–III pruinose, in center pruinosity less dense, tergum IV pruinose, most dense pruinosity on anterior part. Sterna I–II with erect yellow pile, sterna III–IV with short adpressed yellow pile, sterna I–IV thickly pruinose. Genitalia with surstylus about twice as long as wide. Dorsal and ventral lobes of postgonite pointed.

Female

Unknown.

Genetics

See Remarks under *C. aenigmatosa*. The DNA barcode of the holotype is placed between two well-supported clusters of *C. aenigmatosa*.

Biology

The holotype was collected just above the tree line in an area with a mixture of extensive grasslands and Rhododendron (*Rhododendron* sp.) at 2480 m a.s.l.

Distribution

Only known from the type locality from the Greater Caucasus in Georgia.

Cheilosia* (*Cheilosia*) *pagana (Meigen, 1822)
Fig. 52

Syrphus paganus Meigen, 1822: 292.

Cheilosia pagana – Stackelberg & Richter 1968: 247. — Peck 1988: 112. — Barkalov 1993: 712. — Gujabidze 2002: 246. — Barkalov & Mutin 2018: 483. — Mengual *et al.* 2020: 19.

Differential diagnosis

Cheilosia pagana is a small (5–9 mm) and slender species. It is characterized by the bare face, narrow parafacia, bare eye, lunule with distinct medial arm, bicoloured legs, posterior margin of scutellum with setae and shiny sterna. The female stands out amongst those of similar looking species by possessing a very large, bright orange postpedicel (Fig. 52D).

Material examined

Collected in 2018, 2019 and 2023, but 2018 records were not published in Mengual *et al.* (2020) We report here all the records.

GEORGIA – **Adjara Region** • 1 ♀; Kintrishi Nature Reserve; 41.7433° N, 42.0840° E; 1235 m a.s.l.; 27 Jul.–10 Aug. 2018; GGBC-members leg; ZFMK, ZFMK-TIS-8010465. – **Kakheti** • 1 ♀; Lagodekhi N.P.; 41.8767° N, 46.2429° E; 615 m a.s.l.; 2 May 2023; S. Bot leg.; SBA, SB.002716. – **Mtskheta-**

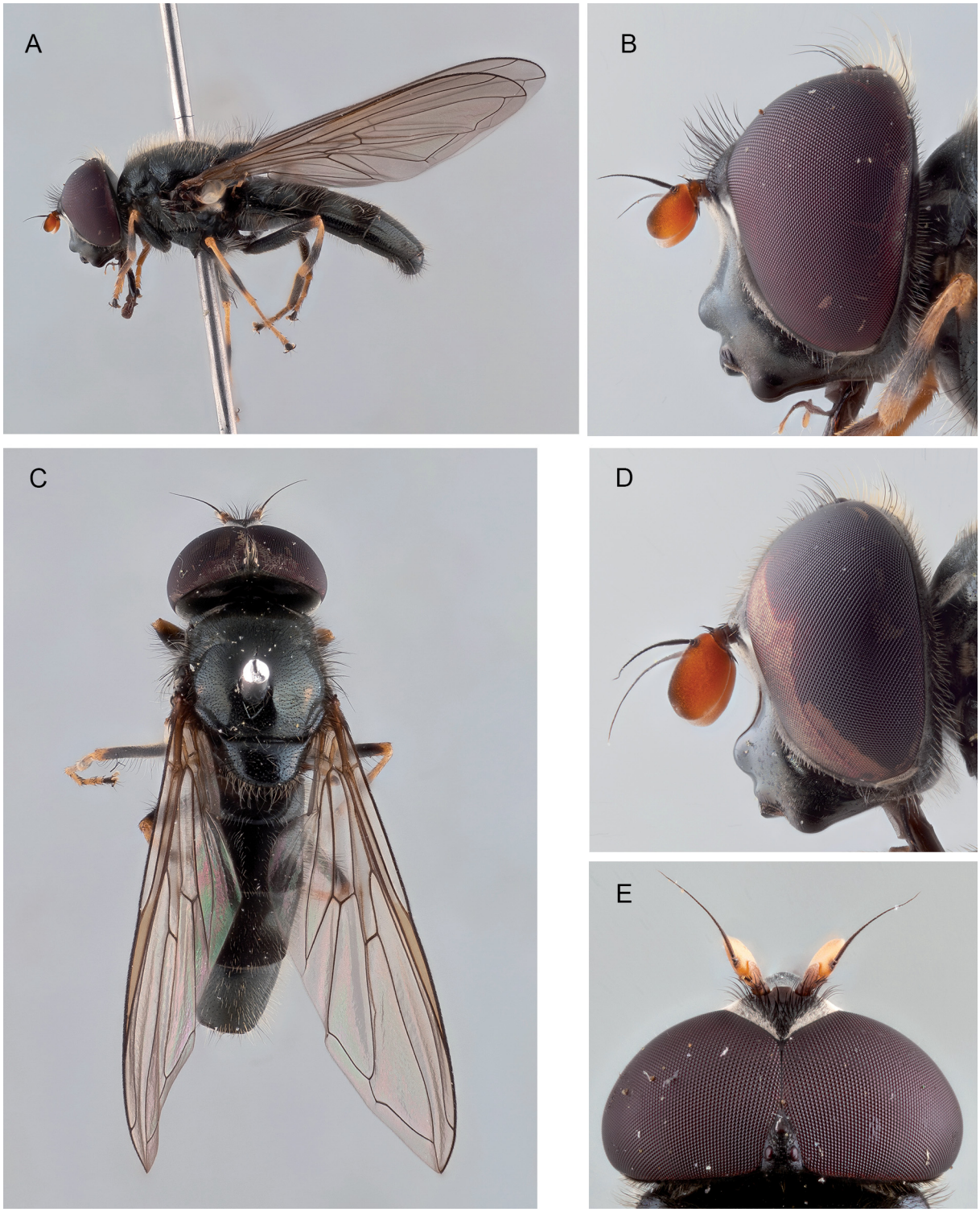

Fig. 52. *Cheilosia* (*Cheilosia*) *pagana* (Meigen, 1822). **A**. ♂ (FMT); habitus, lateral view; collected in Georgia; body length 9.1 mm. **B**. ♂ (FMT); head, lateral view; collected in Georgia; eye width 1.0 mm. **C**. ♂ (FMT); habitus, dorsal view; collected in Georgia; body length 7.7 mm. **D**. ♀ (SBA, SB.002717); head, lateral view; collected in Georgia; eye width 1.2 mm. **E**. ♂ (SBA, SB.004458); head, dorsal view; collected in the Netherlands; head width 2.7 mm. Not to scale.

Mtianeti • 1 ♀; Tbilisi N.P.; 41.880° N, 45.023° E; 1289 m a.s.l.; 4 May 2023; S. Bot leg.; SBA, SB.002717 • 1 ♀; Tbilisi N.P.; 41.877° N, 45.0138° E; 1250 m a.s.l.; 4 May 2023; F. Van de Meutter leg.; FMT • 2 ♂♂; Lutkhubi; 42.3951° N, 44.7847° E; 2138 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; Lutkhubi; 42.3867° N, 44.79° E; 1580 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT. – **Samtskhe-Javakheti** • 1 ♀; Borjomi; 41.96° N, 43.56° E; 700–750 m a.s.l.; 8 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.837 • 1 ♀; Borjomi; 41.7772° N, 42.8372° E; 1368 m a.s.l.; 10–11 Jun. 2019; X. Mengual leg.; Malaise trap; ZFMK, ZFMK-TIS-8010114 • 1 ♂; Tbilisi National Park; 41.8808° N, 45.0204° E; 1270 m a.s.l.; 22 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066199 = ZFMK-TIS-8006806.

Genetics

DNA barcodes of *C. pagana* from several Holarctic localities, including Caucasus specimens, cluster together with high support (BS = 100%).

Biology

During our expeditions, collected between 2 May and 10 August at an altitude between 615 and 2138 m a.s.l. Males were found hovering at a hilltop at 2138 m a.s.l.

Distribution

Palaearctic. Within the Caucasus reported from Georgia and Russia.

Cheilosia* (*Cheilosia*) *paragigantea Barkalov, 1993
Fig. 53

Cheilosia paragigantea Barkalov, 1993: 706.

Cheilosia paragigantea – Barkalov & Mutin 2018: 483. — Mengual *et al*. 2020: 19.

Differential diagnosis

Cheilosia paragigantea is a member of a group of closely related species, called the *proxima* group (Vujić *et al*. 2013) in which the pilose eyes, posterior margin of scutellum with setae, usually partly yellow legs, continuously pilose katepisternum, pruinose sterna and the shape of postgonite are distinctive characters. For a full diagnosis of the *Cheilosia proxima* group see Vujić *et al*. (2013). *Cheilosia paragigantea* stands out, together with *C. teberdensis* from other members of the *proxima* group occurring in the Caucasus by having black legs (tibiae yellow at both ends in the other species). Similar to *C. teberdensis* but larger (body size 11–13 mm vs 9–10 mm), postpedicel ranging from blackish to orange (black in *C. teberdensis*), the male has pile on terga II–IV with distinctive alternating black and white piles: pile on terga on anterior part in center white and erect, in posterior part black and erect (terga with erect white pile and adpressed black pile in *C. teberdensis*) and the female has the pile on the scutum black (with short mainly yellow pile and longer black pile in *C. teberdensis*).

Material examined

Collected in 2018, 2019, 2021, 2022 and 2023; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

DNA sequences of *C. paragigantea* are grouped together with high support (BS = 100%).

Biology

During our expeditions, collected between 8 May and 8 July at an altitude between 1798 and 2601 m a.s.l. This species was most often caught feeding on *Salix* sp. on alpine meadows.

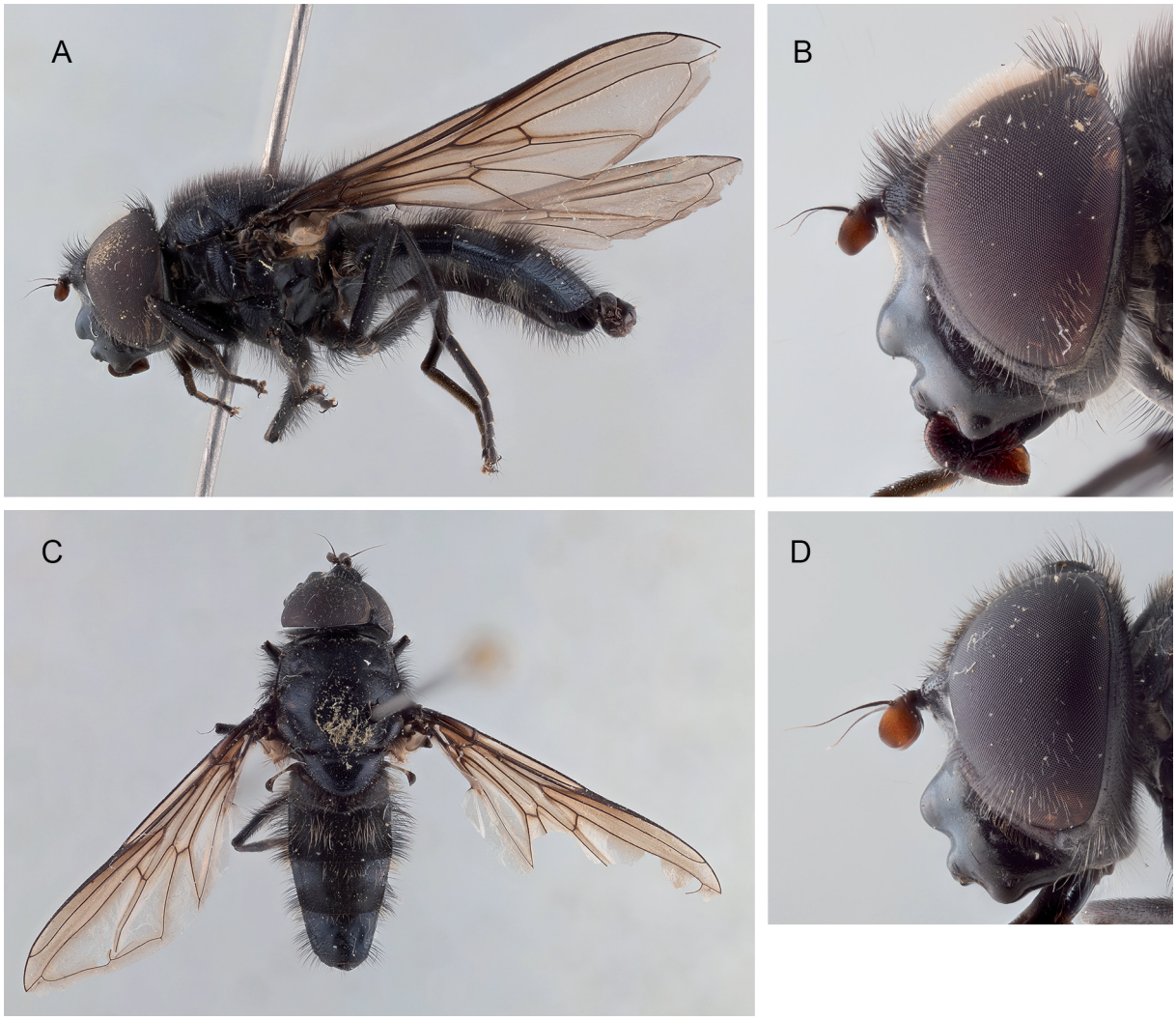

Fig. 53. *Cheilosia* (*Cheilosia*) *paragigantea* Barkalov, 1993. Collected in Georgia. **A**. ♂ (SBA, SB.002719); habitus, lateral view; body length 12.5 mm. **B**. ♂ (SBA, SB.002718); head, lateral view; eye width 1.7 mm. **C**. ♂ (LHH, ZFMK-TIS-8009294); habitus, dorsal view; body length 12.0 mm. **D**. ♀ (SBA, SB.002720); head, lateral view; eye width 1.6 mm. Not to scale.

Distribution

Caucasus (Georgia, Russia).

Cheilosia* (*Cheilosia*) *pogonias sp. nov.
urn:lsid:zoobank.org:act:774279CF-35B2-424F-B817-449F7086A836
Figs 54–55

Differential diagnosis

Cheilosia pogonias sp. nov. is a member of a group of morphologically closely related species, called the *proxima* group (Vujić *et al.* 2013), in which the diagnostic characters are pilose eyes, posterior margin of scutellum with setae, usually partly yellow legs, continuously pilose katepisternum, pruinose sterna and the shape of postgonite. For a full diagnosis of the *Cheilosia proxima* group see Vujić *et al.* (2013). Within the *proxima* group, *C. pogonias* resembles *C. barbafacies* Vujić & Radenković, 2013

(described from the Balkan Peninsula) as they share a pilose face and yellow pile on terga, but the face of *C. pogonias* has a more pronounced facial tubercle (Fig. 55A–B), the male frons is pruinose, tibiae less extensively yellow, ventral surface of tarsi black (instead of yellow in *C. barbafacies*), and tergum IV extensively pruinose (tergum IV shiny in *C. barbafacies*). Female of *C. pogonias* is like the female of *C. barbafacies* but with the scutum with some long black pile intermixed with the yellow pile (Fig. 54C) and tarsi black dorsally (basal tarsomeres yellow in *C. barbafacies*). *Cheilosia pogonias* is similar to *C. melanopa* and *C. redi*, but its male is easily distinguished by the shiny scutum (pruinose in *C. melanopa* and *C. redi*) and very different shape of postgonite (Fig. 55C). The female of *C. pogonias*, however, is remarkably similar to the female of *C. redi* and they are difficult to distinguish: pile on arista very short in *C. pogonias*, shorter than half the width of arista at base (in *C. redi* the pile on arista is about half as long as width of arista at base), occiput completely pruinose (in *C. redi* it is shiny or only slightly pruinose behind dorsal eye corners), occiput with short yellow and sparse long black pile behind dorsal margin of eye (Fig. 55B) (in *C. redi* both short and long pile are yellow), metafemur anteriorly and basoventrally with long pile, at least as long as the width of metafemur (in *C. redi* these piles are shorter, shorter than the width of metafemur).

Etymology

The species name is derived from the Greek '*pogonias*' meaning 'bearded' and it refers to the pilose face of this new species. Species epithet to be treated as a noun in apposition.

Material examined

Holotype

GEORGIA • ♂; Samegrelo-Zemo Svaneti, Ushguli; 42.914° N, 43.090° E; 2562 m a.s.l.; 20 Jun. 2019; S. Bot leg.; ZFMK, CNC databasing S. Bot 932.

Paratypes

ARMENIA – **Kotayk Province** • 1 ♂; Tsaghkadzor, Y.S.U. Rest House; 40.53362° N, 44.70302° E; 1915 m a.s.l.; 23 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093663 = ZFMK-TIS-8014602 • 1 ♂; Tsaghkadzor area, towards Grand Palace Hotel; 40.53310° N, 44.69966° E; 1975 m a.s.l.; 24 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093687 = ZFMK-TIS-8014600.

GEORGIA – **Mtskheta-Mtianeti** • 4 ♂♂; Lutkhubi; 42.3797° N, 44.7969° E; 1463 m a.s.l.; 6 May 2023; S. Bot leg.; SBA, SB.003231 = ZFMK-TIS-8027990, SB.003232 to SB.003234 • 1 ♂; same data as for preceding; ZFMK, ZFMK-TIS-8027975 • 1 ♀; same data as for preceding; SBA, SB.003235 • 1 ♂; Lutkhubi; 42.3930° N, 44.7929° E; 1734 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, C015. – **Racha-Lechkhumi and Kvemo Svaneti** • 1 ♂; 42.888° N, 43.233° E; 1900 m a.s.l.; 30 Jun. 2018; SBA, S. Bot leg.; SBA, SB.003225 • 1 ♀; same data as for preceding; SBA, SB.003226. – **Samegrelo-Zemo Svaneti** • 1 ♂; 42.948° N, 43.021° E; 2800 m a.s.l.; 25 Jun. 2018; S. Bot leg.; SBA, SB.003220 • 4 ♂♂; 42.963° N, 42.990° E; 2300 m a.s.l.; 26 Jun. 2018; S. Bot leg.; SBA, SB.003221 = CNC databasing S. Bot 931, SB.003222 to SB.003224 • 1 ♀; Ushguli; 42.948° N, 43.070° E; 2258 m a.s.l.; 15 Jun. 2019; S. Bot leg.; SBA, SB.003227 • 1 ♀; Ushguli, 42.9498° N, 43.0718° E; 2270 m a.s.l.; 15 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8008816 = ZFMK-DIP-00066551 • 1 ♀; Ushguli; 42.94° N, 43.05° E; 2220 m a.s.l.; 15–17 Jun. 2019; J. van Steenis leg; Malaise trap; JSB, 2019-00.870 • 1 ♂; Ushguli; 42.914° N, 43.090° E; 2562 m a.s.l.; 18 Jun. 2019; L. Hofstee leg.; LHH • 3 ♂♂; Ushguli; 42.914° N, 43.090° E; 2562 m a.s.l.; 20 Jun. 2019; S. Bot leg.; SBA, SB.003228 to SB.003230 • 3 ♂♂, 2 ♀♀; Ushguli, pass from Ushguli to Tsana; 42.9142° E, 43.0911° N; 2575 m a.s.l.; 20 Jun. 2019; F. Van de Meutter leg.; FMT.

Description

Male

Length. Body 9.5–10.5 mm, wing 7.5–9 mm.

Head. Face with pile, with facial tubercle, black, slightly pruinose, more densely pruinose below lunule, facial tubercle shiny. Mala shiny. Parafacia black, wide, almost as wide as postpedicel, pruinose, white pilose. Frontal triangle black, pruinose, with long black pile. Length of eye contiguity about as long as or 1.2 the length of frons. Angle of approximation of eyes 90–100°. Ocellar triangle and occiput pruinose, with long mainly black and some yellow pile. Lunule dark yellow anteriorly, becoming black in posterior part, with distinct medial arm, separating acetabula. Scape black, inner side with yellow setae, outer side with black setae; pedicel black, with black setae; postpedicel squarish, about as high as wide, black; arista black, very short pilose. Eye completely covered in yellow pile.

Thorax. Scutum black, with dark-olive shine except narrowly anteriorly and notopleuron slightly pruinose, finely punctured, with long erect mixed yellow and black pile, proportion variable, but usually yellow pile dominating, especially in anterior and central part. Scutellum black, shiny, with mixed yellow and black pile, posterior margin with long black setae. Pleura black, pruinose, with yellow pile; posterior

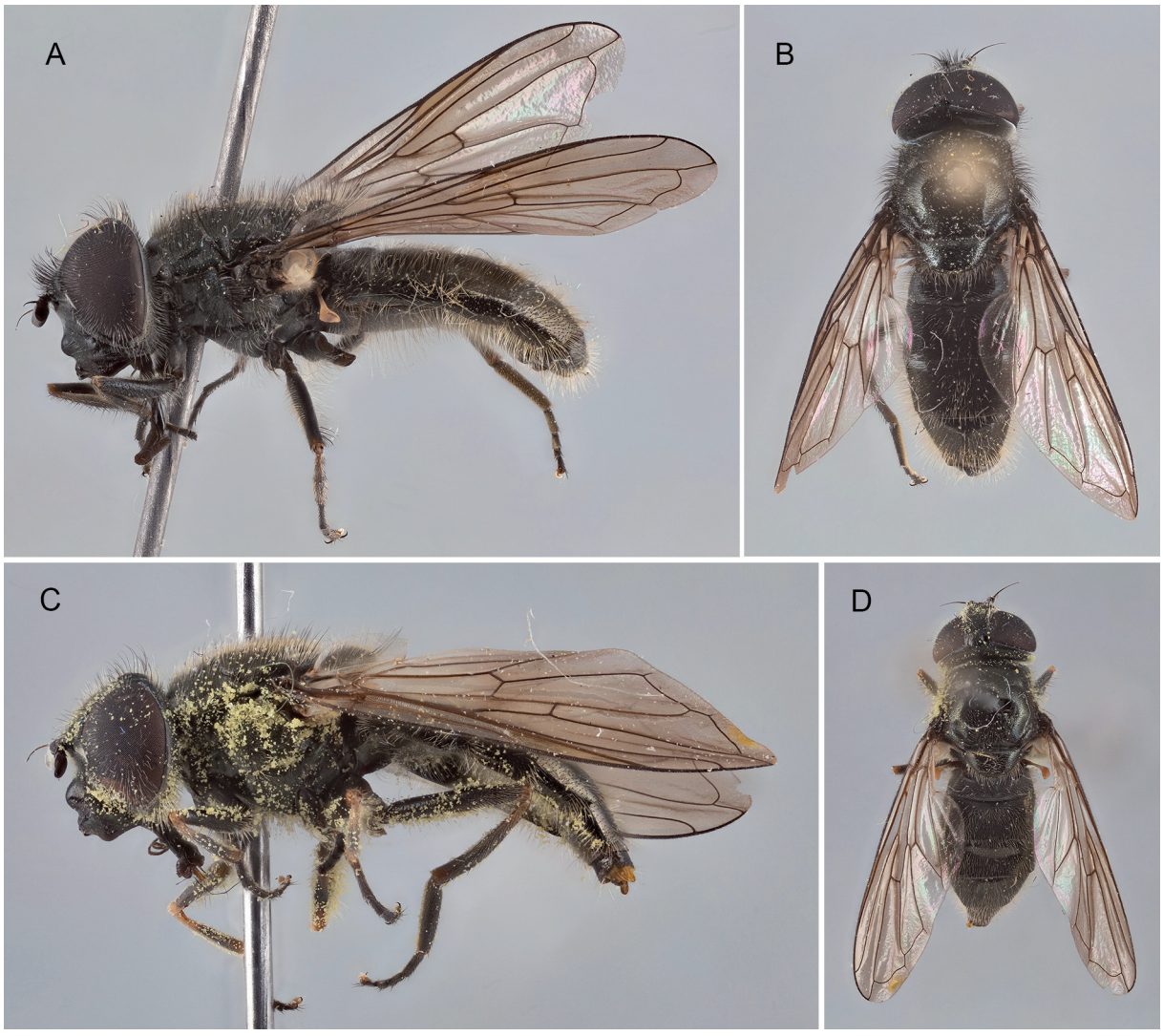

Fig. 54. *Cheilosia* (*Cheilosia*) *pogonias* sp. nov. **A–B**. Holotype, ♂ (ZFMK); habitus, lateral and dorsal views; body length 9.5 mm. **C–D**. Paratype, ♀ (ZFMK, ZFMK-DIP-00066551); habitus, lateral and dorsal views; body length 9.3 mm. Not to scale.

anepisternum and anepimeron with mixed yellow and black pile; katepisternum continuously pilose. Haltere pedicellum yellow, capitulum dark brown to black.

Wing. Wing including alula entirely microtrichose, veins black, stigma dark yellow, vein M_1 meeting vein R_{4+5} at a straight angle.

Legs. Coxae, trochanters, femora, tibiae and tarsi black except yellow apex of femora, basal 1/3–1/4 and apical 1/5–1/6 of tibiae; pile on legs predominately yellow mixed with some black pile; metafemur anteriorly and ventrally with long yellow pile, pile longer than width of metafemur.

Abdomen. Terga I–IV laterally with long erect yellow pile, in center pile shorter and semi-adpressed, sometimes posterior margin of tergum IV with a few black pile; tergum I pruinose; terga II–III laterally shiny, medially pruinose, very posterior edge of tergum III pruinose; over half or tergum IV pruinose,

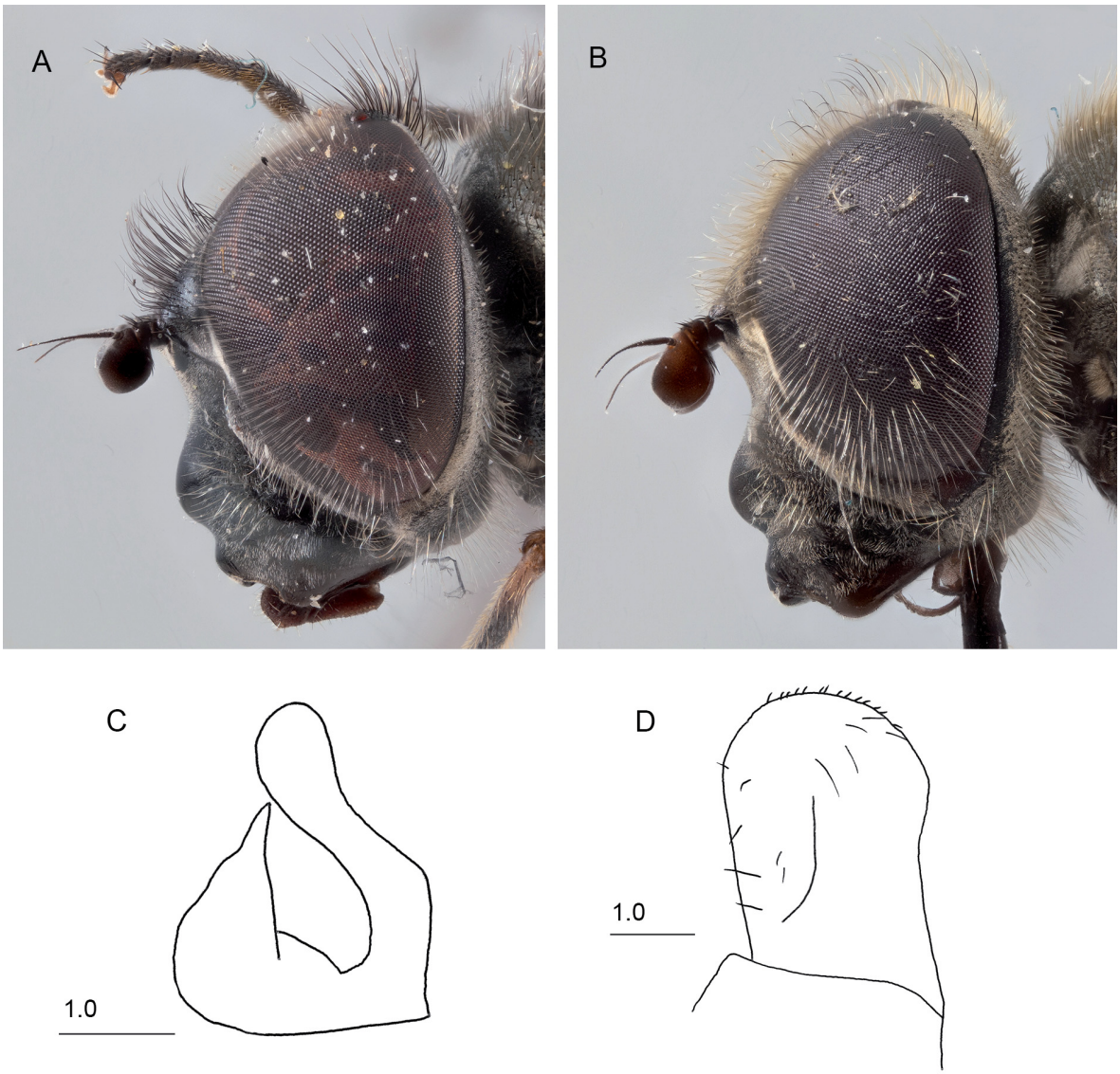

Fig. 55. *Cheilosia* (*Cheilosia*) *pogonias* sp. nov. **A**. Paratype, ♂ (SBA); head, lateral view; eye width 1.3 mm. **B**. Paratype, ♀ (SBA); head, lateral view; eye width 1.3 mm. **C**. ♂ (SBA); postgonite, lateral view. **D**. ♂ (SBA); surstylus, lateral view. Scale bars: A–B not to scale; C–D in µm.

especially in anterior and central part. Sterna I–IV thickly and completely pruinose, with erect yellow pile, adpressed medially on sterna III–IV. Hypopygium pruinose, with yellow pile, rarely a few black pile intermixed. Genitalia with surstylus 1.5 times as long as wide (Fig. 55D) and dorsal lobe of postgonite pointed with wide base (Fig. 55C).

Female

Length. Body 8–10 mm, wing 7–8 mm.

Similar to the male, except for normal sexual dimorphism and the following characters. Frons with yellow pile except a few black pile around ocellar triangle and above antennae. Postpedicel rarely orange-brown basally. Pile on scutum and pleura yellow except for a few black pile on posterior anepisternum, postalar calli and near wing base. Pro- and mesolegs with ventral parts of basitarsomeres yellow. Metafemur anteriorly and ventrally with pile as long as width of metafemur.

Genetics

All DNA sequences of *C. pogonias* sp. nov. cluster together with high support (BS = 100%).

Biology

Collected between 1900 and 2800 m a.s.l. on extensive grasslands.

Distribution

So far only known from the Greater and Lesser Caucasus in Armenia and Georgia.

Cheilosia* (*Taeniochilosia*) *pollinifacies Stackelberg, 1968
Fig. 56

Cheilosia pollinifacies Stackelberg, 1968: 227.

Cheilosia pollinifacies – Stackelberg & Richter 1968: 247. — Peck 1988: 113. — Barkalov 1993: 702. — Barkalov & Ståhls 1997: 52. — Barkalov & Mutin 2018: 486. — Mengual *et al*. 2020: 26.
Cheilosia ponilifacies Stackelberg 1956 [sic] – Gujabidze 2002: 246.

Differential diagnosis

Cheilosia pollinifacies belongs to the subgenus *Taeniochilosia* by the combination of bare eye, black legs and the anterior process of lunula not broadly confluent with the face (Barkalov & Ståhls 1997). Within *Taeniochilosia*, it is similar to *C. aenigmatosa*. For a diagnosis between the two species, see the Differential diagnosis under *C. aenigmatosa*. The male genitalia are figured in Barkalov & Ståhls (1997).

Material examined

Collected in 2018, 2019 and 2021; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

All DNA barcodes of *C. pollinifacies* cluster together with high support (BS = 98.6%). See also Remarks for *C. aenigmatosa*.

Biology

During our expeditions, collected between 9 June and 31 July at an altitude between 1797 and 2630 m a.s.l. Most common on alpine meadows where it feeds on the flowers of herbaceous plants

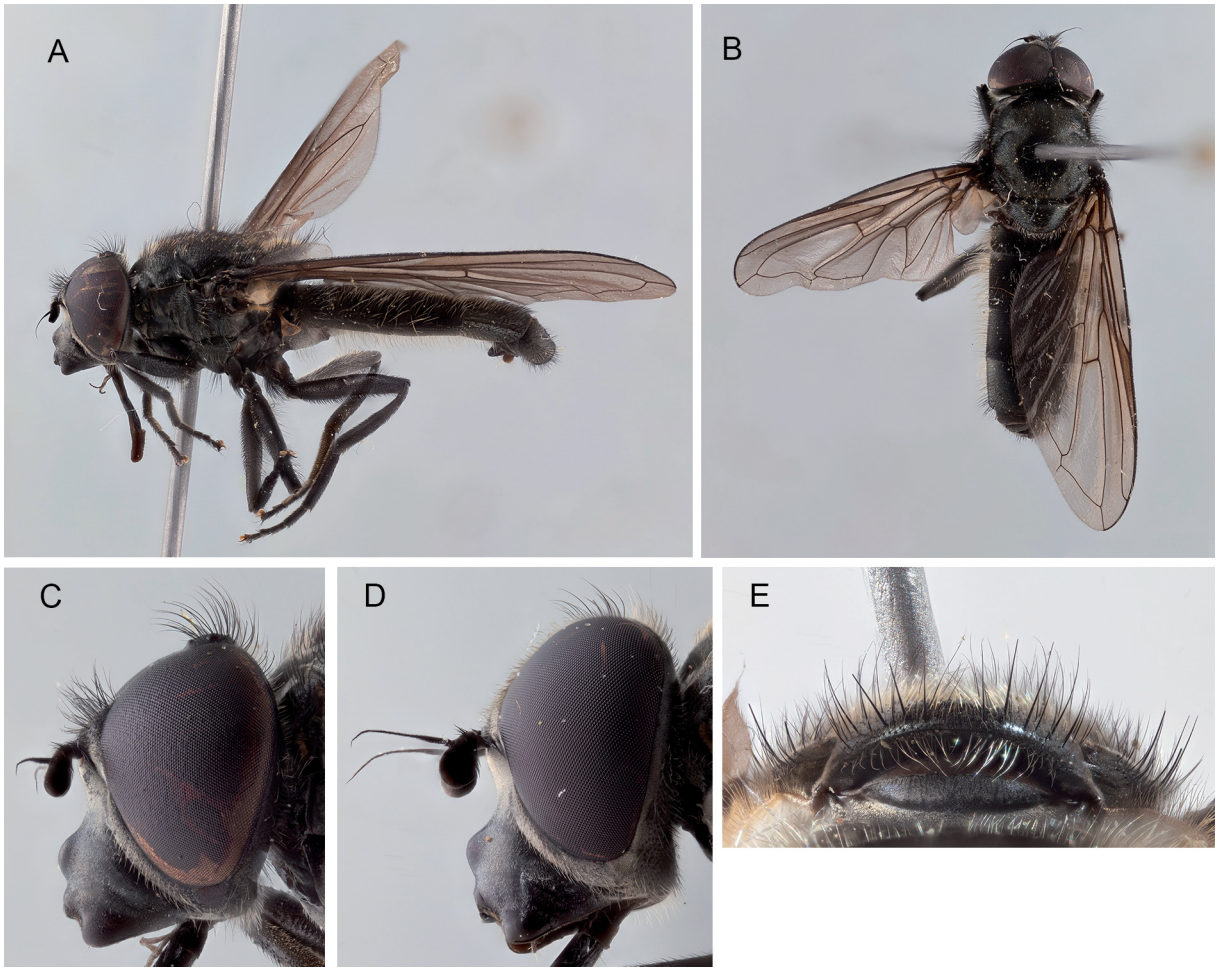

Fig. 56. *Cheilosia* (*Taeniochilosia*) *pollinifacies* Stackelberg, 1968. Collected in Georgia. **A**. ♂ (SBA); habitus, lateral view; body length 9.8 mm. **B**. ♂ (SBA); habitus, dorsal view; body length 10.2 mm. **C**. ♂ (SBA, SB.002729); head, lateral view; eye width 1.3 mm. **D**. ♀ (SBA, SB.002745); head, lateral view; eye width 1.3 mm. **E**. ♂ (SBA, SB.002734); scutellum, posterior view; scutellum width 1.9 mm. Not to scale.

Distribution

Caucasus (Armenia, Azerbaijan, Georgia, Russia).

Cheilosia* (*Cheilosia*) *proxima (Zetterstedt, 1843)
Fig. 57

Eristalis proxima Zetterstedt, 1843: 792.

Cheilosia proxima – Tóth 1986: 94. — Peck 1988: 114. — Barkalov 1993: 700. — Barkalov & Mutin 2018: 483. — Mengual *et al.* 2020: 19.

Differential diagnosis

Cheilosia proxima is a member of a group of closely related species, called the *proxima* group (Vujić *et al.* 2013) in which the pilose eyes, posterior margin of scutellum with setae, usually partly yellow legs, continuously pilose katepisternum, pruinose sterna and the shape of postgonite are distinctive

Fig. 57. *Cheilosia* (*Cheilosia*) *proxima* (Zetterstedt, 1843). Collected in Georgia. **A**. ♂ (FMT, ZFMK-TIS-8028470); habitus, lateral view; body length 10.1 mm. **B**. ♂ (ZFMK, ZFMK-TIS-8008810); habitus, lateral view; body length 9.2 mm. **C**. ♂ (FMT, ZFMK-TIS- 8027950); habitus, lateral view; body length 7.9 mm.

characters. For a full diagnosis of the *Cheilosia proxima* group see Vujić *et al.* (2013). The male genitalia of *C. proxima* are figured in Vujić *et al.* (2013).Within the *proxima* group, *C. proxima* is most similar to *C. gigantea*. For differences, see the Differential diagnosis of *C. gigantea*.

Material examined

Collected in 2018, 2019, 2021 and 2023; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

DNA barcodes of *C. proxima* from the Caucasus appear clustered in three distinct groups with high support (BS = 99.8%; BS = 100%; BS = 100%). Two of these groups comprise only Caucasian individuals and the third has European and Caucasian specimens. For each group a male is portrayed in Fig. 57 A–C.

Remarks

Specimens from all three distinctly different barcoding groups are also morphologically distinct, they often occurred at different locations, habitats and times of the year, and they could represent three distinct species. However, when testing these groups morphologically against European material, European specimens show a wide variation with intermediate looking specimens. Due to the lack of extensive genetic samples in Europe it remains unknown if the variation found in European specimens of *C. proxima* might be correlated with some genetic difference as well or not. More molecular data is needed to properly assess the intraspecific and interspecific variability of this very variable and wide-ranging species.

Biology

During our expeditions, collected between 4 May and 8 July at an altitude between 1090 and 2700 m a.s.l. A species found in meadows and clearings near forest in the lower montane zone to alpine meadows above the treeline, but phenology and habitat (elevation niche) differ between the barcoding clusters.

Distribution

Palaearctic.

Cheilosia* (*Cheilosia*) *pseudogrossa Stackelberg, 1968
Fig. 58

Cheilosia pseudogrossa Stackelberg, 1968: 228.

Cheilosia pseudogrossa – Stackelberg & Richter 1968: 248. — Stackelberg 1970: 59. — Barkalov 1993: 714. — Barkalov & Mutin 2018: 483. — Mengual *et al.* 2020: 20.
Cheilosia pseudogrossa Stackelberg, 1956 [sic] — Gujabidze 2002: 246.

Differential diagnosis

Cheilosia pseudogrossa is genetically and morphologically very similar to *C. grossa*. It can however easily be identified from it by the pilose face (bare in *C. grossa*). Other differences in the male (we could not study the female) include the postpedicel being dark orange to brown (black in *C. grossa*), face ventrolateral of facial tubercle not swollen (swollen in *C. grossa*), pile on anepimeron with straight apex (with wavy apex in *C. grossa*) and terga III–IV pruinose (lateral sides of tergum III widely shiny and tergum IV entirely shiny except anterior margin in *C. grossa*).

Material examined

Not collected in 2018, but collected in 2023.

GEORGIA – **Mtskheta-Mtianeti** • 1 ♂; Lutkhubi; 42.3984° N, 44.7996° E; 2068 m a.s.l.; 8 May 2023; S. Bot leg.; SBA, SB.003236 = ZFMK-TIS-8027992 • 1 ♂; Lutkhubi; 42.4006° N, 44.7956° E; 2130 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT, ZFMK-TIS-8027940 .

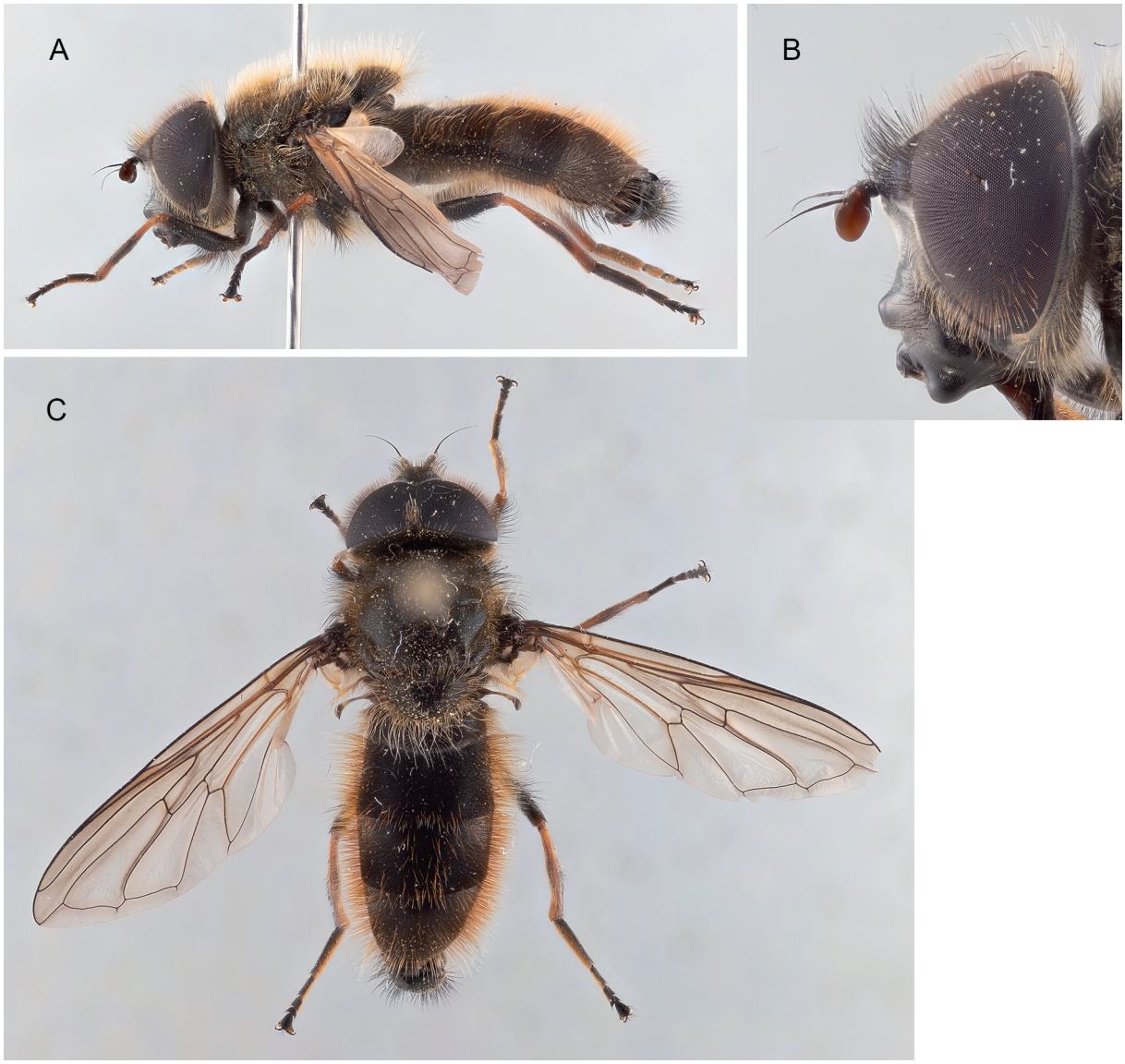

Fig. 58. *Cheilosia* (*Cheilosia*) *pseudogrossa* Stackelberg, 1968. Collected in Georgia. **A**. ♂ (SBA, ZFMK-TIS-8027992); habitus, lateral view; body length 13.4 mm. **B**. ♂ (FMT, ZFMK-TIS-8027940); head, lateral view; eye width 1.5 mm. **C**. ♂ (SBA, ZFMK-TIS-8027992); habitus, dorsal view; body length 13.4 mm. Not to scale.

Genetics

The two DNA sequences of *C. pseudogrossa* cluster together with high support (BS = 99.7%) in our NJ tree. See Genetics under *C. grossa*.

Biology

During our expeditions, collected on 8 May at an altitude between 2068 and 2130 m a.s.l. on flowering willow *Salix sp*.

Distribution

Caucasus (Abkhazia region, Georgia, Russia).

Cheilosia* (*Cheilosia*) *psilophthalma Becker, 1894
Fig. 59

Chilosia psilophthalma Becker, 1894: 495.

Differential diagnosis

Cheilosia psilophthalma is very similar to *C. urbana*, the latter which is very common throughout the Caucasus. The male of *C. psilophthalma* is distinguishable from that of *C. urbana* by the shape of the dorsal lobe of the postgonite (short and triangular in *C. psilophthalma* and narrow and long in *C. urbana*, for drawings of the male genitalia of both species see Claussen & Doczkal 1998) and by the frons (slightly swollen in *C. psilophthalma* but not swollen in *C. urbana*). More differences with *C. urbana*, which are true for both sexes, include the black claws (claw base orange in *C. urbana*), slightly pruinose sterna (true for Caucasian specimens, in Europe shiny in both species) (sterna shiny in *C. urbana*), wider parafacia and postpedicel orange and rounded (postpedicel dark orange to dark brown and wider than high in *C. urbana*). In the female, the frons is wider than in that of *C. urbana*.

Material examined

Cheilosia psilophthalma was not collected in 2018, but collected in 2023.

GEORGIA – **Mtskheta-Mtianeti** • 1 ♀; Lutkhubi; 42.3867° N, 44.79° E; 1580 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT, ZFMK-TIS-8028472. – **Samtskhe-Javakheti** • 1 ♂; Sakire, 41.7301° N, 43.3306° E; 1820 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; FMT, ZFMK-TIS-8028471.

Genetics

DNA barcodes of C. *psilophthalma* from Europe and Caucasus cluster together with high support (BS = 100%).

Remarks

Reported from the Caucasus for the first time.

Biology

During our expeditions, collected between 6 May and 10 May at an altitude between 1580 and 1820 m a.s.l. Present in both the Greater and Lesser Caucasus.

Distribution

Europe, European parts of Russia, Caucasus (Georgia).

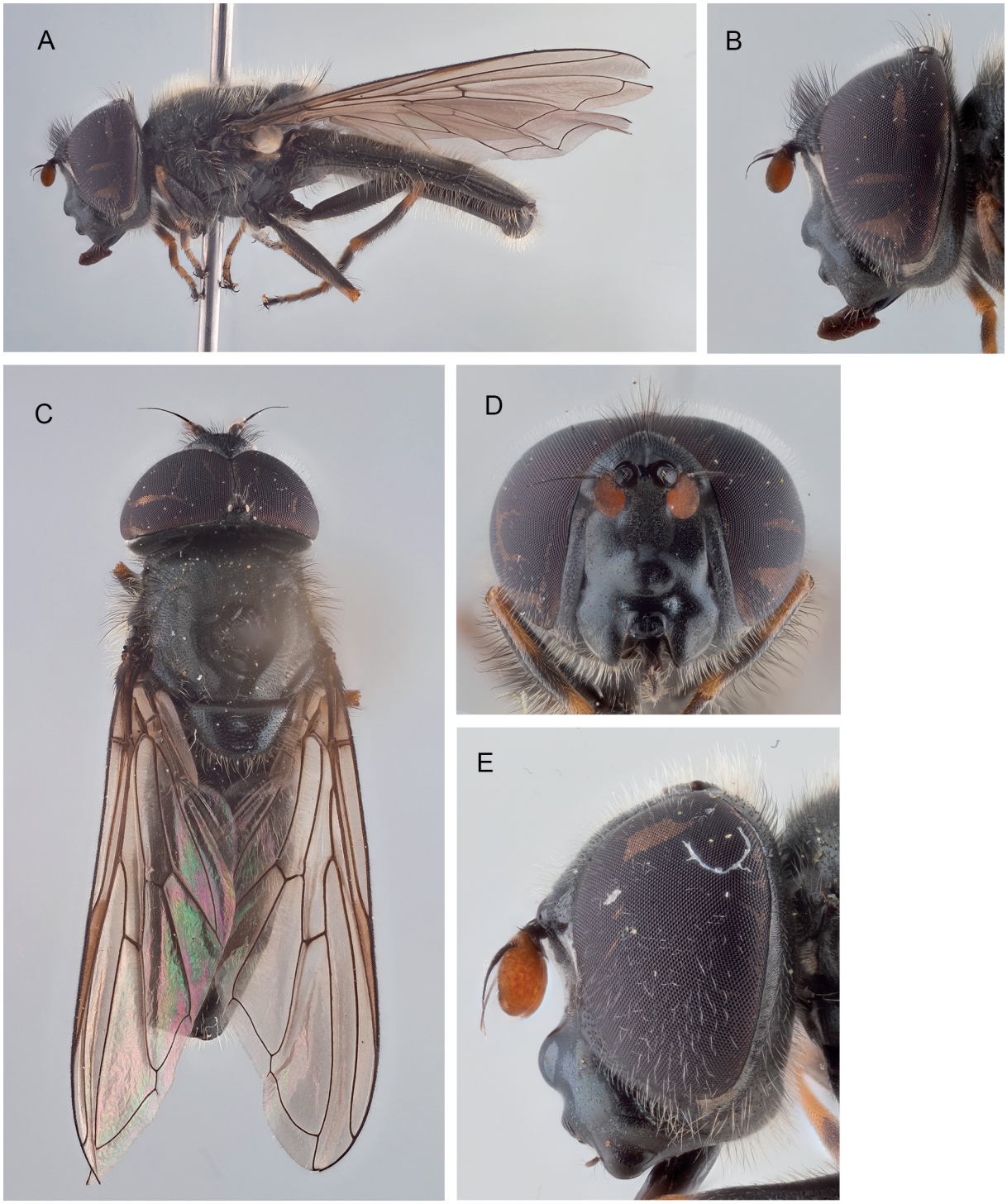

Fig. 59. *Cheilosia* (*Cheilosia*) *psilophthalma* Becker, 1894. Collected in Georgia. **A–D**. ♂ (FMT, ZFMK-TIS-8028471); body length 7.6 mm. **A**. Habitus, lateral view. **B**. Head, lateral view; eye width 1.1 mm. **C**. Habitus, dorsal view. **D**. ♂ (FMT, ZFMK-TIS-8028471); head, frontal view; head width 2.4 mm. **E**. ♀ (FMT, ZFMK-TIS-8028472); head, lateral view; eye width 1.0 mm. Not to scale.

Cheilosia* (*Cheilosia*) *redi Vujić, 1996
Fig. 60

Cheilosia melanopa redi Vujić, 1996: 93.

Cheilosia melanopa (Zetterstedt, 1843) – Mengual *et al.* 2020: 18 (part, see Remarks).

Differential diagnosis

The male of *Cheilosia redi* is distinguishable from those of all other *Cheilosia* except *C. borjomi* sp. nov., *C. lasiopa*, *C. variabilis* and *C. melanopa* by the combination of pilose face, pruinose scutum and sickle-shaped dorsal lobe of the postgonite. The male can be distinguished from that of *C. lasiopa* by, amongst other characters, longer setae on posterior margin of scutellum, shorter sickle-shaped dorsal lobe of postgonite and longer pile on metafemur. The male genitalia of *C. redi* are figured in Francuski *et al.* (2009). The male of *C. redi* differs from those of *C. borjomi* and *C. variabilis* by, amongst other characters, smaller body size (8–11 mm vs 10–12 mm), stockier abdomen, tibiae usually narrowly yellow at base and apex (usually all black in *C. borjomi* and *C. variabilis*), absence of black setae on ventral part of metafemur (present in *C. borjomi* and *C. variabilis*), and yellow pile on entire posterior part of metatibia, (basal half of metatibia with black pile in *C. borjomi* and *C. variabilis*). The male of *C. redi* is very similar to that of *C. melanopa*, but it differs by the short pilosity on arista, at the base of arista about half as long as diameter of arista at base (in *C. melanopa* the aristal pile at base almost as long as diameter of arista at base), long pile on occiput behind dorsal margin of eyes partly yellow (Fig. 60E) (entirely black pilose in *C. melanopa*), metafemur with at least basal 60% of the anterior long and short pile yellow (at most the basal third metafemur yellow pilose in *C. melanopa*), metatibia posteriorly with yellow pile entirely (in *C. melanopa* only apical half of metatibia with yellow pile posteriorly, basal half with black pile). In general, the male of *C. redi* is has more yellow pilosity: face with predominantly yellow instead of predominantly black pile, scutum with larger proportion of yellow pile, dorsal pile of katepisternum yellow (almost always with some black pile intermixed in *C. melanopa*) and terga II–IV entirely or almost entirely with yellow pile (in *C. melanopa* almost always with black pile medially in posterior part); on average the male of *C. redi* has paler legs: usually protibia and mesotibia with yellow base and apex (Fig. 60A), while in *C. melanopa* legs often entirely black or only base yellow or pale parts dark orange.

The female of *C. redi* is similar to that of *C. melanopa* but the metatibia is entirely yellow pilose (in *C. melanopa* the anterior side of metatibia with black pile), terga II–IV medially with yellow pile only, sometimes shorter black pile present (in *C. melanopa* terga II–IV always with distinct adpressed black pile, at least posteriorly). Female of *C. redi* has on average more yellow legs, more often protibia and mesotibia yellow at both ends and with yellow long pile on the dorsal margin of occiput behind dorsal margin of eyes (Fig. 60F) (often black in *C. melanopa*). The female of *C. redi* is very similar to the female of *C. pogonias* sp. nov., for differences see Differential diagnosis under *C. pogonias*.

Material examined

Collected in 2018, 2019, 2022 and 2023, but 2018 records were not published in Mengual *et al.* (2020). Thus, all our records are reported here.

GEORGIA – **Adjara Region** • 1 ♀; Kintrishi Nature Reserve; 41.7293° N, 42.0775° E; 1035 m a.s.l.; 20 Apr.–5 May 2018; GGBC-members leg; ZFMK, ZFMK-TIS-8010448 • 1 ♀; Kintrishi Nature Reserve; 41.7433° N, 42.0840° E; 1235 m a.s.l.; 7–20 May 2018; GGBC-members leg; ZFMK, ZFMK-TIS-8010480 • 1 ♂; Kintrishi Nature Reserve; 41.7551° N, 42.1124° E; 2268 m a.s.l.; 2–16 Jun. 2018; GGBC-members leg; ZFMK, ZFMK-TIS-8010565 • 1 ♀; Kintrishi Nature Reserve; 41.7553° N, 42.1129° E; 2280 m a.s.l.; 2–16 Jun. 2018; GGBC-members leg; ZFMK, ZFMK-

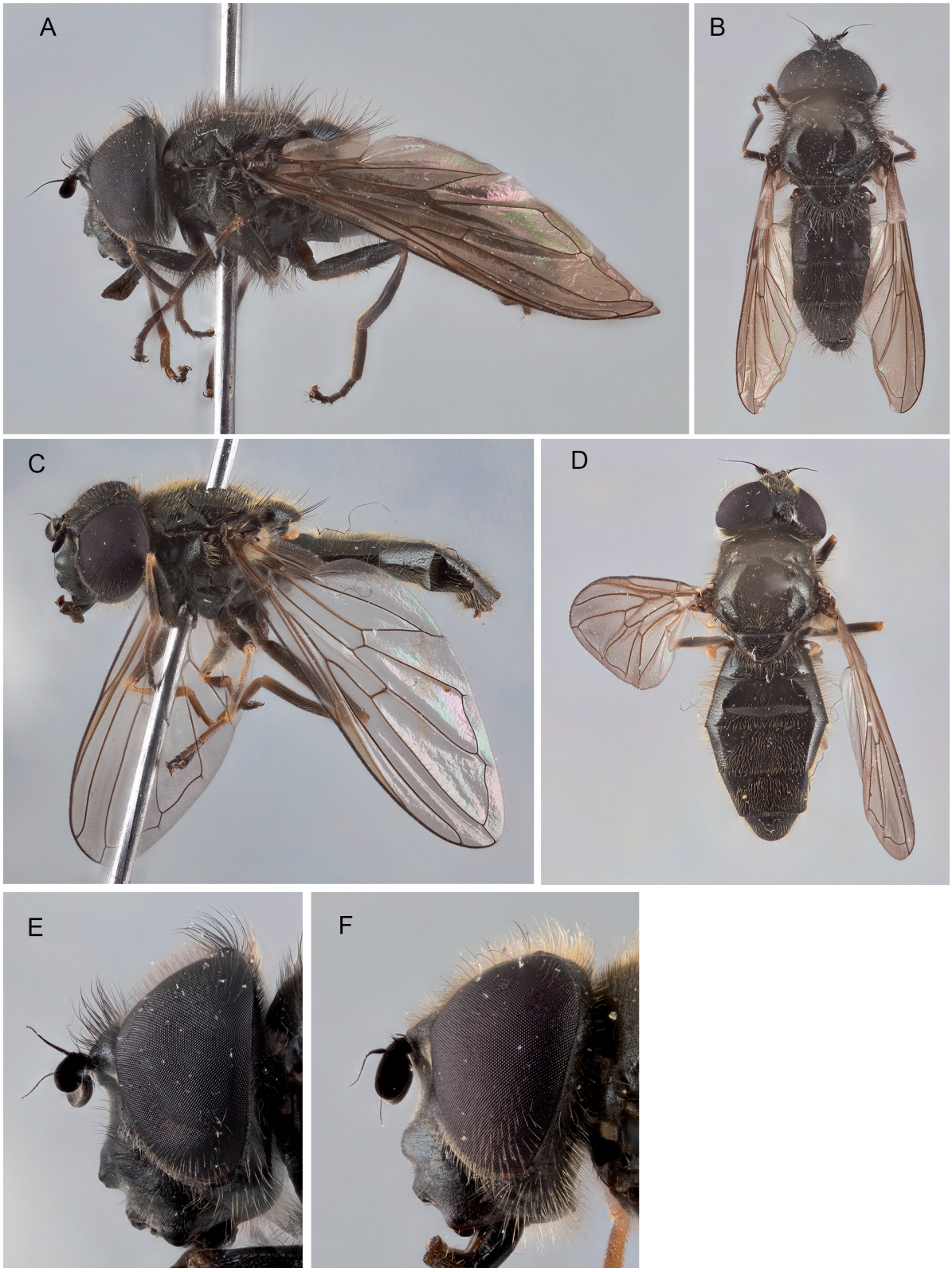

Fig. 60. *Cheilosia* (*Cheilosia*) *redi* Vujić, 1996. Collected in Georgia. **A–B**. ♂ (ZFMK); habitus, lateral and dorsal views; body length 9.8 mm. **C–D**. ♀ (ZFMK, ZFMK-DIP-00066251); habitus, lateral and dorsal views; body length 9.3 mm. **E**. ♂ (ZFMK); head, lateral view; eye width 1.4 mm. **F**. ♀ (ZFMK, ZFMK-DIP-00066251); head, lateral view; eye width 1.4 mm. Not to scale.

TIS-8010543 • 1 ♀; Kintrishi Nature Reserve; 41.7553° N, 42.1128° E; 2280 m a.s.l.; 2–16 Jun. 2018; GGBC-members leg; ZFMK, ZFMK-TIS-8010556 • 1 ♂; Kintrishi Nature Reserve; 41.7619° N, 42.1162° E; 2462 m a.s.l.; 16–30 Jun. 2018; GGBC-members leg; ZFMK, ZFMK-TIS-8010535 • 1 ♀; Kintrishi Nature Reserve; 41.7619° N, 42.1162° E; 2462 m a.s.l.; 30 Jun.–14 Jul. 2018; GGBC-members leg; ZFMK, ZFMK-TIS-8002723. – **Kakheti** • 1 ♀; Batsara Nature Reserve, Rangers office; 42.22246° N, 45.30369° E; 807 m a.s.l.; 28–29 May 2022; X. Mengual leg.; Malaise trap; ZFMK, ZFMK-DIP-00094242. – **Mtskheta-Mtianeti** • 1 ♀; Tbilisi N.P.; 41.8808° N, 45.0203° E; 1270 m a.s.l.; 1 Jun. 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00094160 = ZFMK-TIS-8014609 • 2 ♀♀; Tbilisi N.P.; 41.8808° N, 45.0203° E; 1270 m a.s.l.; 27 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093899 = ZFMK-TIS-8014608, ZFMK-DIP-00093893 = ZFMK-TIS-8014606 • 21 ♀♀; Tbilisi N.P.; 41.88116° N, 45.020803° E; 1275 m a.s.l.; 27 May–1 Jun. 2022; X. Mengual leg.; Malaise trap; ZFMK, ZFMK-DIP-00094263 to ZFMK-DIP-00094265, ZFMK-DIP-00094269, ZFMK-DIP-00094275, ZFMK-DIP-00094308, ZFMK-DIP-00094326, ZFMK-DIP-00094377 to ZFMK-DIP-00094380, ZFMK-DIP-00094446, ZFMK-DIP-00094447, ZFMK-DIP-00094452, ZFMK-DIP-00094453, ZFMK-DIP-00094456, ZFMK-DIP-00094459, ZFMK-DIP-00094461 to ZFMK-DIP-00094464 • 1 ♀; Tbilisi N.P.; 41.880° N, 45.023° E; 1289 m a.s.l.; 4 May 2023; S. Bot leg.; SBA, SB.003049 • 2 ♀♀; same data as for preceding; L. Hofstee leg.; LHH • 3 ♀♀; Tbilisi N.P.; 41.877° N, 45.0138° E; 1250 m a.s.l.; 4 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; Tbilisi N.P.; 41.8802° N, 45.0220° E; 1279 m a.s.l.; 4 May 2023; W. Opdekamp leg.; WOR, A005 • 2 ♀♀; same data as for preceding; WOR, A004, A014 • 1 ♂; Lutkhubi; 42.3797° N, 44.7969° E; 1463 m a.s.l.; 6 May 2023; S. Bot leg.; SBA, SB.003050 • 2 ♀♀; same data as for preceding; SBA, SB.003051, SB.003052 • 1 ♀; same data as for preceding; ZFMK, ZFMK-TIS-8027974 • 1 ♀; Lutkhubi; 42.3797° N, 44.7969° E; 1463 m a.s.l.; 6 May 2023; L. Hofstee leg.; LHH • 4 ♂♂, 3 ♀♀; Lutkhubi; 42.3867° N, 44.79° E; 1580 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT • 10 ♂♂; Lutkhubi; 42.3951° N, 44.7847° E; 2138 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT • 2 ♂♂; Lutkhubi; 42.3930° N, 44.7929° E; 1700 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, A002, A011 • 5 ♂♂; Lutkhubi; 42.3823° N, 44.7856° E; 1500 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, D001, D004, D015, D018, D019 • 1 ♀; same data as for preceding; D032 • 3 ♂♂; Lutkhubi; 42.3938° N, 44.7857° E; 2120 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, E004, E020, E021 • 6 ♂♂, 7 ♀♀; Lutkhubi; 42.3936° N, 44.7923° E; 1760 m a.s.l.; 8 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; Lutkhubi; 42.3930° N, 44.7929° E; 1734 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, C025 • 1 ♀; Tbilisi N.P.; 41.8787° N, 45.0288° E; 1316 m a.s.l.; 9 May 2023; S. Bot leg.; SBA, SB.003055 • 2 ♀♀; Tbilisi N.P.; 41.8770° N, 45.0137° E; 1248 m a.s.l.; 9 May 2023; S. Bot leg.; SBA, SB.003053, SB.003054. – **Racha-Lechkhumi and Kvemo Svaneti** • 1 ♀; Tsana; 42.90° N, 43.14° E; 1830 m a.s.l.; 18 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.861 • 1 ♀; Tsana; 42.9089° N, 43.1425° E; 1900 m a.s.l.; 19 Jun. 2019; F. Van de Meutter leg.; FMT • 3 ♀♀; 42.82111° N, 43.16069° E; 1450 m a.s.l.; 20 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8006797 = ZFMK-DIP-00066232, ZFMK-TIS-8006817 = ZFMK-DIP-00066233, ZFMK-DIP-00066195 • 2 ♀♀; 42.82° N, 43.16° E; 1485 m a.s.l.; 20 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.862, 2019-00.863. – **Samegrelo-Zemo Svaneti** • 1 ♀; 42.912° N, 42.937° E; 2430 m a.s.l.; 27 Jun. 2018; S. Bot leg.; SBA, SB.003046 • 1 ♀; Mestia; 43.0256° N, 42.8908° E; 2550 m a.s.l.; 13 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♂; Ughviri Lake; 43.0319° N, 42.8272° E; 1905 m a.s.l.; 13 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8006798 = ZFMK-DIP-00066231 • 1 ♀; 43.02836° N, 42.87878° E; 2345 m a.s.l.; 13 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8006799 = ZFMK-DIP-00066251 • 1 ♀; Mestia; 43.042° N, 42.768° E; 1473 m a.s.l.; 13 Jun. 2019; S. Bot leg.; SBA, SB.003047 = CNC databasing S. Bot 933 • 1 ♀; Mestia; 43.02° N, 42.87° E; 2350 m a.s.l.; 13 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.880 • 1 ♀; 42.9989° N, 42.6501° E; 1273 m a.s.l.; 13–14 Jun. 2019; X. Mengual leg.; Malaise trap; ZFMK, ZFMK-DIP-00078704 = ZFMK-TIS-8010113 • 1 ♀; 43.112° N, 42.743° E; 1713 m a.s.l.; 14 Jun. 2019; L. Hofstee leg.; LHH • 1 ♀; Ushguli; 42.920° N, 42.937° E; 2283 m a.s.l.; 16 Jun. 2019; L. Hofstee leg.; LHH • 1 ♀; Ushguli; 42.920° N, 42.937° E; 2283 m a.s.l.; 17 Jun. 2019; S. Bot leg.; SBA, SB.003048 = CNC databasing S. Bot 934 • 1 ♂; Ushguli; 42.898° N, 43.008° E; 2601 m a.s.l.; 18 Jun. 2019; S. Bot

leg.; SBA, SB.003044. – **Samtskhe-Javakheti** • 1 ♀; Borjomi N.P.; 41.867° N, 43.251° E; 2000 m a.s.l.; 18 Jun. 2018; S. Bot leg.; SBA, SB.003045 • 1 ♂; Borjomi N.P.; 41.824° N, 42.848° E; 2165 m a.s.l.; 10 Jun. 2019; S. Bot leg.; SBA, SB.003043 • 1 ♀; 41.8234° N, 42.8400° E; 2025 m a.s.l.; 11 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066336.

Genetics

There is a cluster (BS = 91.2%) in our NJ tree with *C. redi* and *C. melanopa* barcodes. All DNA barcodes of *C. redi* are clustered together with high support value (BS = 100%) and all DNA sequences of *C. melanopa* as well (BS = 98.1%).

Remarks

Reported from the Caucasus, and Georgia, for the first time. Barkalov (1993) already wrote that *C. melanopa* was polymorphic, with one morph having almost black legs and black pilosity on scutum and scutellum, and a second pale morph with legs partly yellow and mostly yellow pilosity on scutum and scutellum. The pale morph, very likely, is *C. redi*. Some records of *C. melanopa* in Mengual *et al.* (2020) actually are *C. redi*, and are reported here again as *C. redi*.

Biology

Collected in mountains between 1248–2601 m a.s.l. between 4 May and 20 June. It can be found in sympatry with *C. melanopa*. Found in the montane and subalpine zone near forest and in forest clearings as well as on alpine meadows.

Distribution

Within Europe, occurs mainly in the Balkan Peninsula with scattered records in Central Europe. Caucasus (Georgia).

Cheilosia* (*Cheilosia*) *rhynchops Egger, 1860
Fig. 61

Cheilosia rhynchops Egger, 1860: 353.

Cheilosia rhynchops – Barkalov 1993: 699. — Barkalov & Mutin 2018: 484. — Mengual *et al.* 2020: 20.

Differential diagnosis

Cheilosia rhynchops is characterized by the combination of a bare face, pilose eye, black legs, posterior margin of scutellum with setae and shiny sterna. In the Caucasus it can be mainly confused with *C. caucasi* sp. nov. but it has an elongated face (Fig. 61B, D, with long straight part between antennae and facial tubercle (in *C. caucasi* sp. nov. face not elongated) and the dorsal and ventral pile patches on the katepisternum are connected or almost so in the Caucasian populations (widely separated in *C. caucasi*). In the male the frons is swollen (not swollen in *C. caucasi*) and scutum with long black and white pile (scutum usually with mainly black pile in *C. caucasi*). In the female scutum with adpressed mainly golden pile (variable in *C. caucasi*) and postpedicel dark orange in basoventral corner (black in *C. caucasi*).

Material examined

Collected in 2018, 2019 and 2023; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

A well-supported (BS = 100%) cluster is found in our NJ tree with the barcodes of *C. lenta* Becker, 1894, *C. andalusiaca* Torp Pedersen, 1971, *C. siciliana* Becker, 1894, and *C. rhynchops*. No further grouping appears in our dataset.

Remarks

Cheilosia rhynchops is extremely similar to extralimital *C. lenta* from Europe and little is known how to differentiate the two species. The absence or presence of pile connecting the dorsal and ventral pile patches on the katepisternum is, however, regarded as the most important difference between the two species: in *C. lenta* both dorsal and ventral pile patches on the katepisternum are connected or joined with

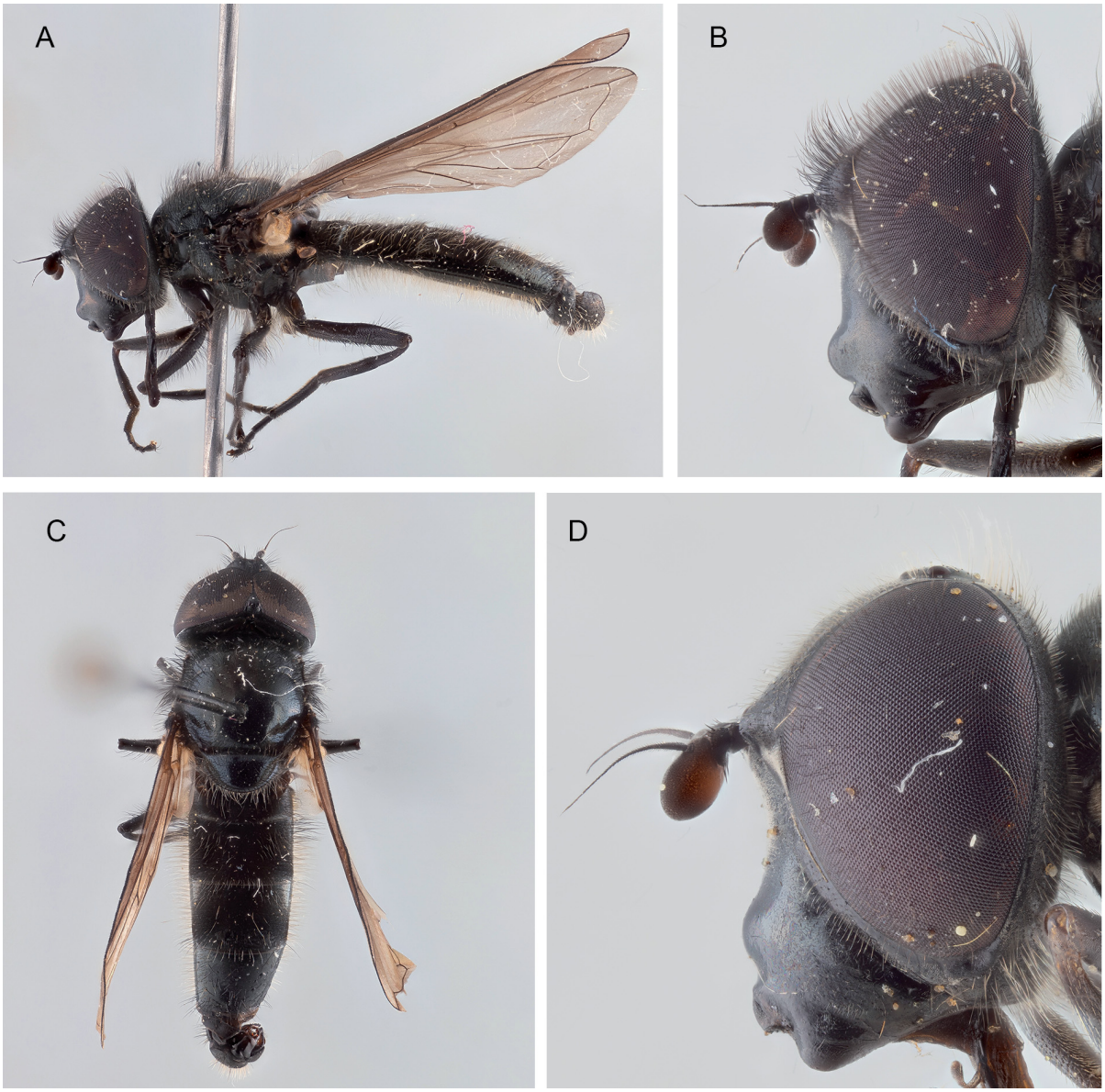

Fig. 61. *Cheilosia* (*Cheilosia*) *rhynchops* Egger, 1860. Collected in Georgia. **A**. ♂ (SBA, SB.002782); habitus, lateral view; body length 10.3 mm. **B**. ♂ (SBA); head, lateral view; eye width 1.5 mm. **C**. ♂ (FMT); habitus, dorsal view; body length 10.3 mm. **D**. ♀ (FMT); head, lateral view; eye width 1.4 mm. Not to scale.

pile, but this pile are absent in *C. rhynchops* and the dorsal and ventral pile patches on the katepisternum are not connected. All specimens collected in the Caucasus have the dorsal and ventral pile patches on the katepisternum connected. However, dorsal and ventral pile patches on the katepisternum can sometimes also be connected in populations of *C. rhynchops* (e.g., from the Alps; S. Bot pers. obs.), making certain identification of the two species sometimes impossible. No morphological difference was found between European and Caucasian populations of *C. rhynchops*. Moreover, our genetic results show *C. lenta* to be genetically not distinct from *C. rhynchops*. Given the current uncertainty in the identification of these two species, we here name the individuals from the Caucasus *C. rhynchops* for the time being, until there is more certainty on the status of *C. lenta*. We chose the earlier published name of the two. Taxonomy of these two and two other similar European species will be subject of more extensive research in the near future.

Biology

During our expeditions, collected between 9 May and 17 June at an altitude between 920 and 2327 m a.s.l. In the lower montane zone present in forest clearings and herb-rich grasslands with shrubs, in the subalpine and alpine zone present in meadows.

Distribution

Central and Southern Europe, Caucasus (Georgia, Russia).

Cheilosia* (*Montanocheila*) *rufa sp. nov.
urn:lsid:zoobank.org:act:8ED0B122-5D19-462F-A10F-C4ADE40C5BC4
Figs 62–63

Differential diagnosis

Cheilosia rufa sp. nov. belongs to the subgenus *Montanocheila* and is very similar to the sympatrically occurring *C. subpictipennis*. Males of *C. rufa* can be distinguished from those of *C. subpictipennis* by the anterior part of procoxa with only yellow setae on apical half (in *C. subpictipennis* the anterior part of procoxa has mixed black and yellow setae on apical half) and the dorsal lobe of the postgonite of the male genitalia shorter than ventral lobe, curved inwards and with widening, pointed apex (Fig. 63C) (in *C. subpictipennis* dorsal lobe of postgonite as long as ventral lobe, erect and more rectangular, Fig. 68E). Moreover, males of *C. rufa* have pile on terga more rufous and clypeus longer. Females of *C. rufa* cannot be distinguished from those of *C. subpictipennis*, except for the on average longer clypeus; but this character is variable. Hence, females can only de identified with certainty on the basis of DNA barcodes. *Cheilosia rufa* is also similar to the sympatric *C. gorodkovi* but our new species is larger (10.5–12.5 mm vs 9.5–10 mm) and has the face more protruding (Fig. 63A–B), facial tubercle less pronounced, face more densely pruinose, veins paler at wing base (veins Rs, M and CuA bright yellow) (in *C. gorodkovi* veins Rs and M are orange, and CuA brown). Male of *C. rufa* has anterodorsal pile on metafemur long and dense, almost two times as long as diameter of metafemur in ventral view (in *C. gorodkovi* these piles are less dense and at most just over diameter of metafemur in ventral view) and the surstylus of the male genitalia is less than two times as long as wide (Fig. 63D) (in *C. gorodkovi* the surstylus is more than two times as long as wide. Female of *C. rufa* has the pile on body and legs longer, e.g., pile on scutellum longer than diameter of metafemur (pile shorter in *C. gorodkovi*) and the metafemur with pile longer than diameter of metafemur anteroventrally (in *C. gorodkovi* the metafemur has pile anteroventral less dense and shorter than the diameter of metafemur).

Etymology

The species name is derived from the Latin '*rufus*' meaning 'red, reddish' (Brown 1956: 672), and it refers to the abdominal pile of the species, which is on average more rufous compared to the paler pile on the very similar and sympatric *C. subpictipennis*. Species epithet is to be treated as an adjective.

Material examined

Holotype

GEORGIA • ♂; Samtskhe-Javakheti, Sakire; 41.7301° N, 43.3306° E; 1820 m a.s.l.; 10 May 2023; F. Van de Meutter leg.; ZFMK, ZFMK-TIS-8028515.

Paratypes

GEORGIA – **Mtskheta-Mtianeti** • 2 ♂♂; Lutkhubi; 42.3797° N, 44.7969° E; 1463 m a.s.l.; 6 May 2023; S. Bot leg.; SBA, SB.003237 = ZFMK-TIS-8027981, SB.003238 = ZFMK-TIS-8027982 • 1 ♀; same data as for preceding; SBA, SB.003239 = ZFMK-TIS-8027986 • 2 ♂♂; Lutkhubi; 42.3867° N, 44.79° E; 1580 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT • 1 ♂; same data as for preceding; ZFMK. – **Samtskhe-Javakheti** • 2 ♂♂; Kodiani; 41.7300° N, 43.3485° E; 2080 m a.s.l.; 10 May 2023; W. Opdekamp leg.; WOR, A009, A018 = ZFMK-TIS-8028458 • 1 ♀; same data as for preceding; WOR, A003 = ZFMK-TIS-8028485; identified by genetic analysis.

Description

Male

Length. Body 10.5–12.5 mm, wing 8.5–10 mm.

Fig. 62. *Cheilosia* (*Montanocheila*) *rufa* sp. nov. **A–B**. Holotype, ♂ (ZFMK, ZFMK-TIS-8028515); habitus, lateral and dorsal views; body length 12.2 mm. **C–D**. Paratype, ♀ (SBA, ZFMK-TIS-8027986); habitus, lateral and dorsal views; body length 11.4 mm. Not to scale.

Head. Face bare, black, slightly protruding downwards, with facial tubercle, pruinose except facial tubercle shiny, below lunule narrower than an eye. Mala black, shiny. Parafacia black, thinly pruinose, yellow pilose except ventral quarter black pilose, about 0.9 times as wide as postpedicel. Clypeus about 2.5 times as long as wide. Frontal triangle black, shiny, except narrowly pruinose along eye margin, with long mixed black and yellow or yellow pile, sometimes with yellow pile intermixed, with medial

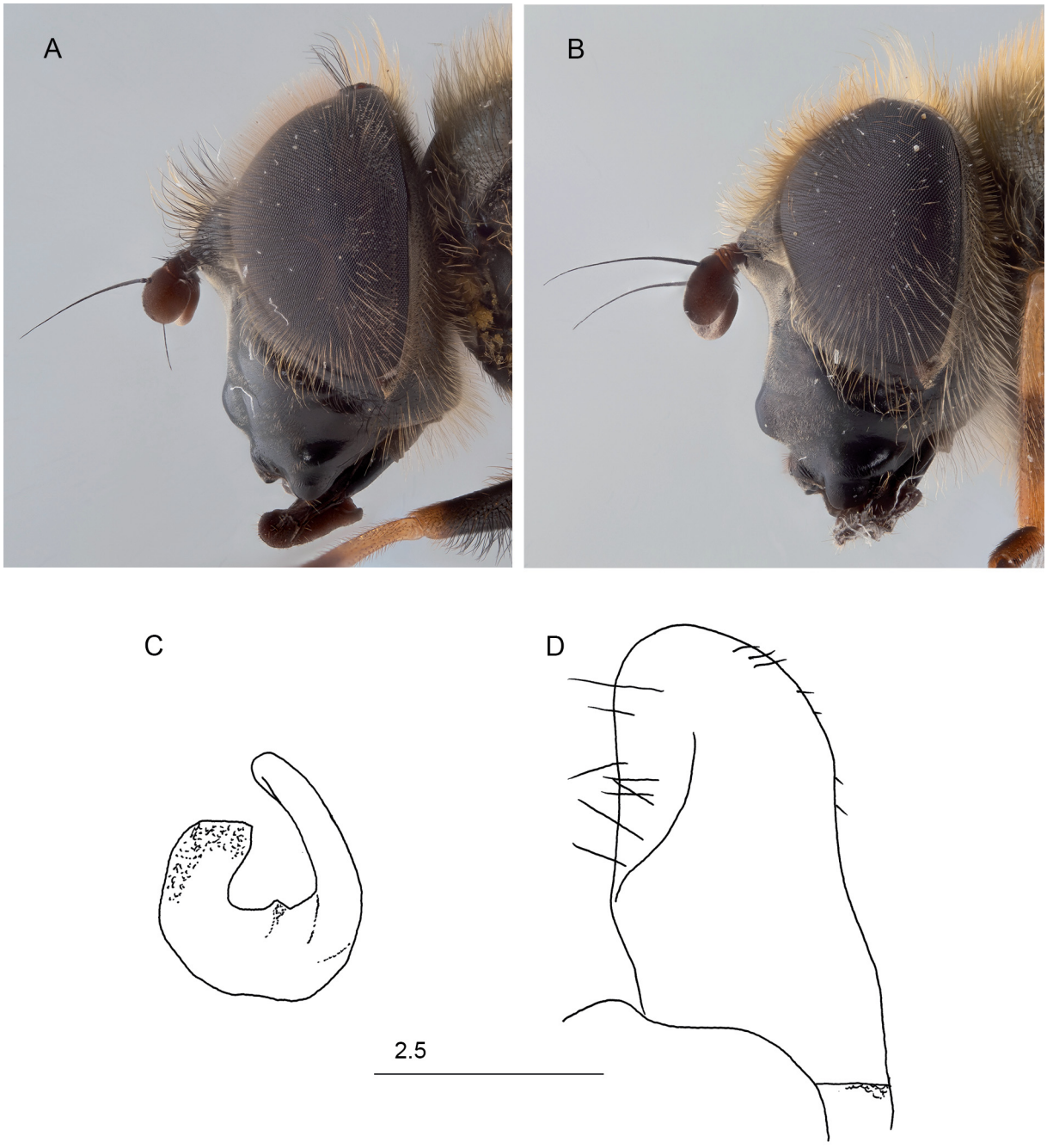

Fig. 63. *Cheilosia* (*Montanocheila*) *rufa* sp. nov. **A**. Holotype, ♂ (ZFMK, ZFMK-TIS-8028515); head, lateral view; eye width 1.5 mm. **B**. Paratype, ♀ (SBA, ZFMK-TIS-8027986); head, lateral view; eye width 1.6 mm. **C**. Paratype, ♂ (SBA); postgonite, lateral view. **D**. ♂ (WOR); surstylus, lateral view. Scale bar: A–B not to scale; C–D in µm.

frontal sulcus. Length of eye contiguity about 0.7–0.9 times the length of frons. Angle of approximation of eyes 90–100°. Vertical triangle black, ocellar triangle pruinose, long mixed black and yellow pilose. Occiput pruinose, short yellow and long mixed black and yellow or yellow pilose. Lunule dark orange to blackish, with distinct medial arm, separating acetabula. Scape black, anteriorly with black and yellow setae; pedicel blackish or dark orange anteriorly with mixed black and yellow setae; postpedicel orange, sometimes dorsal outer corner darkened, rounded except in dorsal outer corner where often more angular, pruinose, about as wide as high; arista black, almost bare, pile much shorter than diameter of arista at base. Eye with long, dense yellow or brown pile. Haltere pedicellum orange, capitulum orange or dark brown.

Thorax. Scutum black, shiny, finely punctured, with long erect pile, pile yellow, except medially between wing bases with a field of shorter black pile. Scutellum black, medially shiny, with long erect yellow pile, sometimes medially shorter black pile intermixed, without setae along posterior margin. Pleura black, pruinose, with yellow pile; dorsal and ventral pile patches on katepisternum connected; metasternum yellow pilose. Haltere pedicellum orange, capitulum ranging from orange to brown.

Wing. Wing including alula entirely microtrichose, hyaline except with a more or less clear brown central spot between cell sc and base of cell dm, wing veins orange in the basal part and black in the apical part of the wing.

Legs. Coxae, trochanters black, anterior part of procoxa with yellow setae on apical half. Femora black except apices narrowly yellow, with black and yellow pile, metafemur with very long anterodorsal and anteroventral yellow pile, metafemur anteriorly with very long yellow pile, pile longer than diameter of metafemur, ventrally basal two third with predominantly yellow setae. Tibiae yellow with indistinct brown ring in apical part, with yellow pile except sometimes ventrally with some black pile. Protarsus dorsally black, ventrally yellow except fifth tarsomere which is black; mesotarsus yellow except fourth tarsomere dorsally and fifth tarsomere black; metatarsus yellow except basitarsomere and often fourth tarsomere ventrally and fifth tarsomere black.

Abdomen. Black. Terga I–IV shiny except tergum I, tergum II medially and tergum III anteromedially slightly pruinose; covered with long yellow erect pile, laterally longest, more rufous on terga II–III, exceptionally with a few black pile on posterolateral margin of tergum IV. Sternum I pruinose, with long yellow erect pile; sternum II shiny except anterolateral corners, with very long erect yellow pile, posteromedially with a few semi-adpressed pile amongst the erect pile; sterna III–IV shiny, with long erect yellow pile, pile medially less dense, where intermixed with short adpressed yellow or mixed black and yellow pile. Genitalia with surstylus ca 1.7 times as long as wide, with keel (Fig. 63D); postgonite with spike between ventral and dorsal lobe, ventral lobe of postgonite with widening rounded apex, slightly but distinctly longer than dorsal lobe of postgonite (Fig. 63C); dorsal lobe of postgonite curved inwards and with widening black pointed apex (Fig. 63C); sclerite of the distiphallus with two ventral spurs.

Female

Length. Body 11.5 mm, wing 9 mm.

Similar to the male, except for normal sexual dimorphism and the following characters: parafacia entirely yellow pilose. Frons shiny. Postpedicel brown, rounded. All pile on head, thorax, legs and abdomen yellow. Terga shiny except tergum I medially and tergum II anteromedially narrow pruinose.

Genetics

DNA barcodes of *C. rufa* sp. nov. cluster together with the sequences of *C. contrasta* sp. nov. with low support (BS < 90%), although all DNA barcodes of *C. rufa* are grouped together as do all sequences of *C. contrasta*.

Biology

Collected in mountains between 1463 and 2080 m a.s.l. Most specimens were found feeding on willow *Salix* sp. catkins, or drinking at mud puddles.

Distribution

So far only known from the type series localities in the Greater and Lesser Caucasus in Georgia.

Cheilosia* (*Eucartosyrphus*) *ruffipes (Preyssler, 1793)
Fig. 64

Syrphus ruffipes Preyssler, 1793: 216.
Eristalis soror Zetterstedt, 1843: 809. Syn. by Rozkošný *et al*. (1982).

Cheilosia (*Eucartosyrphus*) *soror* – Stackelberg & Richter 1968: 249. — Stackelberg 1970: 58.
Cheilosia rufipes Preyssler, 1793 [sic] – Peck 1988: 115.
Cheilosia rufipes (Preyssler, 1793) [sic] – Barkalov 1993: 712.
Cheilosia soror Zetterstendt, 1843 [sic] – Gujabidze 2002: 245.
Cheilosia ruffipes – Mengual *et al.* 2020: 23. — Żóralski & Bystrowski 2021: 26.

Differential diagnosis

Cheilosia ruffipes shares the following set of characters only with the very similar *C. scutellata*: face and eye bare, arista long pilose (pile longer than width of arista at base) and facial tubercle broad, semicircular in dorsal view. It can always be distinguished from *C. scutellata* by the pilose posterodorsal corner of the anterior anepisternum (bare in *C. scutellata*), and usually postpedicel bright orange (Fig. 64B, D) (in *C. scutellata* variable, ranging from dark orange to dark brown).

Material examined

Not collected in 2018, but collected in 2019, 2021, 2022 and 2023.

ARMENIA – **Yerevan** • 1 ♂; Yerevan Botanical Garden; 40.21197° N, 44.55889° E; 1237 m a.s.l.; 14–21 May 2022; B. Rulik, B. Müller leg.; Malaise trap; ZFMK, ZFMK-DIP-00094193.

GEORGIA – **Kakheti** • 4 ♂♂; Dedoplis Tskaro; 41.4884° N, 46.0957° E; 752 m a.s.l.; 1 Jul. 2021; S. Bot leg.; SBA, SB.002810 to SB.002813 • 4 ♀♀; same data as for preceding; SBA, SB.002806 to SB.002809; SBA • 4 ♂♂; Batsara Nature Reserve; 42.22238° N, 45.30352° E; 806 m a.s.l.; 28 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093952, ZFMK-DIP-00093957 = ZFMK-TIS-8014593, ZFMK-DIP-00093958 to ZFMK-DIP-00093961 • 7 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00093968, ZFMK-DIP-00093969, ZFMK-DIP-00093974 to ZFMK-DIP-00093976, ZFMK-DIP-00093977 = ZFMK-TIS-8014594, ZFMK-DIP-00093979 • 5 ♂♂; Batsara Nature Reserve; 42.22246° N, 45.30369° E; 807 m a.s.l.; 28–29 May 2022; X. Mengual leg.; Malaise trap; ZFMK, ZFMK-DIP-00094230, ZFMK-DIP-00094231, ZFMK-DIP-00094233 to ZFMK-DIP-00094235 • 3 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00094236, ZFMK-DIP-00094237, ZFMK-DIP-00094240 • 1 ♂; Batsara Nature Reserve; 42.222385° N, 45.303528° E; 806 m a.s.l.; 29 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00094006 • 2 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00094009, ZFMK-DIP-00094010 = ZFMK-TIS-8014643 • 4 ♂♂; Dedoplis Tskaro; 41.488° N, 46.094° E; 780 m a.s.l.; 30 April 2023; S. Bot leg.; SBA, SB.002802 to SB.002805 • 1 ♀; same data as for preceding; SBA, SB.002801 • 4 ♂♂, 2 ♀♀; Dedoplis Tskaro; 41.4856° N, 46.0947° E; 750 m a.s.l.; 30 April 2023; F. Van de Meutter leg.; FMT • 3 ♂♂; Dedoplis Tskaro; 41.4852° N, 46.0950° E; 750 m a.s.l.; 30 April 2023; W. Opdekamp leg.; WOR, C006, C011, C018 • 1 ♀; Dedoplis Tskaro; 41.336° N, 45.8402° E; 300 m a.s.l.; 1 May 2023; F. Van de Meutter leg.; FMT • 1 ♂, 1 ♀; Heretiskari;

41.7144° N, 46.0531° E; 215 m a.s.l.; 2 May 2023; F. Van de Meutter leg.; FMT • 1 ♀; Dedoplis Tskaro; 41.4848° N, 46.0947° E; 750 m a.s.l.; 5 May 2023; S. Bot leg.; SBA, SB.002800 • 1 ♂; Heretiskari; 41.7125° N, 46.0515° E; 220 m a.s.l.; 5 May 2023; W. Opdekamp leg.; WOR, B006. – **Kvemo Kartli** • 2 ♂♂; Gardabani Monastery; 41.8341° N, 44.8762° E; 600 m a.s.l.; 9 May 2023; W. Opdekamp leg.; WOR, A003, A002. – **Mtskheta-Mtianeti** • 1 ♀; Saguramo; 41.89° N, 44.75° E; 550 m a.s.l.; 21 Jun. 2019; J. van Steenis leg.; JSB, 2019-00.836 • 1 ♂; 41.8811° N, 45.0206° E; 1251 m a.s.l.; 22 Jun. 2019; S. Bot leg.; SBA, SB.002814 • 1 ♂; Tbilisi National Park; 41.8808° N, 45.0204° E; 1270 m a.s.l.; 22 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066225 • 2 ♀♀; same data as for preceding; ZFMK, ZFMK-DIP-00066200 = ZFMK-TIS-8006803, ZFMK-DIP-00066201 = ZFMK-TIS-8006804 • 1 ♀; same data as for preceding; F. Van de Meutter leg.; FMT • 1 ♀; Mtskheta-Mtianeti, Tbilisi National Park; 41.8784° N, 45.016° E; 1249 m a.s.l.; 22 Jun. 2019; J.H. Skevington leg.; CNC1392958; CNC. – **Tbilisi** • 3 ♂♂; Mamkoda; 41.8339° N, 44.8763° E; 920 m a.s.l.; 9 May 2023; F. Van de Meutter leg.; FMT

Genetics

DNA barcodes of *C. ruffipes* from Europe and Caucasus cluster together with high support (BS = 99.9%).

Fig. 64. *Cheilosia* (*Eucartosyrphus*) *ruffipes* (Preyssler, 1793). Collected in Georgia. **A**. ♂ (SBA, SB.002804); habitus, lateral view; body length 8.9 mm. **B**. ♂ (SBA, SB.002811); head, lateral view; eye width 1.1 mm. **C**. ♂ (SBA, SB.002811); habitus, dorsal view; body length 9.8 mm. **D**. ♀ (SBA, SB.002806); head, lateral view; eye width 1.2 mm. Not to scale.

Remarks

This species appears in recent literature with the name *C. soror*; but see Mengual *et al.* (2020).

Biology

During our expeditions, collected between 30 April and 1 July at an altitude between 301 and 1251 m a.s.l. Occurs in or near dry forests. Is often found on umbellifer flowers.

Distribution

Palaearctic. Within the Caucasus reported from Armenia, Georgia and Russia.

Cheilosia* (*Cheilosia*) *schnabli Becker, 1894
Fig. 65

Chilosia schnabli Becker, 1894: 498.

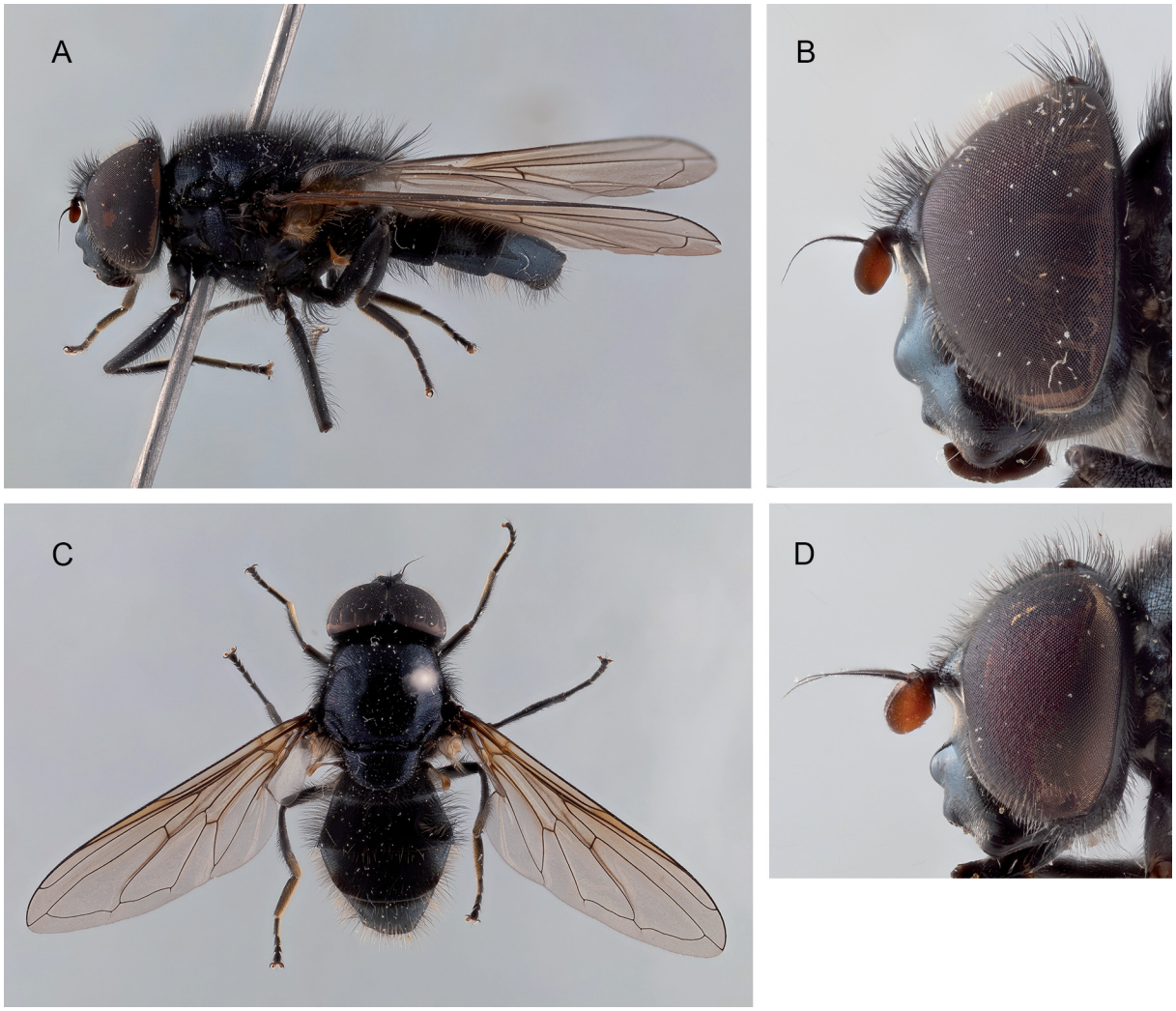

Fig. 65. *Cheilosia* (*Cheilosia*) *schnabli* Becker, 1894. Collected in Georgia. **A**. ♂ (SBA); habitus, lateral view; body length 9.2 mm. **B**. ♂ (SBA); head, lateral view; eye width 1.4 mm. **C**. ♂ (SBA); habitus, dorsal view; body length 8.9 mm. **D**. ♀ (SBA, SB.002794); head, lateral view; eye width 1.3 mm. Not to scale.

Chilosia schnabli – Stackelberg & Richter 1968: 248. — Stackelberg 1970: 61. — Peck 1988: 116. — Barkalov 1993: 726. — Mengual *et al.* 2020: 20. — Speight 2020a: 50.
Cheilosia schnabli Becker, 1921 [sic] – Gujabidze 2002: 246.

Differential diagnosis

Cheilosia schnabli is very similar to *C. inarmata* sp. nov. For a diagnosis, see the Differential diagnosis under *C. inarmata*. For differences with the extralimital *C. impressa*, and for drawings of the male genitalia, see Vujić *et al*. (1998).

Material examined

Collected in 2018, 2019, 2021, 2022 and 2023; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

All DNA barcodes of *C. schnabli* cluster together with a relatively high support (BS = 94.7%). Moreover, we recovered a cluster with high support (BS = 99.7%) with some COI sequences of the *C. transcaucasica* (BS = 100%) and those of *C. schnabli*.

Biology

During our expeditions, collected between 4 May and 24 July at an altitude between 1250 and 1969 m a.s.l.

Distribution

Balkan Peninsula, Caucasus (Armenia, Georgia, Russia), Kazakhstan.

Cheilosia* (*Eucartosyrphus*) *scutellata (Fallén, 1817)
Fig. 66

Eristalis scutellata Fallén, 1817: 55.

Cheilosia scutellata – Stackelberg & Richter 1968: 248. — Stackelberg 1970: 58, — Peck 1988: 116. — Barkalov 1993: 712. — Gujabidze 2002: 245. — Barkalov & Mutin 2018: 485. — Mengual *et al.* 2020: 23.

Differential diagnosis

Cheilosia scutellata shares the following set of characters only with the very similar *C. ruffipes*: face and eye bare; arista long pilose (pile longer than width of arista at base) and facial tubercle broad, semicircular in dorsal view. It can always be separated from *C. ruffipes* by the bare posterodorsal corner of the anterior anepisternum (pilose in *C. ruffipes*), and colour of the postpedicel ranging from dark orange to dark brown (Fig. 66B, D) (bright orange in *C. ruffipes*).

Material examined

Collected in 2018, 2019, 2021, 2022 and 2023; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

European and Caucasian DNA barcodes of *C. scutellata* group together in our NJ tree with high support (BS = 98.7%).

Biology

During our expeditions, collected between 12 May and 3 August at an altitude between 1090 and 2022 m a.s.l. Is often found in or near forest and feeds on umbellifer flowers.

Distribution

Palaearctic. Within the Caucasus known from Armenia, Georgia and Russia.

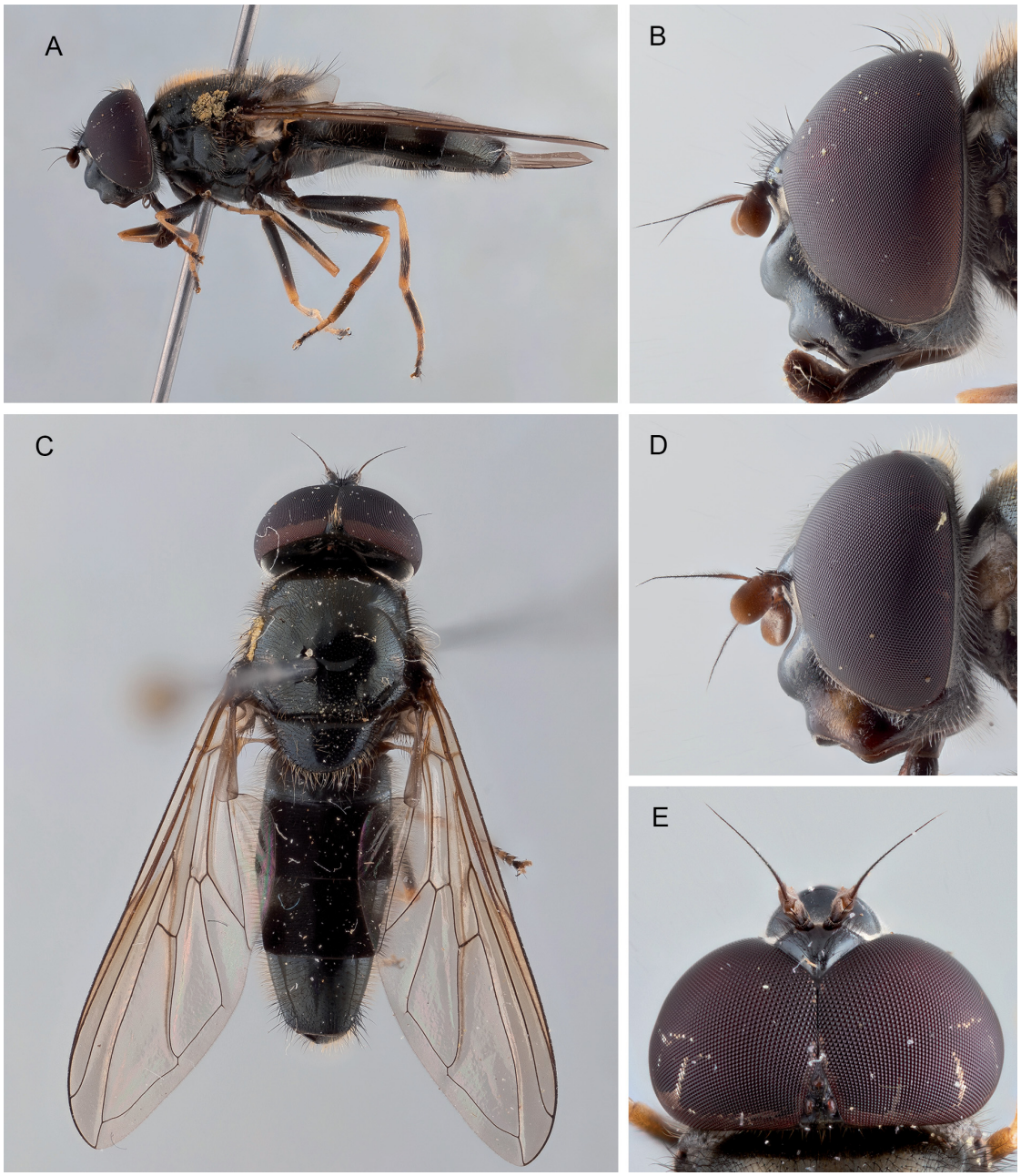

Fig. 66. *Cheilosia* (*Eucartosyrphus*) *scutellata* (Fallén, 1817). **A, C**. ♂ (SBA, SB.002823), collected in Georgia;. **A**. Habitus, lateral view; body length 9.8 mm. **B**. ♂ (SBA, SB.002817); head, lateral view; collected in Georgia; eye width 1.2 mm. **C**. Habitus, dorsal view; collected in Georgia; body length 9.8 mm. **D**. ♀ (SBA, SB.002815); head, lateral view; collected in Georgia; eye width 1.1 mm. **E**. ♂ (SBA, SB.004477); head, dorsal view; collected in the Netherlands; head width 2.9 mm. Not to scale.

Cheilosia* (*Pollinocheila*) *semifasciata Becker, 1894
Fig. 67

Chilosia semifasciata Becker, 1894: 443.

Chilosia semifasciata – Barkalov 1993: 699. — Barkalov & Mutin 2018: 486.

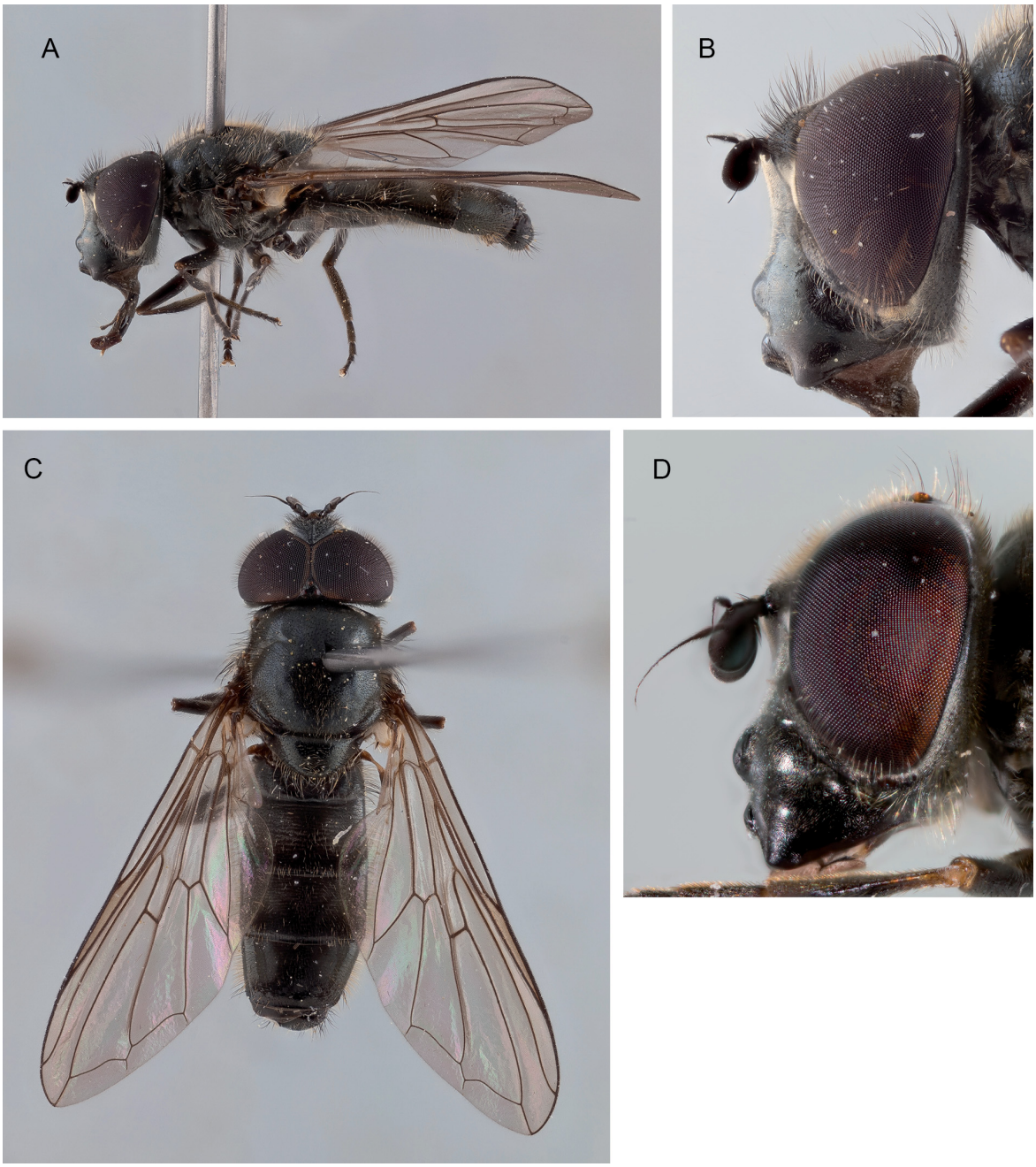

Fig. 67. *Cheilosia* (*Pollinocheila*) *semifasciata* Becker, 1894. **A**. ♂ (ASW, ZFMK-TIS-8008774); habitus, lateral view; collected in Georgia; body length 7.2 mm. **B**. ♂ (ASW, ZFMK-TIS-8008774); head, lateral view; collected in Georgia; eye width 0.9 mm. **C**. ♂ (ASW, ZFMK-TIS-8008774); habitus, dorsal view; collected in Georgia; body length 7.2 mm. **D**. ♀ (SBA, SB.004484); head, lateral view; collected in the Netherlands; eye width 0.8 mm. Not to scale.

Differential diagnosis

Cheilosia semifasciata is characterized by the combination of bare face, bare eye, at least base of tibiae yellow, posterior margin of scutellum with setae and ventral and dorsal pile patches on katepisternum widely separated. Easily misidentified because of inconclusive pattern on Sterna II–IV, not being uniformly shiny nor pruinose: on anterior part distinctly pruinose, on posterior part usually shiny. Males can be distinguished from similar species by the distinct pruinose spots on the abdomen (two large grey pruinose spots on terga II–IV) and the females by the scutum with erect golden pile. For identification from similar but extralimital *C. fasciata* Schiner & Egger, 1853, see Bot & Van de Meutter (2023).

Material examined

Not collected in 2018, but collected in 2019.

GEORGIA • 1 ♂, Samegrelo-Zemo Svaneti; 43.1166° N, 42.7276° E; 1850 m a.s.l.; 14 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066393 = ZFMK-TIS-8008774.

Genetics

COI sequences of *C. semifasciata* from Europe and Caucasus cluster together with high support (BS = 100%).

Remarks

Barkalov (1993) reported a single female of *C. semifasciata* collected in Lars, a small town in the Republic of North Ossetia-Alania. Thus, our record is the first for Georgia.

Distribution

Europe, Caucasus (Georgia, Russia).

Cheilosia* (*Montanocheila*) *subpictipennis Claussen, 1998
Fig. 68

Cheilosia subpictipennis Claussen, 1998: 405.

Differential diagnosis

Cheilosia subpictipennis belongs to the subgenus *Montanocheila* and is very similar to the sympatric occurring *Cheilosia rufa* sp. nov. For differences, see the Differential diagnosis under *Cheilosia rufa* sp. nov. For diagnostic characteristics of *C. subpictipennis* from other European species of *Montanocheila*, and for figures of the male genitalia, see Claussen (1998).

Material examined

Cheilosia subpictipennis was not collected in 2018, but collected in 2019 and 2023.

GEORGIA – **Mtskheta-Mtianeti** • 1 ♂; Lutkhubi; 42.3797° N, 44.7969° E; 1463 m a.s.l.; 6 May 2023; S. Bot leg.; SBA, SB.002832 = ZFMK-TIS-8027977 • 1 ♂; Lutkhubi; 42.3930° N, 44.7929° E; 1700 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, A019 = ZFMK-TIS-8028486 • 1 ♂; Lutkhubi; 42.3888° N, 44.7915° E; 1624 m a.s.l.; 8 May 2023; S. Bot leg.; SBA, SB.002833 = ZFMK-TIS-8027969 • 1 ♀; same data as for preceding; SBA, SB.002834 = ZFMK-TIS-8027970 • 1 ♂; Lutkhubi; 42.3930° N, 44.7929° E; 1734 m a.s.l.; 8 May 2023; W. Opdekamp leg.; WOR, C019. – **Samtskhe-Javakheti** • 1 ♀; Borjomi N.P.; 41.823° N, 42.841° E; 2049 m a.s.l.; 11 Jun. 2019; S. Bot leg.; SBA, SB.002835 = ZFMK-TIS-8010570.

Genetics

DNA barcodes of *C. subpictipennis* from Europe and Georgia cluster together with high support (BS = 100%).

Remarks

Species reported from the Caucasus and from Georgia for the first time.

Biology

During our expeditions, collected between 6 May and 11 June at an altitude between 1463 and 2049 m a.s.l. Almost all specimens were caught on willow *Salix* sp. catkins.

Distribution

Europe, Western Siberia, Caucasus (Georgia).

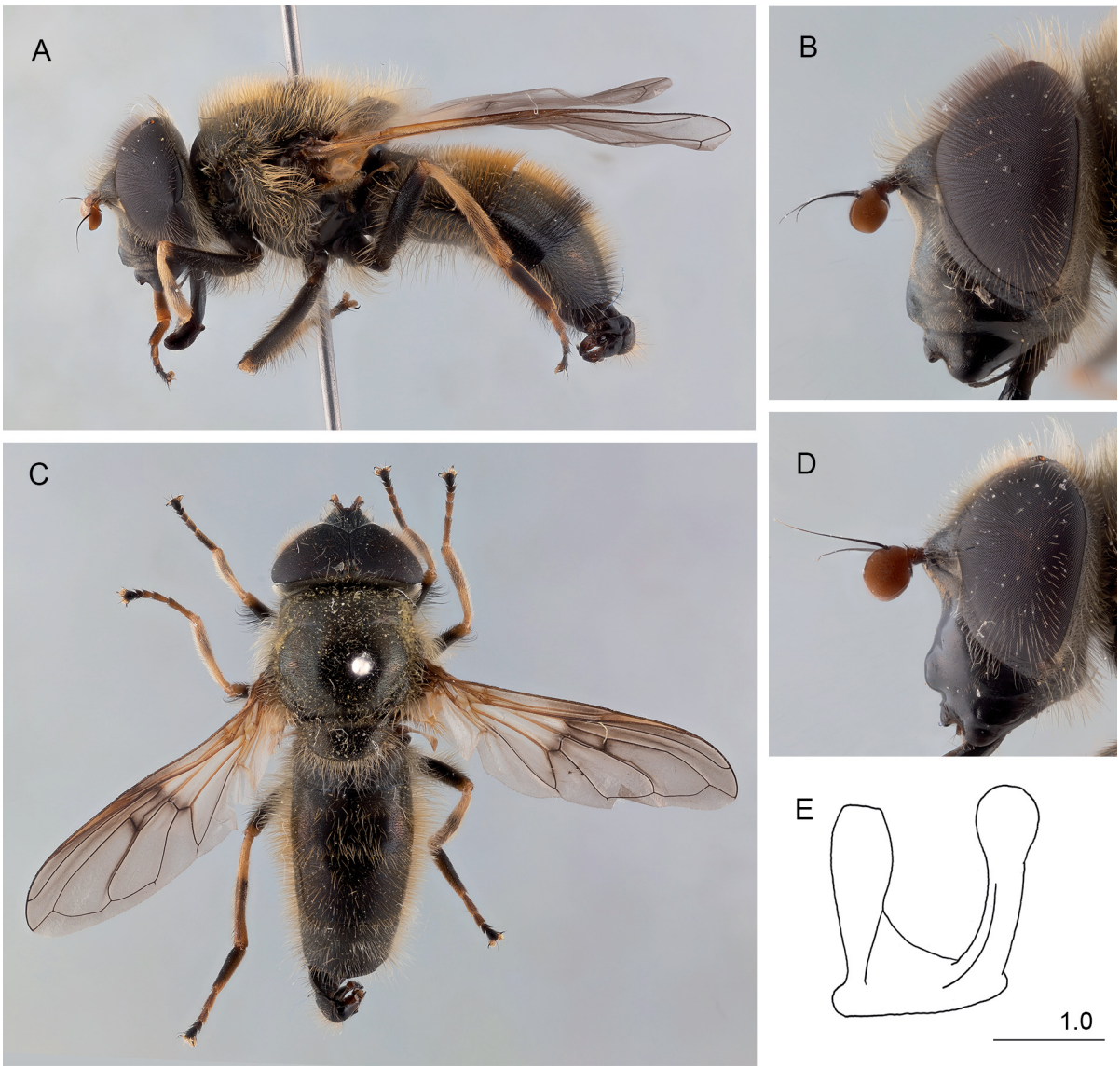

Fig. 68. *Cheilosia* (*Montanocheila*) *subpictipennis* Claussen, 1998. Collected in Georgia. **A**. ♂ (WOR, ZFMK-TIS-8028486); habitus, lateral view; body length 12.5 mm. **B**. ♂ (SBA, SB.002833); head, lateral view; eye width 1.5 mm. **C**. ♂ (SBA, SB.002832); habitus, dorsal view; body length 12.5 mm. **D**. ♀ (SBA, ZFMK-TIS-8010570); head, lateral view; eye width 1.5 mm. **E**. ♂ (SBA); postgonite, lateral view. Scale bar: A–D not to scale; E in µm.

Cheilosia* (*Cheilosia*) *teberdensis Barkalov, 1993
Fig. 69

Cheilosia teberdensis Barkalov, 1993: 705.

Cheilosia teberdensis – Barkalov & Mutin 2018: 484. — Mengual *et al*. 2020: 21.

Fig. 69. *Cheilosia* (*Cheilosia*) *teberdensis* Barkalov, 1993. Collected in Georgia. **A**. ♂ (SBA, SB.002841); habitus, lateral view; body length 10.3 mm. **B**. ♂ (SBA, SB.002838); head, lateral view; eye width 1.4 mm. **C**. ♂ (SBA, SB.002839); habitus, dorsal view; body length 9.5 mm. **D**. ♀ (SBA, SB.002837); head, lateral view; eye width 1.4 mm. Not to scale.

Differential diagnosis

Cheilosia teberdensis is a member of a group of closely related species, called the *proxima* group (Vujić *et al*. 2013) in which the pilose eyes, posterior margin of scutellum with setae, usually partly yellow legs, continuously pilose katepisternum, pruinose sterna and the shape of postgonite are distinctive characters. For a full diagnosis of the *Cheilosia proxima* group, see Vujić *et al*. (2013). *Cheilosia teberdensis* stands out, together with *C. paragigantea*, from other members of the *proxima* group occurring in the Caucasus by having black legs (tibiae yellow at both ends in the other species). Similar to *C. paragigantea*; for differences, see Differential diagnosis of that species.

Material examined

Collected in 2018, 2019, 2021 and 2022; see Mengual *et al.* (2020) for detailed records from 2018.

ARMENIA – **Syunik Province** • 1 ♂; Spandaryan, small river; 39.621045° N, 45.910242° E; 1986 m a.s.l.; 19 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093159 = ZFMK-TIS-8014613.

Genetics

DNA barcodes of *C. teberdensis* cluster together with high support (BS = 98.6%).

Remarks

Species reported from Armenia for the first time.

Biology

During our expeditions, collected between 19 May and 14 July at an altitude between 1463 and 2887 m a.s.l.

Distribution

Caucasus (Armenia, Georgia, Northern Caucasus).

Cheilosia* (*Cheilosia*) *transcaucasica Stackelberg, 1960
Fig. 70

Cheilosia transcaucasica Stackelberg, 1960: 440.

Cheilosia transcaucasica – Stackelberg & Richter 1968: 249. — Stackelberg 1970: 59. — Peck 1988: 118. — Barkalov 1993: 714. — Barkalov & Mutin 2018: 484. — Mengual *et al.* 2020: 21.
Cheilosia transcaucasika Stackelberg, 1956 [sic] – Gujabidze 2002: 246.

Differential diagnosis

Cheilosia transcaucasica has a pilose face, pilose eye, black legs, posterior margin of scutellum with setae and sterna pruinose. It stands out amongst *Cheilosia* species with the same set of characters by the yellow wing base (Fig. 70C), brown or black in the other species. Genetically similar to *Cheilosia inarmata* sp. nov., but that species has the face bare (pilose in *C. transcaucasica*).

Material examined

Collected in 2018, 2019 and 2021; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

DNA barcodes of *C. transcaucasica* are grouped together with high support (BS = 100%), with the exception of three specimens from Georgia (ZFMK-TIS-8002801, ZFMK-TIS-8002826, ZFMK-TIS-8009526) that share the COI haplotype with *C. inarmata* sp. nov.

Remarks

Stackelberg (1960) described the species based on material from Armenia and Azerbaijan, and Stackelberg & Richter (1968) reported material from Armenia, Georgia and Northern Caucasus. Barkalov (1993) stated that this species is found in the entire Caucasus, and later, Barkalov & Mutin (2018) listed it from Northern Caucasus and Iran. Khaghaninia *et al*. (2012) and Khaghaninia & Kazerani (2014)

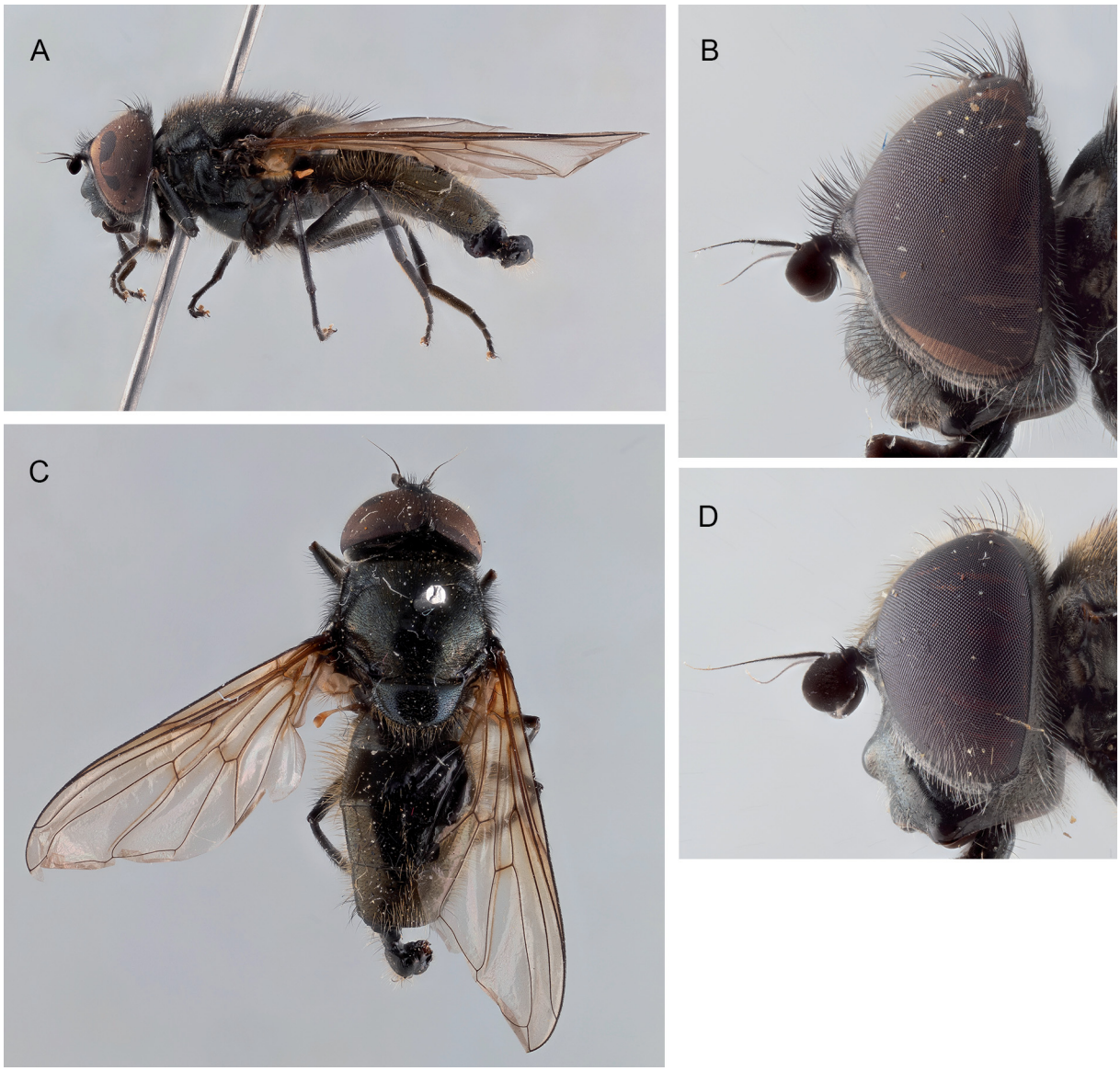

Fig. 70. *Cheilosia* (*Cheilosia*) *transcaucasica* Stackelberg, 1960. Collected in Georgia. **A**. ♂ (SBA, SB.002850); habitus, lateral view; body length 9.3 mm. **B**. ♂ (SBA, SB.002844); head, lateral view; eye width 1.3 mm. **C**. ♂ (SBA, SB.002850); habitus, dorsal view; body length 9.3 mm. **D**. ♀ (SBA, SB.002856); head, lateral view; eye width 1.4 mm. Not to scale.

published the Iranian records. Kuznetzov & Lyubvina (2001) listed the species from the Zhiguli (also Zhigulevsky) Nature Reserve, officially the I.I. Sprygin Zhiguli State Nature Biosphere Reserve. The Zhiguli Nature Reserve is located in the Samara Region, which is part of the European part of Russia. More recently, Lyubvina (2019) did not include *C. transcaucasica* in her report of Diptera Brachycera species from the Zhiguli Nature Reserve.

The three Georgian specimens that cluster with the DNA barcodes of *C. inarmata* sp. nov. have been studied several times to properly assess their identity. Authors do not have doubts about their identification, and we have no reason to doubt the molecular laboratory pipeline. Thus, the unexpected clustering of these three DNA barcodes of *C. transcaucasica* with the sequences of *C. inarmata* remains a surprise.

Biology

During our expeditions, collected between 19 June and 1 August at an altitude between 1400 and 2275 m a.s.l.

Distribution

Caucasus (Armenia, Azerbaijan, Georgia, Russia), Iran (West Azerbaijan and East Azerbaijan provinces).

Cheilosia* (*Cheilosia*) *urbana (Meigen, 1822)
Fig. 71

Syrphus urbana Meigen, 1822: 287.
Eristalis praecox Zetterstedt, 1843: 801. Syn. by Claussen & Speight (1999).

Cheilosia praecox – Tóth 1986: 94. — Peck 1988: 114.
Cheilosia urbana – Mengual *et al.* 2020: 21. — Żóralski & Bystrowski 2021: 26.

Differential diagnosis

Cheilosia urbana is a relatively small (body length: 6–8 mm) and narrow species. *Cheilosia urbana* is very similar to *Cheilosia psilophthalma*. The male of *C. urbana* is distinguishable from that of *C. psilophthalma* by the shape of the dorsal lobe of the postgonite (short and triangular in *C. psilophthalma* and narrow and long in *C. urbana*) and by the frons (slightly swollen in *C. psilophthalma* but not swollen in *C. urbana*). More differences with *C. psilophthalma*, which are true for both sexes, include the bicoloured claws, base orange, apex black (claws black in *C. psilophthalma*), shiny sterna (slightly pruinose in Caucasian specimens of *C. psilophthalma*, in Europe shiny in both species), narrower parafacia and postpedicel dark orange to dark brown and wider than high (postpedicel orange and rounder *C. psilophthalma*). In the female, the frons is narrower than in that of *C. psilophthalma*. Also similar to that of *C. mutabilis*, best distinguished by the metaleg: metatibia with distinct orange base and apex, in *C. mutabilis* metaleg black, with only base of metatibia yellow. Moreover, arista short pilose, with pile shorter than the width of arista at base, in *C. mutabilis*, arista with long pilosity, longer than or almost equal to the width of arista at base.

Material examined

Collected in 2018, 2019, 2021, 2022 and 2023; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

DNA barcodes of *C. urbana* cluster together in our NJ tree without a high support (BS < 90%) and they form two groups with two different Barcode Index Numbers or BINs (Ratnasingham & Hebert

2013): one with all European specimens (BIN BOLD:AAK0967; BS = 99.18.8%), except for a German specimen (CNCDB383-11) that is placed among the Caucasian specimens in a second group (BIN BOLD:AGA7172; BS = 94.7%).

Remarks

Except for one European specimen, all barcoded Georgian specimens of *C. urbana* group together in a separate cluster from the European specimens. We also found small morphological differences, mostly in the different pilosity colouration on the scutum and scutellum. The Caucasian male differs from the European male in having the scutum with mixed black and yellow pile as follows: the black pile dominates on the lateral parts, and the black and yellow pile have a roughly equal presence in the medial part of the scutum (in the European *C. urbana* the portion of black and yellow pile usually is roughly

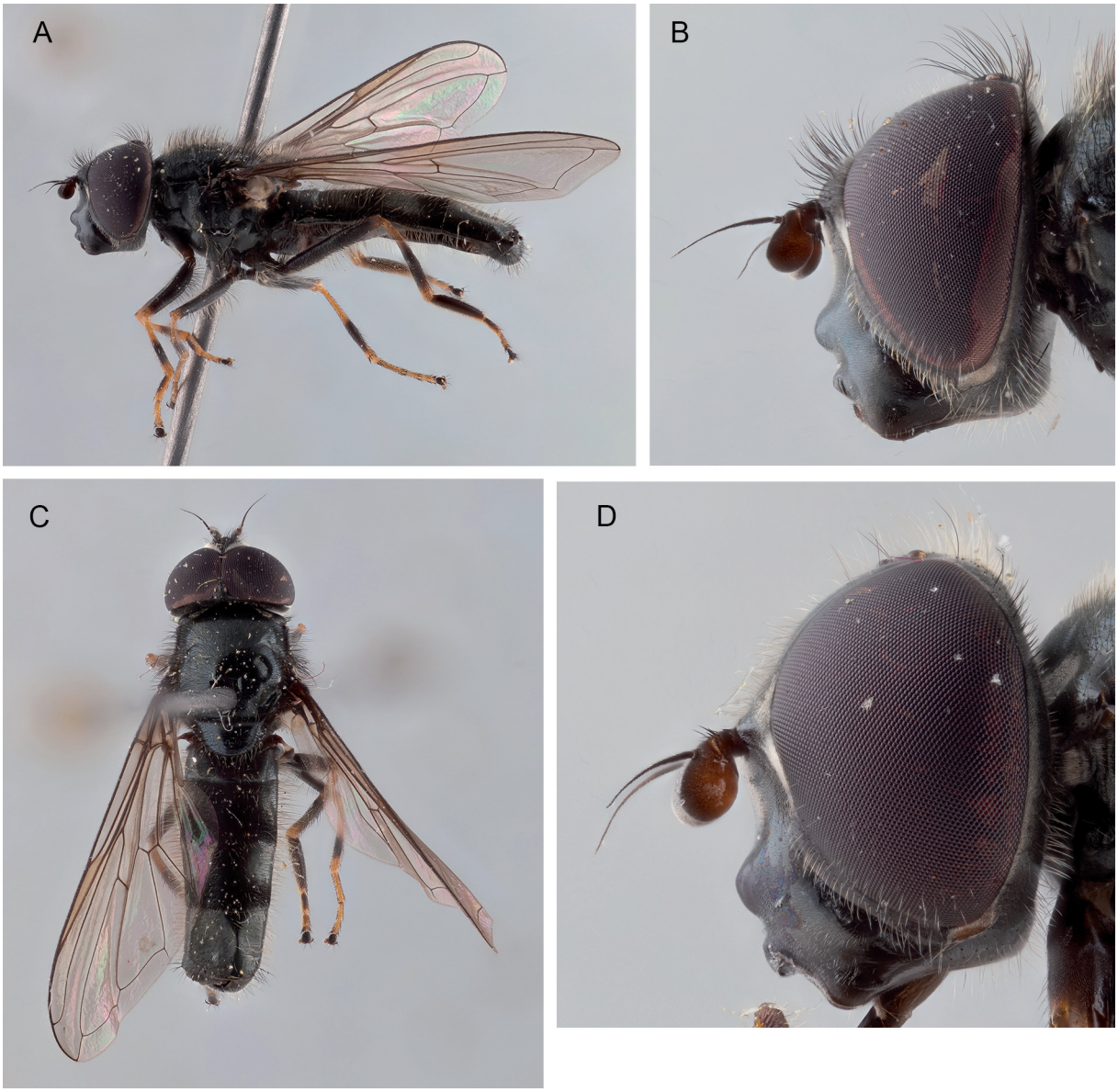

Fig. 71. *Cheilosia* (*Cheilosia*) *urbana* (Meigen, 1822). Collected in Georgia. **A–C**. ♂ (SBA, SB.002901. **A**. Habitus, lateral view; body length 6.8 mm. **B**. Head, lateral view; eye width 1.1 mm. **C**. Habitus, dorsal view; body length 6.8 mm. **D**. ♀ (SBA, SB.002919); head, lateral view; eye width 1.1 mm. Not to scale.

equal on the lateral parts or the yellow pile is predominant, while in the medial part of the scutum the yellow pile is more abundant with only scattered black pile). Moreover, the scutellum of the Caucasian specimens have short yellow pile and long black pile on the disc; whilst in European individuals the scutellum has short yellow pile and the long pile on the disc is either only yellow or black and yellow. We could not detect any differences in the male genitalia. In female Caucasian specimens, the pile on scutum is longer compared to European *C. urbana*, and usually some black pile is present in the anterolateral corner, usually absent in European *C. urbana*. Meier *et al.* (2022) critically argued the unsuitability to use the DNA barcodes for delimiting and describing species, and others explained the problems associated with the stand-alone-COI barcode taxonomy (see Ahrens *et al.* 2021). Moreover, Meier *et al.* (2022) clearly exposed that BINs do not always deserve a name. We like to emphasize the different clustering of the European and Caucasian specimens of *C. urbana* and their minor morphological differences; however, we are not confident in describing them as a separate species. Future research should focus on more (genetic) sampling in intermediate regions to better understand the current pattern.

Biology

During our expeditions, collected between 4 May and 12 July at an altitude between 1090 and 2800 m a.s.l. This is often one of the commonest species of *Cheilosia* in the alpine zone. Feeds on a large variety of flowers including trees (*Acer velutinum*, *Salix* sp.) and many low flowers (yellow and white crucifers, yellow composites, *Caltha palustris*, *Ranunculus* sp., etc.).

Distribution

Western Palaearctic. Within the Caucasus known from Armenia, Georgia and Russia.

Cheilosia* (*Cheilosia*) *ushguliensis sp. nov.
urn:lsid:zoobank.org:act:F60C0CC8-2959-4F18-84D9-A36188DC4C6E
Figs 72–73

Differential diagnosis

Cheilosia ushguliensis sp. nov. is a member of a group of closely related species, called the *proxima* group (Vujić *et al.* 2013) in which the pilose eyes, posterior margin of scutellum with setae, usually partly yellow legs, continuously pilose katepisternum, pruinose sterna and the shape of postgonite are distinctive characters. For a full diagnosis of the *Cheilosia proxima* group see Vujić *et al.* (2013). Within the *proxima* group, *C. ushguliensis* is very similar to *C. balkana* Vujić, 1994 (known from the Alps and the Balkan Peninsula) and males of our new species key out to those of *C. balkana* when using the identification key by Vujić *et al.* (2013). Male of *C. ushguliensis* differs from the male of *C. balkana* as follows: facial tubercle narrower and less differentiated (Fig. 73A), frons slightly pruinose instead of densely pruinose, ocellar triangle partly or predominantly with yellow pile (Fig. 73A) (with black pile in *C. balkana*), with higher proportion of black pile on scutum, without field of short pile on posterior part of scutum, haltere capitulum dark brown to black (yellowish in *C. balkana*), tibiae distinctly yellow at both ends (Fig. 72A) (tibiae all black except knees in *C. balkana*), and tergum III largely and tergum IV partly pruinose (both terga completely shiny in *C. balkana* except for the anterior margin of tergum III). In rare cases, males of *C. gigantea* and *C. proxima* can have the abdomen with (almost) entirely yellow pile like males of *C. ushguliensis*, but those of *C. gigantea* and *C. proxima* have the facial tubercle more developed, more protruding (Fig. 31B vs 73A). Moreover, *C. gigantea* is on average larger (8–12 mm vs 8–10 mm) and has the metafemur with anteroventral pile fringe longer than the anterodorsal pile fringe; on the other hand, *C. proxima* has the dorsal lobe of postgonite with a more or less distinct hook on its dorsal margin, which is absent in *C. ushguliensis* (Fig. 73C). Both male and female can be mistaken for *C. velutina* given the poorly developed facial tubercle, but facial tubercle still better developed than in *C. velutina* and they have the postpedicel black (basoventrally orange in *C. velutina*).

In addition, the male terga I–IV have yellow pile, rarely posterior margin of tergum IV with a few black pile (in *C. velutina* terga II–III medially with field of black pile just anterior to posterior margin). In the key by Vujić *et al.* (2013), females of *C. ushguliensis* key out near *C. proxima* and *C. gigantea* and not *C. balkana*, as the tibiae are yellowish at both ends. Females of our new species differ from females of *C. proxima* and *C. gigantea* by shiny terga III–IV (at most some pruinosity at anterior margin of tergum III) (in *C. proxima* and *C. gigantea* the central part of tergum III and the anterior part of tergum IV are pruinose) and scutum with erect golden pile (Fig. 72C) (in *C. proxima* and *C. gigantea* scutal pile are often partly black and semi-adpressed). Furthermore, female of *C. ushguliensis* differs from the female of *C. balkana* as follows: facial tubercle less differentiated (Fig. 73B), scutum entirely with yellow pile (Fig. 72C) (with partly black pile in *C. balkana*), and tibiae yellowish at both ends (Fig. 72C) (tibiae only yellow at base in *C. balkana*).

Etymology

The species name is derived from the locality where we collected most of the type series, the Georgian village of Ushguli in the Greater Caucasus and the Latin suffix '*-ensis*' denoting place, locality, country, or belonging to, pertaining to (Brown 1956: 45, 303). Species epithet is to be treated as an adjective.

Material examined

Holotype

GEORGIA • ♂; Samegrelo-Zemo Svaneti, near Ushguli, close to river Inguri; 42.9498° N, 43.0718° E; 2270 m a.s.l.; 15 Jun 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8008812 = ZFMK-DIP-00066503.

Paratypes

GEORGIA – **Racha-Lechkhumi and Kvemo Svaneti** • 1 ♂; Tsana; 42.915° N, 43.143° E; 1969 m a.s.l.; 19 Jun. 2019; S. Bot leg.; SBA, SB.002344 • 1 ♂; same data as for preceding; L. Hofstee leg.; LHH • 1 ♂; near Tsana; 42.9090° N, 43.1425° E; 1900 m a.s.l.; 19 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♀: near Tsana; 42.9160° N, 43.1428° E; 1975 m a.s.l.; 19 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8008815 = ZFMK-DIP-00066509. – **Samegrelo-Zemo Svaneti** • 1 ♂; Ushguli; 42.948° N, 43.070° E; 2258 m a.s.l.; 15 Jun. 2019; S. Bot leg.; SBA, SB.003242 • 1 ♀; same data as for preceding; SBA, SB.003243 • 1 ♂; Ushguli; 42.909° N, 43.007° E; 2294 m a.s.l.; 16 Jun. 2019; S. Bot leg.; SBA, SB.002340 • 2 ♂♂; Ushguli; 42.9062° N, 42.9370° E; 2615 m a.s.l.; 16 Jun. 2019; F. Van de Meutter leg.; FMT, ZFMK-TIS-8010392 • 1 ♂; Ushguli; 42.9062° N, 42.9370° E; 2615 m a.s.l.; 16 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8008811 = ZFMK-DIP-00066502 • 1 ♂; Ushguli; 42.56° N, 43.04° E; 2260 m a.s.l.; 16 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.141 • 1 ♂; near Ushguli; 42.9140° N, 43.0911° E; 2575 m a.s.l.; 18 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8010389 = ZFMK-DIP-00066501 • 2 ♀♀; near Ushguli; 42.9140° N, 43.0911° E; 2575 m a.s.l.; 18 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8009222 = ZFMK-DIP-00066607, ZFMK-TIS-8009223 = ZFMK-DIP-00066608 • 1 ♂; Ushguli; 42.914° N, 43.090° E; 2562 m a.s.l.; 20 Jun. 2019; S. Bot leg.; SBA, SB.003241 = ZFMK-TIS-8010393 • 2 ♀♀; same data as for preceding; SBA, SB.003245, SB.003246 • 1 ♂; near Ushguli; 42.9140° N, 43.0911° E; 2575 m a.s.l.; 20 Jun. 2019; F. Van de Meutter leg.; FMT, ZFMK-TIS-8010391 • 1 ♀; same data as for preceding; FMT • 1 ♂; near Ushguli; 42.9142° N, 43.0900° E; 2564 m a.s.l.; 20 Jun. 2019; J.H. Skevington leg.; CNC, CNC1388145 • 1 ♀; same data as for preceding; CNC, CNC1388110 • 1 ♂; Shkhara glacier; 42.9616° N, 43.0914° E; 2447 m a.s.l.; 12 Jul. 2021; S. Bot leg.; SBA, SB.003247.

Description

Male

Length. Body 8–10 mm, wing 6.5–8 mm.

Head. Face black, slightly pruinose, more densely pruinose below lunule, bare, with moderately pronounced facial tubercle, facial tubercle and mala anteriorly poorly differentiated. Parafacia black, equal in size to half the width of the postpedicel, weakly pruinose, white pilose. Frons including lunule black, slightly pruinose, with long black pile. Length of eye contiguity about 1.2 times the length of frons. Angle of approximation of eyes ca 90°. Ocellar triangle and occiput pruinose, with long mainly yellow pile, ocelli arranged in an isosceles triangle or with longest side along occiput. Lunule dark orange to blackish, with distinct medial arm, separating acetabula. Scape, pedicel and postpedicel black; postpedicel squarish, about as wide as high; arista black, very short pilose, maximum width of pilosity less than half the maximum width of the arista. Eye with yellow pile, length of pile equal to length of pedicel.

Thorax. Scutum black, with dark-olive shine except narrowly anteriorly and notopleuron slightly pruinose, finely punctured, with long erect yellow and black pile of one length, proportion variable, but yellow pile dominating, pile not mixed but black pile restricted to the sides, central part of the scutum always with yellow pile. Scutellum black, shiny, with yellow pile, posterior margin with multiple long black setae, with a slight transverse depression one quarter from apex. Pleura black, pruinose, with

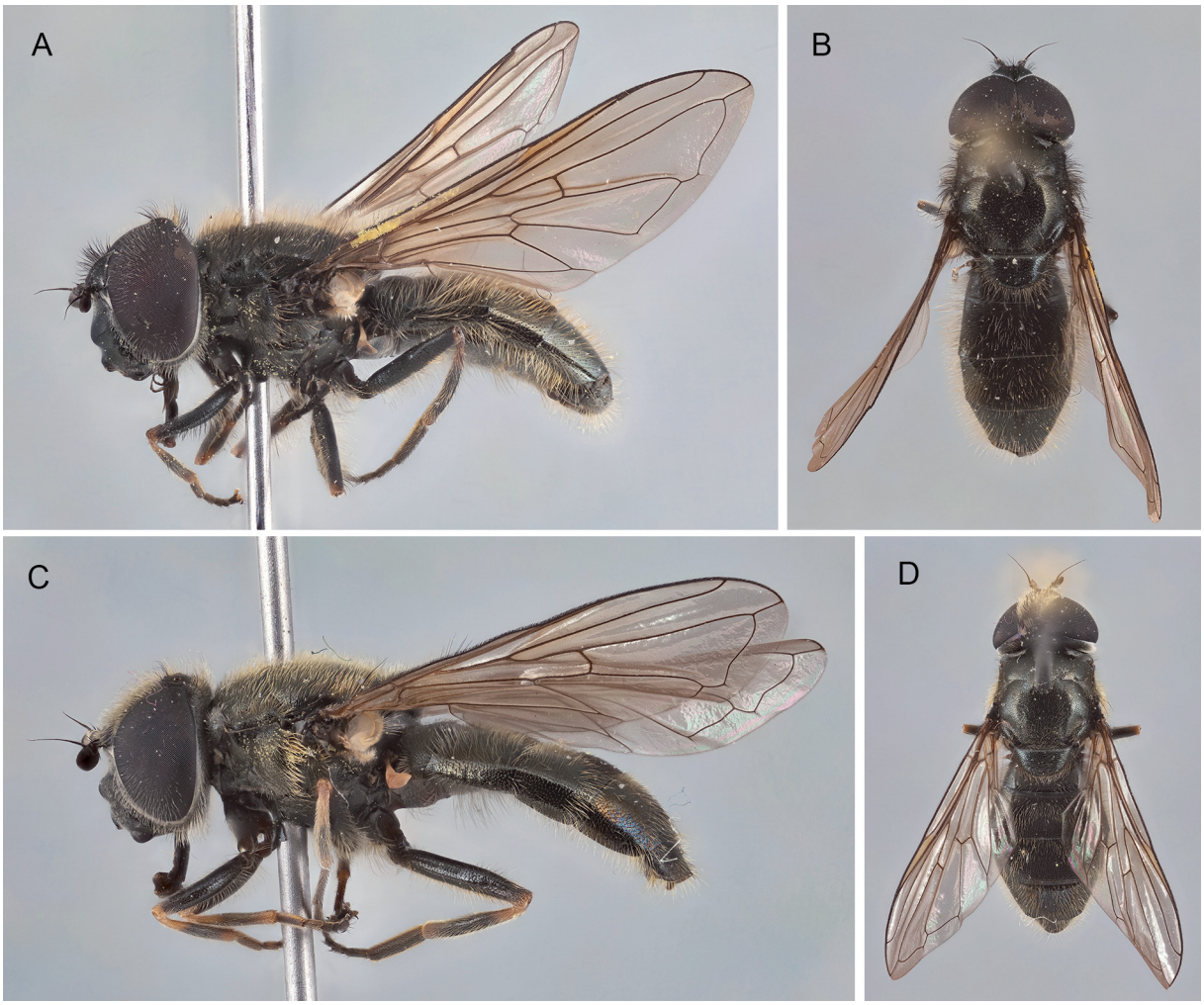

Fig. 72. *Cheilosia* (*Cheilosia*) *ushguliensis* sp. nov. **A–B**. Holotype, ♂ (ZFMK, ZFMK-DIP-00066503); habitus, lateral and dorsal views; body length 8.7 mm. **C–D**. Paratype, ♀ (ZFMK, ZFMK-DIP-00066608); habitus, lateral and dorsal views; body length 8.7 mm. Not to scale.

yellow pile, posterior anepisternum and anepimeron with mainly yellow pile, sometimes some black pile intermixed; katepisternum continuously pilose. Haltere pedicellum yellow, capitulum dark brown to black.

Wing. Wing including alula entirely microtrichose, veins dark brown, stigma yellow, vein M_1 meeting vein R_{4+5} at a straight angle.

Legs. Coxae, trochanters, femora, tibiae and tarsi black except yellow apex of femora and basal $^1/_3$–$^1/_4$ and apical $^1/_5$–$^1/_6$ of tibiae; pile on legs predominately yellow mixed with black; basal $^2/_3$ of metafemur with the anterodorsal pile as long as anteroventral pile.

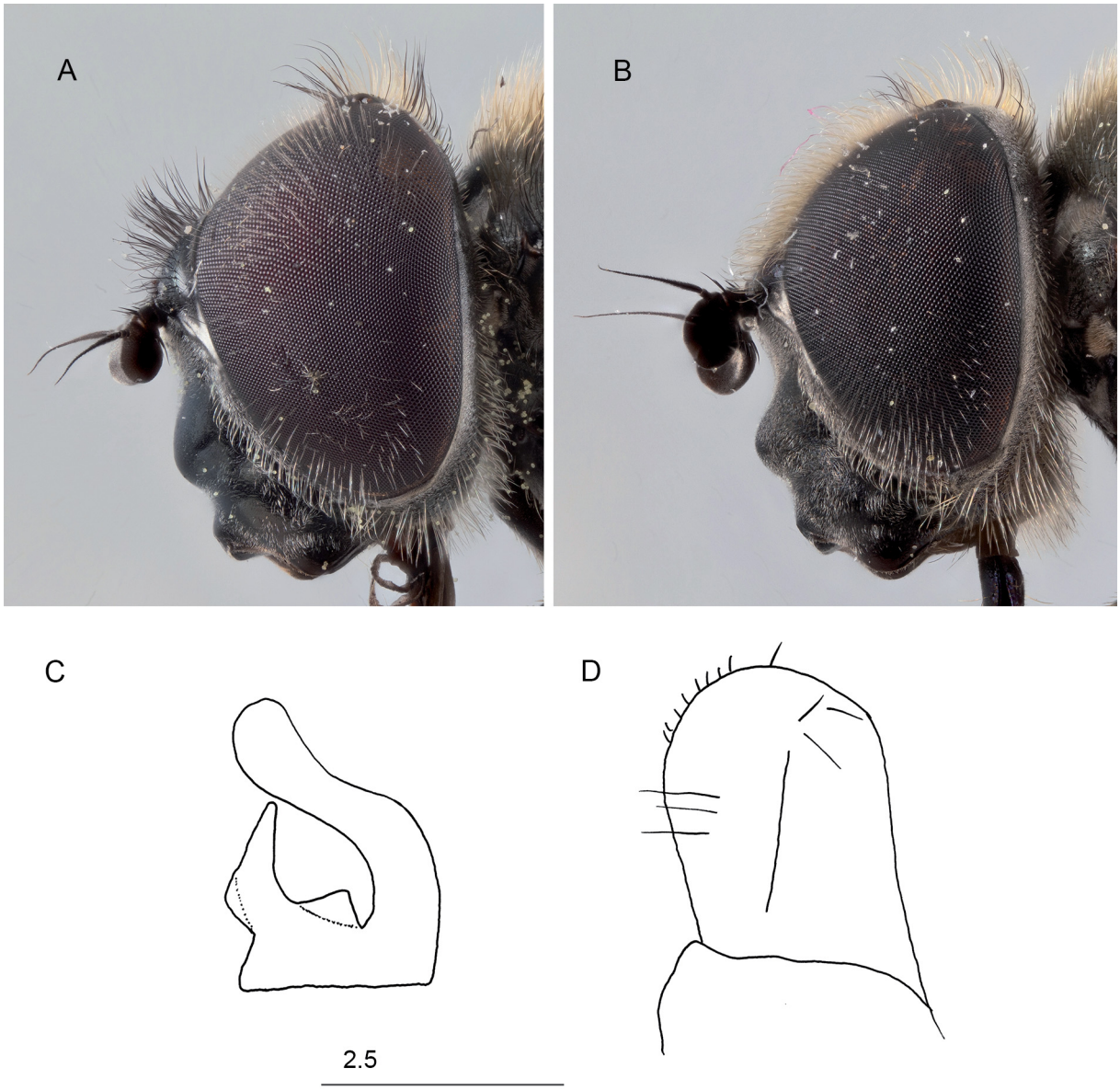

Fig. 73. *Cheilosia* (*Cheilosia*) *ushguliensis* sp. nov. **A**. Holotype, ♂ (ZFMK, ZFMK-DIP-00066503); head, lateral view; eye width 1.3 mm. **B**. Paratype, ♀ (ZFMK, ZFMK-DIP-00066608); head, lateral view; eye width 1.4 mm. **C**. Paratype, ♂ (SBA); postgonite, lateral view. **D**. Paratype, ♂ (SBA); surstylus, lateral view. Scale bar: A–B not to scale; C–D in µm.

Abdomen. Terga I–IV with long, fine, erect yellow pile, rarely posterior margin of tergum IV with a few black pile; tergum I pruinose; terga II–III laterally shiny, medially pruinose, tergum IV pruinose on anterior half to quarter. Sterna I–IV thickly and completely pruinose, with erect yellow pile, adpressed medially on sterna III–IV. Hypopygium pruinose, with yellow pile. Genitalia with surstylus ca 1.4 times as long as wide; dorsal lobe of postgonite narrow basally, long and pointed without a clear hook near the top.

Female

Length. Body 8.7–9 mm, wing 7.2–7.5 mm.

Similar to the male, except for normal sexual dimorphism and the following characters. Frons with yellow pile except a few black pile around ocellar triangle. Postpedicel rarely basally reddish. Pile on scutum and pleura golden yellow, rarely a few black pile on posterior anepisternum, post-alar calli and near wing base. Terga with erect yellow pile at the sides, adpressed in the middle. Tergum I pruinose. Tergum II laterally shiny, medially pruinose, terga III–IV shiny, except for a small area along the anterior margin of tergum III, which is pruinose.

Genetics

All DNA sequences of *C. ushguliensis* sp. nov. group together in our NJ tree with high support (BS = 99.4%).

Biology

Collected between 1900–2615 m a.s.l. on extensive grasslands and in lush vegetation along roadsides.

Distribution

Only known from the Greater Caucasus in Georgia.

Cheilosia* (*Cheilosia*) *uviformis Becker, 1894
Fig. 74

Chilosia uviformis Becker, 1894: 499.

Differential diagnosis

Cheilosia uviformis is difficult to identify, mainly because it is inconclusive in two characters often used in the identification of *Cheilosia*: the sterna are only slightly pruinose, which could be interpreted as either pruinose or shiny, and in the female the eye is sparsely pilose, which could easily be missed and consequently, the eye pilosity could be interpreted as either bare or pilose (the eye is distinctly pilose in the male). It is very similar to *C. psilophthalma*, whose Caucasian population also has slightly pruinose sterna. It is distinguishable from *C. psilophthalma* by bicoloured claws with orange base and black apex (claws all black in *C. psilophthalma*); the male by densely pruinose frons (shiny or indistinctly pruinose in that of *C. psilophthalma*) and narrow parafacia, about half as wide as width of postpedicel (about 0.8 times as wide as width of postpedicel in *C. psilophthalma*) and the female by sparse pilose eye (with distinct pile in that of *C. psilophthalma*). For differences with other species of *Cheilosia*, see Bot & Van de Meutter (2023).

Material examined

Cheilosia uviformis was not collected in 2018, but collected in 2019.

GEORGIA – **Racha-Lechkhumi and Kvemo Svaneti** • 1 ♂; 42.9150° N, 43.1430° E; 1969 m a.s.l.; 19 Jun. 2019; S. Bot leg.; SBA, SB.002942 • 1 ♂; 42.9160° N, 43.1428° E; 1975 m a.s.l.; 19 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066504 • 4 ♂♂; Tsana; 42.9089° N, 43.1425° E;

1900 m a.s.l.; 19 Jun. 2019 F. Van de Meutter leg.; FMT. – **Samegrelo-Zemo Svaneti** • 1 ♂; 43.1133° N, 42.7378° E; 1800 m a.s.l.; 14 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066507 = ZFMK-TIS-8008814 • 3 ♂♂, 1 ♀; Ushguli; 42.9500° N, 43.0719° E; 2270 m a.s.l.; 15 Jun. 2019; F. Van de Meutter leg.; FMT • 8 ♂♂; 43.0671° N, 42.9471° E; 2684 m a.s.l.; 15 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386513, CNC1386514, CNC1386523, CNC1386528, CNC1386534, CNC1386537, CNC1386554, CNC1386558 • 1 ♂; 42.9437° N, 43.0539° E; 2220 m a.s.l.; 15 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066506 • 2 ♂♂; 42.9498° N, 43.0718° E; 2270 m a.s.l.; 15 Jun. 2019; X. Mengual leg.; ZFMK, ZFMK-DIP-00066505, ZFMK-DIP-00066508 = ZFMK-TIS-8008813 • 5 ♂♂; Ushguli; 42.56° N, 43.04° E; 2260 m a.s.l.; 15 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.123, 2019-01.124, 2019-01.126 to 2019-01.128 • 2 ♂♂; 42.9480° N, 43.0700° E; 2258 m a.s.l.; 15 Jun. 2019; S. Bot leg.; SBA, SB.002950, SB.002951 • 1 ♂; Ushguli; 42.94° N, 43.05° E; 2220 m a.s.l.; 15–17 Jun. 2019; X. Mengual leg.; Malaise trap; ZFMK, ZFMK-TIS-8010119 • 1 ♀; same data as for preceding;

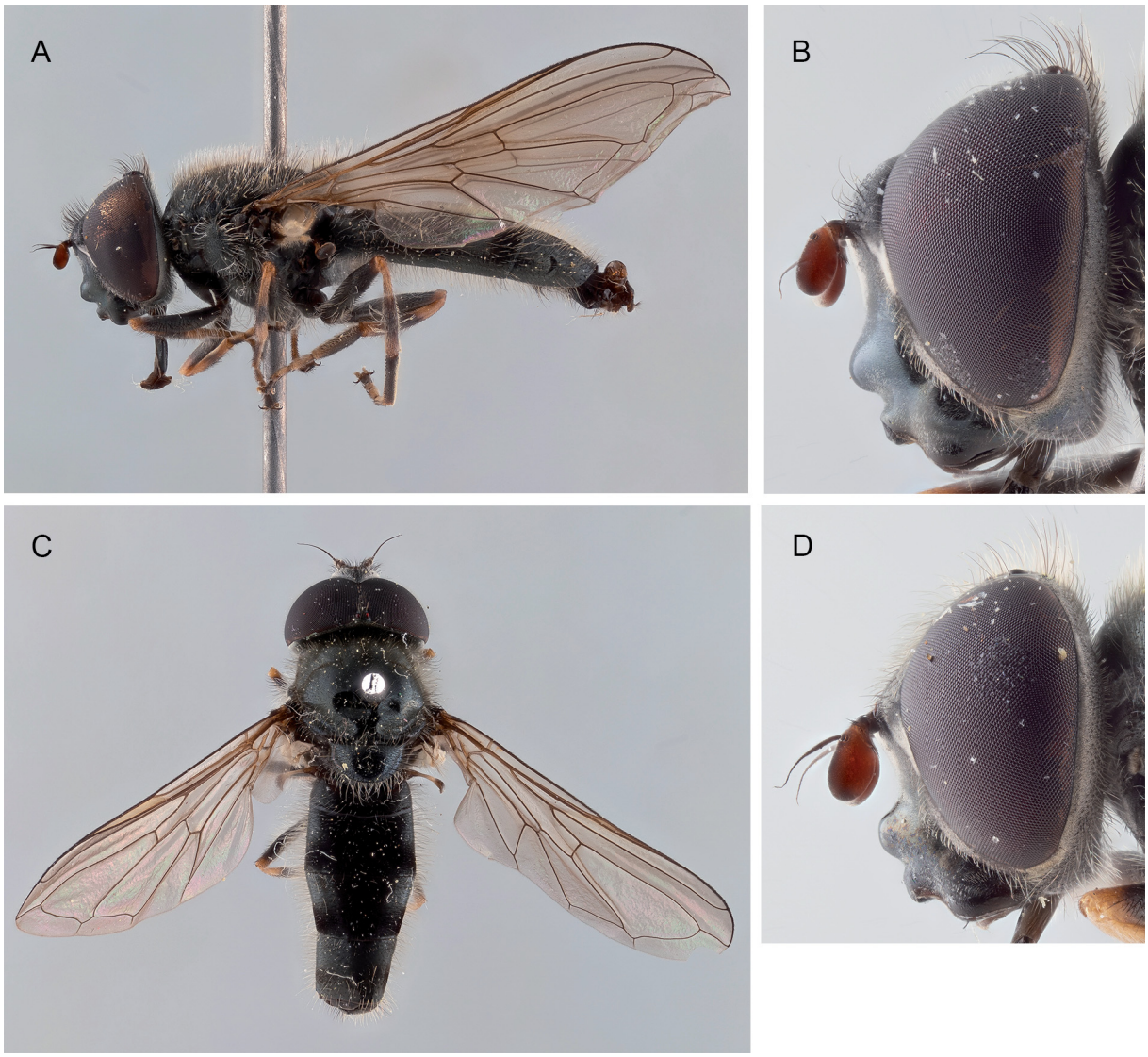

Fig. 74. *Cheilosia* (*Cheilosia*) *uviformis* Becker, 1894. Collected in Georgia. **A**. ♂ (SBA, SB.002945); habitus, lateral view; body length 7.9 mm. **B**. ♂ (SBA, SB.002944); head, lateral view; eye width 1.3 mm. **C**. ♂ (SBA, SB.002946); habitus, dorsal view; body length 8.2 mm. **D**. ♀ (SBA, SB.002943); head, lateral view; eye width 1.1 mm. Not to scale.

ZFMK, ZFMK-TIS-8010118 • 4 ♀♀; Ushguli; 42.94° N, 43.05° E; 2220 m a.s.l.; 15–17 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.100 to 2019-01.103 • 3 ♂♂; 42.9090° N, 43.0070° E; 2294 m a.s.l.; 16 Jun. 2019; S. Bot leg.; SBA, SB.002947 to SB.002949 • 1 ♂; Ushguli; 42.56° N, 43.04° E; 2260 m a.s.l.; 16 Jun. 2019; J. van Steenis leg.; 2019-01.180; JSB • 4 ♂♂, 2 ♀♀; 2 km SW of Ushguli; 43.0052° N, 42,8986° E; 2550 m a.s.l.; 17 Jun. 2019; F. Van de Meutter leg.; FMT • 1 ♀; 2 km SW of Ushguli; 43.0052° N, 42,9036° E; 2550 m a.s.l.; 17 Jun. 2019; F. Van de Meutter leg.; FMT • 3 ♂; 42.8980° N, 43.0080° E; 2601 m a.s.l.; 18 Jun. 2019; S. Bot leg.; SBA, SB.002944 to SB.002946 • 1 ♀; same data as for preceding; SBA, SB.002943 • 3 ♂♂, 6 ♀♀; 2 km SW of Ushguli; 43.0052° N, 42,8986° E; 2550 m a.s.l.; 18 Jun. 2019; F. Van de Meutter leg.; FMT • 3 ♂♂; 42.8964° N, 43.0047° E; 2658 m a.s.l.; 18 Jun. 2019; J.H. Skevington leg.; CNC, CNC1386812, CNC1386814, CNC1386817 • 1 ♀; same data as for preceding; CNC, CNC1386806 • 1 ♂; Zagarari Pass; 42.91° N, 43.09° E; 2585 m a.s.l.; 18 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.145.

Genetics

DNA barcodes of European and Caucasian specimens of *C. uviformis* cluster together with high support (BS = 100%).

Remarks

Reported from the Caucasus for the first time.

Biology

Remarkably, only sampled in 2019 while areas of occurrence were also visited in other years. Collected between 14 June and 20 June at an altitude between 1800 and 2684 m a.s.l. All specimens were caught visiting willow *Salix* sp. catkins on alpine and subalpine grasslands.

Distribution

Europe and Caucasus (Georgia).

Cheilosia* (*Cheilosia*) *vansteenisi sp. nov.
urn:lsid:zoobank.org:act:C7EDACEF-AE70-4B0C-87FF-50B8AA0661E3
Figs 75–76

Differential diagnosis

Cheilosia vansteenisi sp. nov. is morphologically and genetically very close to *C. aerea*. The easiest character to distinguish them is the pile on the posterodorsal corner of the anterior anepisternum: pilose in *C. aerea*, but bare in *C. vansteenisi*. Other differences are the darker legs in *C. vansteenisi*, which are black, except for the base and apex of protibia and mesotibia in the male which are dark brown (in *C. aerea* tibiae are extensively yellow at base and apex), scutum slightly finer punctured and terga shinier (tergum III almost entirely shiny in *C. vansteenisi* vs extensively pruinose medially in *C. aerea*). Moreover, male of *C. vansteenisi* sp. nov. has the face with denser pruinosity (Fig. 76A) and the frons with dense pruinosity; the female of *C. vansteenisi*, on the other hand, has the frons pruinose in anterior part (shiny in *C. aerea*), postpedicel black (Fig. 76B) (usually in *C. aerea* at least basoventral corner dark orange) and terga with only very few black pile in posteromedial parts of terga III–IV (in *C. aerea* with extensive black pile medially on terga II–IV).

Our new species is similar to species of the *proxima* group (Vujić *et al*. 2013), and within that group closest to *C. proxima*, but smaller (7–7.5 mm vs 7–9 mm) and with darker legs (Fig. 75A, C) (in *C. proxima*, tibiae usually distinctively yellow at base). The male has denser pruinosity on face (Fig. 76A), frons, postpronotum and terga with more and denser pruinosity, scutum medially with an area of short black pile at the level of wing bases (Fig. 75A) (short black pile on this area is missing in

C. proxima), terga and sterna on average with less black pile, sterna less densely pruinose with shiny spots on sterna I–II (sterna I–II entirely pruinose in *C. proxima*), surstylus with field of microtrichia (Fig. 76D) (absent in *C. proxima*) and dorsal lobe of postgonite long and pointed with straight dorsal margin (Fig. 76C) (in *C. proxima* the lobe is shorter and less pointed and the dorsal margin has an extension). The female of *C. vansteenisi* sp. nov. has the frons extensively pruinose in anterior part (shiny in *C. proxima*), scutum with shorter and more adpressed pile, terga II–III shinier and tergum IV with yellow pile (medially with black pile in *C. proxima*).

Etymology

This new species is named after Jeroen van Steenis, our friend and the collector of the paratype. We name this species after him to acknowledge his immense contribution to the study of Syrphidae. Species epithet to be treated as a noun in the genitive case.

Material examined

Holotype

GEORGIA • ♂; Racha-Lechkhumi and Kvemo Svaneti, Tsana; 42.9160° N, 43.1428 E; 1975 m a.s.l.; 19 Jun 2019; X. Mengual leg.; ZFMK, ZFMK-TIS-8008772 = ZFMK-DIP-00066391.

Paratype

GEORGIA – **Samegrelo-Zemo Svaneti** • 1 ♀; Mestia; 43.02° N, 42.89° N; 2600 m a.s.l.; 13 Jun. 2019; J. van Steenis leg.; JSB, 2019-01.121, ZFMK-TIS-8009610.

Description

Male

Length. Body 7.5 mm, wing 7 mm.

Head. Face bare, with distinct facial tubercle, black, densely pruinose, below lunule narrower than an eye; parafacia black, pruinose, white pilose. Clypeus pruinose, about one and a half times as long as wide. Frontal triangle black, pruinose, long black pilose. Length of eye contiguity about 1.2 the length of frons. Angle of approximation of eyes ca 90°. Vertical triangle black, shiny, ocellar triangle shiny, long black pilose and with few shorter yellow pile. Occiput pruinose, short yellow and long black pilose. Lunule dark yellow, with distinct medial arm, separating acetabula. Scape black, anteriorly with black and yellow setae; pedicel black, anteriorly with black setae; postpedicel blackish, pruinose, about as wide as high; arista black, with short pile, pile much shorter than diameter of arista at base. Eye with dense, yellow pile.

Thorax. Scutum black, shiny, except postpronotum densely pruinose and notopleural area slightly pruinose, finely punctured, with long yellow pile, intermixed with sparse often longer black pile, black pile dominant only in anterolateral corners, posteriorly in the center with field of short erect black pile. Scutellum shiny, with long erect yellow pile and sparse erect black pile intermixed, and long black setae along posterior margin. Pleura black, slightly pruinose; anterior anepisternum bare; pile on pleura white except in posterodorsal corner of posterior anepisternum with few black pile and setae; katepisternum continuously pilose. Haltere yellow.

Wing. Wing including alula entirely microtrichose, hyaline, veins dark brown.

Legs. Coxae and trochanters black. Femora, tibiae and tarsi black except base and apex of protibia and mesotibia dark brown; profemur with mixed black and yellow pile; mesofemur with yellow pile; metafemur with anterodorsal and anteroventral long yellow pile, ventrally with short black setae; tibiae and tarsi with black and yellow pile.

Abdomen. Tergum I pruinose, tergum II pruinose except lateral and posterior margins, tergum III pruinose anteriorly, pruinosity decreasing, from the anterior margin of tergum III towards the middle of the tergum, tergum IV shiny except narrow strip medially along anterior margin; terga with long erect yellow pile, pile shorter in center of terga II–III, except sparse short black pile intermixed in center of posterior half of tergum II and center of tergum III. Sterna I–IV pruinose except center of sterna I–II with shiny spot; sterna with long erect yellow pile, except along posterior margin of sternum II and in center of sterna III–IV where pile adpressed. Genitalia with surstylus 1.3 times as long as wide, and with large field of microtrichia on lamella (Fig. 76D); dorsal lobe of postgonite long and pointed (Fig. 76C).

Female

Length. Body 7 mm, wing 7 mm.

Similar to the male, except for normal sexual dimorphism and the following characters. Posteroventral corner of face and genae with orange spot. Frons with mixed yellow and black pile. Frons shiny except anteriorly where pruinose. Occiput pruinose except shiny behind dorsal eye corner. Occiput yellow pilose. Scutum with semi-adpressed yellow pile, in center of posterior part mixed with black pile.

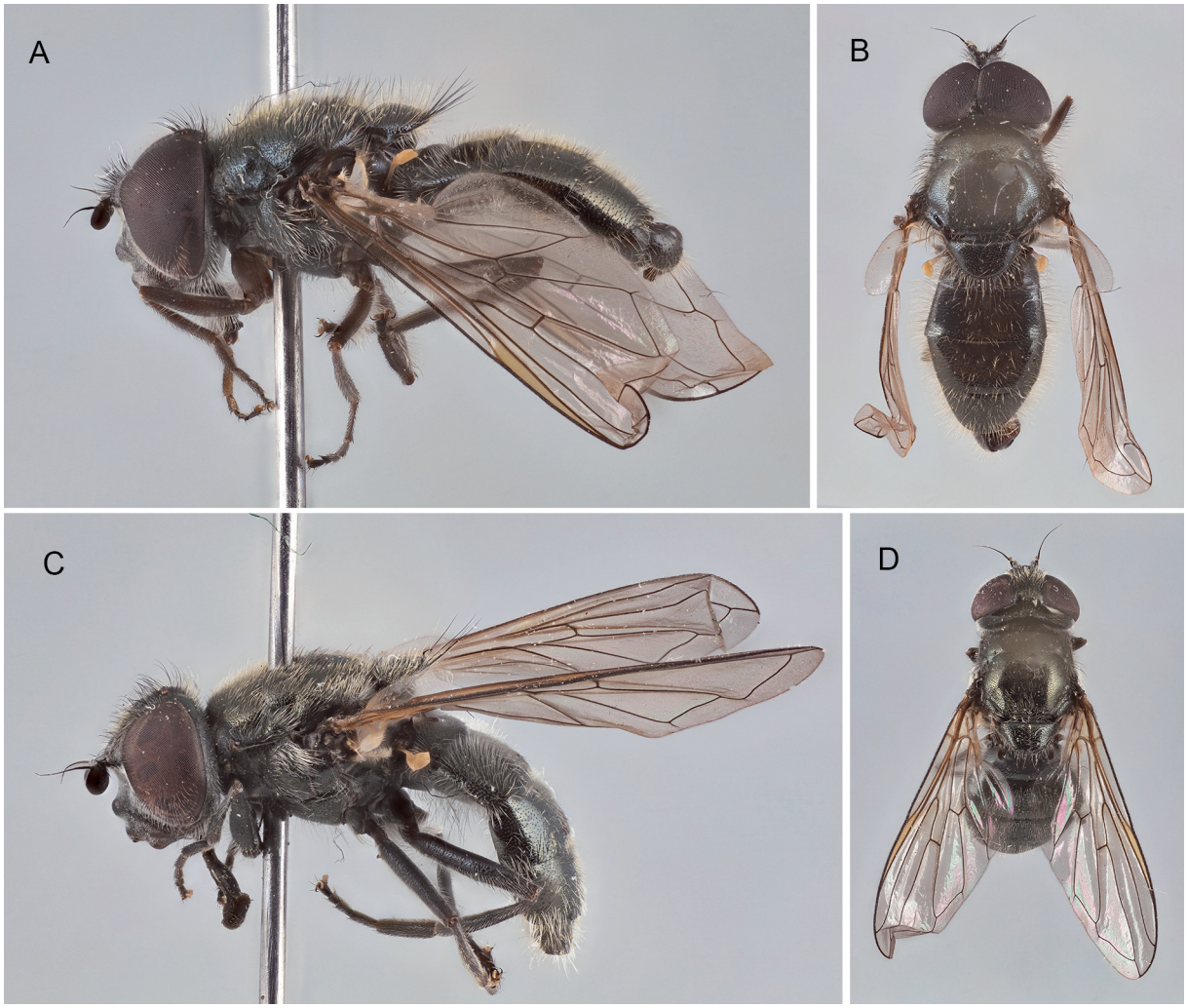

Fig. 75. *Cheilosia* (*Cheilosia*) *vansteenisi* sp. nov. **A–B**. Holotype, ♂ (ZFMK, ZFMK-DIP-00066391); habitus, lateral and dorsal views; body length 7.5 mm. **C–D**. Paratype, ♀ (JSB, 2019-01.121, ZFMK-TIS-8009610); habitus, lateral and dorsal views; body length 7.0 mm. Not to scale.

Scutellum with short yellow pile. Pile on pleura yellow. Legs black. Femora with yellow pile. Terga shiny except tergum I and the center of anterior margin of tergum II. Terga with yellow pile, except tergum II posteriorly in center with small area of black pile and tergum III medially with large triangular area of black pile. Sterna I–IV pruinose.

Genetics

Both DNA barcodes from the holotype and paratype cluster together with high support (BS = 100%).

Remarks

We consider the species rare, with only two specimens collected during three expeditions in three different years in the same area.

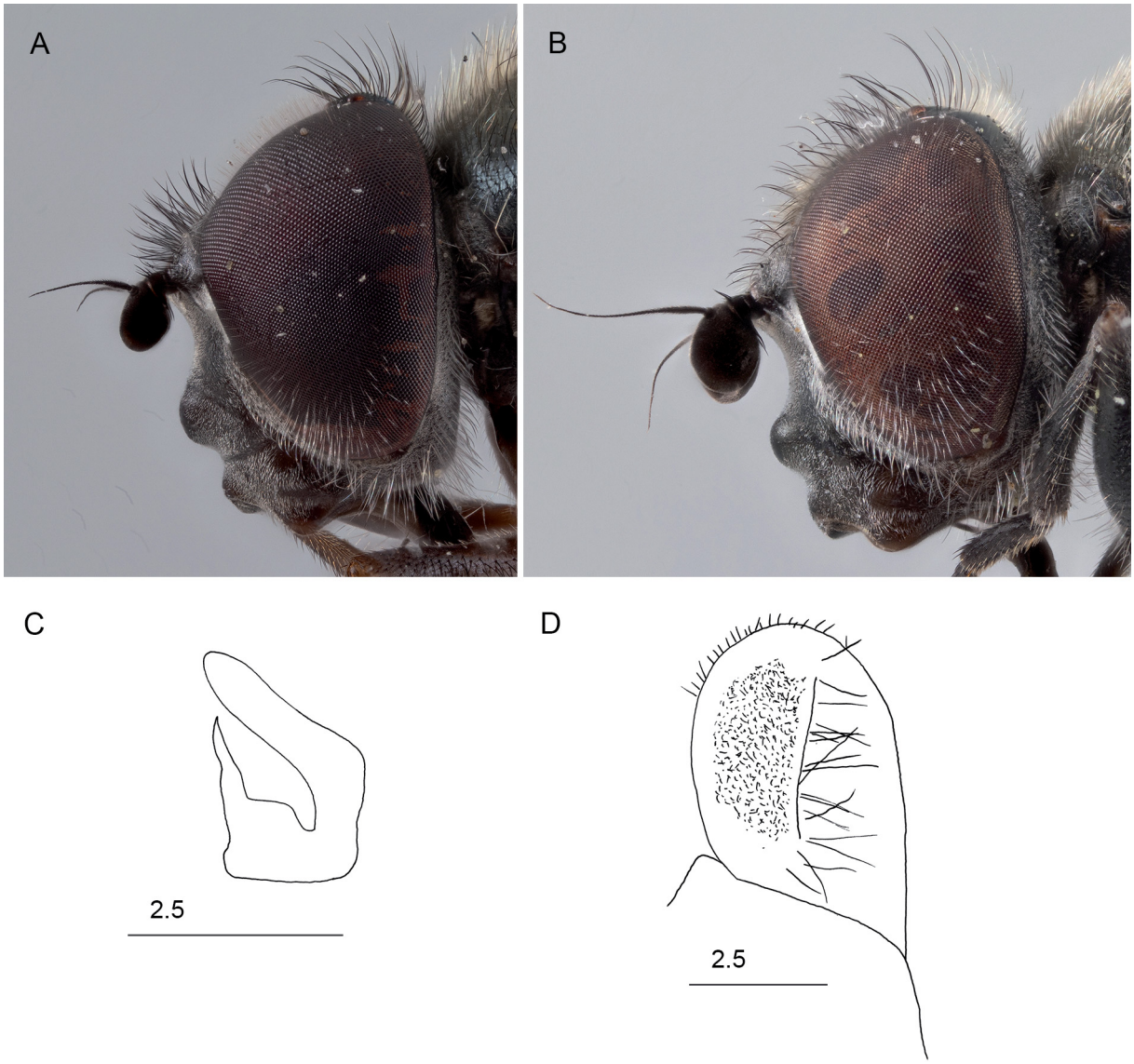

Fig. 76. *Cheilosia* (*Cheilosia*) *vansteenisi* sp. nov. **A, C–D**. Holotype, ♂ (ZFMK, ZFMK-DIP-00066391); eye width 1.2 mm. **A**. Head, lateral view. **B**. Paratype, ♀ (JSB, 2019-01.121, ZFMK-TIS-8009610); head, lateral view; eye width 1.2 mm. **C**. Postgonite, lateral view. **D**. Surstylus, lateral view. Scale bars: A–B not to scale; C–D in μm.

Biology

Collected in mountains between 1975–2600 m a.s.l.

Distribution

So far only known from the type series localities in the Greater Caucasus in Georgia.

Cheilosia* (*Cheilosia*) *variabilis (Panzer, 1798)
Fig. 77

Syrphus variabilis Panzer, 1798: 10.

Cheilosia variabilis – Stackelberg & Richter 1968: 249. — Stackelberg 1970: 59. — Barkalov 1993: 714. — Gujabidze 2002: 245. — Mengual *et al.* 2020: 21 (part). — Żóralski & Bystrowski 2021: 26.

Differential diagnosis

The combination of eye and face with pile and black legs of *Cheilosia variabilis* distinguish this species from all other *Cheilosia* of the region, except for *C. borjomi* sp. nov., *C. melanopa* and *C. redi*. It is similar to *C. melanopa* and *C. redi* but on average larger (9–12 mm vs 8–10 mm), with slenderer abdomen, legs all black (base and sometimes apex of tibiae yellow in those of *C. melanopa* and *C. redi*), in the male, the ventral part of the metafemur has black setae (with short black pile in *C. melanopa* and *C. redi*) and in the female, the metatibia has black pile anterolaterally (yellow in that of *C. redi*) and scutum with shorter semi-adpressed yellow and black pile and with sparse, longer, more erect black pile (with short erect yellow pile in that of *C. melanopa*). It is very similar to *C. borjomi*; see Differential diagnosis of that species for differences. Despite small genetic differences with European populations of *C. variabilis*, no consistent morphological differences were found. The male genitalia of *C. variabilis* are figured in Francuski *et al.* (2009).

Material examined

Collected in 2018, 2019, 2021 and 2023; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

DNA barcodes of *C. variabilis* are grouped in one cluster without high support (BS < 90%), comprising a group of sequences from European specimens (BS < 90%) and another group of sequences with the Caucasian individuals (BS = 95.4%).

Remarks

Some records of *C. variabilis* in Mengual *et al.* 2020 actually are *C. borjomi* sp. nov., and are reported as such in the account of *C. borjomi*.

Biology

During our expeditions, collected between 30 April and 26 June at an altitude between 751 and 2300 m a.s.l. Often found near forest or shrubs or near tall vegetation in meadows. Males sit on leaves of trees and both sexes visit a variety of flowers, often white umbellifers.

Distribution

Western and Central Palaearctic, into western Siberia. Distribution within the Caucasus difficult to assess because previous records could also be *Cheilosia borjomi* sp. nov., but reported from Armenia, Georgia and Russia.

Cheilosia* (*Cheilosia*) *velutina Loew, 1840
Fig. 78

Chilosia velutina Loew, 1840: 33.

Chilosia velutina – Stackelberg & Richter 1968: 249. — Stackelberg 1970: 64. — Peck 1988: 119. — Barkalov 1993: 724. — Mengual *et al.* 2020: 22.
Cheilosia velutina Loew, 1848 [sic] – Gujabidze 2002: 245.

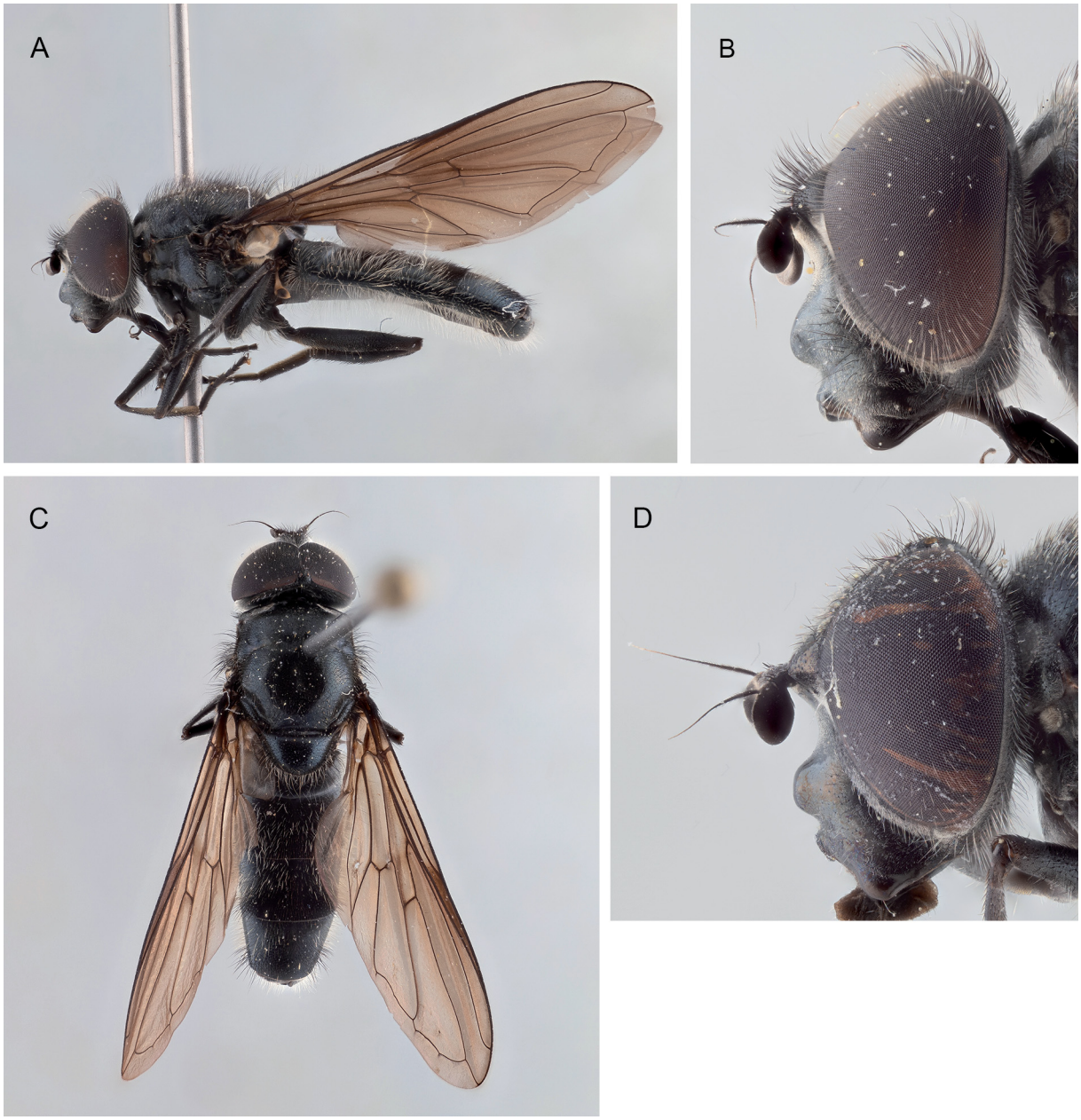

Fig. 77. *Cheilosia* (*Cheilosia*) *variabilis* (Panzer, 1798). Collected in Georgia. **A**. ♂ (ZFMK, ZFMK-TIS-8006822); habitus, lateral view; body length 10.0 mm. **B**. ♂ (ZFMK, ZFMK-TIS-8006822); head, lateral view; eye width 1.4 mm. **C**. ♂ (ZFMK, ZFMK-TIS-8006822); habitus, dorsal view; body length 10.0 mm. **D**. ♀ (SBA, SB.002954); head, lateral view; eye width 1.4 mm. Not to scale.

Differential diagnosis

Cheilosia velutina is a member of a group of closely related species, called the *proxima* group (Vujić *et al.* 2013) in which the pilose eyes, posterior margin of scutellum with setae, usually partly yellow legs, continuously pilose katepisternum, pruinose sterna and the shape of postgonite are distinctive characters. For a full diagnosis of the *Cheilosia proxima* group and for figures of the male genitalia of *C. velutina*, see Vujić *et al.* (2013). Within the *proxima* group *C. velutina* is best identified by the poorly developed facial tubercle, resulting in the face being almost flat between facial tubercle and postclypeus (Fig. 78B, D) (in the other species, facial tubercle well-developed, face in lateral view obviously concave between facial tubercle and postclypeus). Moreover, no other species in the *proxima* group have the combination of the postpedicel usually orange at least basoventrally and scutum coarsely punctured like in *C. velutina*.

Material examined

Species not collected.

Genetics

DNA barcodes of European specimens of *C. velutina* cluster together with high support (BS = 100%).

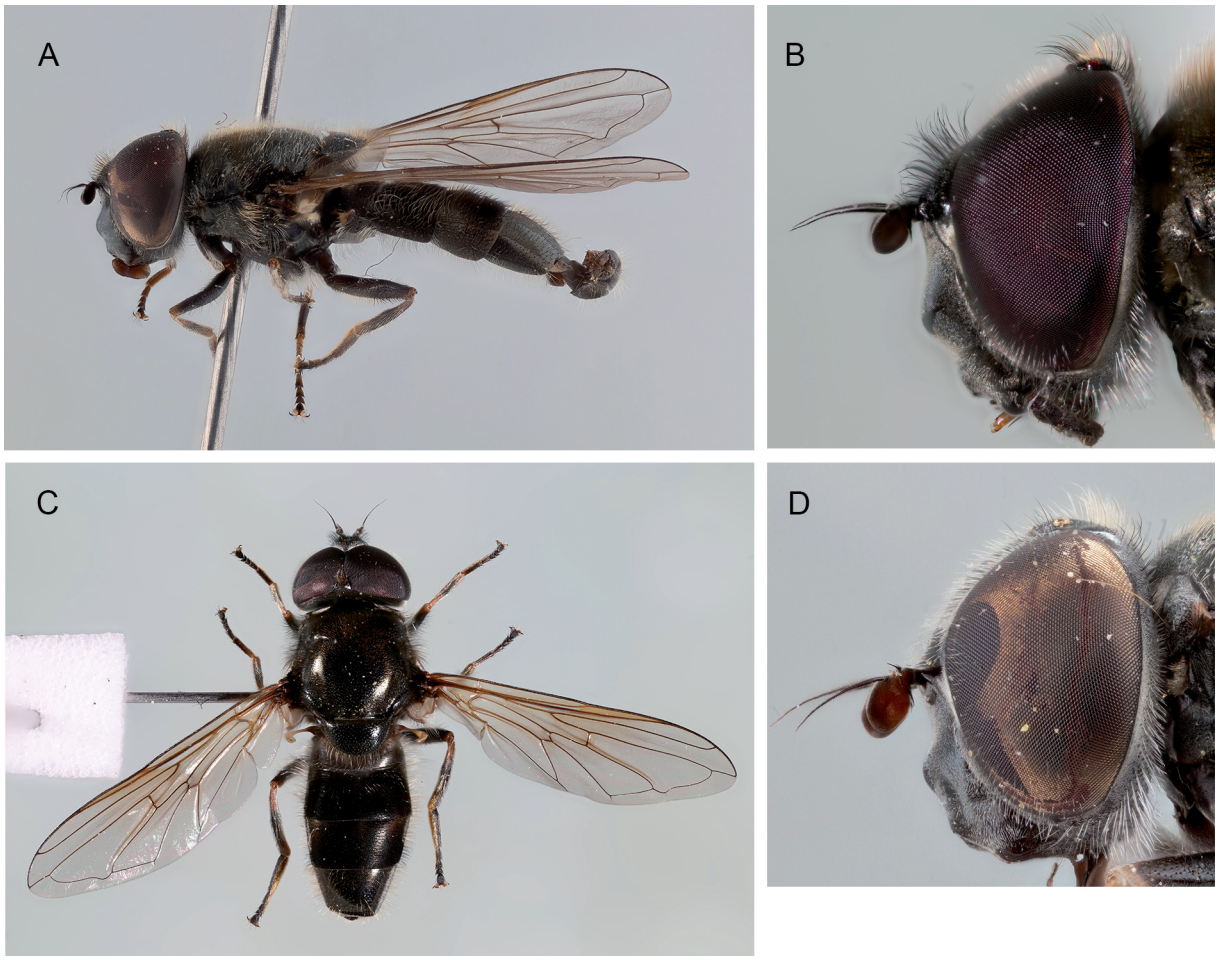

Fig. 78. *Cheilosia* (*Cheilosia*) *velutina* Loew, 1840. **A**. ♂ (SBA); habitus, lateral view; collected in Mongolia; body length 8.9 mm. **B–C**. ♂ (SBA, SB.004486); collected in the Netherlands. **B**. Head, lateral view; eye width 1.3 mm. **C**. Habitus, dorsal view; body length 8.6 mm. **D**. ♀ (GPA); head, lateral view; collected in Germany; eye width 1.3 mm. Not to scale.

Distribution

Palaearctic. Within the Caucasus reported from Azerbaijan and Russia.

Cheilosia* (*Cheilosia*) *vernalis (Fallén, 1817)
Fig. 79

Eristalis vernalis Fallén, 1817: 55.

Cheilosia vernalis – Stackelberg & Richter 1968: 250. — Peck 1988: 120. — Barkalov 1993: 721. — Gujabidze 2002: 245. — Barkalov & Mutin 2018: 484. — Mengual *et al.* 2020: 22. — Żóralski 2022: 68.

Differential diagnosis

Cheilosia vernalis is a small (body size: 5–8 mm) and variable species (Ståhls *et al.* 2008). In the Caucasus, mainly to be confused with *C. confusa* sp. nov., see the Differential diagnosis of that species to distinguish the two taxa. Also, see Prokhorov *et al.* (2020) for a key to distinguish *C. vernalis* from similar species. *Cheilosia vernalis* is similar to *C. cynocephala*, but on average smaller (body size 5–8 mm vs 7–9 mm), body with brown or black shine (with blue shine in *C. cynocephala*), wing hyaline (female *C. cynocephala* usually with faint blackish median spot), pile on scutum often predominantly yellow (black in *C. cynocephala*) and with the two basal tarsomeres of mesoleg often dark orange (black in *C. cynocephala*). In our tree (Supp. file 1: Fig. S1), there are two specimens genetically in between *C. vernalis* and *C. confusa* which we call '*Cheilosia* sp.' (ZFMK-TIS-8009292 and ZFMK-TIS-8014649). They are morphologically very close to *C. vernalis*, but slightly different. Our sample size and the differences are too small to draw firm conclusions on the identity of these two specimens. They could belong to the variation within *C. vernalis* or represent a new species; thus, we decided to leave them unidentified.

Material examined

Collected in 2018, 2019, 2022 and 2023; see Mengual *et al.* (2020) for detailed records from 2018.

Genetics

DNA barcodes of *C. vernalis* cluster together without high support (BS < 90%) with the DNA sequences of *C. confusa* sp. nov., *C. gemmula* sp. nov., *C. melanura*, *C. bracusi*, *C. triamilia*, and two specimens left as *Cheilosia* sp.

Biology

During our expeditions, collected between 6 May and 2 August at an altitude between 1250 and 2885 m a.s.l., both on low flowers and on willow *Salix* sp. catkins.

Distribution

Palaearctic. Within the Caucasus, known from Georgia and Russia.

Cheilosia* (*Cheilosia*) *vulpina (Meigen, 1822)
Fig. 80

Syrphus vulpinus Meigen, 1822: 29.
Chilosia conops Becker, 1894: 385. Syn. by Claussen & Speight (1998).

Chilosia conops – Stackelberg & Richter 1968: 245. — Stackelberg 1970: 59. — Peck 1988: 100.

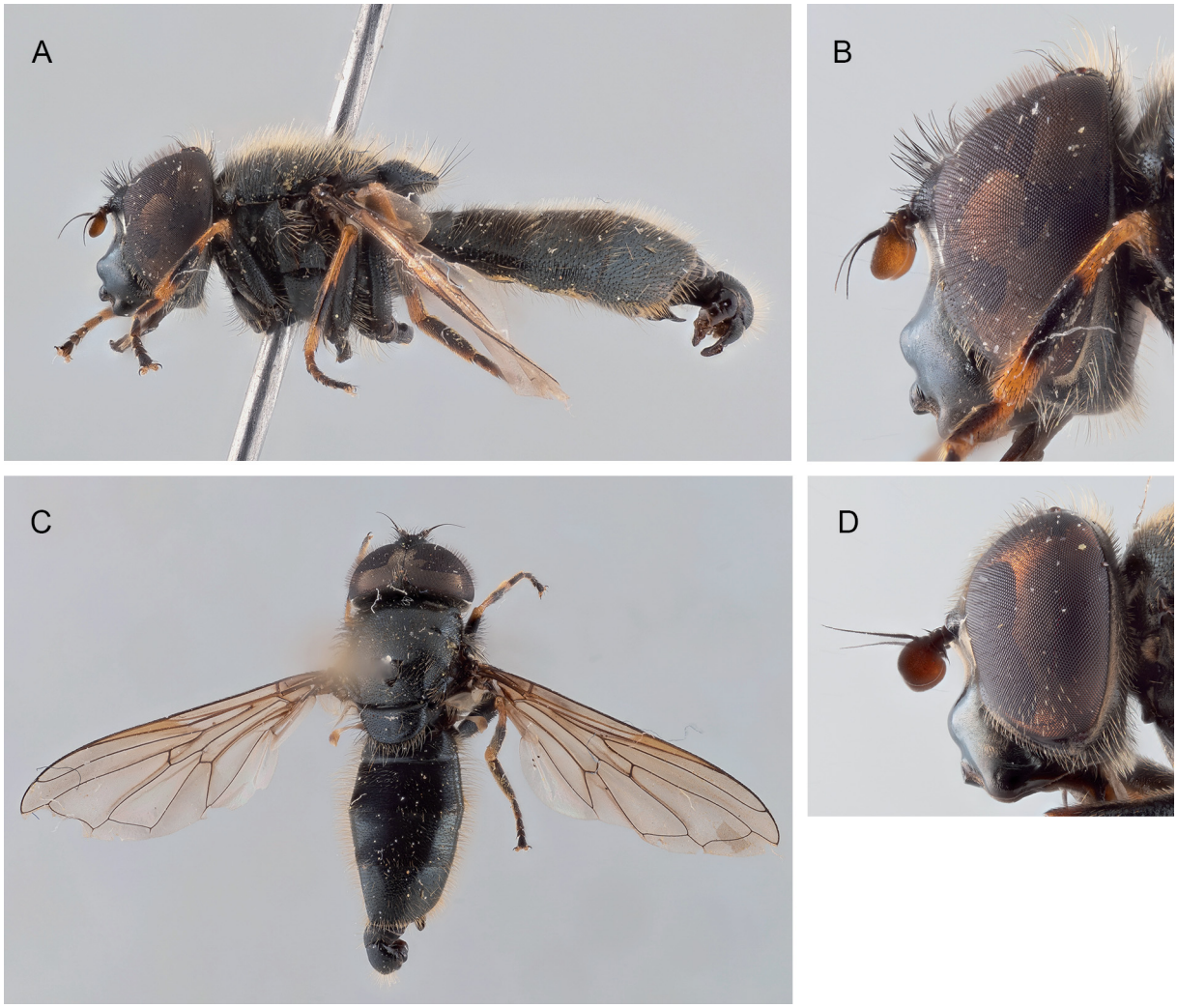

Fig. 79. *Cheilosia* (*Cheilosia*) *vernalis* (Fallén, 1817). Collected in Georgia. **A**. ♂ (SBA, ZFMK-TIS-8027989); habitus, lateral view; body length 7.4 mm. **B**. ♂ (SBA, ZFMK-TIS-8027989); head, lateral view; eye width 1.0 mm. **C**. ♂ (SBA, ZFMK-TIS-8027989); habitus, dorsal view; body length 7.4 mm. **D**. ♀ (SBA, ZFMK-TIS-8009293); head, lateral view; eye width 1.0 mm. Not to scale.

Cheilosia vulpina – Stackelberg & Richter 1968: 250. — Stackelberg 1970: 59. — Barkalov 1993: 714. — Mengual *et al.* 2020: 22.

Differential diagnosis

Cheilosia vulpina can be confused with *C. melanopa* and *C. redi*, but in the male the scutum is shiny and the dorsal lobe of the postgonite is pointed (*C. melanopa* and *C. redi* have scutum pruinose and dorsal lobe of the postgonite sickle-shaped) and in the female the metatibia entirely with yellow pile (anterolateral with black pile in *C. melanopa*) and tergum IV medially with black pile (almost entirely or entirely with yellow pile in *C. redi*). *Cheilosia vulpina* is a member of a group of closely related species, called the *proxima* group (Vujić *et al.* 2013) in which the pilose eyes, posterior margin of scutellum with setae, usually partly yellow legs, continuously pilose katepisternum, pruinose sterna and the shape of postgonite are distinctive characters. Within this group *C. vulpina* stands out in having the face pilose (Fig. 80B), a character only shared within this group in the Caucasus by *C. pogonias* sp. nov. The male can be identified from *C. pogonias* by having the abdomen partly with black pile, at least tergum III in

posterior half with black pile (exclusively with yellow pile in *C. pogonias*), parafacia narrower, about half the width of postpedicel (parafacia broad, about two third as wide as postpedicel in *C. pogonias*), arista with pile, length equaling at least half the width of arista at base (arista nearly bare in *C. pogonias*) and dorsal lobe of postgonite slender (basally broad, almost triangular in shape in *C. pogonias*, for a drawing of the male genitalia of *C. vulpina*, see Vujić *et al.* 2013). The female can be distinguished from *C. pogonias* by the black pile medially on tergum IV (tergum IV almost entirely or entirely with yellow pile in *C. pogonias*).

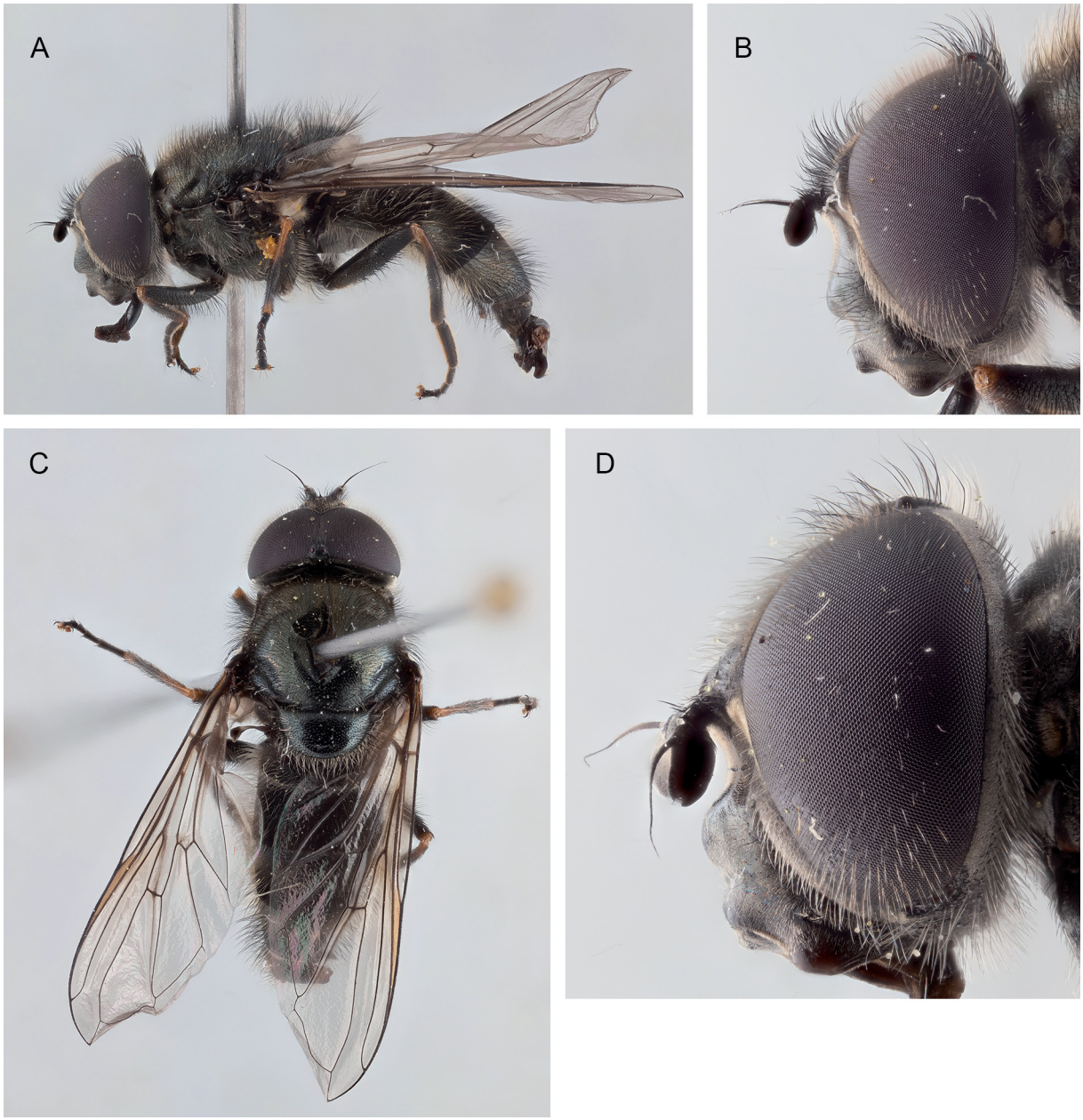

Fig. 80. *Cheilosia* (*Cheilosia*) *vulpina* (Meigen, 1822). **A–C**. ♂ (SBA, SB.002971); collected in Georgia. **A**. Habitus, lateral view; body length 10.4 mm. **B**. Head, lateral view; eye width 1.5 mm. **C**. Habitus, dorsal view; body length 10.4 mm. **D**. ♀ (ZFMK, ZFMK-TIS-8014628); collected in Armenia; head, lateral view; eye width 1.4 mm. Not to scale.

Material examined

Not collected in 2018, but collected in 2022 and 2023.

ARMENIA – **Syunik Province** • 1 ♀; from Lichk to the Zvaravank Monastery; 39.05497° N, 46.171353° E; 1765 m a.s.l.; 16 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093037 = ZFMK-TIS-8014431. – **Vayots Dzor Province** • 2 ♂♂; W of Saravan; 39.718437° N, 45.63076° E; 1590 m a.s.l.; 19 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093413 = ZFMK-TIS-8014621, ZFMK-DIP-00093415 = ZFMK-TIS-8014604 • 1 ♀; same data as for preceding; ZFMK, ZFMK-DIP-00093424 = ZFMK-TIS-8014626.

GEORGIA – **Mtskheta-Mtianeti** • 1 ♀; Tbilisi N.P.; 41.8808° N, 45.0203° E; 1270 m a.s.l.; 27 May 2022; X. Mengual leg.; ZFMK, ZFMK-DIP-00093892 = ZFMK-TIS-8014628 • 2 ♂♂; Tbilisi N.P.; 41.877° N, 45.0138° E; 1250 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT, ZFMK-TIS-8028518 • 1 ♂; Lutkhubi; 42.3867° N, 44.79° E; 1580 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT, ZFMK-TIS-8028477 • 3 ♂♂; Lutkhubi; 42.3951° N, 44.7847° E; 2138 m a.s.l.; 6 May 2023; F. Van de Meutter leg.; FMT • 4 ♂♂; Lutkhubi; 42.3938° N, 44.7857° E; 2120 m a.s.l.; 6 May 2023; W. Opdekamp leg.; WOR, E005, E008, E014, E016 • 1 ♀; same data as for preceding; WOR, E003 • 1 ♂; Tbilisi N.P.; 41.8770° N, 45.0137° E; 1248 m a.s.l.; 9 May 2023; S. Bot leg.; SBA, SB.002971. – **Samtskhe-Javakheti** • 1 ♂; Sakire; 41.7360° N, 43.3034° E; 1550 m a.s.l.; 10 May 2023; W. Opdekamp leg.; WOR, C009 • 1 ♂; Borjomi; 41.8098° N, 43.3327° E; 850 m a.s.l.; 12 May 2023; W. Opdekamp leg.; WOR, A022 • 1 ♀; same data as for preceding; WOR, A009 • 1 ♀; Dviri; 41.7543° N, 43.2733° E; 1100 m a.s.l.; 12 May 2023; W. Opdekamp leg.; WOR, B011.

Genetics

DNA barcodes of *C. vulpina* from Europe, Caucasus and Siberia cluster together with high support (BS = 100%).

Biology

During our expeditions, collected between 6 May and 27 May at an altitude between 850 and 2138 m a.s.l. Some males were hovering at a hilltop.

Distribution

Western and Central Palaearctic, into western Siberia. Within the Caucasus, known from Armenia, Georgia and Russia.

Species of Cheilosia removed from the hover fly checklist from the Caucasus

The species of *Cheilosia* in the following list are removed from the Caucasus checklist based on current knowledge and evidence, and their presence in the Caucasus Region might need corroboration based on new records.

Cheilosia* (*Montanocheila*) *alpina (Zetterstedt, 1838)

Eristalis alpina Zetterstedt, 1838: 611.

Cheilosia alpina – Mengual *et al.* 2020: 24.
Cheilosia alpine Zetterstendt, 1843 [sic] – Gujabidze 2002: 245.

Remarks

This species is reported by Gujabidze (2002) from Lagodekhi, Batsara canyon, but with the wrong species name and year of publication. Here, we report *C. balu* in the Caucasus for the first time, this species is very similar to *C. alpina*. We think it is likely that the report of *C. alpina* is actually *C. balu* and remove *C. alpina* from the checklist.

Distribution

Germany, Northern Europe, Siberia, Mongolia to the Pacific.

Cheilosia* (*Montanocheila*) *caucasogenita Kuznetzov, 1997

Cheilosia caucasogenita Kuznetzov, 1997: 199.

Cheilosia caucasogenita – Barkalov & Mutin 2018: 485.

Remarks

Kuznetzov (1997) described *C. caucasogenita* based on three females from three different countries, namely Armenia (Meghri district = Syunik Province), Georgia (Bakuriani near Borjomi, Samtskhe-Javakheti), and Russia (North Ossetia-Alania). The original description by Kuzentzov fits both *C. rufa* sp. nov. and *C. subpictipennis*. Our new species *C. rufa* is described from Samtskhe-Javakheti (Sakire, ca 25 km W of Bakuriani in the Borjomi area) and we have collected *C. subpictipennis* from Borjomi N.P. in Samtskhe-Javakheti and from Lutkhubi in Mtskheta-Mtianeti (125 km NE of Bakuriani). The females of *C. rufa* and *C. subpictipennis* cannot be identified on the basis of morphology and the help of DNA barcodes is needed. Because the male of *C. caucasogenita* is not described it remains impossible to assess the identity of *C. caucasogenita* and therefore we regard it as a nomen dubium.

Cheilosia* (*Cheilosia*) *chloris (Meigen, 1822)

Syrphus chlorus Meigen, 1822: 284.

Cheilosia chloris – Gujabidze 2002: 245. — Mengual *et al.* 2020: 16.

Remarks

This species is morphologically very similar to *C. bracusi*, a species that was reported new for the Caucasus only in 2020 (Mengual *et al.* 2020). The only published record of *C. chloris* from the Caucasus (from Gurshevi in Shida Kartli; Gujabidze 2002) predates Mengual *et al.* (2020) and needs confirmation. We think it is unlikely that *C. chloris* occurs in the Caucasus and remove it from the checklist.

Distribution

Western and Central Palaearctic, into Siberia.

Cheilosia* (*Cheilosia*) *fraterna (Meigen, 1830)

Syrphus fraternus Meigen, 1830: 352.

Cheilosia fraterna – Stackelberg 1970: 64. — Peck 1988: 102. — Mengual *et al.* 2020: 16.

Remarks

Literature references for this species from the Caucasus are probably based on Stackelberg (1970). Barkalov (2007) states that the report of Stackelberg (1970) is most likely erroneous and does not include the species in his key for the Caucasian species (Barkalov 1993).

Distribution

Western and Central Palaearctic, into Siberia.

Cheilosia* (*Taeniochilosia*) *grisella Becker, 1894

Remarks

All published references of this species in the Caucasus are based on Stackelberg & Richter (1968). Barkalov (1993) reidentified their material as *C. aenigmatosa*. Although he reported the species again later (Barkalov & Ståhls 1997), this is an error (A.V. Barkalov, pers. com.) and *C. grisella* should be treated as absent from the Caucasus.

Genetics

DNA barcodes of European specimens of *C. grisella* were grouped together with high support (BS = 98.7%). The cluster with the barcodes of *Cheilosia lukashovae* (BS = 100%) was placed sister to the barcodes cluster of *C. grisella* with high support (BS = 100%).

Distribution

Central Europe (Pyrenees, Alps, Carpathians) south to Montenegro, Serbia and North Macedonia, and eastwards to Romania and Bulgaria.

Cheilosia* (*Cheilosia*) *impressa Loew, 1840

Remarks

Specimens from the Caucasus identified as *C. impressa* in previous publications are assigned to *C. inarmata* sp. nov. and therefore the name *C. impressa* is removed from the Caucasus checklist. For literature references citing *C. impressa* from the Caucasus, see under *C. inarmata*.

Genetics

All DNA barcodes of *C. impressa* from Europa and Russia cluster together with low support (BS < 90%) within a larger group with the sequences from *C. inarmata* sp. nov.

Distribution

Central Europe to European parts of Russia and Siberia reaching the Pacific.

Cheilosia* (*Taeniochilosia*) *impudens Becker, 1894

Chilosia impudens Becker, 1894: 348.

Cheilosia impudens – Stackelberg & Richter 1968: 246. — Peck 1988: 105. — Mengual *et al.*, 2020: 26. — Speight 2020a: 38.

Remarks

Stackelberg & Richter (1968) reported only females from the Northern Caucasus and Armenia. Barkalov (1993) was not certain whether *C. impudens* occurs in the Caucasus after examining the material of

Stackelberg & Richter (1968) and did not include this species in his key. When reviewing the species of *Cheilosia* with bare eyes and black legs, Barkalov & Ståhls (1997) did not included the Caucasus in the range of this species. We also could not find this taxon during any of our expeditions. We think it is unlikely that *C. impudens* occurs in the Caucasus and remove it from the checklist.

Genetics

The two available DNA barcodes of *C. impudens* are resolved within a cluster with high support (BS = 99.9%) with the sequences of other species, such as *C. sahlbergi*, *C. vicina*, and *C. nigripes*.

Distribution

Central Europe, the Balkans and Romania.

Cheilosia* (*Cheilosia*) *lenis Becker, 1894

Remarks

In the present study specimens of *Cheilosia lenis* from the Caucasus are described as *C. aurantia* sp. nov. and therefore, the name *C. lenis* is removed from the Caucasian checklist. For literature references citing *C. lenis* from the Caucasus, see under *C. aurantia*.

Genetics

All European DNA barcodes of *C. lenis* cluster together with high support (BS = 100%).

Distribution

Europe and European parts of Russia.

Cheilosia* (*Cheilosia*) *melanura Becker, 1889

Remarks

Published records of *C. melanura* from the Caucasus are considered here to refer to *C. confusa* sp. nov. and therefore, the name *C. melanura* is removed from the Caucasus checklist. For literature references citing *C. melanura* from the Caucasus, see under *C. confusa*.

Genetics

DNA barcodes of European *C. melanura* are grouped without high support (BS < 90%) with the DNA sequences of *C. confusa* sp. nov., *C. gemmula* sp. nov., *C. vernalis*, *C. bracusi*, *C. triamilia*, and two specimens left as *Cheilosia* sp.

Distribution

Mountain ranges in Central Europe, Balkans, east to the Baikal Region.

Cheilosia* (*Montanocheila*) *pictipennis Egger, 1860

Cheilosia pictipennis Egger, 1860: 352.

Cheilosia pictipennis – Stackelberg & Richter 1968: 247. — Stackelberg 1970: 61. — Peck 1988: 113. — Barkalov 1993: 718. — Gujabidze 2002: 246. — Barkalov & Mutin 2018: 485. — Mengual *et al.* 2020: 25.

Remarks

Published records of this species from the Caucasus are before the description of three very similar species occurring in the Caucasus (*C. contrasta* sp. nov., *C. rufa* sp. nov. and *C. subpictipennis*). It is very likely that these previous reports of *C. pictipennis* actually belong to *C. contrasta*, *C. rufa* and/or *C. subpictipennis*. The presence of the real *C. pictipennis* in the Caucasus Region is thus unlikely. Therefore, the name *C. pictipennis* is removed from the Caucasian checklist.

Distribution

Europe, European parts of Russia, and Siberia.

Cheilosia* (*Taeniochilosia*) *sahlbergi Becker, 1894

Chilosia sahlbergi Becker, 1894: 354.

Chilosia sahlbergi – Stackelberg 1970: 58. — Peck 1988: 115. — Mengual *et al.* 2020: 26. — Speight 2020a: 50.

Genetics

We included three DNA barcodes of *C. sahlbergi* from Europe in our NJ tree, which cluster with high support (BS = 99.9%) with the barcodes of *C. vicina*, *C. impudens*, and *C. nigripes*.

Remarks

In this publication we describe *C. ouwehandae* sp. nov., which is close to *Cheilosia sahlbergi*. We have not seen real *Cheilosia sahlbergi* from the Caucasus, the species is not in the review of the Caucasian *Cheilosia* in Barkalov (1993) and we did not find any published record in the literature. Thus, we think that previous reports could refer to *C. ouwehandae*, and the name *C. sahlbergi* is removed from the Caucasian checklist.

Distribution

Europe, European parts of Russia.

Cheilosia* (*Taeniochilosia*) *vicina (Zetterstedt, 1849)

Cheilosia vicina Zetterstedt, 1849: 3175.
Cheilosia nasutula Becker, 1894: 342. Syn. by Lucas *et al*. (1995).

Cheilosia nasutula – Tóth 1986: 94.
Cheilosia vicina – Mengual *et al.* 2020: 26. — Żóralski & Bystrowski 2021: 26.

Remarks

Tóth (1986) reported the single known record of this species from the Caucasus; one male collected on 28 May 1975 in the Kodori valley (Greater Caucasus area). *Cheilosia vicina* is very similar to *C. nigripes* and the best difference between the two species is the pruinose frons and posterior anepisternum in *C. vicina*, which are shiny in *C. nigripes*. However, specimens of *C. nigripes* collected in the Caucasus have a pruinose frons and posterior anepisternum too, which makes the identification very difficult (see Differential diagnosis under *C. nigripes*). Since both species are morphologically more similar in the Caucasus Region than previously thought and all studied specimens belong to *C. nigripes*, it is very likely that the specimens of *C. vicina* reported by Tóth belong to *C. nigripes*. The presence of this species in the Caucasus needs further evidence.

Genetics

We included several DNA barcodes of *C. vicina* from Europe in our NJ tree, which cluster with high support (BS = 99.9%) with the barcodes of *C. sahlbergi*, *C. impudens*, and *C. nigripes*.

Distribution

Europe, European parts of Russia.

Key to the species of Cheilosia occurring in the Caucasus

The male of *C.* (*Cheilosia*) *atypica* and the female of *C.* (*Taeniochilosia*) *ouwehandae* sp. nov. remain unknown and are not included in the key.

Males

1. Eye bare 2
– Eye pilose 15

2. Protibia black 3
– Protibia yellow at base or yellow at base and apex 8

3. Sternum II pruinose 4
– Sternum II shiny ..... ***C.* (*T.*) *nigripes*** (Meigen, 1822)

4. Parafacia pruinose 5
– Parafacia shiny (Fig. 10B) ..... ***C.* (*T.*) *bakurianiensis*** Kuznetzov, 1987

5. Postpedicel black 6
– Postpedicel orange ventrally (Fig. 51B) ..... ***C.* (*T.*) *ouwehandae*** Bot sp. nov. (female unknown)

6. Scutum shiny, at most slightly pruinose on the very anterior part of scutum 7
– Scutum slightly or distinctly pruinose in central part ..... ***C.* (*T.*) *lukashovae*** Barkalov, 1993

7. Posterior margin of scutellum with few and thin setae, whose diameter is almost the same as scattered black pile on central disc of scutellum (Fig. 2E); scutum with erect sparse long black pile and dense short erect golden pile ..... ***C.* (*T.*) *aenigmatosa*** Barkalov, 1993
– Posterior margin of scutellum with black setae, whose diameter is distinctly larger than diameter of scattered long black pile on central disc of scutellum (Fig. 56E); scutum with erect sparse long black pile and dense short semi-adpressed pile, colour of short dense pile ranging from predominantly black to predominantly golden ..... ***C.* (*T.*) *pollinifacies*** Stackelberg, 1968

8. Face in dorsal third along parafacia bare; pile on parafacia short 9
– Face in dorsal third along parafacia covered with long whitish pile; pile on parafacia very long (Fig. 25B) ..... ***C.* (*Convocheila*) *laticornis*** Rondani, 1857

9. Wings with cross-veins infuscated; ventral part of face protruding (Fig. 6B) 10
– Wings hyaline; ventral part of face not protruding (Fig. 42E) 11

10. Face only slightly protruding (Fig. 6B); haltere yellow; tarsi with tarsomeres dorsally brown or blackish; terga II–III shiny ..... ***C.* (*T.*) *armeniaca*** Stackelberg, 1960
– Face distinctly protruding (Fig. 41B); haltere with dark brown or black capitulum; tarsi with tarsomeres 2–4 yellow; terga II–III medially pruinose ..... ***C.* (*T.*) *longifacies*** sp. nov.

11. Face black, at most with a brownish or brownish-yellow spot at mala (Fig. 42E); basal third of wings with brown venation; trochanters black 12
– Face partly yellow (Fig. 28B); basal third of wings with orange-yellow venation; trochanters at least partly yellow ..... ***C.* (*E.*) *flavissima*** (Becker, 1894)

12. Facial tubercle broad, semicircular in dorsal view (Fig. 66E) 13
– Facial tubercle narrow, almost conical in dorsal view (Fig. 52E) 14

13. Anterior anepisternum with long pile on posterodorsal part; postpedicel usually bright orange (Fig. 64B) ..... ***C.* (*E.*) *ruffipes*** (Preyssler, 1793)
– Anterior anepisternum bare, without long pile on posterodorsal part; postpedicel variable, ranging from dark orange to dark brown (Fig. 66B) ..... ***C.* (*E.*) *scutellata*** (Fallén, 1817)

14. Arista with pile longer than diameter of arista at base; protarsus brown or black; lunule with reduced medial arm, antennal fossa present (Fig. 10E) ..... ***C.* (*E.*) *longula*** (Zetterstedt, 1838)
– Arista bare or nearly so; protarsus with central tarsomeres orange; lunule with distinct medial arm, acetabula separated (Fig. 44D) ..... ***C.* (*Cheilosia*) *pagana*** (Meigen, 1822)

15. Face around facial tubercle pilose, pile as long as or longer than pile on parafacia 16
– Face around facial tubercle bare 25

16. Scutellum without setae along posterior margin 17
– Scutellum with setae along posterior margin 18

17. A small species, body length ca 7–9 mm; parafacia broad; eye with sparse pile (Fig. 40B) .... ***C.* (*Cheilosia*) *latifrons*** (Zetterstedt, 1843)
– A large species, body length ca 12–13 mm; parafacia narrow; eye with long, dense pile (Fig. 58B) ..... ***C.* (*Cheilosia*) *pseudogrossa*** Stackelberg, 1968

18. Setae on posterior margin of scutellum long, longer than length of scutellum; colour of tibia ranging from black to yellow at both ends 19
– Setae on posterior margin of scutellum short, shorter than length of scutellum; tibiae black with basal part yellow, apex black (Fig. 38C) ..... ***C.* (*Cheilosia*) *lasiopa*** Kowarz, 1885

19. Wing base dark brown or black 20
– Wing base yellow (Fig. 70C) ..... ***C.* (*Cheilosia*) *transcaucasica*** Stackelberg, 1960

20. Scutum shiny on the central part; dorsal lobe of postgonite not sickle-shaped (cf. Fig. 55C); pro- and mesotibiae yellow at both ends 21
– Scutum pruinose on central part; dorsal lobe of postgonite very long and slender, sickle-shaped (cf. Fig. 14D); pro- and mesotibiae black or only yellow at base 22

21. Abdomen partly with black pile, at least tergum III in posterior half with black pile; parafacia narrow, about half the width of postpedicel; arista with pile, length equaling at least half the width of arista at base; dorsal lobe of postgonite slender ..... ***C.* (*Cheilosia*) *vulpina*** (Meigen, 1822)
– Abdomen with yellow pile; parafacia broad, about two third as wide as postpedicel; arista nearly bare; dorsal lobe of postgonite broad basally, almost triangular in shape (Fig. 55C) .... ***C.* (*Cheilosia*) *pogonias*** sp. nov.

22. Large species with slender abdomen, body length ca 11–12 mm; metafemur ventrally covered with short black setae; legs black 23

– Smaller species with less slender abdomen, body length ca 10 mm; metafemur ventrally covered with short black pile; legs black or base of pro- and mesotibia dark yellow 24

23. Scutum and scutellum with pile of two lengths, both long and short pile; procoxa usually with yellow pile and setae only; tergum IV medially with adpressed pile, widening in posterior half, covering ca one third of tergum surface .....***C.* (*Cheilosia*) *variabilis*** (Panzer, 1798)
– Scutum and scutellum with long pile of one length (Fig. 14A); anterior part of procoxa with at least some black setae on apical half (Fig. 14C); tergum IV covered with erect pile, adpressed pile absent or restricted to posteromedial area, covering distinctly less than one third of tergum surface .... ***C.* (*Cheilosia*) *borjomi*** sp. nov.

24. Pile on arista at base almost as long as diameter of arista at base; apical half of posterior side of metatibia with yellow pile, basal half with black pile; long pile on dorsal margin of occiput behind dorsal margin of eyes black (Fig. 46B); at most basal one third of anterior long and short pile on metafemur yellow .....***C.* (*Cheilosia*) *melanopa*** (Zetterstedt, 1843)
– Pile on arista at base almost about as half as long as diameter of arista at base; posterior side of metatibia with yellow pile; long pile on dorsal margin of occiput behind dorsal margin of eyes predominantly or entirely yellow (Fig. 60E); at least basal 60% of anterior long and short pile on metafemur yellow ..... ***C.* (*Cheilosia*) *redi*** Vujić, 1996

25. Posterior margin of scutellum without setae 26
– Posterior margin of scutellum with setae, usually black, sometimes yellow 43

26. Dorsal and ventral pile patches on katepisternum widely separated 27
– Katepisternum continuously pilose 30

27. Basal three or four tarsomeres of protarsus yellow 28
– Protarsus black (Fig. 44A) .....***C.* (*Cheilosia*) *megaclama*** sp. nov. [part]

28. Arista black 29
– Arista with yellow or orange base (Fig. 48B) .....***C.* (*Cheilosia*) *nebulosa*** Verrall, 1871

29. Postpedicel ca 1.5 times as wide as high (Fig. 27B); angle of approximation of eyes less than 90°; frons not swollen, shiny, pruinose only narrowly along eye; usually very base up to basal one third of metafemur yellow .....***C.* (*Cheilosia*) *flavipes*** (Panzer, 1798)
– Postpedicel ca two times as wide as high (Fig. 16B); angle of approximation of eyes 100–110°; frons swollen and pruinose; base of metafemur black ..... ***C.* (*Cheilosia*) *brunnipennis*** Becker, 1894

30. Wing hyaline, or with an indistinct blackish spot in the middle; if pile on mesonotum and abdomen bicoloured, then not in the form of alternating bands of black and yellow piles 31
– Wing with a distinct blackish spot in the middle (Fig. 35C); large woolly species, mesonotum and abdomen with alternating pattern of black and pale (white and/or yellow and/or orange) pile bands (Fig. 35A, C) .....***C.* (*Floccocheila*) *illustrata portschinskiana*** Stackelberg, 1960

31. Ventral part of eye bare or with sparse, shorter pile; large species, 12–15 mm 32
– Eye entirely long pilose; large or smaller species 34

32. Pile on posterior anepisternum with wavy apex; face slightly pruinose 33
– Pile on posterior anepisternum with straight apex; face predominantly shiny (Fig. 50B) .... ***C.* (*Cheilosia*) *orthotricha*** Vujić & Claussen, 1994

33. Pile on arista about half the basal width of arista; apical segment of protarsus often darkened; for differences in genitalia see Stuke & Claussen (2000) .....***C.* (*Cheilosia*) *himantopus*** (Panzer, 1798)
– Pile on arista longer than the basal width of arista; protarsus often completely yellow; for differences in genitalia see Stuke & Claussen (2000) .....***C.* (*Cheilosia*) *canicularis*** (Panzer, 1801)

34. Postpedicel black 35
– At least basoventral corner of postpedicel orange 36

35. Metafemur yellow; eye with black pile (Fig. 33B); sterna pruinose; scutum with yellow pile .....***C.* (*Cheilosia*) *grossa*** (Fallén, 1817)
– Metafemur with black ring; eye with yellow or brown pile (Fig. 11B); sterna predominantly shiny; scutum with black pile .....***C.* (*Montanocheila*) *balu*** Violovitsh, 1966

36. Wing hyaline; apical sclerite of distiphallus with wide and large anterior lobes, posterior lobes missing (subgenus *Cheilosia*) 37
– Wing with brown pattern in the middle; apical sclerite of distiphallus with two pairs (anterior and posterior) of lobes (subgenus *Montanocheila*) 39

37. Pile on eye yellow; pile on eye shorter than postpedicel width (Fig. 4B) 38
– Pile on eye black; pile on eye very long, as long as or longer than postpedicel width (Fig. 9A) .....***C.* (*Cheilosia*) *aurantia*** sp. nov. [part]

38. Pile on anepimeron with wavy apex; face narrow, below antennae about ⅔ as wide as an eye at the same height; parafacia pruinose; katepisternal pile patches connected by wide long pile ....***C.* (*Cheilosia*) *albipila*** Meigen, 1838
– Pile on anepimeron straight or with bent apex; face wide, below antennae about as wide as an eye at the same height (Fig. 44D); parafacia shiny (Fig. 44D); katepisternal pile patches separated or connected by short pile .....***C.* (*Cheilosia*) *megaclama*** sp. nov. [part]

39. Surstylus long, approximately 3–5 times as long as wide (Figs 20B, 24D) 40
– Surstylus at most two times as long as wide (Fig. 63D) 41

40. Surstylus narrow, approximately five times as long as wide (Fig. 20D); a smaller species, body length 9–11 mm .....***C.* (*M.*) *chrysocoma*** (Meigen, 1822)
– Surstylus wider, approximately three times as long as wide (Fig. 24D); a larger species, body length 12–13.5 mm .....***C.* (*M.*) *contrasta*** sp. nov.

41. Larger species, ca 10.5–12.5 mm; face protruding (Fig. 63A); facial tubercle less developed; facial tubercle shiny, the area directly around it pruinose; anterodorsal pile on metafemur long and dense, almost two times as long as diameter of metafemur in ventral view 42
– Smaller species, ca 9.5–10 mm; face not protruding (Fig. 32A); facial tubercle well developed; face shiny around facial tubercle; anterodorsal pile on metafemur not dense and at most just over diameter of metafemur in ventral view .....***C.* (*M.*) *gorodkovi*** Stackelberg, 1963

42. Anterior part of procoxa with mixed black and yellow setae on apical half; dorsal lobe of postgonite erect and rectangular, as long as ventral lobe (Fig. 68E) ..... ***C.* (*M.*) *subpictipennis*** Claussen, 1998
– Anterior part of procoxa with only yellow setae on apical half; dorsal lobe of postgonite curved inwards and with black, widening, pointed apex, shorter than ventral lobe (Fig. 63C) ....***C.* (*M.*) *rufa*** sp. nov.

43. Proleg black or partly yellow, if partly yellow not only middle segments of protarsus yellow 44

– Proleg black except segments 2–4 of protarsus yellow (Fig. 5A) ..... ***C.* (*Cheilosia*) *albitarsis*** (Meigen, 1822)

44. Wing base yellow and/or procoxa basolaterally with a knob-like projection 45
– Wing base dark brown or black; procoxa basolaterally without a knob-like projection 46

45. Procoxa basolaterally without a knob-like projection (Fig. 37B); scutum rough and densely punctured; postpedicel black or only dark orange in ventral half, seldom bright orange; tergum III pruinose in anterior half, pruinosity not reaching posterior margin; sclerite of the distiphallus asymmetric (Fig. 37E) ..... ***C.* (*Cheilosia*) *inarmata*** sp. nov.
– Procoxa basolaterally with a knob-like projection (Fig. 37C); scutum finely punctured; postpedicel often at least partly bright orange (Fig. 65B); tergum III with pruinosity reaching posterior margin; sclerite of the distiphallus symmetric ..... ***C.* (*Cheilosia*) *schnabli*** Becker, 1894

46. Sterna II–IV shiny or only very slightly pruinose 47
– Sterna II–IV distinctly pruinose, at least anterior parts 60

47. Legs black 48
– Legs partly yellow, at least tibiae yellow at both ends 51

48. Wings hyaline or with brown tinge; posterior anepisternum at least slightly pruinose 49
– Anterior part of wing blackish (Fig. 1A, C); posterior anepisternum shiny ..... ***C.* (*Cheilosia*) *abagoensis*** Skufjin, 1979

49. Face not elongated, face between antennae and facial tubercle short; katepisternal piles widely separated; frons not swollen; scutum usually with mainly black pile; scutum shiny; parafacia broad over full length; surstylus with field of microtrichia on dorsal part 50
– Face elongated, with long straight part between antennae and facial tubercle (Fig. 61B); katepisternal piles almost continuously pilose (only true for populations in the Caucasus, see species account for more information); frons swollen; scutum with long black and white pile; scutum at least in central anterior part slightly pruinose; parafacia slender, ventral part slenderer than dorsal part; surstylus without field of microtrichia on dorsal part ..... ***C.* (*Cheilosia*) *rhynchops*** Egger, 1860

50. Larger species, 8.5–11.5 mm; frons along eye margins broadly pruinose; arista not thickened in basal half and about three times as long as postpedicel (Fig. 19A); sternum I pruinose; pile on dorsal part of eye short, ranging from whitish to dark brown (Fig. 19A) ..... ***C.* (*Cheilosia*) *caucasi*** sp. nov. [part]
– Smaller species, 6.5–8.5 mm; frons along eye margins very narrowly pruinose; arista thickened in basal half and just over two times as long as postpedicel (Fig. 30A); sternum I medially shiny or slightly pruinose; pile on dorsal part of eye black and very long (Fig. 30A) ..... ***C.* (*Cheilosia*) *gemmula*** sp. nov.

51. Dorsal and ventral pile patches on katepisternum widely separated; pile on eye not very long 52
– Katepisternum continuously pilose; pile on eye very long, as long as or longer than postpedicel width (Fig. 9A) ..... ***C.* (*Cheilosia*) *aurantia*** sp. nov. [part]

52. Eye entirely pilose 53
– Ventral part of eye bare (Fig. 12B) ..... ***C.* (*Cheilosia*) *bergenstammi*** Becker, 1894

53. Metatibia yellow at both ends; arista bare or with pile shorter than diameter of arista; postpedicel usually at least partly orange 54

– Metaleg black or only base of tibia narrowly yellow; arista with pile as long as or longer than width of arista; postpedicel usually black .....***C.* (*Cheilosia*) *mutabilis*** (Fallén, 1817)

54. Postpedicel about as wide as high; if a small, slender species, postpedicel partly bright orange .. 55
– Postpedicel elongate, about 1.5 times as wide as height, usually dark brown or dark brown with dark orange basoventral corner (Fig. 71B); small, slender species, 6–8 mm .... ***C.* (*Cheilosia*) *urbana*** (Meigen, 1822)

55. Sterna slightly pruinose 56
– Sterna shiny 57

56. Base of claws yellow, apex black; frons densely pruinose; parafacia narrow, about half as wide as width of postpedicel .....***C.* (*Cheilosia*) *uviformis*** Becker, 1894
– Claws black; frons shiny or indistinctly pruinose; parafacia broad, about 0.8 times as wide as width of postpedicel .....***C.* (*Cheilosia*) *psilophthalma*** Becker, 1894

57. Scutum without blue shine; pile on scutum varying from yellow to black; parafacia pruinose or shiny 58
– Scutum with blue shine; scutum covered largely with black pile; parafacia pruinose .... ***C.* (*Cheilosia*) *cynocephala*** Loew, 1840

58. Mesotarsus with basal two segments black or orange; metatibia with short pile only, pile shorter than tibia width; pale pile on terga whitish or yellowish 59
– Mesotarsus with basal two segments orange (Fig. 15A); metatibia with individual long black pile, longer than tibia width; terga entirely golden pilose (Fig. 15A) .... ***C.* (*Cheilosia*) *bracusi*** Vujić & Claussen, 1994

59. Body size 5–8 mm; frons not swollen; metasternum usually pilose; basal two tarsomeres of mesotarsus usually dorsally orange .....***C.* (*Cheilosia*) *vernalis*** (Fallén, 1817)
– Body size 8.8–9.5 mm; frons slightly swollen; metasternum bare; mesotarsus dorsally black (Fig. 21A) ..... ***C.* (*Cheilosia*) *confusa*** sp. nov.

60. Dorsal and ventral pile patches on katepisternum widely separated 61
– Katepisternum continuously pilose 64

61. Postpedicel at least at base brightly orange 62
– Postpedicel black 63

62. Base of claws yellow, apex black; frons densely pruinose; parafacia narrow, about half as wide as width of postpedicel .....***C.* (*Cheilosia*) *uviformis*** Becker, 1894
– Claws black; frons shiny or indistinctly pruinose; parafacia broad, about 0.8 times as wide as width of postpedicel .....***C.* (*Cheilosia*) *psilophthalma*** Becker, 1894

63. Abdomen without distinct pruinose spots; scutum shiny ..... ***C.* (*Cheilosia*) *caucasi*** sp. nov. [part]
– Abdomen with distinct pruinose spots (Fig. 67C); scutum pruinose or with large pruinose parts ....***C.* (*P.*) *semifasciata*** Becker, 1894

64. Face not very wide, below lunule narrower than an eye; face along parafacia in dorsal one third bare 65
– Face very wide, below lunule as wide as an eye; face along parafacia in dorsal one third covered with long pile (Fig. 25B) .....***C.* (*Convocheila*) *cumanica*** Szilády, 1938

65. Anterior anepisternum without pile on posterodorsal part 66
– Anterior anepisternum with pile on posterodorsal part ..... ***C.* (*Cheilosia*) *aerea*** Dufour, 1848

66. Scutum with long pile only, without field of short black pile on posterior part 67
– Besides long erect pile, scutum medially in posterior part also with field of short black pile (Fig. 75A) ..... ***C.* (*Cheilosia*) *vansteenisi*** sp. nov.

67. Legs black or at most base of protibia dark orange 68
– Legs partly yellow, at least pro- and mesotibia yellow at both ends 69

68. Large species, ca 11–13 mm; postpedicel ranging from blackish to orange (Fig. 53B); pile on terga II–IV with distinctive alternating black and white pile: pile on terga on anterior part in center white and erect, in posterior part black and erect ..... ***C.* (*Cheilosia*) *paragigantea*** Barkalov, 1993
– Smaller species, 9–10 mm; postpedicel black (Fig. 69B); terga with erect white pile and adpressed black pile ..... ***C.* (*Cheilosia*) *teberdensis*** Barkalov, 1993

69. Face in lateral view obviously concave between facial tubercle and postclypeus (Fig. 31B); postpedicel usually black; scutum finely punctured 70
– Face in lateral view almost flat between facial tubercle and postclypeus (Fig. 78B); postpedicel usually with at least basoventral part orange; scutum coarsely punctured ..... ***C.* (*Cheilosia*) *velutina*** Loew, 1840

70. Abdomen usually partly with black pile, usually at least sternum VIII with few black pile; facial tubercle well developed (Fig. 31B) 71
– Abdomen (including sternum VIII) usually with yellow pile only (Fig. 70A); facial tubercle poorly developed (Fig. 73A) ..... ***C.* (*Cheilosia*) *ushguliensis*** sp. nov.

71. Basal two thirds of metafemur with the anterodorsal pile longer than the anteroventral pile; dorsal lobe of postgonite with a more or less distinct hook on its dorsal margin (see Vujić *et al.* 2013: fig. 3d) ..... ***C.* (*Cheilosia*) *proxima*** (Zetterstedt, 1843)
– Basal two thirds of metafemur with the anterodorsal pile as long as or shorter than the anteroventral pile; dorsal lobe of postgonite without distinct hook (see Vujić *et al.* 2013: fig. 3e) ..... ***C.* (*Cheilosia*) *gigantea*** (Zetterstedt, 1838)

Females

1. Eye bare 2
– Eye pilose 23

2. Face around the facial tubercle bare 3
– Face around the facial tubercle pilose, pilosity as long as or longer than pile on parafacia (Fig. 40D) ..... ***C.* (*Cheilosia*) *latifrons*** (Zetterstedt, 1843) [part]

3. Protibia black 4
– Protibia yellow at base or yellow at base and apex 10

4. Lunule with distinct medial arm, separating acetabula (Fig. 45D) 5
– Lunule with reduced medial arm, acetabula joined forming an antennal fossa (Fig. 10E) 6

5. Tarsomeres 2–4 of protarsus yellow or brown, paler than tarsomeres 1 and 5; veins yellow in basal half of wing ..... ***C.* (*Cheilosia*) *albitarsis*** (Meigen, 1822)
– Protarsus black; veins of wing black ..... ***C.* (*Cheilosia*) *caucasi*** sp. nov. [part]

6. Scutum with erect pile 7
– Scutum with adpressed pile 8

7. Face narrow, at level of antennal base narrower than eye; parafacia pruinose (Fig. 43D) ..... ***C.* (*T.*) *lukashovae*** Barkalov, 1993
– Face broad, at level of antennal base as wide as an eye (Fig. 10E); parafacia shiny (Fig. 10E) ..... ***C.* (*T.*) *bakurianiensis*** Kuznetzov, 1987

8. Sterna II–IV densely pruinose 9
– Sterna II–IV shiny ..... ***C.* (*T.*) *nigripes*** (Meigen, 1822)

9. Posterior margin of scutellum with black setae ..... ***C.* (*T.*) *pollinifacies*** Stackelberg, 1968
– Posterior margin of scutellum without black setae ..... ***C.* (*T.*) *aenigmatosa*** Barkalov, 1993

10. Lunule with reduced medial arm, antennal fossa present (Fig. 10E) 11
– Lunule with distinct medial arm, acetabula separated (Fig. 45D) 16

11. Wings with cross-veins infuscated; ventral part of face protruding (Fig. 6B) 12
– Wings hyaline; ventral part of face not protruding (Fig. 42F) 13

12. Face only slightly protruding (Fig. 6B); haltere yellow; tarsi with tarsomeres dorsally brown or blackish; terga II–III shiny ..... ***C.* (*T.*) *armeniaca*** Stackelberg, 1960
– Face distinctly protruding (Fig. 41B); haltere with dark brown or black capitulum; tarsi with tarsomeres 2–4 yellow; terga II–III medially pruinose ..... ***C.* (*T.*) *longifacies*** sp. nov.

13. Pro- and mesofemur black, with narrow yellow apices; scutellum black or partly yellow 14
– Pro- and mesofemur yellow; scutellum entirely yellow ..... ***C.* (*E.*) *flavissima*** (Becker, 1894)

14. Facial tubercle broad, semicircular in dorsal view (Fig. 66E) 15
– Facial tubercle narrow, almost conical in dorsal view (Fig. 52E) ..... ***C.* (*E.*) *longula*** (Zetterstedt, 1838)

15. Anterior anepisternum with long pile on posterodorsal part; postpedicel usually bright orange (Fig. 64D) ..... ***C.* (*E.*) *ruffipes*** (Preyssler, 1793)
– Anterior anepisternum bare, without long pile on posterodorsal part; postpedicel variable, ranging from dark orange to dark brown (Fig. 66D) ..... ***C.* (*E.*) *scutellata*** (Fallén, 1817)

16. Face in dorsal third along parafacia covered with long whitish pile; pile on parafacia very long (Fig. 25D); postpedicel large to very large, orange, distinctly darkened in apical part (Figs 25D, 39D); face with dense grey pruinosity 17
– Face in dorsal third along parafacia bare; pile on parafacia shorter (Fig. 27D); when postpedicel very large and orange, face shiny and postpedicel without darkened apical part (Fig. 52D) 18

17. Lunule bare and shiny mediodorsally; occiput with long yellow pile only (Fig. 39D); scutellum on posterior margin with weak, yellow setae ..... ***C.* (*Convocheila*) *laticornis*** Rondani, 1857
– Lunule pruinose mediodorsally; occiput, besides long yellow pile, also with few long black pile (Fig. 25D); scutellum on posterior margin with robust black setae ..... ***C.* (*Convocheila*) *cumanica*** Szilády, 1938

18. Postpedicel very large, bright orange (Fig. 52D); sterna shiny; parafacia narrow ..... ***C.* (*Cheilosia*) *pagana*** (Meigen, 1822)
– Without combination of postpedicel very large and bright orange, sterna shiny and parafacia narrow 19

19. Femora black, only apices narrowly yellow 20
– Femora yellow ..... ***C.* (*Cheilosia*) *flavipes*** (Panzer, 1798)

20. Arista bare or with short pile, pile shorter than width of arista at base; postpedicel predominantly orange 21
– Arista with long pilosity, longer than or almost equal to the width of arista at base (Fig. 47D); postpedicel black or only orange at basoventral corner ..... ***C.* (*Cheilosia*) *mutabilis*** (Fallén, 1817) [part]

21. Posterior margin of scutellum without black setae; parafacia very broad (cf. Fig. 45D); eye bare ..22
– Posterior margin of scutellum with black setae; parafacia narrow; eye with short sparse pile that can easily be overlooked ..... ***C.* (*Cheilosia*) *uviformis*** Becker, 1894 [part]

22. Tibiae yellow with indistinct black ring in the middle; tarsi dorsally predominantly yellow ..... ***C.* (*Cheilosia*) *atypica*** Barkalov, 1993 (male unknown)
– Tibiae yellow with distinct black ring in the middle (Fig. 45C); tarsi dorsally predominantly black (Fig. 45C) ..... ***C.* (*Cheilosia*) *megaclama*** sp. nov.

23. Face around facial tubercle pilose, pile as long as or longer than pile on parafacia 24
– Face around facial tubercle bare 33

24. Scutellum without setae along posterior margin 25
– Scutellum with setae along posterior margin 26

25. A small species, body length ca 7–9 mm; parafacia broad; eye with sparse pile (Fig. 40B) ..... ***C.* (*Cheilosia*) *latifrons*** (Zetterstedt, 1843) [part]
– A large species, body length ca 12–13 mm; parafacia narrow; eye with long, dense pile (Fig. 58B) ..... ***C.* (*Cheilosia*) *pseudogrossa*** Stackelberg, 1968

26. Setae on posterior margin of scutellum long, longer than length of scutellum; colour of tibia ranging from black to yellow at both ends 27
– Setae on posterior margin of scutellum short, shorter than length of scutellum; tibiae black with basal part yellow, apex black (Fig. 38C) ..... ***C.* (*Cheilosia*) *lasiopa*** Kowarz, 1885

27. Wing base dark brown or black 28
– Wing base yellow (Fig. 70C) ..... ***C.* (*Cheilosia*) *transcaucasica*** Stackelberg, 1960

28. Metatibia entirely with yellow pile; usually protibia and mesotibia yellow at both ends 29
– Metatibia posterolaterally largely or entirely with yellow pile, anterolaterally with black pile; tibiae completely black, or with a yellow base, or both ends dark orange 31

29. Tergum IV almost entirely or entirely with yellow pile 30
– Tergum IV centrally with black pile ..... ***C.* (*Cheilosia*) *vulpina*** (Meigen, 1822)

30. Occiput behind dorsal eye corners shiny or slightly pruinose; occiput with short and sparse long yellow pile behind dorsal margin of eye (Fig. 60F); metafemur anteriorly and posteroventral with short yellow pile; pile on arista about half as long as width of arista at base ..... ***C.* (*Cheilosia*) *redi*** Vujić, 1996
– Occiput entirely pruinose; occiput with short yellow and sparse long black pile behind dorsal margin of eye (Fig. 55B); metafemur anteriorly and posteroventral with long pile, at least as long as width of metafemur; pile on arista shorter than half the width of arista at base ..... ***C.* (*Cheilosia*) *pogonias*** sp. nov.

31. Posterior anepisternum pruinose 32
– Ventral part of posterior anepisternum shiny ..... ***C.* (*Cheilosia*) *variabilis*** (Panzer, 1798)

32. Scutum with short semi-adpressed pile, this pile usually predominantly black and with longer erect sparse black pile intermixed (Fig. 14B); tibiae usually black or only very base dark orange to blackish ..... ***C.* (*Cheilosia*) *borjomi*** sp. nov.
– Scutum with short erect predominantly yellow pile and with longer erect sparse black pile intermixed; often base of tibiae dark orange ..... ***C.* (*Cheilosia*) *melanopa*** (Zetterstedt, 1843)

33. Posterior margin of scutellum without setae 34
– Posterior margin of scutellum with setae, usually black, sometimes yellow 47

34. Dorsal and ventral pile patches on katepisternum widely separated 35
– Katepisternum continuously pilose 36

35. Arista black ..... ***C.* (*Cheilosia*) *brunnipennis*** Becker, 1894
– Arista with yellow or orange base (Fig. 48D) ..... ***C.* (*Cheilosia*) *nebulosa*** Verrall, 1871

36. Wing hyaline, or with an indistinct blackish spot in the middle; if pile on mesonotum and abdomen bicoloured, then not in the form of alternating bands of black and yellow piles 37
– Wing with a distinct blackish spot in the middle (Fig. 35C); large woolly species, mesonotum and abdomen with alternating pattern of black and pale (white and/or yellow and/or orange) pile bands (Fig. 35A, C) ..... ***C.* (*Floccocheila*) *illustrata portschinskiana*** Stackelberg, 1960

37. Ventral part of eye bare or with sparse, shorter pile; large species, 12–15 mm 38
– Eye entirely long pilose; large or smaller species 40

38. Pile on posterior anepisternum with wavy apex; face slightly pruinose 39
– Pile on posterior anepisternum with straight apex; face predominantly shiny (Fig. 50D) .... ***C.* (*Cheilosia*) *orthotricha*** Vujić & Claussen, 1994

39. Pile on arista about half the basal width of arista; posterior margin of tergum III with thin incomplete adpressed pile; posterior third of tergum IV with scattered semi-erect pile; scutum centrally with white pile only ..... ***C.* (*Cheilosia*) *himantopus*** (Panzer, 1798)
– Pile on arista longer than the basal width of arista; posterior margin of tergum III with dense band of adpressed pile; posterior third of tergum IV with dense adpressed pile; scutum centrally in posterior half with variable black pile ..... ***C.* (*Cheilosia*) *canicularis*** (Panzer, 1801)

40. Postpedicel black 41
– At least basoventral corner of postpedicel orange 42

41. Metafemur yellow; eye with black pile (Fig. 33D); sterna pruinose .... ***C.* (*Cheilosia*) *grossa*** (Fallén, 1817)
– Metafemur with black ring; eye with yellow or brown pile (Fig. 11D); sterna predominantly shiny ..... ***C.* (*Montanocheila*) *balu*** Violovitsh, 1966

42. Wing hyaline; femora orange 43
– Wing with brown pattern in the middle; femora black except apices narrowly yellow 44

43. Pile on anepimeron with wavy apex; pile on eye yellow (Fig. 4D) .... ***C.* (*Cheilosia*) *albipila*** Meigen, 1838
– Pile on anepimeron straight; at least dorsal half of pile on eye dark brown or black (Fig. 9B) .... ***C.* (*Cheilosia*) *aurantia*** sp. nov. [part]

44. Posterior margin of tergum V not rounded 45
– Posterior margin of tergum V rounded ..... ***C.* (*M.*) *chrysocoma*** (Meigen, 1822)

45. Face protruding (Fig. 63B); pile on scutellum longer than diameter of metafemur; metafemur anteroventrally with pile longer than diameter of metafemur 46
– Face not protruding (Fig. 32F); pile on scutellum shorter than diameter of metafemur; metafemur anteroventrally with pile shorter than diameter of metafemur ..... ***C.* (*M.*) *gorodkovi*** Stackelberg, 1963

46. Pile on terga III–V black (Fig. 23C–D) ..... ***C.* (*M.*) *contrasta*** sp. nov.
– Pile on terga III–V yellow or orange (Fig. 62C–D) ..... ***C.* (*M.*) *subpictipennis*** Claussen, 1998 & ***C.* (*M.*) *rufa*** sp. nov.

47. Wing base yellow and/or procoxa basolaterally with a knob-like projection 48
– Wing base dark brown or black; procoxa basolaterally without a knob-like projection 49

48. Procoxa basolaterally without a knob-like projection (Fig. 37B); scutum rough and densely punctured; postpedicel black or only dark orange in ventral half, seldom bright orange; pile on scutum short and adpressed (Fig. 36D) ..... ***C.* (*Cheilosia*) *inarmata*** sp. nov.
– Procoxa basolaterally with a knob-like projection (Fig. 37C); scutum finely punctured; postpedicel often at least partly bright orange (Fig. 65D); scutum with semi-adpressed short pile mixed with some longer pile ..... ***C.* (*Cheilosia*) *schnabli*** Becker, 1894

49. Sterna II–IV shiny or only very slightly pruinose 50
– Sterna II–IV distinctly pruinose, at least anterior parts 64

50. Legs black 51
– Legs partly yellow, at least tibiae yellow at both ends 54

51. Wings hyaline or with brown tinge; posterior anepisternum at least slightly pruinose 52
– Anterior part of wing blackish (Fig. 1A, C); posterior anepisternum shiny ..... ***C.* (*Cheilosia*) *abagoensis*** Skufjin, 1979

52. Larger species, 8.5–11.5 mm; pile on scutum adpressed or semi-adpressed; arista not thickened in basal half and about three times as long as postpedicel 53
– Smaller species, 6.5–8.5 mm; pile on scutum long and erect (Fig. 29C); arista thickened in basal half and just over two times as long as postpedicel (Fig. 30B) ..... ***C.* (*Cheilosia*) *gemmula*** sp. nov.

53. Face elongated (Fig. 61D); katepisternal piles almost continuously pilose (only true for population in the Caucasus, see species account for more information); scutum with adpressed mainly golden pile; postpedicel dark orange in basoventral corner ..... ***C.* (*Cheilosia*) *rhynchops*** Egger, 1860
– Face not elongated (Fig. 19B); katepisternal piles widely separated; colour of pile on scutum variable; postpedicel black ..... ***C.* (*Cheilosia*) *caucasi*** sp. nov. [part]

54. Femora predominantly black; dorsal and ventral pile patches on katepisternum widely separated 55
– Femora yellow; katepisternum continuously pilose ..... ***C.* (*Cheilosia*) *aurantia*** sp. nov. [part]

55. Eye entirely pilose 56
– Ventral part of eye bare (Fig. 12D) ..... ***C.* (*Cheilosia*) *bergenstammi*** Becker, 1894

56. Metaleg black or only base of tibia narrowly yellow; arista with pile as long as or longer than width of arista; postpedicel usually black 57
– Metatibia yellow at both ends; arista bare or with pile shorter than diameter of arista; postpedicel usually at least partly orange 58

57. Abdomen medially with predominantly black pile; sterna II–IV shiny ..... ***C.* (*Cheilosia*) *mutabilis*** (Fallén, 1817) [part]
– Abdomen with yellow pile; sterna II–IV pruinose on anterior half, shiny on posterior half ..... ***C.* (*Pollinocheila*) *semifasciata*** Becker, 1894 [part]

58. Postpedicel about as wide as high; if a small, slender species, postpedicel partly bright orange 59
– Postpedicel elongate, about 1.5 times as wide as height, usually dark brown or dark brown with dark orange basoventral corner (Fig. 71D); small, slender species, 6–8 mm ..... ***C.* (*Cheilosia*) *urbana*** (Meigen, 1822)

59. Sterna slightly pruinose 60
– Sterna shiny 61

60. Base of claws yellow, apex black; eye almost bare (Fig. 74D) ..... ***C.* (*Cheilosia*) *uviformis*** Becker, 1894 [part]
– Claws black; eye with distinct pile (Fig. 59E) ..... ***C.* (*Cheilosia*) *psilophthalma*** Becker, 1894

61. Scutum without blue shine; pile on scutum varying from yellow to black; parafacia pruinose or shiny; wings brownish without blackish cloud 62
– Scutum with blue shine; scutum covered largely with black pile; parafacia pruinose; usually wings brownish with a faint, blackish cloud ..... ***C.* (*Cheilosia*) *cynocephala*** Loew, 1840

62. Mesotarsus with basal two segments black or orange; tibiae with distinct black rings 63
– Mesotarsus with basal two segments orange; tibiae entirely orange, or only with traces of black rings ..... ***C.* (*Cheilosia*) *bracusi*** Vujić & Claussen, 1994

63. Body size 7 mm; pile on scutum semi-adpressed; posterior anepisternum shiny; metasternum pilose; basal two tarsomeres of mesotarsus usually dorsally orange ..... ***C.* (*Cheilosia*) *vernalis*** (Fallén, 1817)
– Body size 8 mm; pile on scutum erect; posterior anepisternum lightly pruinose; metasternum bare or with one or two pili only; mesotarsus dorsally black (Fig. 21C) ..... ***C.* (*Cheilosia*) *confusa*** sp. nov.

64. Dorsal and ventral pile patches on katepisternum widely separated 65
– Katepisternum continuously pilose 67

65. Postpedicel at least at base brightly orange 60
– Postpedicel black 66

66. Scutum with mixed black and yellow or predominantly black semi-adpressed pile (Fig. 18C); Sterna II–IV shiny or only slightly pruinose ..... ***C.* (*Cheilosia*) *caucasi*** sp. nov. [part]
– Scutum with erect golden pile; sterna II–IV at least on anterior part distinctly pruinose ..... ***C.* (*P.*) *semifasciata*** Becker, 1894 [part]

67. Anterior anepisternum without pile on posterodorsal part 68
– Anterior anepisternum with pile on posterodorsal part ..... ***C.* (*Cheilosia*) *aerea*** Dufour, 1848

68. Scutum not with short semi-adpressed almost exclusively yellow pile; frons shiny or only pruinose in anterolateral corner 69
– Scutum with short semi-adpressed almost exclusively yellow pile (Fig. 75C); anterior part of frons, i.e., above lunule, pruinose ..... ***C.* (*Cheilosia*) *vansteenisi*** sp. nov.

69. Legs black or at most base of protibia dark orange 70
– Legs partly yellow, at least pro- and mesotibia yellow at both ends 71

70. Large species, ca 11–13 mm; postpedicel ranging from blackish to orange (Fig. 53D); pile on scutum black ..... ***C.* (*Cheilosia*) *paragigantea*** Barkalov, 1993
– Smaller species, 9–10 mm; postpedicel black (Fig. 69D); scutum with short mainly yellow pile and longer black pile ..... ***C.* (*Cheilosia*) *teberdensis*** Barkalov, 1993

71. Face in lateral view obviously concave between facial tubercle and postclypeus (Fig. 31D); postpedicel usually black; scutum finely punctured 72
– Face in lateral view almost flat between facial tubercle and postclypeus (Fig. 78D); postpedicel usually with at least basoventral part orange; scutum coarsely punctured .... ***C.* (*Cheilosia*) *velutina*** Loew, 1840

72. Tergum III medially and anterior part of tergum IV pruinose; pile on scutum often partly black and semi-adpressed 73
– Terga III–IV shiny, except pruinose along anterior margin of tergum III; scutum with erect golden pile (Fig. 72A) ..... ***C.* (*Cheilosia*) *ushguliensis*** sp. nov.

73. Metafemur without anteroventral pile, occasionally with few individual pile anteroventrally which are shorter than, or rarely as long as, the diameter of the metafemur; apex of the metafemur ventrally most often without black setae ..... ***C.* (*Cheilosia*) *proxima*** (Zetterstedt, 1843)
– Basal two thirds of metafemur with the anteroventral pile long, usually obviously longer than diameter of metafemur; apex of metafemur ventrally with some black setae .... ***C.* (*Cheilosia*) *gigantea*** (Zetterstedt, 1838)

Discussion

Our updated checklist of the species of *Cheilosia* present in the Caucasus comprises 68 species and includes 14 species new to science. In terms of subgeneric division, there are 46 species of the subgenus *Cheilosia*, two in *Convocheila*, four in *Eucartosyrphus*, one in *Floccocheila*, six in *Montanocheila*, one in *Pollinocheila* and eight in *Taeniochilosia*. Based on the current knowledge and evidence, we remove twelve species from the checklist, whose presence in the Caucasus Region might need corroboration based on new records. Additionally, for *C. chrysocoma* the study of the referenced material or new material is needed to confirm its presence.

In the previous checklist for the region, Barkalov (1993) reported 48 species. Taxonomic changes between publications make direct comparison of the lists difficult, but the increase in the number of species in our checklist is mainly due to the description of 14 new species in this publication and the discovery of several species new to the region during our field expeditions. New species reported for the Caucasus Region are *C. balu* (Georgia), *C. cynocephala* (Georgia), *C. gorodkovi* (Armenia, Georgia), C. *himantopus* (Georgia), *C. nebulosa* (Georgia), *C. orthotricha* (Georgia), *C. subpictipennis* (Georgia) and *C. uviformis* (Georgia). Furthermore, we provide the first records of *C. latifrons*, *C. longula*, *C. lukashovae*, *C. semifasciata* from Georgia, and the first records of *C. bakurianiensis* and *C. teberdensis* from Armenia. In addition, we consider *Cheilosia circassica* Ståhls & Barkalov, 2017 a junior synonym of *Cheilosia armeniaca* Stackelberg, 1960 (syn. nov.).

The taxonomic composition of the genus *Cheilosia* at the subgeneric level in Georgia is clearly different from that in the Alps (here restricted to Austria, France, Germany, Switzerland and Italy), the most extensive mountain range system in Europe with an elevation range comparable to that of Caucasus. Based on Speight (2020a), 92 species of *Cheilosia* are found in and near the Alps in these countries, with 31 species belonging to the subgenus *Taeniochilosia* (34%). In the Caucasus Region, eight *Taeniochilosia* (12%) are found among the 68 species of *Cheilosia* reported so far. It thus appears that this subgenus has radiated in the Alps into a speciose group comprising one third of the *Cheilosia* diversity, but much less so in the Caucasus.

In our goal to genetically diagnose the Caucasian species of *Cheilosia* we sequenced specimens from other regions to compare their DNA barcodes. Most of the sequencing was possible thanks to the Caucasus Barcode of Life project (CaBOL) (Thormann *et al*. 2019; Mengual *et al*. 2020). We sequenced 699 new DNA barcodes for species of *Cheilosia* and compiled a total of 874 *Cheilosia* barcodes from 84 different species from 28 different countries. Four DNA barcodes come from GBOL, one is private, and 164 were downloaded from BOLD. All of them can be found in BOLD (https://www.boldsystems.org/) under the data set DS-CHEICAUC (https://doi.org/10.5883/DS-CHEICAUC). In terms of Caucasian specimens, we successfully sequenced 63 *Cheilosia* individuals from Armenia, 396 specimens from Georgia, and 23 from Northern Caucasus (Russia). Our effort to diagnose genetically the species of *Cheilosia* found in the Caucasus Region is visually summarized in the Supp. file 1: Fig. S1.

Based on the NJ tree, we observe that the majority of the species can be unequivocally diagnosed by means of DNA barcodes, with the exception of certain species pairs, namely *C. armeniaca–C. longifacies* sp. nov., *C. aenigmatosa–C. ouwehandae* sp. nov., *C. illustrata–C. motodomariensis*, *C. contrasta* sp. nov.*–C. rufa* sp. nov., *C. canicularis–C. himantopus*, *C. caucasi* sp. nov.*–C. abagoensis*, and some species groups where some taxa are resolved in a single cluster, but without enough genetic differentiation from other species, such as *C. vicina–C. sahlbergi–C. impudens–C. nigripes*, *C. inarmata* sp. nov.*–C. impressa–C. transcaucasica* (part), *C. grossa–C. pseudogrossa–C. albipila*, *C. lenta–C. rhynchops–C. andalusiaca–C. siciliana*, and the large group comprising *C. vernalis–C.* sp.*–C. confusa* sp. nov.*–C. triamilia–C. gemmula* sp. nov.*–C. melanura–C. bracusi*. It is interesting to see that the members of some of these species pairs are clearly distinct morphologically, such as *C. armeniaca–C. longifacies* sp. nov., *C. aenigmatosa–C. ouwehandae*, *C. contrasta* sp. nov.*–C. rufa* sp. nov., or *C. caucasi* sp. nov.*–C. abagoensis*.

For several species of *Cheilosia* we observed high morphological diversity in the Caucasian populations, not as gradients but rather as different trait states. For example, we found atypical specimens with a pilose face for *C. aurantia* sp. nov., *C. caucasi* sp. nov. and *C. nigripes* and strong leg colour variation in *C. albipila* and *C. aurantia.*

Of the 68 species of *Cheilosia* occurring in the Caucasus, 25 species (37%) is endemic for the Caucasus region. For several species we collected one or two specimens only (e.g., *C. cynocephala*, *C. ouwehandae* sp. nov., *C. pseudogrossa*, *C. vansteenisi* sp. nov.) despite multiple visits, making us think that the actual number of species of *Cheilosia* probably is higher, and new species for science and/or the region may still be awaiting discovery.

Acknowledgements

We thank Janne Ouwehand for joining the 2018 and the 2021 expedition. We thank Jeroen van Steenis and Lenze Hofstee for joining the 2019 expedition and Lenze Hofstee and Wout Opdekamp for joining the 2023 expedition and giving access to their collected material. We thank Jana Thormann (ZFMK) for all the help in the molecular lab and her technical assistance with BOLD, and Björn Rulik and Nils Hein (ZFMK) for helping in the field and with the Caucasian bureaucracy. We thank Tinatin

Chkhartishvili, Shota Japarashvili, Giorgi Iankoshvili and all other students and professors of the Ilia State University (ISU), Marine Dallakyan (National Academy of Sciences of Armenia) and George Japoshvili (Agricultural University of Georgia) for joining us in the field and helping us to obtain the necessary collecting permits. We thank Bernhard Misof (ZFMK), David Tarkhnishvili (ISU) and Levan Mumladze (ISU) for making possible this collaboration. We thank Gunilla Ståhls for proving sequences and Iván Ballester-Torres for proving the sequences of *C. cynocephala*.

We are very thankful to Andrey A. Przhiboro for letting us study his material from Northern Caucasus, and to Olga Ovtshinnikova for providing images of the type material deposited at the Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia.

The expedition in 2018 by XM was funded through the German Federal Ministry of Education and Research (BMBF) under grant number 01DK17048, within the GGBC project. Expeditions in 2019 and 2022 by XM were carried out within the CaBOL project (https://ggbc.eu/). The CaBOL project on which this study is based was funded by the German Federal Ministry of Education and Research under the grant number 01DK20014A. The responsibility for the content of this publication lies with the authors.

Our field work was possible with the permits from the Agency of Protected Areas and the Ministry of Environment Protection and Agriculture of Georgia (numbers 1452-0-2-201905011744, 4654-01-2-201905081440, 3043-01-2-202103261716, 889-0-2-202303291450 and 3235-01-2-202302011513), and the Letter 2/29.7/1803 of the Ministry of Environment of the Republic of Armenia, and the Certificate N–2459-73a of the National Academy of Sciences of the Republic of Armenia.

References

Ahrens D., Ahyong S. T., Ballerio A., Barclay M.V.L., Eberle J., Espeland M., Huber B.A., Mengual X., Pacheco T.L., Peters R.S., Rulik B., Vaz-de-Mello F., Wesener T. & Krell F.T. 2021. Is it time to describe new species without diagnoses? A comment on Sharkey et al. (2021). *Zootaxa* 5027 (2): 151–159. https://doi.org/10.11646/zootaxa.5027.2.1

Ballester-Torres I., Nedeljković Z., Aguado-Aranda P., Vujić A., Marcos-García M.Á. & Ricarte A. 2024. Resolving the taxonomy of mountain Syrphidae (Diptera) in the Iberian Peninsula: The species group of *Cheilosia melanura* Becker, 1894. *Insects* 15: 640. https://doi.org/10.3390/insects15090640

Barkalov A.V. 1981. Taxonomy of species closely allied to *Cheilosia illustrata*. *Izvestiya Sibirskogo otdeleniya Akademii Nauk SSSR. Seriya Biologicheskikh Nauk* 3: 112–116.

Barkalov A.V. 1993. Hover flies of the genus *Cheilosia* Meigen, 1822 (Diptera, Syrphidae) of the Caucasus. *Entomologicheskoe Obozrenie* 72 (3): 698–727. [in Russian; English version published in: Barkalov A.V. 1994. Hover flies of the genus *Cheilosia* Meigen, 1822 (Diptera, Syrphidae). *Entomological Review* 73 (5): 28–58.]

Barkalov A.V. 2002. A subgeneric classification of the genus *Cheilosia* Meigen, 1822 (Diptera, Syrphidae). *Entomologicheskoe Obozrenie* 81 (1): 218–234. [in Russian; English version published in: Barkalov A.V. 2002. Subgeneric classification of the genus *Cheilosia* Meigen, 1822 (Diptera, Syrphidae). *Entomological Review* 82 (5): 518–531.]

Barkalov A.V. 2007. A new species, a new synonym, and new records of the hover-fly genus *Cheilosia* Meigen (Diptera, Syrphidae). *Entomological Review* 87: 368–375. https://doi.org/10.1134/S0013873807030104

Barkalov A.V. & Mutin V. 2018. Checklist of the hover-flies (Diptera, Syrphidae) of Russia. *Euroasian Entomological Journal* 17 (6): 466–510. https://doi.org/10.15298/euroasentj.17.6.12

Barkalov A.V. & Ståhls G. 1997. Revision of the Palaearctic bare-eyed and black-legged species of the genus *Cheilosia* Meigen (Diptera, Syrphidae). *Acta Zoologica Fennica* 208: 1–74.

Bartsch H., Binkiewicz E., Klintbjer A., Rådén A. & Nasibov E. 2009. *Nationalnyckeln till Sveriges flora och fauna. Tvåvingar: Blomflugor: Eristalinae & Microdontinae. Diptera: Syrphidae: Eristalinae & Microdontinae*. Artdatabanken, SLU, Uppsala.

Becker T. 1894. Revision der Gattung *Chilosia* Meigen. *Nova Acta Academiae Caesareae Leopoldino-Carolinae Germanicae Naturae Curiosorum* 62 (3): 195–524. https://doi.org/10.5962/bhl.title.10472

Bot S. & Van de Meutter F. 2019. *Veldgids Zweefvliegen*. KNNV publishing, Zeist.

Bot S. & Van de Meutter F. 2023. *Hoverflies of Britain and North-west Europe*. Bloomsbury publishing Plc, London.

Brădescu V. 1991. Les Syrphides de Roumanie (Diptera, Syrphidae). Clés de détermination et répartition. *Travaux du Muséum national d'Histoire naturelle "Grigore Antipa"* 31: 7–83.

Brown R.W. 1956. *Composition of Scientific Words*. Smithsonian Books, Washington.

Claussen C. 1998. Die europäischen Arten der *Cheilosia alpina*-Gruppe (Diptera, Syrphidae). *Bonner zoologische Beiträge* 47 (3–4): 381–410.

Claussen C. & Doczkal D. 1998. Eine neue Art der Gattung *Cheilosia* Meigen, 1822 (Diptera, Syrphidae) aus den Zentralalpen. *Volucella* 3: 1–13.

Claussen C. & Speight M.C.D. 1999. On the identity of *Cheilosia ruralis* (Meigen, 1822) (Diptera, Syrphidae) – with a review of its synonymies. *Volucella* 4 (1/2): 93–102.

Claussen C. & Speight M.C.D. 2007. Names of uncertain application and some previously unpublished synonyms, in the European *Cheilosia* fauna (Diptera, Syrphidae). *Volucella* 8: 73–86.

Claussen C. & Thompson F.C. 1996. Zur Identität und Synonymie der von Camillo Rondani beschriebenen *Cheilosia*-Arten (Diptera, Syrphidae). *Studia Dipterologica* 3 (2): 275–281.

Claussen C. & Vujić A. 1995. Eine neue Art der Gattung *Cheilosia* Meigen aus Mitteleuropa (Diptera: Syrphidae). *Entomologische Zeitschrift* 105: 77–85.

Doczkal D. 2000. Description of *Cheilosia ranunculi* spec.nov. from Europe, a sibling species of *C. albitarsis* Meigen (Diptera, Syrphidae). *Volucella* 5: 63–78.

Dufour L. 1848. Histoire des métamorphoses de *Cheilosia aerea*. *Annales de Sciences naturelles. Zoologie* (3) 9: 205–209. Available from https://www.biodiversitylibrary.org/page/14490984 [accessed 21 Oct. 2023].

Egger J. 1860. Dipterologische Beiträge. *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien* 10: 339–358.
Available from https://www.biodiversitylibrary.org/page/11714659 [accessed 21 Oct. 2023].

Evenhuis N. & Pape T. 2023. Syrphidae. Systema Dipterorum, version 4.4.
Available from http://www.diptera.org/Nomenclator [accessed 21 Oct. 2023].

Fallen C.F. 1817. Syrphici Sveciae. In: *Diptera Sveciae*: 1–62. Berlingianis, Lund.
https://doi.org/10.5962/bhl.title.10586

Francuski Lj., Vujić A., Kovačević A., Ludoški J. & Milankov V. 2009. Identification of the species of the *Cheilosia variabilis* group (Diptera, Syrphidae) from the Balkan Peninsula using wing geometric morphometrics, with the revision of status of *C. melanopa redi* Vujić, 1996. *Contributions to Zoology* 78 (3): 129–140. https://doi.org/10.1163/18759866-07803004

Gibson J.F., Kelso S., Jackson M.D., Kits J.H., Miranda G.F.G. & Skevington J.H. 2011. Diptera-specific polymerase chain reaction amplification primers of use in molecular phylogenetic research. *Annals of the Entomological Society of America* 104: 976–997. https://doi.org/10.1603/AN10153

Gujabidze M. 2002. Syrphidae (Diptera, Syrphidae) of Georgia. *Proceedings of the Institute of Zoology, Tbilisi* 21: 240–250.

Hebert P.D.N., Cywinska A., Ball S.L. & deWaard J.R. 2003a. Biological identifications through DNA barcodes. *Proceedings of the Royal Society of London B* 270: 313–321. https://doi.org/10.1098/rspb.2002.2218

Hebert P.D.N., Ratnasingham S. & DeWaard J.R. 2003b. Barcoding animal life: Cytochrome C oxidase subunit 1 divergences among closely related species. *Proceedings of the Royal Society of London B* 270: S96–S99. https://doi.org/10.1098/rsbl.2003.0025

Khaganinia S. & Kazerani F. 2014. A review of the genus *Cheilosia* (Diptera, Syrphidae) from Iran. *Vestnik Zoologii* 48 (5): 401–410. https://doi.org/10.2478/vzoo-2014-0048

Khaghaninia S., Vosughian M. & Kazerani F. 2012. Faunistic study of the genus *Cheilosia* Meigen, 1822 (Diptera: Syrphidae) in the south-eastern valleys of the Sahand mountain chain, East Azerbaijan Province, Iran. *Calodema* 238: 1–6.

Kowarz F. 1885. Beiträge zu einem Verzeichniss der Dipteren Böhmens. V. *Wiener entomologische Zeitung* 4: 201–208. Available from https://www.biodiversitylibrary.org/page/12081274 [accessed 21 Oct. 2023].

Kuznetzov S.Y. 1987. New data on the systematics of the Palaearctic hover-flies (Diptera, Syrphidae). *Entomologicheskoe obozrenie* 66: 419–435.

Kuznetzov S.Y. 1997. Five new Palaearctic Syrphidae. *International Journal of Dipterological Research* 5: 231–238.

Kuznetzov S.Y. & Lyubvina I.V. 2001. To the hover-flies fauna of the Zhigulevsky Nature Reserve (Diptera, Syrphidae). *International Journal of Dipterological Research* 12 (4): 253–267.

Loew H. 1840. Bemerkungen uber die in der Posener Gegend einheimischen Arten mehrerer Zweiflugler = Gattungen. [Zu der] offentlichen Prufung der Schuler des Koniglichen Friedrich-Wilhelms-Gymnasiums zu Posen 1840.

Loew H. 1858. Die europäischen Arten der Gattung *Cheilosia*. *Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien* 7 [1857]: 579–616.
Available from https://www.biodiversitylibrary.org/page/26520439 [accessed 21 Oct. 2023].

Lucas J.A.W., Nielsen T.R. & Stahls G. 1995. The identity of the *Cheilosia* complex *vicina* (Zetterstedt, 1849) – *nigripes* (Meigen, 1822) (Diptera, Syrphidae). *International Journal of Dipterological Research* 6: 3–7.

Lyubvina I.V. 2019. The list of short-horned flies (Diptera, Brachycera) of the Zhiguli Reserve. Version 1.3. I.I. Sprygin Zhiguli State Nature Biosphere Reserve. Checklist dataset. https://doi.org/10.15468/skqldm [accessed via GBIF.org 23 Apr. 2024].

Marshall S.A. 2012. *Flies: The Natural History and Diversity of Diptera*. Firefly Books, New York.

Meier R., Blaimer B.B., Buenaventura E., Hartop E., von Rintelen T., Srivathsan A. & Yeo D. 2022. A re-analysis of the data in Sharkey et al.'s (2021) minimalist revision reveals that BINs do not deserve names, but BOLD Systems needs a stronger commitment to open science. *Cladistics* 38 (2): 264–275. https://doi.org/10.1111/cla.12489

Meigen J.W. 1822. *Systematische Beschreibung der bekannten europaischen zweiflugeligen Insekten*. *Dritter Theil*. Schulz-Wundermann, Hamm. https://doi.org/10.5962/bhl.title.12464

Meigen J.W. 1830. *Systematische Beschreibung der bekannten europaischen zweiflugeligen Insekten. Sechster Theil*. Schulz, Hamm. https://doi.org/10.5962/bhl.title.12464

Meigen J.W. 1838. *Systematische Beschreibung der bekannten europaischen zweiflugeligen Insekten. Siebenter Theil oder Supplementband*. Schultz, Hamm. https://doi.org/10.5962/bhl.title.12464

Mengual X., Bot S., Chkhartishvili T., Reimann T., Thormann J. & von der Mark L. 2020. Checklist of hover flies (Diptera, Syrphidae) of the Republic of Georgia. *ZooKeys* 916: 1–123. https://doi.org/10.3897/zookeys.916.47824

Mittermeier R.A., Robles-Gil P., Hoffmann M., Pilgrim J., Brooks T., Mittermeier C.G., Lamoreux J. & Da Fonseca G.A.B. 2004. *Hotspots Revisited: Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions*. Cemex/Agrupación Sierra Madre.

Myers N., Mittermeier R.A., Mittermeier C.G., da Fonseca G.A.B. & Kent J. 2000. Biodiversity hotspots for conservation priorities. *Nature* 403 (6772): 853–858. https://doi.org/10.1038/35002501

Panzer G.W.F. 1797. *Favnae insectorvm Germanicae initia oder Devtschlands Insecten*. Heft 54. Felsecker, Nurnberg. https://doi.org/10.5962/bhl.title.15007

Panzer G.W.F. 1798. *Favnae insectorvm Germanicae initia oder Devtschlands Insecten*. Heft 60. Felsecker, Nurnberg. https://doi.org/10.5962/bhl.title.15007

Panzer G.W.F. 1801. *Favnae insectorvm Germanicae initia oder Devtschlands Insecten*. Heft 82. Felsecker, Nurnberg. https://doi.org/10.5962/bhl.title.15007

Peck L.V. 1988. Family Syrphidae. *In*: Soós Á. & Papp L. (eds) *Catalogue of Palaearctic Diptera, Volume 8*: 11–230. Akadémiai Kiadó, Budapest.

Portschinsky J.A. 1877. Materialy dlya istorii faunyi Rossii i Kavkaza. Shmeleobraznye dvukrylye. *Trudy Russkago Entomologicheskago Obshchestva* 10: 102–198. [In Russian.]

Preyssler J.D.E. 1793. New species. *In*: Preyssler J.D.E., Lindacker J.L. & Hoser J.K.E. Beobachtungen über Gegenstände der Natur auf einer Reise durch den Böhmer Wald im Sommer 1791. *Sammlung Physikalischer Aufsätze, besonders die Böhmische Naturgeschichte Betreffend* 3: 135–378.

Prokhorov A.V., Popov G.V., Shparyk V.Yu. & Vasilyeva Yu.S. 2020. New records of hoverflies (Diptera, Syrphidae) from Ukraine. V. *Zoodiversity* 54 (3): 237–258. https://doi.org/10.15407/zoo2020.03.237

Radde G. 1899. *Die Sammlungen des kaukasischen Museums. Band I. Zoologie.* Typographie der Kanzelei des Landeschefs, Tiflis. https://doi.org/10.5962/bhl.title.49456

Radenković S., Likov L., Ståhls G., Rojo S., Pérez-Bañón C., Smit J., Petanidou T., van Steenis J. & Vujić A. 2020. Three new hoverfly species from Greece (Diptera: Syrphidae). *Zootaxa* 4830 (1): 103–124. https://doi.org/10.11646/zootaxa.4830.1.4

Ratnasingham S. & Hebert P.D.N. 2013. A DNA-based registry for all animal species: The Barcode Index Number (BIN) System. *PLoS ONE* 8 (8): e66213. https://doi.org/10.1371/journal.pone.0066213

Rondani C. 1857. *Dipterologiae Italicae prodromus. Vol: II. Species italicae Pars prima: Oestridae, Syrpfhidae, Conopidae*. A. Stocchi, Parma [Parmae]. https://doi.org/10.5962/bhl.title.8160

Rotheray G. 1993. Colour guide to hoverfly larvae. *Dipterists Digest* 9: 1–156.

Rozkošný R., Chvála M. & Pont A.C. 1982. Diptera described by Johann Daniel Preyssler, 1790–1793. *Scripta Facultatis Scientiarum Naturalis Univiversitatis* 12: 349–356.

Rozo-Lopez P. & Mengual X. 2015. Mosquito species (Diptera, Culicidae) in three ecosystems from the Colombian Andes: identification through DNA barcoding and adult morphology. *ZooKeys* 513: 39–64. https://doi.org/10.3897/zookeys.513.9561

Skevington J., Locke M., Young A., Moran K., Crins W. & Marshall S. 2019. *Field Guide to the Flower Flies of Northeastern North America*. Princeton University Press, Princeton.

Skufjin K.V. 1977. New species and subspecies of the genus *Cheilosia* Mg. (Diptera, Syrphidae) from the Galichya gora (Lipetsk Region). *Novye i maloizvestnye vidy nasekomykh Evropeiskoi chasti SSSR Leningrad*: 57–60.

Skufjin K.V. 1979. New species of hover-flies (Diptera, Syrphidae) from the northern Caucasus. *Entomologicheskoe Obozrenie* 55 (4): 931–933.

Speight M.C.D. 2020a. *Species Accounts of European Syrphidae, 2020. Syrph the Net, the Database of European Syrphidae* (*Diptera*)*, Vol. 104*. Syrph the Net publications, Dublin.

Speight M.C.D. 2020b. *StN Key for the Identification of the Genera of European Syrphidae* (*Diptera*) *2020. Syrph the Net, the Database of European Syrphidae, Vol. 105.* Syrph the Net publications, Dublin.

Speight M.C.D. & Lucas J.A.W. 1992. Liechtenstein Syrphidae (Diptera). *Berichte der Botanisch-Zoologischen Gesellschaft Liechtenstein-Sargans-Werdenberg* 19: 327–463.

Speight M.C.D. & Sarthou J.-P. 2017. *StN Keys for the Identification of the European Species of Various Genera of Syrphidae 2017 Syrph the Net, the Database of European Syrphidae (Diptera), Vol. 99.* Syrph the Net publications, Dublin.

Stackelberg A.A. 1960. New Syrphidae (Diptera) from the Caucasus. *Entomologicheskoe Obozrenie* 39 (2): 438–449.

Stackelberg A.A. 1963. Neue palaarktische *Cheilosia*-Arten (Diptera: Syrphidae). *Beiträge zur Entomologie* 13 (3/4): 513–522. https://doi.org/10.21248/contrib.entomol.13.3-4.513-522

Stackelberg A.A. 1968. New species of hover flies (Diptera, Syrphidae) from the Caucasus. *Entomologicheskoe Obozrenie* 47 (1): 227–232.

Stackelberg A.A. 1970. Family Syrphidae. *In*: Bei-Bienko G.Y. (ed.) *A Key to the Insects of the European Part of the USSR Vol. 5, No. 2*: 11–96. Nauka, Leningrad [In Russian.]

Stackelberg A.A. & Richter V.A. 1968. Hover-flies (Diptera, Syrphidae) of the Caucasus. *Trudy Vserossijskogo Entomologicheskogo Obshestva* 52: 224–274.

Ståhls G. & Barkalov A.V. 2017. Taxonomic review of the Palaearctic species of the *Cheilosia caerulescens*-group (Diptera, Syrphidae). *ZooKeys* 662: 137–171. https://doi.org/10.3897/zookeys.662.11267

Ståhls G., Stuke J.H., Vujić A., Doczkal D. & Mueona J. 2004. Phylogenetic relationships of the genus *Cheilosia* and the tribus Rhingiini (Diptera, Syrphidae) based on morphological and molecular characters. *Cladistics* 20: 105–122. https://doi.org/10.1111/j.1096-0031.2004.00023.x

Ståhls G., Vujić A. & Milankov V. 2008. *Cheilosia vernalis* (Diptera, Syrphidae) complex: Molecular and morphological variability. *Annales Zoologici Fennici* 45 (2): 149–159. https://doi.org/10.5735/086.045.0206

Stuke J.-H. 2000. Phylogentic relationships within the genus *Cheilosia* Meigen, 1822, as evidenced by the larval stages (Diptera, Syrphidae). *Studia Dipterologica* Suppl. 8: 1–118.

Stuke J.-H. & Claussen C. 2000. *Cheilosia canicularis* auctt. – ein Artenkomplex. *Volucella* 5: 79–94.

Szilády Z. 1938. Uber palaarktische Syrphiden. II. *Annales historico-naturales Musei Nationalis Hungarici* 31: 137–143.

Thompson F.C., Rotheray G.E. & Zumbado M.A. 2010. Syrphidae (flower flies). *In*: Brown B.V., Borkent A., Cumming J.M., Wood D.M., Woodley N.E. & Zumbado M.A. (eds) *Manual of Central American Diptera*: 763–792. NRC Research Press, Ottawa.

Thormann J., Ahrens D., Anderson C., Astrin J.J., Mumladze L., Rulik B., Tarkhnishvili D., Espeland M., Geiger M., Hein N., Iankoshvili G., Karalashvili E., Mengual X., Morkel C., Neiber M.T., Peters R.S., Reimann A., Ssymank A., Wesener T., Ziegler J. & Misof B. 2019. A prelude to the Caucasus Barcode of Life Platform (CaBOL): Biodiversity Days in Georgia in 2018 and 2019. *Bonn Zoological Bulletin* 68 (2): 275–296. https://doi.org/10.20363/bzb-2019.68.2.275

Tóth S. 1986. Beiträge zur Kenntnis der Schwebfliegen-Fauna des Südwest-Kaukasus (Diptera: Syrphidae). *Folia Musei Historico-Naturalis Bakonyiensis* 5: 85–98.
https://doi.org/10.1002/mmnd.19920390417

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.

Verrall G.H. 1871. Additions and correction to the list of British Syrphidae, with a description of one species new to science. *The Entomologist's Monthly Magazine* 7: 200–203.
Available from https://www.biodiversitylibrary.org/page/32903754 [accessed 21 Oct. 2023].

Violovitsh N.A. 1966. A new species of the genus *Cheilosia* Meig. (Diptera, Syrphidae) from the Altai. *Novye i Maloizvestnye Vidy Fauny Sibiri* 2: 54–56.

Violovitsh N.A. 1983. *Siberian Syrphids* (*Diptera, Syrphidae*). Akademiya Nauk USSR, Novosibirsk.

Vujić A. 1996. *Genus Cheilosia Meigen and Related Genera (Diptera: Syrphidae) on the Balkan Peninsula*. Monographs of the Department of natural sciences, Matica Srpska, Novi Sad.

Vujić A. & Claussen C. 1994. *Cheilosia orthotricha*, spec. nov., eine weitere Art aus der Verwandtschaft von *Cheilosia canicularis* aus Mitteleuropa. *Spixiana* 17 (3): 261–267.

Vujić A. & Claussen C. 2000. *Cheilosia alba* spec. nov. and first description of the female of *C. pini* Becker, 1894 (Diptera, Syrphidae). *Volucella* 5: 51–62.

Vujić A., Radenković S. & Stanescu C. 1998. New data on hoverflies (Diptera, Syrphidae) in Romania. *Volucella* 3: 63–74.

Vujić A., Radenković S., Trifunov S. & Nikolić T. 2013. Key for European species of the *Cheilosia proxima* group (Diptera, Syrphidae) with a description of a new species. *ZooKeys* 269: 33–50.
https://doi.org/10.3897/zookeys.269.4619

Vujić A., Ståhls G. & Radenković S. 2019. Hidden European diversity: a new monotypic hoverfly genus (Diptera: Syrphidae: Eristalinae: Rhingiini). *Zoological Journal of the Linnean Society* 185: 1188–1211. https://doi.org/10.1093/zoolinnean/zly066

Zetterstedt J.W. 1838. Dipterologis Scandinaviae. Sect. 3: Diptera, pp. 477-868. *In*: Zetterstedt J.W. *Insecta Lapponica.* Voss, Leipzig [Lipsiae].
Available from https://doi.org/10.5962/bhl.title.8242 [accessed 21 Oct. 2023].

Zetterstedt J.W. 1843. *Diptera Scandinaviæ disposita et descripta Vol. 2*. Officina Lundbergiana, Lund [Lundae]. https://doi.org/10.5962/bhl.title.8143

Zetterstedt J.W. 1849. *Diptera Scandinaviæ disposita et descripta Vol. 8*. Officina Lundbergiana, Lund [Lundae]. https://doi.org/10.5962/bhl.title.8143

Żóralski R. 2022. New records of hoverflies (Diptera, Syrphidae) from the Republic of Georgia based on materials collected by the Polish expedition in the fall of 1963. *Fragmenta Faunistica* 64: 63–75. https://doi.org/10.3161/00159301FF2021.64.2.063

Żóralski R. & Bystrowski C. 2021. Contribution to the knowledge of Syrphidae (Diptera) of the Republic of Georgia. *Notatki Entomologiczne* 6 (1): 25–27.

Printed versions of all papers are deposited in the libraries of four of the institutes that are members of the *EJT* consortium: Muséum national d'Histoire naturelle, Paris, France; Meise Botanic Garden, Belgium; Royal Museum for Central Africa, Tervuren, Belgium; Royal Belgian Institute of Natural Sciences, Brussels, Belgium. The other members of the consortium are: Natural History Museum of Denmark, Copenhagen, Denmark; Naturalis Biodiversity Center, Leiden, the Netherlands; Museo Nacional de Ciencias Naturales-CSIC, Madrid, Spain; Leibniz Institute for the Analysis of Biodiversity Change, Bonn – Hamburg, Germany; National Museum of the Czech Republic, Prague, Czech Republic; The Steinhardt Museum of Natural History, Tel Aviv, Israël.

Supplementary material

Supp. file 1. Fig. S1. Neighbor-joining tree using Jukes-Cantor model of the 874 COI sequences of the *Cheilosia* specimens included in our study. Bootstrap support values (>90) are indicated at the nodes. https://doi.org/10.5852/ejt.2025.1023.3097.13807

Supp. file 2. Table S1. Information for all *Cheilosia* specimens included in this study collected in the Caucasus Region. https://doi.org/10.5852/ejt.2025.1023.3097.13809

Supp. file 3. Table S2. Uncorrected pairwise distances for the COI sequences of the *Cheilosia* specimens included in our study. https://doi.org/10.5852/ejt.2025.1023.3097.13811