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Monograph

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Cheilosia (Diptera, Syrphidae: Rhingiini) of Nepal with descriptions of 29 new species

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Abstract. The genus *Cheilosia* (Diptera: Syrphidae: Rhingiini) of Nepal is reviewed. We recorded 37 species of *Cheilosia*, of which 29 species are described here. Twenty-six of the new species are classified to a subgenus: *Cheilosia* (*Cheilosia*) *angusta* sp. nov., *C. (C.) falcata* sp. nov., *C. (C.) hauseri* sp. nov., *C. (C.) maculata* sp. nov., *C. (C.) pica* sp. nov., *C. (C.) pilivena* sp. nov., *C. (C.) spinosa* sp. nov., *C. (C.) spuria* sp. nov., *C. (C.) weiperti* sp. nov., *C. (M.) montanocheila albipicta* sp. nov., *C. (M.) alpha* sp. nov., *C. (M.) brevimontana* sp. nov., *C. (M.) gilva* sp. nov., *C. (M.) minuscula* sp. nov., *C. (M.) nigella* sp. nov., *C. (M.) pernigra* sp. nov., *C. (M.) picta* sp. nov., *C. (F.) floccocheila collis* sp. nov., *C. (F.) crassata* sp. nov., *C. (F.) illustratoides* sp. nov., *C. (F.) indistincta* sp. nov., *C. (F.) leucozonoides* sp. nov., *C. (F.) vellea* sp. nov., *C. (Eucartosyrphus) procera* sp. nov., *C. (Pollinocheila) rava* sp. nov., and *C. (Taeniochilosia) nepalensis* sp. nov. The remaining three new species, *C. flavigena* sp. nov., *C. insolita* sp. nov., and *C. versa* sp. nov., are described based on a female only, and are thus not classified to a subgenus. The subgenus *Taeniochilosia* Oldenberg, 1916 is here re-defined to also include species with a pilose eye in combination with the previously defined characters. *Cheilosia nigriventris* Barkalov & Cheng, 2004 is herewith placed as junior synonym of *Cheilosia erratica* Barkalov & Peck, 1997, and the description of the female sex is provided. We provide digital photographs and line drawings to illustrate morphological details of all species, and an identification key to the subgenera and to the species recorded for Nepal. We explored the infrageneric classification of some Nepalese species new to science for which molecular work was possible using mtDNA COI barcode sequences. A maximum likelihood analysis of the assembled COI barcode dataset with multiple representatives of the most speciose Palearctic subgenera of *Cheilosia* resolved the included seven taxa from Nepal within subgenera *Cheilosia* s. str. and *Montanocheila* Barkalov, 2002. The large number of new species of this study highlights the still prevailing incomplete knowledge of this speciose genus in the montane regions of the Palearctic and Oriental realms.

Keywords. *Cheilosia*, Syrphidae, *Taeniochilosia*, Nepal, Himalaya.

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Introduction

Hoverflies (Diptera Linnaeus, 1758: Syrphidae Latreille, 1802) constitute a diverse family of true flies, comprising about 6200 species worldwide (Courtney *et al.* 2017). The most recent taxonomic review of the hoverfly fauna of Nepal (also including a review of the bibliography) listed altogether 130 species for Nepal, and presented numerous species described as new to science (Claussen & Weipert 2003, and references therein). A recent checklist of Syrphidae of Nepal by Ghorpadé (2015) documented 157 species, with nine of these unnamed and awaiting description.

Among the most abundant and ubiquitous genera in the Holarctic region is the genus *Cheilosia* Meigen, 1822 (Diptera, Syrphidae: Rhingiini Meigen, 1822). *Cheilosia* is the species-richest hoverfly genus of the Holarctic region, with a species number approaching 500, while about 20 species of *Cheilosia* are known from the Oriental and two from the Neotropical regions (Knutson *et al.* 1975; Thompson *et al.* 2010; Vujić *et al.* 2019).

The adults of *Cheilosia* are small to large-sized flies mostly with a black ground-colour of the body, with the colour of the body pilosity ranging from black to yellow, white and foxy-red, and frequently with conspicuous pollinosity on various body parts. Some of the species are mimics of (small) bumblebees, while other species are mimics of small, black bees. Barkalov & Cheng (2004) provided descriptions and discussion on the variability of morphological characteristics of *Cheilosia*. Barkalov (2002) presented an overview of the described subgeneric groupings of *Cheilosia* and listed the combination of diagnostic character states for each subgenus. The study included *Cheilosia* s. str., *Endoiasimyia* Bigot, 1882, *Hiatomyia* Shannon, 1922, *Neocheilosia* Barkalov, 1983 and *Taeniochilosia* Oldenberg, 1916 (placing subgenus *Nigrocheilosia* Shatalkin, 1975 as synonym of subgenus *Taeniochilosia*). Based on morphological characters Barkalov (2002) also established eight new subgenera for the remaining Palearctic and Oriental taxa, and listed or tentatively classified all then known species and subspecies of *Cheilosia* into these subgenera. Barkalov (2007) placed the subgenus *Nephocheila* Barkalov, 2002 as a synonym of *Nephomyia* Matsumura, 1916.

The molecular phylogenetic study of Vujić *et al.* (2019) used datasets of three standard genes (mtDNA COI and nuclear rDNA 28S and 18S) and the three genes combined with morphology for exploration of the relationships among taxa of the tribe Rhingiini. Their study clearly resolved *Cheilosia* as monophyletic with high bootstrap support, and recovered the subgenera *Endoiasimyia* and *Hiatomyia* as members the genus *Cheilosia*, thus corroborating the classification established by Barkalov (2002).

Barkalov & Ståhls (2015) explored phylogenetic placements of a few newly described Chinese species of *Cheilosia* using parsimony analysis for a large fragment of the mtDNA COI gene. In their molecular phylogenetic analysis they included multiple representatives of eight of the 13 established subgenera of the genus *Cheilosia*. The subgeneric placements of most of the included new Chinese taxa of *Cheilosia* were in agreement with their classifications according to diagnostic morphological characteristics, except for the species *C. nuda* Shiraki, 1930 and *C. yunnanensis* Barkalov & Ståhls, 2015, which were not resolved within existing subgenera.

The Himalayas form a mountain range separating the plains of the Indian subcontinent from the Tibetan Plateau, and range across the countries Nepal, India, Bhutan, China and Pakistan. Nepal occupies a central location within the nearly 3000-km arc of the Himalayas, which separates High Asia from tropical South Asia and South-East Asia, and functions as a transition zone between the mountain blocks adjoining to the east and west. The Himalayas constitutes the border between the Palearctic and the Oriental biogeographical regions (or the Palearctic and the Indo-Malayan realms), and the area can also be regarded as a part of or bordering the Sino-Japanese realm as defined in Holt *et al.* (2013). The

major biogeographical barrier in Nepal, which separates the western (Palearctic) fauna from the eastern (Oriental) fauna is the deep gorge system of the Kali-Gandaki River (Ghorpadé 2015).

The Himalayas are considered a hotspot for biodiversity and the fauna constitutes a rich mixture of taxa from surrounding biogeographical regions, in addition to a large portion of endemics including arthropods (Martens 2015 and references therein). Nepal and the Himalayas in general support an unusual and extremely rich faunal diversity of both vertebrates and invertebrates (Martens 2015).

Only three species of *Cheilosia* were reported for Nepal in older and more recent species checklists. Multiple publications reported *C. nigroaenea* Brunetti, 1915 (Coe 1964; Knutson *et al.* 1975; Kapoor *et al.* 1979; Thapa 2000; Ghorpadé 2015), while *Cheilosia (Endoiasimyia) indiana* (Bigot, 1883) and *Cheilosia hasegawai* Shiraki, 1968 (placed as synonym of *C. longula* (Zetterstedt, 1838) in Ohishi & Ichige 2006) were only mentioned in a couple of studies. *Cheilosia (E.) indiana* was listed by Thapa (2000) and Ghorpadé (2015), and *C. hasegawai* in the study of Shrestha & Aryal (2000) and Ghorpadé (2015).

A large amount of *Cheilosia* hoverflies from Nepal collected between years 1967 and 2013 during multiple expeditions to Nepal were available for our study. Here we review the fauna of *Cheilosia* of Nepal, and name, describe and illustrate the numerous undescribed species of *Cheilosia* identified in the material studied. Additionally, we provide an identification key to *Cheilosia* of Nepal, and using mtDNA COI barcode sequences we explore the subgeneric placements of a few Nepalese species, which were available for molecular work.

The large number of new species proposed in this paper highlights the still prevailing incomplete knowledge of this speciose genus particularly in the mountainous areas of the (Eastern) Palearctic region and the transitional areas of the Palearctic and Oriental realms.

Material and methods

The studied specimens of *Cheilosia* originate from several entomological collection expeditions to Nepal: the Canadian Nepal Expedition in 1967, with specimens deposited in the Canadian National Collection, Ottawa (Cumming *et al.* 2011), a collecting expedition of Martin Hauser in 1997 with specimens deposited in the California State Collection of Arthropods, Sacramento, USA, and the insect collections made during years 1992–2001, 2005, 2009 and 2013 within the project ‘Zoologische Nepal-Expeditionen des Naturkunde museums Erfurt’ (NME) (additional data in Hartmann *et al.* 1998; Claussen & Weipert 2003; Hartmann & Weipert 2012), with specimens deposited in the insect collection at IBSJW/NME or in Naturkundemuseum Erfurt (NME). The specimens were collected using both handheld insect nets and Malaise traps. The hoverflies were collected at altitudes ranging from 1500 to 5000 meters above sea level. The studied specimens are from localities in Western and Central Nepal.

Taxonomic description

All new species of this study were compared with species of *Cheilosia* described from the SE and E Palearctic region, or with species’ descriptions (Barkalov & Peck 1997a, 1997b; Barkalov & Cheng 1998, 2004). For the new species described here, the following format of description is used: description of the male (if applicable), and description of female characters except for normal sexual dimorphism. Morphological terminology follows Cumming & Wood (2017) (Fig. 1), except for parts of male terminalia for which we follow terminology used by Ståhls & Barkalov (2017). Male genitalia were macerated in 10% KOH, neutralized with 10% acetic acid and soaked in water, and are kept stored in glycerol in plastic microvials on the same pin as the specimen.

Digital images and line drawings

Digital images of dorsal and lateral aspects of entire fly specimens or parts of specimens were taken at the Finnish Museum of Natural History Luomus with a Canon EOS 40S digital camera using d-cell software ver. 5.1. Multiple images (up to 120 exposures) of each aspect were combined using Zerene stacker software ver. 2 (www.zerenesystems.com/cms/home). For each species, images were made for the holotype and one paratype, if applicable. Body length and wing length measurements were taken with the aid of an ocular grid with a Zeiss Stemi 2000 compound microscope.

Line drawings of body parts were prepared with the aid of an ocular grid and graph paper with a Zeiss Stemi 2000 compound microscope. The drawings were scanned, and then edited using Adobe Photoshop CS3 Extended ver. 10.0 (<https://www.adobe.com/>). Line drawings are provided of the hypandrial gonopod (for which we use the term superior lobe) and aedeagus-complex consisting of distiphallus, basiphallus and aedeagal apodeme, and of the epandrial cercus and surstylus of the male genitalia, of the lateral profile of the face and the basoflagellomere for the males, and of the dorsal view of frons and basoflagellomere of the females. The figures of heads show the distribution of pollinosity (microtrichia in the form of dust-like pruinescence) and pilosity. The frons of the female has two lateral and one medial longitudinal furrows (grooves), and sometimes a distinct transverse furrow. These shallow, more or less densely punctured furrows are clearly indicated in the line drawings of the female head (dorsal view) when distinct, sometimes they are indistinct to almost invisible and thus indicated as a weaker dotted line. The bent arrow in the figures of the wings indicates the inner angle between veins M1 and R4+5.

Institutional abbreviations

The material studied is preserved in the following collections referred to in the text by their acronyms:

CNC	=	Canadian National Collections of Insects, Arachnids and Nematodes, Ottawa, Canada
CSCA	=	California State Collection of Arthropods, Sacramento, USA
IBSJW/NME	=	Institut für Biologische Studien Jörg Weipert, Plaue, Germany/Naturkundemuseum Erfurt (Natural History Museum Erfurt), Erfurt Germany
FMNH	=	Finnish Museum of Natural History
MZH	=	Finnish Museum of Natural History, Zoology unit
NHM	=	Natural History Museum, London
NME	=	Naturkundemuseum Erfurt (Natural History Museum Erfurt), Erfurt, Germany
SMNS	=	Staatliches Museum für Naturkunde, Stuttgart, Germany
ZICAS	=	Zoological Institute of Chinese Academy of Sciences, Beijing, China
ZMMGU	=	Zoological Museum of Moscow State University, Russia
ZSMC	=	Zoologische Staatssammlung München (Zoological State Collection Munich)

The first line of the specimen labels of specimens deposited in the CSCA includes a field collection code in square brackets with numbers ranging from 500–548. These field codes were originally established by W. Schwaller for collecting localities in Nepal (M. Hauser pers. com.), and the same field codes were also used by M. Hauser. There is no additional data associated with these field collection codes, and in the label information data of specimens of this study the field codes are shown in square brackets after collector's name. The elevation of the collecting localities of the Candian Nepal Expedition is given in feet (abbreviated ft) on the labels (conversion of feet to meters above see level, $m = ft/3.2808$).

Molecular work

The Phire™ Tissue Direct PCR Master Mix #F-170S kit (Thermo Scientific Baltics UAB, Vilnius, Lithuania) was used for DNA extraction and PCR amplification. The DNA isolation followed the Dilution & Storage protocol provided with the kit with slight modifications. Genomic DNA was

extracted using 1–2 legs of a pinned or ethanol preserved fly specimen, as a least-invasive approach. PCR amplification of the mtDNA COI barcode used the universally conserved primer pair LCO-1490 and HCO-2198 (Folmer *et al.* 1994) of 14 specimens of Nepalese *Cheilosia*. The sequences were edited for case-calling errors using the software Sequencher (<https://www.genecodes.com/>), and trimmed to a length of 658 bp. The resulting COI barcodes were integrated into a dataset comprising barcodes of representative species from all larger Holarctic subgenera of *Cheilosia* following Barkalov (2002) and the subsequently established species groups (Claussen 2000; Ohishi & Ichige 2006). The COI barcode sequence dataset comprised mainly Palearctic taxa, with both newly generated barcodes and published DNA barcodes retrieved from Barcode of Life Database (BOLD; <https://www.boldsystems.org/>) or GenBank (<https://www.ncbi.nlm.nih.gov/genbank/>) (Supp. file 1).

DNA barcode analyses

The final COI barcode dataset was subjected to maximum likelihood (ML) analysis and a distance tree building operation using the neighbor-joining (NJ) method (Saitou & Nei 1987) using the software MEGA ver. X (Kumar *et al.* 2018). For the ML analysis we determined the best choice of evolutionary model of nucleotide change under the Akaike Information Criterion (AIC) in MEGAX, for the NJ analysis we used the standard Kimura 2-parameter (K2P) model of nucleotide change used by BOLD. *Rhingia laevigata* Loew, 1858 (*Rhingini*) was chosen as outgroup taxon for rooting the trees.

Results

Cheilosia of Nepal

We found 29 species of *Cheilosia* new to science, and we additionally recorded eight species originally described from either China or Tajikistan. The subgeneric placements of the Nepalese taxa of the genus *Cheilosia* are as follows: 11 species in *Cheilosia* s. str., 10 species in subgenus *Montanocheila* Barkalov, 2002, six species in subgenus *Floccocheila* Barkalov, 2002, three species in subgenus *Pollinocheila* Barkalov, 2002, and one species in each of the subgenera *Endoiasimyia* Bigot, 1882, *Eucartosyrphus* Barkalov, 2002, *Rubrocheila* Barkalov, 2002, and *Taeniochilosia* Oldenburg, 1916. Three species here described are known from the female sex only, namely *Cheilosia flavigena* sp. nov., *C. insolita* sp. nov. and *C. versa* sp. nov. The subgeneric affinities of these taxa remain unclear to us and thus we here place them as incertae sedis.

Fore coxa with a baso-lateral spur is a distinct and unusual characteristic within *Cheilosia* known in three Palearctic species of *Cheilosia*, *C. (C.) impressa* Loew, 1840, *C. (Nephocheila) nadiae* Barkalov & Cheng, 2004 and *C. (C.) schnabli* Becker, 1894. In the present study we describe three additional species with this distinct character, *C. (C.) falcata* sp. nov., *C. (C.) spinosa* sp. nov. and *C. (C.) spuria* sp. nov. The species possessing this character do not belong to the same clade. This is supported by the molecular data presented here, not resolving *C. falcata* sp. nov. and *C. spuria* sp. nov. as closely allied with *C. impressa* and *C. schnabli*. Judging by the complexity of the characters of the male genitalia, *C. impressa* and *C. schnabli* are typical members of *Cheilosia* s. str., while *C. nadiae*, *C. spuria* sp. nov. and *C. falcata* sp. nov. have a different structure of male genitalia (e.g., structure of gonostylus). The COI barcode tree resolved all taxa among other *Cheilosia* s. str. taxa, but as separate species clusters (Fig. 1). The morphology and particularly the structure of the male genitalia is very similar in the species *C. nadiae* and *C. spuria* sp. nov. Therefore, *C. (Nephocheila) nadiae* should rather be placed in the nominotypical subgenus.

Specimens or photographs of the species *Cheilosia (Eucartosyrphus) hasegawai* Shiraki, 1968 listed for Nepal by Ghorpadé (2015) could not be obtained. An unsuccessful attempt was made to locate and obtain photographs of the male or female syntype of the type material of *Cheilosia nigroaenea* Brunetti, 1915 housed in the collections of Zoological Survey India, New Delhi. Six specimens of *Cheilosia hirticincta* Brunetti, 1915 from Naini Hills (India) are deposited in the Natural History Museum, London, UK (N. Wyatt, pers. com.).

DNA barcode analyses

The mtDNA COI barcode sequence dataset includes 77 ingroup terminals (Supp. file 1), and the outgroup *Rhingia laevigata* on which the trees were rooted. The best choice of evolutionary model of nucleotide change for the COI barcode analysis was the General Time Reversible model (Nei & Kumar 2000) with gamma distributed rates among sites with invariant sites (GTR+I+G). The tree with the highest log likelihood (-7268.69) from the ML analysis of the COI barcode data using the GTR+I+G is shown in Fig. 1. The ML sequence analysis resolved the included taxa in (monophyletic) species clusters, which are largely congruent with the subgenera as defined by Barkalov (2002) and/or infrageneric species groups (*angustigenis* group, *sibirica* group and *aokii* group) established based on morphological characters (Claussen 2000; Ohishi & Ichige 2006; Claussen & Ståhls 2007). The included seven taxa from Nepal were resolved with Palearctic subcongeners within species clusters of *Cheilosia* s. str. and *Montanocheila* Barkalov, 2002 respectively. The COI barcode distance tree under NJ (Supp. file 2) compares favourably with the ML tree, with identical placements of species taxa, but resolves the relationships among the identified subgenera and species groups differently. The present study was not planned to infer the infrageneric evolutionary relationships of *Cheilosia*, as the COI barcode is a gene region primarily aimed for species identification and species delimitation (e.g., Hebert *et al.* 2003). The infrageneric evolutionary relationships deserves a particular study with additional data.

Both analyses resolved *Cheilosia (Montanocheila) albipicta* sp. nov. as a sister taxon to *C. (M.) erratica* Barkalov & Peck, 1997 (with a pairwise genetic divergence of 4.1%) in a cluster consisting of taxa of subgenera *Floccocheila* and *Montanocheila*. The overall morphology of *C. (M.) albipicta* sp. nov. is similar with other taxa of subgenus *Montanocheila*, but the structure of the male genitalia of *C. (M.) albipicta* sp. nov. is more similar to this of taxa of subgenus *Floccocheila*. *Cheilosia albipicta* sp. nov. is here considered a member of subgenus *Montanocheila*. *Cheilosia difficilis* Hervé-Bazin, 1929, *C. falcata* sp. nov., *C. spuria* sp. nov., *C. suspecta* Barkalov & Cheng, 2004 and *C. weiperti* sp. nov. were resolved within *Cheilosia* s. str., and here considered members of *Cheilosia* s. str., in light of both their morphological characteristics shared with other members of *Cheilosia* s. str. and their placement in the ML tree. *Cheilosia (C.) falcata* sp. nov. and *C. (C.) spuria* sp. nov. were resolved as sister taxa with a pairwise genetic divergence of 1.9–2.0%.

Re-definition of subgenus *Taeniochilosia* Oldenberg, 1916

The infrasubgeneric variability of many commonly applied morphological (diagnostic) characters (see, e.g., Barkalov 2002) of the subgenera of *Cheilosia* is extensive. Typical examples include characters like eye and face pilosity, and leg colour, which vary extensively among the species of the subgenera.

Among the studied *Cheilosia* from Nepal we discovered specimens agreeing with the diagnostic morphological characteristics as defined for the subgenus *Taeniochilosia* in Barkalov (2002): a bare face, black legs, confluent antennal pits, superior lobes (anterior lobes of Barkalov 2002) of hypandrium with a sclerotized plate with a dentate inner margin, and distiphallus (apical sclerite of the aedeagus of Barkalov 2002) wide-oval along anterior margin and with elongate lobes posteriorly. While agreeing with characters of the subgeneric type, *C. (T.) atriseta* (Oldenberg, 1916), and subgenus *Taeniochilosia* as defined by Barkalov (2002), the mentioned specimens differ by having an entirely pilose eye. Eye pilosity is present in most subgenera of *Cheilosia*, except for the species of subgenera *Eucartosyrphus*, *Hiatomyia* Shannon, 1922 and *Taeniochilosia* (e.g., Barkalov 2002). However, Claussen & Ståhls (2007) noted that sparse, short eye pilosity could be discernible for some species of *Eucartosyrphus* under high magnification and good illumination. The presence of eye pilosity is variable in multiple species of *Cheilosia* s. str., with the type species *C. flavipes* (Panzer, 1798) having a bare eye in the female and pilose eye in the male sex. The eye pilosity is also variable in subgenera *Conicheila* Barkalov, 2002 (bare in one species and pilose in two; Barkalov & Cheng 2004) and *Convocheila* Barkalov, 2002 (bare in three species and pilose eye in three species; Barkalov 2002; Radenković *et al.* 2020).

The subgenus type *Taeniochilosia atriseta* has non-pilose eyes. However, scarce eye pilosity was recently observed in the females of a species of *Taeniochilosia* collected in Bulgaria (*Cheilosia* (*Taeniochilosia*) aff. *faucis*, unpublished observation), the first species with this character for subgenus *Taeniochilosia*. *Cheilosia nepalensis* sp. nov. is the second species with pilose eye, and the eye pilosity in this taxon is longer and distinct in both sexes. The leg colour is mostly all black (dark) in *Taeniochilosia*, but partly yellow in the species of *C. caerulescens* species group of *Taeniochilosia* (Stähls & Barkalov 2017), and while most species have a bare face, some species with pilose face are known (e.g., *C. (T.) aratica* Barkalov, 1978). For this reason and based on the discussion above, the subgenus *Taeniochilosia* is here redefined to include the species with the following combination of characters: eye bare or pilose (the latter state in fewer species); face bare or pilose (the latter state in fewer species); legs black or partly yellow (the latter for members of *C. (T.) caerulescens* species group); antennal pits confluent (or nearly



Fig. 1. Maximum likelihood tree based on mtDNA COI barcodes. Species labelled with subgeneric or species group membership. Taxa from Nepal in boldface.

confluent); the left process of the hypandrial gonopod (superior lobe) (anterior lobes of the hypandrium of Barkalov 2002; superior lobes in, e.g., Barkalov & Ståhls 2015) with a characteristic, sclerotized plate with a (more or less) dentate inner margin, and with the right process broad, and extended in one direction; and distiphallus (apical sclerite of aedeagus of Barkalov 2002) wide-oval anteriorly with elongate lobes in the posterior part.

Key to subgenera of *Cheilosia* occurring in Nepal

The subgeneric key works for specimens of the male sex, and for females except for the last couplet of the key.

1. Antennal pits confluent (meaning that the medial process of lunule is narrowed (pointed) anteriorly, and not connected with the face and the antennal pits are thus connected, sometimes seemingly connected and close inspection using higher magnification is necessary) 2
 - Antennal pits separated (medial process of lunule anteriorly broader and clearly merged with the face (Fig. 2D) 4
2. Eye bare 3
 - Eye pilose *Taeniochilosia* Oldenberg, 1916 (in part)
3. Length of black pile on scutellum margin shorter than length of scutellum (this character is variable in species from Europe and Central Asia); right process of superior lobe of hypandrium short (extended only in distal direction) and broad (Fig. 43F)
 - *Taeniochilosia* Oldenberg, 1916 (in part)
 - Length of black bristles on scutellum margin as long as or longer than length of scutellum; right process of superior lobe of hypandrium long and narrow, curved in distal part (Fig. 54G, I)
 - *Eucartosyrphus* Barkalov, 2002
4. Tergites orange with black stripes along hind margins (Fig. 14C), superior lobe of hypandrium with four projections (Fig. 17F) *Rubrocheila* Barkalov, 2002
 - Tergites black or dark-brown, if with pale maculae, then superior lobe of hypandrium with other structure 5
5. Arista plumose (Fig. 32A) *Endoiasimyia* Bigot, 1882
 - Arista bare or with shorter pilosity 6
6. Wings with distinct brown spot medially (Figs 30A, 32C). Big flies, resembling small bumblebees (Fig. 12). Left process of superior lobe of hypandrium shifted to the middle (Fig. 29G)
 - *Floccocheila* Barkalov, 2002
 - Wings without brown spot medially, or, if with large black spots on wings, then left process of superior lobe of hypandrium different 7
7. Surstylus broad to strikingly broad basally, and cercus enlarged (in size almost comparable with size of surstylus Fig. 57E), superior lobes of hypandrium asymmetric *Pollinocheila* Barkalov, 2002
 - Surstylus not very broad basally and cercus distinctly smaller than surstylus (e.g., Fig. 56H), superior lobes of hypandrium symmetric or asymmetric 8
8. Distiphallus (apical sclerite of aedeagus) without lobes (projections) anteriorly, with big lobes posteriorly (Fig. 68G); frons broad, at level of antenna the frons is at least as broad as or much broader than the width of one eye *Neocheilosia* Barkalov, 1983
 - Distiphallus with lobes (projections) anteriorly, frons narrower than width of eye 9

9. Distiphallus with broad and large anterior lobes, without posterior lobes (e.g., Figs 20G, 27H)
 *Cheilosia* Meigen, 1822
 – Distiphallus with two pairs of lobes – anterior and posterior (e.g., Figs 2E, 18D, 24C, 50E)
 *Montanocheila* Barkalov, 2002

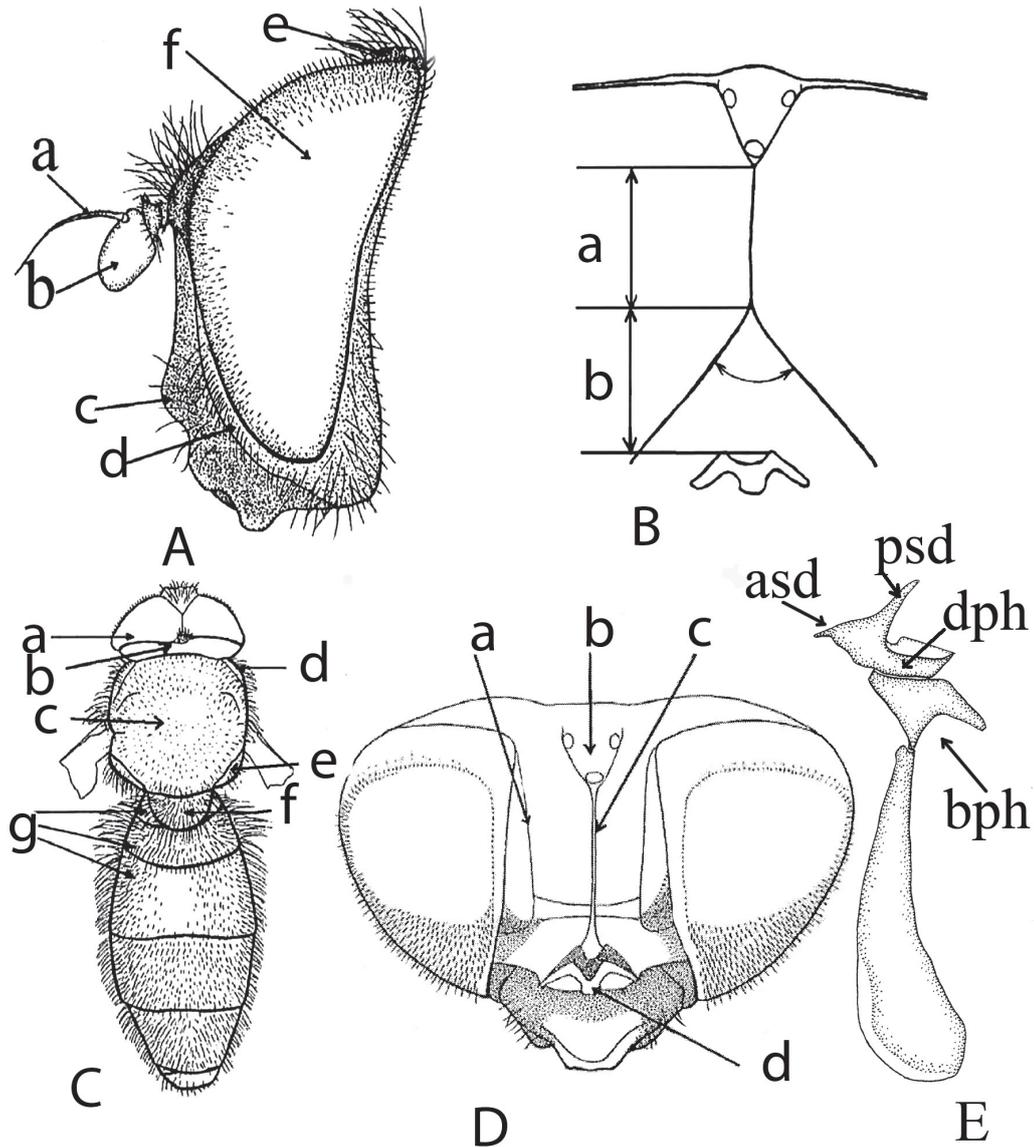


Fig. 2. Morphology of adult *Cheilosia* Meigen, 1822. **A.** Male head, lateral view; a = arista, b = basoflagellomere, c = facial tubercle, d = parafacia, e = ocellar triangle, f = eye. **B.** Male head, dorsal view; a = length of frons, b = length of eye contiguity (bent arrow denotes the frontal angle). **C.** Body of ♂, dorsal view; a = eye, b = occiput, c = scutum, d = postpronotum, e = postalar callaus, f = scutellum, g = tergites. **D.** Female head, dorsal view; a = lateral furrow, b = ocellar triangle, c = medial (central) furrow, d = lunule. **E.** Male genitalia, lateral view of aedeagus-complex (aedeagus = distiphallus + basiphallus); dph = distiphallus, asd = anterior sclerite (projection) of distiphallus, psd = posterior sclerite (projection) of distiphallus, bph = basiphallus.

Key to Nepalese species of *Cheilosia*

1. Eye bare (slender, black, short pilose species, antennal pits confluent) (Figs 54–55)
 *C. (Eucartosyrphus) procera* sp. nov. ♂♀
 – Eye pilose, entirely or partly (sometimes pile very short and visible only under high magnification)
 2
2. Face in ventral and/or dorsal part with distinct pile (pilosity of parafacia or gena not considered)
 (Figs 13A, 24A, 25A, D, 31A) 3
 – Face without distinct pile (Figs 5A, 18A, 43A) 16
3. Arista plumose (Fig. 31B) *C. (Endoiasimyia) indiana* (Bigot, 1883) ♂♀
 – Arista bare, or with short or long pilosity (e.g., Figs 5B, 57B) 4
4. Abdomen with distinct grey pollinose maculae antero-laterally on tergites I–III, pollinosity forming
 a grey band on tergite IV, scutum medially densely grey pollinose (Fig. 40)
 *C. (C.) maculata* sp. nov. ♂♀
 – Not this combination of characters (abdomen without distinct grey pollinose maculae, scutum not
 densely grey pollinose medially) 5
5. Body robust, with long, dense, pale pilosity, (small) bee-mimic (Fig. 26) *C. (M.) gilva* sp. nov.
 – Body slender (Fig. 53D), pilosity not so long and bright, not bee-like 6
6. Body black, face with only some pile dorso-laterally near parafacia, basoflagellomere orange, scutum
 black pilose (Fig. 68)
 .. *C. (Neocheilosia) komabaensis* Shiraki, 1968 [males of *C. flavigena* sp. nov. could key out here]
 – Not with this combination of characters 7
7. Holoptic (♂♂) (Fig. 2C) 8
 – Dichoptic (♀♀) (Fig. 2D) 12
8. Face with only few long pile on ventral part, face densely pollinose (Fig. 57A)
 *C. (P.) rava* sp. nov. ♂
 – Face more extensively pilose, or with patch of pilosity near dorsal part of parafacia (Figs 13A, 24A,
 25A, D, 31A) 9
9. Femora dark-brown or black in basal 1/3 and yellow in apical 2/3, body pollinose but shiny with distinct
 golden-green reflections (Fig. 53D) *C. (P.) quinta* Barkalov & Cheng, 2004
 – Not this combination of characters 10
10. Katepisternum with dorsal and ventral pile patches connected, parafacia with some pile longer than
 eye pilosity (Fig. 25A, D) *C. (M.) gilva* sp. nov.
 – Katepisternum with dorsal and ventral pile patches widely separated, parafacia with shorter
 pilosity 11
11. Femora black with yellow tips; eye partly pilose; superior lobe of hypandrium with sharply pointed
 left process (Figs 13, 14A) *C. (C.) difficilis* Hervé-Bazin, 1929
 – Femora yellow in apical 1/2–1/3, and black in basal part; eye entirely pilose; superior lobe of hypandrium
 with different shape of left process (Figs 48–49) *C. (C.) pica* sp. nov.
12. Frons with a (narrow) transversal stripe of grey pollinosity (Figs 22B, 25A, 56B, 65A) 13
 – Frons without transversal stripe of grey pollinosity (e.g., Figs 58C, 62B) 15

13. Scutum antero-medially with two longitudinal stripes of grey pollinosity, pilosity semi-erect and of equal length. Eye with very short pilosity, only visible under high magnification (Figs 22, 23A–B) 14
 – Scutum antero-medially without longitudinal stripes of grey pollinosity, pilosity erect and of different lengths, comparatively long and with 2–3× shorter pile on posterior half. Eye with longer pilosity, visible under low magnification (Figs 25–26) *C. (M.) gilva* sp. nov.
14. Scutum short black pilose, lunule clear yellow, anepisternum yellow pilose, face with small pile patch restricted to dorsal part at parafacia (Figs 22, 23A) *C. flavigena* sp. nov.
 – Scutum yellow pilose, anepisternum yellow pilose and postero-dorsally with some black pile, face with pile on ventral part (Figs 64C–E, 65) *C. versa* sp. nov.
15. Femora blackish in basal 1/3, apical 2/3 yellow. (Figs 48–49) *C. (C.) pica* sp. nov.
 – Femora black, apical 1/6 of tips yellow (Fig. 14A) *C. (C.) difficilis* Hervé-Bazin, 1929
16. Fore coxa with a distinct, lateral spur (Fig. 61D) 17
 – Fore coxa without lateral spur 19
17. Face protruded, with characteristic shape in lateral view, in anterior view face narrow (Figs 20A, 21B) *C. (C.) falcata* sp. nov.
 – Face not protruded 18
18. Scutum with short adpressed and 3–5× longer erect black pilosity (Fig. 59B, D)
 *C. (C.) spinosa* sp. nov.
 – Scutum with erect yellow pilosity of approximately equal length (Fig. 61A–B)
 *C. (C.) spuria* sp. nov.
19. Tergites I–IV yellow in colour, with black transversal bands at posterior margins (width of bands 1/3 or 1/4 of tergite length) (Fig. 14C) *C. (R.) egregia* Barkalov & Cheng, 1998
 – Tergites I–IV black or brown, with more or less developed grey pollinosity 20
20. Scutellum hind margin without distinct strong black bristles, with dense long, black or yellow pilosity 21
 – Scutellum hind margin with at least two distinctly stronger black bristles (stronger than surrounding pilosity), or with multiple long and somewhat stronger bristles than surrounding pilosity 40
21. Eye with black (or dark-brown) pilosity 22
 – Eye with yellow or with brown pilosity (use high magnification and good illumination) 32
22. Face distinctly produced antero-ventrally (Fig. 12A–D) *C. (F.) crassata* sp. nov. ♂♀
 – Face less or not protruded antero-ventrally (Fig. 18A) 23
23. Basoflagellomere orange-yellow or brownish-orange, dorsal margin often darkened 24
 – Basoflagellomere dark-brown or black, sometimes densely brown pollinose, with or without reddish-brown postero-ventral corner 26
24. Parafacia non-pollinose along margin near face, while densely grey pollinose near eye
 *C. (M.) erratica* Barkalov & Peck, 1997 (see also couplet 35)
 – Parafacia entirely pollinose or almost so 25

25. Scutellum hind margin and postalar calli with yellow pilosity (Fig. 4)
 *C. (M.) albipicta* sp. nov. ♂♀
 – Scutellum hind margin and postalar calli with black pilosity (Fig. 6A)
 *C. (M.) alpha* sp. nov. ♂ (see also couplets 39 and 49)
26. Tergites III–V only black pilose, clearly contrasting with pale pilosity of tergite II (Fig. 36)
 *C. (F.) leucozonoides* sp. nov. ♀
 – Tergites III–V with mostly yellow or orange pilosity, sometimes also with patches of black pile of
 variable sizes laterally on tergites 27
27. Legs completely black 28
 – Legs at least with brownish or yellow basal 1/3 of tibia 29
28. Legs and pleura with only black pilosity (Fig. 10A–B) *C. (M.) brevimontana* sp. nov. ♀
 – Legs with some yellow pile on tarsi, hind femur, ventral part of anepisternum and katepisternum with
 patches of light pile (Fig. 46C–D) *C. (M.) pernigra* sp. nov. ♀
29. Tergite I with yellow pilosity laterally *C. (F.) illustratoides* sp. nov. (in part, see also couplet 39)
 – Tergite I with black pilosity antero-laterally 30
30. Sternites completely black pilose, superior lobe of hypandrium without left process (Fig. 45F)
 *C. (M.) nigella* sp. nov. ♂
 – Sternites with mixed black and yellowish pilosity, superior lobe of hypandrium with left process
 (Fig. 33E) 31
31. Face densely grey pollinose, except narrow shiny stripe in lower part (Fig. 63A); superior lobe of
 hypandrium as on Fig. 63D *C. (F.) vellea* sp. nov. ♂
 – Face shiny with narrow stripe of grey pollinosity in mid part (Fig. 33A); superior lobe of hypandrium
 as on Fig. 33E *C. (F.) indistincta* sp. nov.
32. Pleura with only whitish or yellowish pilosity 33
 – At least posterior part of anepisternum postero-dorsally also with some black pile 37
33. Tergites entirely yellow or white pilose 34
 – Tergites II, III or IV yellow pilose with small patches of black pile on antero-lateral corners, or, yellow
 pilose and tergite III with transversal stripe of black pile 36
34. Parafacia very broad, in broadest part nearly as broad as basoflagellomere width, katepisternum with
 dorsal and ventral pile patches broadly separated *C. (C.) pilivena* sp. nov. ♀
 – Parafacia narrower, about 2/3 of basoflagellomere width, katepisternum with dorsal and ventral pile
 patches connected 35
35. Hind femur apically with black and yellow pile *C. (M.) erratica* Barkalov & Peck, 1997
 – Hind femur apically with only yellow pilosity (Fig. 16B–C)
 *C. (M.) distincta* Barkalov & Cheng, 1998 ♀
36. Tergites III & IV with very small patches of black pile antero-laterally *C. (F.) collis* sp. nov.
 – Only tergite III with transversal band of black pile (Fig. 16B)
 *C. (M.) distincta* Barkalov & Cheng, 1998 ♂ (but see discussion under *C. distincta*)

37. Katepisternum with dorsal and ventral pile patches separated, tergites III–IV only with whitish or pale yellowish pilosity *C. (C.) pilivena* sp. nov. ♂
 – Katepisternum with dorsal and ventral pile patches connected (sometimes only narrowly connected), tergites III–IV with yellowish, orange and/or black pilosity 38
38. Tergite IV black pilose on posterior $\frac{2}{3}$ of tergite 39
 – Tergite IV entirely whitish or yellowish pilose, sometimes also with some black pile 40
39. Hind femur with dense pale ventral and antero-ventral pilosity longer than femur width (Fig. 51B, D) *C. (M.) picta* sp. nov. ♂♀
 – Hind femur only with some scattered pale pile longer than femur width (Fig. 6B, D)
 *C. (M.) alpha* sp. nov. ♂ (see also couplets 25, 49)
40. Scutum broadly black pilose between wing bases (Fig. 30A–B) *C. (F.) illustratoides* sp. nov. ♂
 – Scutum with patchy black and yellow pilosity (Fig. 4) *C. (M.) albipicta* sp. nov.
41. Body yellowish-brown; with dark-brown colour of parafacia, lateral stripes on frons, irregular fascia on femora, tibiae and tergites I–III dark-brown to black (Fig. 32C–D) *C. insolita* sp. nov. ♀
 – Body black, with more or less yellow legs 42
42. Scutum and abdomen with bright green reflections, tibiae and metatarsi mostly yellow (Fig. 38) ...
 *C. lucida* Barkalov & Cheng, 1998
 – Scutum and abdomen not with bright green reflections, tibiae and/or metatarsi largely black 43
43. Antennae dark-brown to black, basoflagellomere often densely grey pollinose 44
 – At least basoflagellomere partly yellow or reddish in colour 45
44. Male: posterior margin of tergite IV with black (or dark-brown) semi-erect or appressed pile in addition to semi-erect yellow pile. Female: fore coxa yellow (Fig. 67)
 *C. (C.) weiperti* sp. nov. ♂♀
 – Male: posterior margin of tergite IV with yellowish semi-erect or appressed pile. Female: fore coxa brown *C. (C.) suspecta* Barkalov & Cheng, 2004
45. Male: apices of femora yellow on anterior area, yellow part about $\frac{1}{3}$ – $\frac{1}{2}$ in anterior area but narrower in posterior part of femora. Female: femora completely yellow (Fig. 28)
 *C. (C.) hauseri* sp. nov. ♂♀
 – Femora black or dark-brown, or with narrowly yellow tips 46
46. Face, parafacia, frons and pleurae heavily grey pollinose (Fig. 53E–G), with pollinosity obscuring the black integument 47
 – Some of named parts non-pollinose and shiny, or sparsely pollinose 48
47. All tibiae black *C. (P.) rava* sp. nov. ♂
 – Tibiae yellow with more or less developed black ring (Fig. 44A–D)
 *C. (T.) nepalensis* sp. nov. ♂♀
48. Face distinctly protruded in lower part, basoflagellomere orange-brown or brown (Figs 7A, 8B) ...
 *C. (C.) angusta* sp. nov. ♂
 – Face not protruded in lower part, basoflagellomere bright orange in postero-ventral part and black in antero-dorsal part, or basoflagellomere orange 49

49. Moderately sized species: body length 7–9.5 mm. Parafacia at least in dorsal half densely grey pollinose (Fig. 5A); frons of female with transversal stripe of grey pollinosity (Fig. 5D)
..... *C. (M.) alpha* sp. nov. ♂ (see also couplets 25, 39)
– Small sized species: body length about 5 mm. Parafacia non-pollinose, shiny (Fig. 41A); frons of female without transversal stripe of grey pollinosity (Fig. 41D) *C. (M.) minuscula* sp. nov. ♂♀

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

Cheilosia albipicta sp. nov.

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Figs 3–4

Differential diagnosis

Cheilosia (Montanocheila) albipicta sp. nov. is most similar to *C. (M.) picta* sp. nov., and can be distinguished by the black pilosity of *C. picta* sp. nov. laterally on tergites III–IV, while *C. albipicta* sp. nov. has black pilosity only on postero-lateral margin of tergite III. *Cheilosia albipicta* sp. nov. has a distinct shape of the superior lobe of the male genitalia, not shared with any other member of the subgenus (e.g., Fig. 3D–F).

Etymology

The specific epithet is from the Latin ‘*albipicta*’ meaning ‘white patterned’, referring to the whitish pilosity.

Material examined

Holotype

NEPAL • ♂; Solukhumbu Lamjura Pass; 27°34' N, 86°30' E; 3500 m a.s.l.; 11 May [19]97; Hauser leg. [512]; CSCA.

Paratypes

NEPAL • 2 ♂♂; same data as for holotype; CSCA • 1 ♂; 27°58' N, 85°00' E; 11 100 ft a.s.l.; 17 May 1967; Can. Nepal Exped.; CNC • 1 ♂; same data as for preceding; 14 May 1967; CNC • 3 ♂♂; same data as for preceding; 25 May 1967; CNC • 3 ♂♂; Solukhumbu, Goyom above Sete; 3100 m a.s.l.; 27°34' N, 86°27' E; 10 May [19]97; Hauser leg. [511]; CSCA • 1 ♀; Solukhumbu, Tragdobuk; 3200–3000 m a.s.l.; 27°34' N, 86°31' E; 11 May [19]97; Hauser leg. [513]; CSCA • 1 ♀; Prov. Gandaki, Bhimtang; 3700 m a.s.l.; 23 May 2013; J. Weipert leg.; labcode MZH_Y2671; IBSJW/NME • 1 ♀; same data as for preceding; labcode MZH_Y2673; IBSJW/NME • 1 ♀; Prov. Gandaki, Bhimtang; 3700 m a.s.l.; 23 May 2013; J. Weipert leg.; IBSJW/NME.

Description

Male

LENGTH. Body 9.9–12.5 mm, wing 9.6–10.4 mm.

HEAD. Face broad, in anterior view ventrally broadened, in lateral view moderately protruded; grey pollinose except tip of facial tubercle and on shiny stripe in ventral part; non-pilose; facial tubercle of moderate size but distinct; parafacia broad, in broadest part almost equal to width of basoflagellomere, parafacia along face bare and more shiny, near eye with dense white pollinosity and very long, fine, white

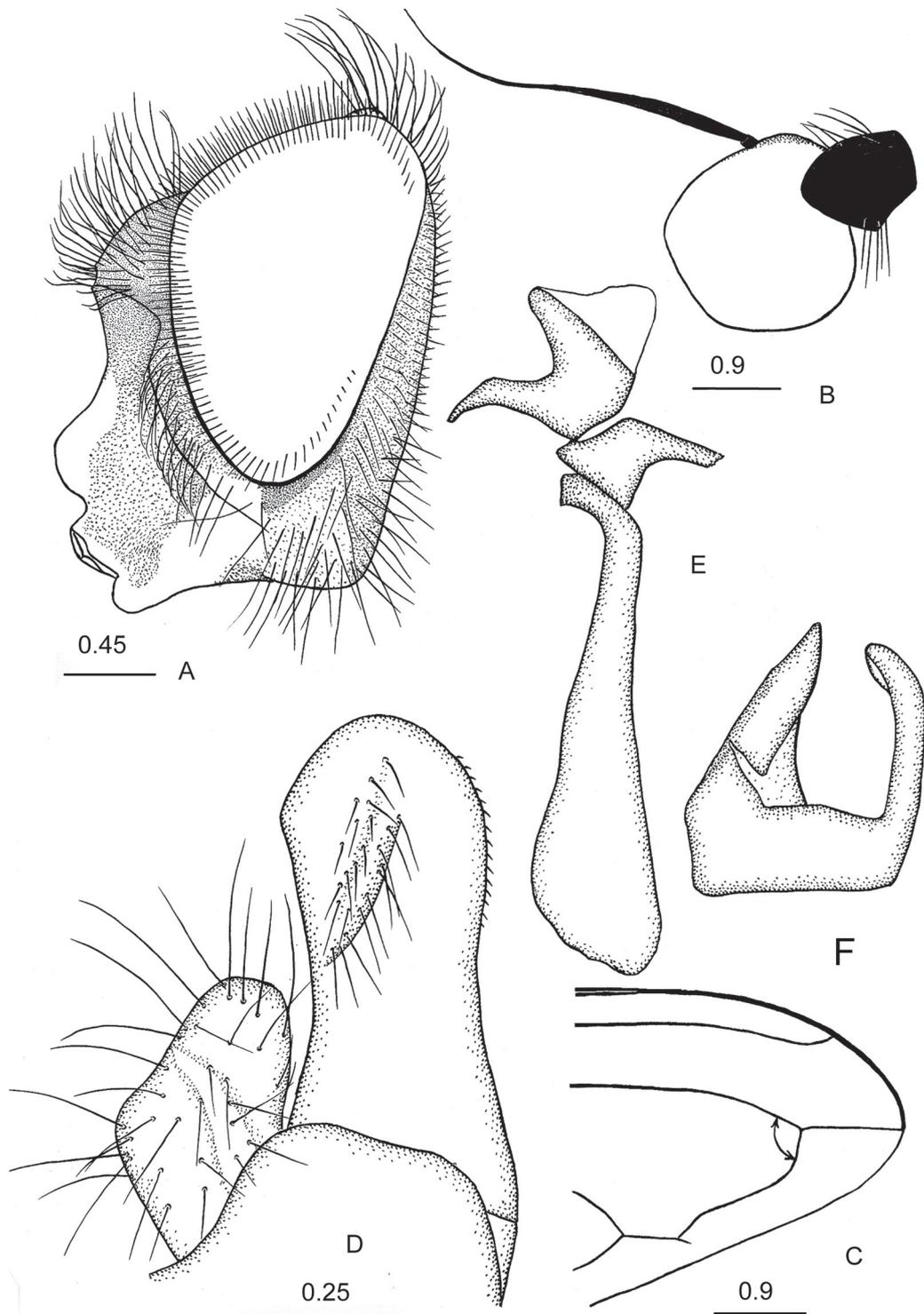


Fig. 3. *Cheilosia (Montanocheila) albipicta* sp. nov., holotype, ♂ (CSCA). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Tip of wing. **D.** Surstylus and gonocercus, lateral view. **E.** Aedeagus and aedeagal apodeme, lateral view. **F.** Superior lobe of hypandrium, lateral view. Scale bars indicated in drawings.

pilosity, a small brown fascia ventral to eye; gena broad, finely grey pollinose and long yellow pilose; lower occiput densely grey pollinose and long yellow pilose. Frons slightly convex, densely greyish-white pollinose, long black and yellow pilose; frontal angle distinctly obtuse; lunule yellow to brownish-yellow, whitish pollinose; antennal pits broadly separated. Scape and pedicel brownish-black, shiny with slight pollinosity, basoflagellomere oval, bright orange-yellow with narrowly darkened margin at arisal insertion; arista long, black, dulled with very short adpressed pilosity. Eye with dense, long, dark-brown pilosity; length of eye contiguity almost equal to length of frons without lunule. Vertex convex, pilosity long, brown; ocellar triangle equilateral. Occiput in upper part with only yellow pilosity.

THORAX. Postpronotum black with brownish-yellow margin, densely grey pollinose and white pilose. Scutum fine-punctured, shiny black with some grey pollinosity on lateral parts; in anterior half mainly with

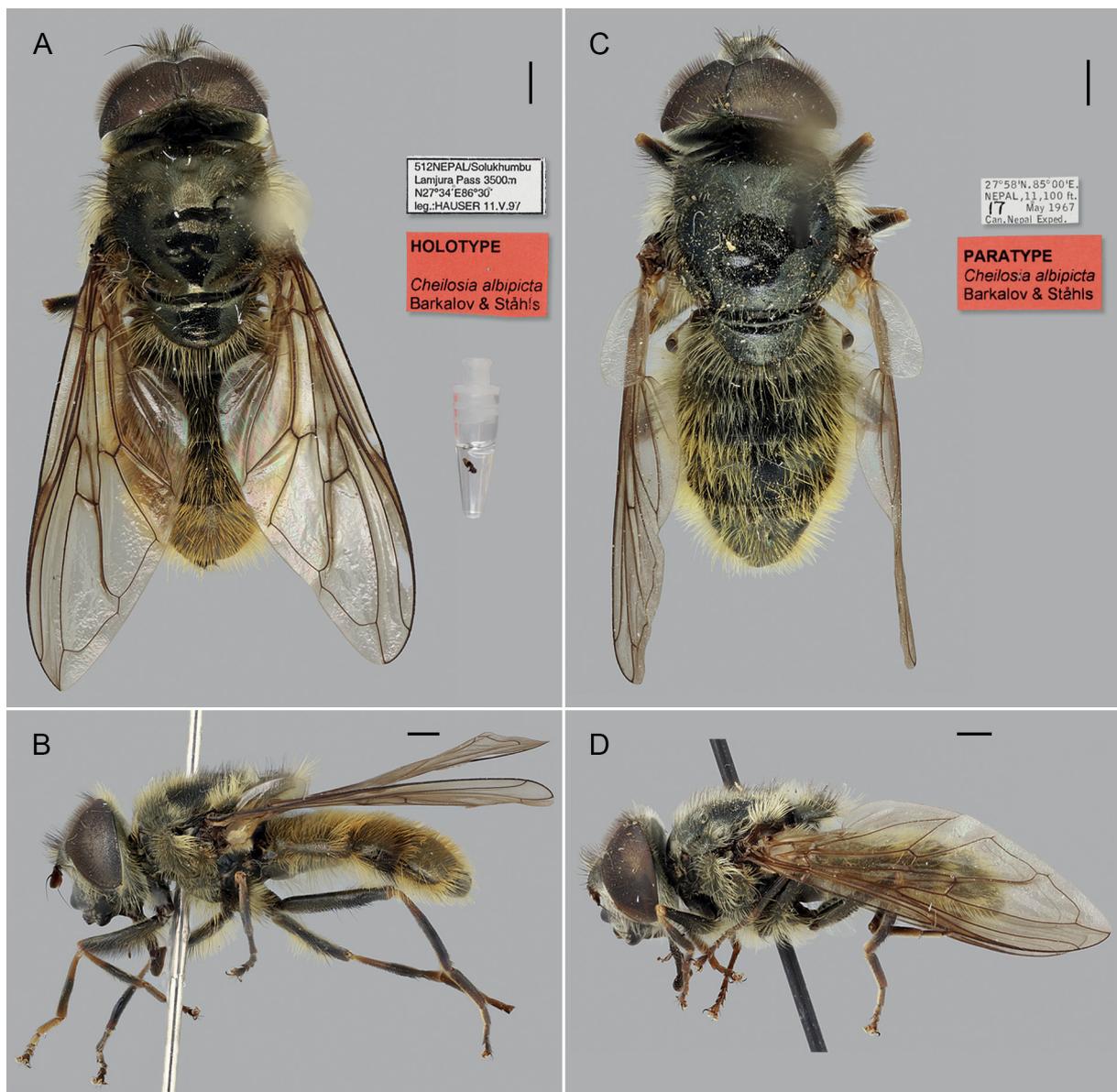


Fig. 4. *Cheilosia (Montanocheila) albipicta* sp. nov. A–B. Holotype, ♂ (CSCA); dorsal and lateral views. C–D. Paratype, ♂ (CNC); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

long erect pale pilosity, on posterior half with long pale and black pilosity and 3 × shorter black pilosity, area anterior to scutellum only white pilose; postalar callus with long, yellow pilosity; scutum laterally with long yellow and black intermixed pilosity, lacking strong black bristles; scutellum with very long yellow and black pilosity, hind margin lacking black bristles; subscutellar fringe pile long, dense, yellow. Pleura black, with brown fascia on dorsal part of katepisternum and anterior part of katepimeron; grey pollinose and long, dense, yellow pilose; katepisternum with confluent pilosity; posterior anepisternum with mixed yellow and black pilosity; metasternum yellow pilose.

LEGS. Fore coxa brown, densely grey pollinose and yellow pilose; without baso-lateral spur; femora black with yellow tips; tibiae yellow with broad black annulus medially; fore and hind tarsi dorsally black with yellow tip of basitarsus; mid tarsus with 1–4 segments yellow and 5th segment black, all tarsi ventrally yellow; long pilosity on posterior margin of fore and mid femora yellow in basal part and black in apical part; antero-ventral long pilosity on hind femur yellow, with some long black pilosity in apical half.

WING. Entirely microtrichose, translucent with brownish tinge at transversal veins; inner angle of veins M_1 and R_{4+5} right, R_{4+5} seemingly re-entrant; Rs with short black pile. Haltere yellow with black knob; calypter yellow with yellow pilosity.

ABDOMEN. Comparatively broad, oval, in broadest part slightly broader than mesonotum at level of wing base; black, matte, with large shiny fascia laterally on tergites III–IV; with dense, erect, long, yellow to orange-yellow pilosity, with a patch of black long pilosity on postero-lateral margin of tergite III. Sternites I–IV densely greyish pollinose, with long, erect and short adpressed yellow pilosity, posterior $\frac{2}{3}$ of sternite IV with short, adpressed black pilosity and some longer adpressed or erect yellow pile. Pre-genital segments pollinose, with black and yellow pilosity.

Female

LENGTH. Body 8.4–9.7 mm, wing 7.9–9.3 mm.

HEAD. Shape of face as in male, but pollinosity denser, and with longer microtrichia (resembling true pile); parafacia broad, in width almost equal to half of basoflagellomere width. Frons broad, distinctly broadened anteriorly, with distinct, broad lateral furrows and a very fine medial furrow, covered with dense, erect yellow and black pilosity. Basoflagellomere very big, oval, orange-brown with antero-dorsal margin slightly darkened.

THORAX. Scutum in anterior third grey pollinose, pilosity as in male. Katepisternum with pilosity narrowly separated medially. Scutellum with black long pilosity medially and on margins yellow pilose. Pleura densely grey pollinose and white pilose.

WING. Transverse veins of wing without brownish tinge.

LEGS. Hind femur with dense, long yellow pilosity antero-ventrally.

ABDOMEN. Oval, distinctly broader than mesonotum at level of wing base, colour of pilosity same as in male but length shorter. Other characters as in male.

Distribution

Nepal.

Cheilosia alpha sp. nov.

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Figs 5–6

Differential diagnosis

Cheilosia (Montanocheila) alpha sp. nov. can be discerned from other *Montanocheila* spp. by the combination of presence of black pilosity on lower part of parafacia (only whitish or yellowish in other species), presence of black bristles on hind margin of scutellum, in the female this combination and distinctly glossy maculae on lateral parts of tergites III–IV.

Etymology

The specific epithet ‘*alpha*’ is from the Greek and refers to the first letter.

Material examined

Holotype

NEPAL • ♂; 27°58' N, 85°00' E; 11 100 ft a.s.l.; 11 May 1967; Can. Nepal Exped.; CNC.

Paratypes

NEPAL • 21 ♂♂, 4 ♀♀; 27°58' N, 85°00' E; 11 100 ft a.s.l.; 15 May–3 Jun. 1967; Can. Nepal Exped.; CNC • 10 ♂♂, 4 ♀♀; 27°58' N, 85°00' E; 11 100 ft a.s.l.; 15–28 May 1967; Can. Nepal Exped.; Malaise trap 1; CNC • 2 ♀♀; 27°58' N, 85°00' E; 11 200 ft a.s.l.; 15–28 May 1967; Can. Nepal Exped.; Malaise trap 2; CNC • 1 ♀; 27°58' N, 85°00' E; 11 400 ft a.s.l.; 25 May 1967; Can. Nepal Exped.; Malaise trap 3; CNC • 1 ♀; 27°58' N, 85°00' E; 10 100 ft a.s.l.; 28 May 1967; Can. Nepal Exped.; Malaise trap 8; CNC • 2 ♂♂, 4 ♀♀; Prov. Mahakali, Hochlager vor Api bis Lager an Chamliya Khola bei Shinae [camp before Api to camp at Chamliya Khola near Shinae]; 3400–2800 m a.s.l.; 10 Jun. 2005; J. Weipert leg.; IBSJW/NME • 3 ♀♀; Prov. Mahakali, Hochlager vor Api [camp before Api]; 3400 m a.s.l.; 8 Jun. 2005; J. Weipert leg.; IBSJW/NME • 2 ♀♀; Prov. Karnali, Umg. Gotchichaur [surroundings of Gotchichaur]; 2800 m a.s.l.; 21 May 1995; J. Weipert leg.; IBSJW/NME • 1 ♂; Solukhumba, E of Pangkongma La; 27°34' N, 86°45' E; 3000 m a.s.l.; 17 May 1997; M. Hauser leg. [523]; CSCA • 1 ♂; Prov. Seti, 42 km NE of Chainpur, Hochtal am Khalapani Khola [valley at Khalapani Khola]; 29°48'23" N, 81°29'04" E; 3700–4100 m a.s.l.; 22–23 Jun. 2009; J. Weipert leg.; IBSJW/NME.

Description

Male

LENGTH. Body 6.9–9.4 mm, wing 6.7–8.9 mm.

HEAD. Face in anterior view rather broad, distinctly broadened ventrally, in lateral view moderately protruded, slightly grey pollinose except shiny on facial knob and shiny stripe in lower part, without distinct pilosity; facial tubercle small but distinct; parafacia broad, in width approximately equal to width of basoflagellomere, grey pollinose and densely pollinose along eye, sometimes without pollinosity ventrally, pilosity very long, fine, semi-erect, mostly yellow but mixed with some black pilosity in lower part; gena broad, brownish with fine grey pollinosity and long, pale-yellow pilosity. Frons distinctly convex, finely grey pollinose, denser near eye, covered with long black pilosity; lunule pale yellow, antennal pits distinctly separated; frontal angle distinctly obtuse. Eye completely covered with long, dense brownish pilosity, length of eye contiguity approximately equal to length of frons without lunule. Vertex inflated, long, black pilose, ocellar triangle equilateral. Occiput narrow, in posterior part with long, black and short yellow pilosity. Scape and pedicel shiny black but with slight pollinosity, basoflagellomere roundish, orange, anterior and antero-dorsal margins dark; arista long, black, bare.

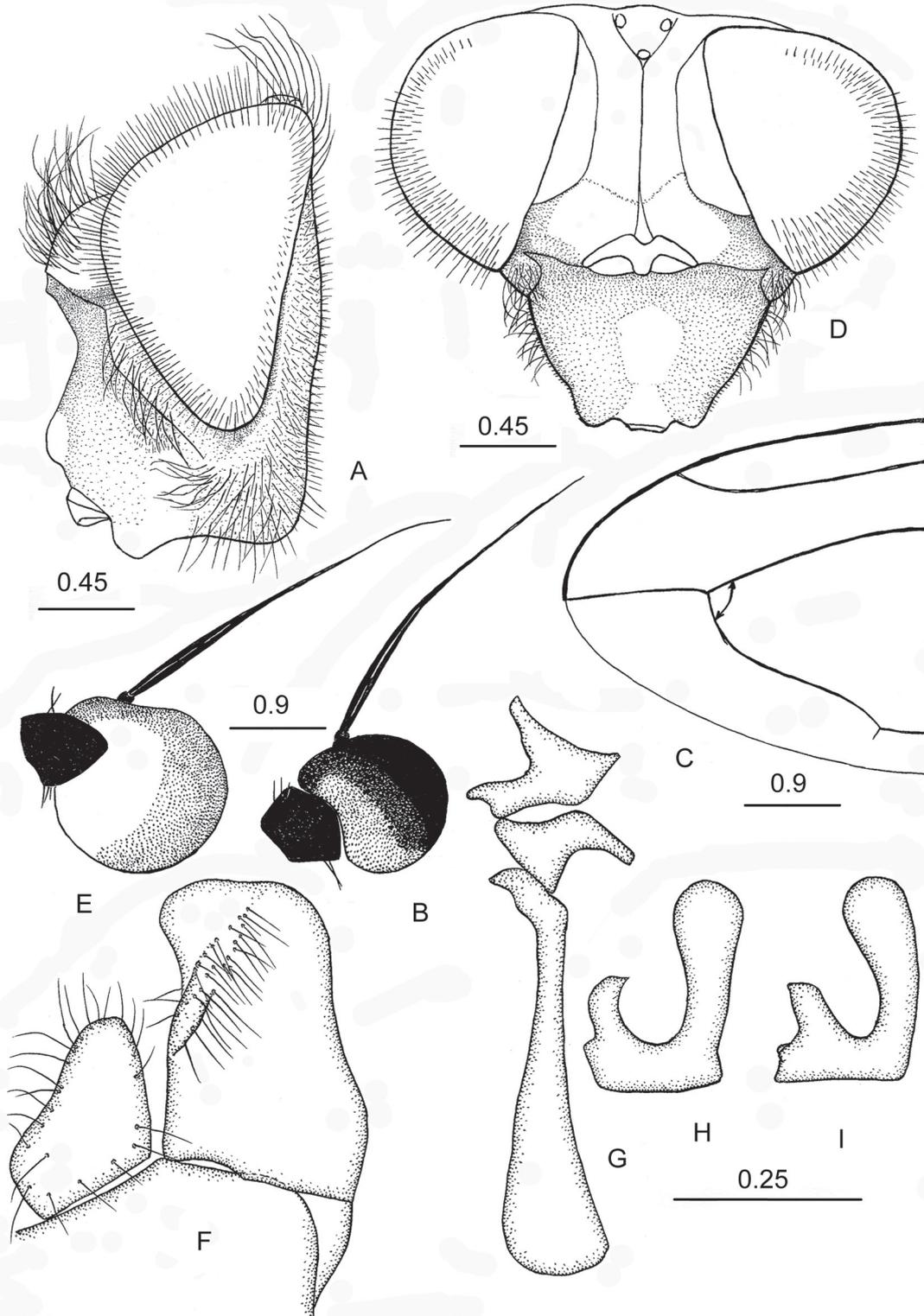


Fig. 5. *Cheilasia (Montanocheila) alpha* sp. nov.; A–C, F–I = paratype, ♂ (CNC), D–E = paratype, ♀ (CNC). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Tip of wing. **D.** Head, dorsal view. **E.** Antenna, lateral view of pedicel and basoflagellomere. **F.** Surstylus and gonocercus, lateral view. **G.** Aedeagus and aedeagal apodeme, lateral view. **H–I.** Superior lobes of hypandrium, lateral view. Scale bars indicated in drawings.

THORAX. Postpronotum black, densely grey pollinose and white pilose. Scutum smooth, with weak puncturation, shiny-black with grey pollinose area anterior to transverse suture and narrow stripe in front of scutellum, in anterior part covered with comparatively long, dense, whitish or yellowish pilosity, in posterior half with very long black and yellow pilosity, intermixed with 4–5 times shorter yellow pilosity, lateral parts lacking strong bristles; scutellum with pollinose stripe anteriorly, otherwise shiny without pollinosity, pilosity long black and short yellow, scutellum hind margin without strong black bristles; subscutellar fringe with long yellow pilosity. Pleura black, with a more or less developed brown macula on katepimeron, grey pollinose and long white pilose, postero-dorsal corner of anepisternum and anepimeron with some black pilosity, katepisternum with confluent yellowish pilosity, intermixed with some black pile. Metasternum yellowish pilose.

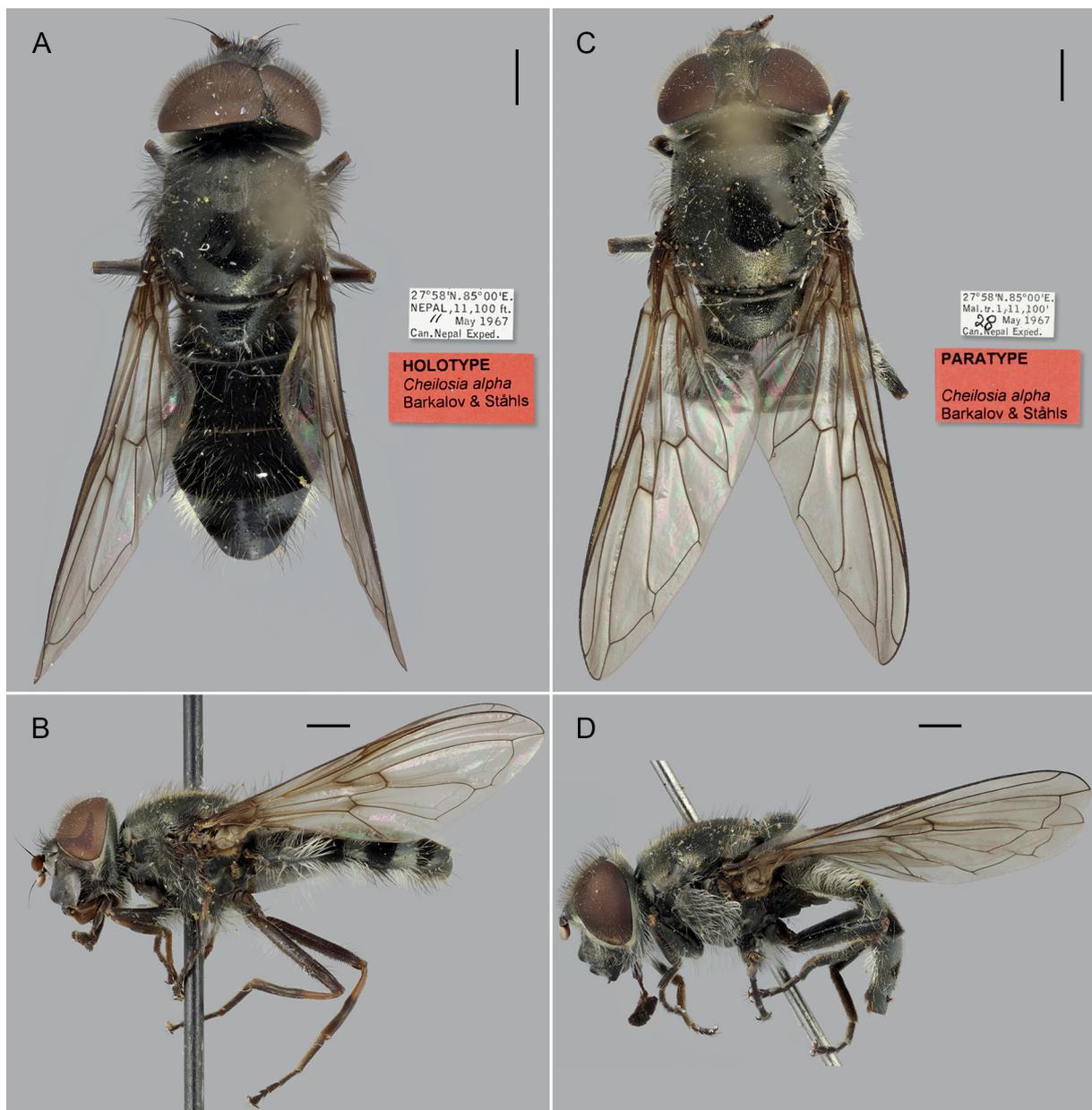


Fig. 6. *Cheilosia (Montanocheila) alpha* sp. nov. A–B. Holotype, ♂ (CNC); dorsal and lateral views. C–D. Paratype, ♀ (CNC); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

LEGS. Fore coxa brown, densely grey pollinose, with appressed yellow pilosity, without baso-lateral spur; femora black with tip narrowly yellow; long pilosity on fore and mid femur in basal half yellow and black in apical half, long pilosity on hind femur yellow; tibia black, but yellow in basal $\frac{1}{3}$ and at tip; tarsi black dorsally and yellow ventrally.

WING. Completely microtrichose, translucent with slight brownish tinge medially; inner angle between veins M_1 and R_{4+5} right, Rs with short dark pile along all length. Haltere brownish with black knob; calypter yellow with brown rim and yellow pilosity.

ABDOMEN. Comparatively broad, oval, in broadest part approximately equal to width of scutum at level of wing base, black; tergites with distinctly shining large maculae on antero-laterally; covered with comparatively long, rather sparse, erect pilosity, white on terga I–II and anterior corners of terga III–IV, and black on posterior corner of tergites II–IV. Hypopygium with yellow and some black pilosity. Sternites densely grey pollinose, covered with long, erect and short appressed white pilosity, some short, black appressed pilosity on medial part of tergite IV.

Female

LENGTH. Body 6.9–9.4 mm, wing 6.7–8.9 mm.

HEAD. Face and facial tubercle as in male; parafacia broad, narrower than width of basoflagellomere, mainly white pilose but often with a few black pile ventrally, in some specimens with brown spot or stripe on lower part. Frons comparatively narrow, with distinct lateral furrows and sometimes an almost invisible central furrow; pilosity erect yellow or black and yellow; at anterior $\frac{1}{3}$ with narrow transverse stripe of grey pollinosity. Basoflagellomere moderate in size (not much broader than in male).

THORAX. Scutum with less developed grey pollinosity on anterior part; notopleural area and postalar callus more densely pollinose; pilosity short, erect yellow and black, intermixed with 3–5 times longer black pilosity. No bristles on lateral parts of scutum. Scutellum margin with some long, black, not very strong bristles.

ABDOMEN. Slightly broader than mesonotum at level of wing base, broadest part at the end of tergite II. Black, matte, with shiny anterior corners of tergites III–IV and all of tergite V. Otherwise as in male.

Remarks

Cheilosia alpha sp. nov. is included in the subgenus *Montanocheila*. The shapes of the distiphallus (apical sclerite of aedeagus) and of the surstylus of the male genitalia are similar to those of members of subgenus *Floccocheila*, but the species is not large sized and long pilose as the other taxa placed in *Floccocheila*.

Distribution

Nepal.

Cheilosia angusta sp. nov.

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Figs 7–8

Differential diagnosis

Cheilosia (Cheilosia) angusta sp. nov. can be discerned from all other Nepalese *Cheilosia* by the following combination of characters: eye black pilose, basoflagellomere and arista orange-yellow to dusky orange-brown in colour and scutellum margin black pilose.

Etymology

The specific epithet is from the Latin ‘*angusta*’ meaning ‘narrow’, and refers to the slender habitus of the species.

Material examined

Holotype

NEPAL • ♂; Distr. Humla, 18 km NW Simikot Brücke am Chuma Khola [18 km NW of Simikot Bridge on Chuma Khola]; 30°02'25" N, 81°39'06" E; 2950 m a.s.l.; 20–22 Jun. 2001; F. Creutzburg leg.; yellow trap; IBSJW/NME.

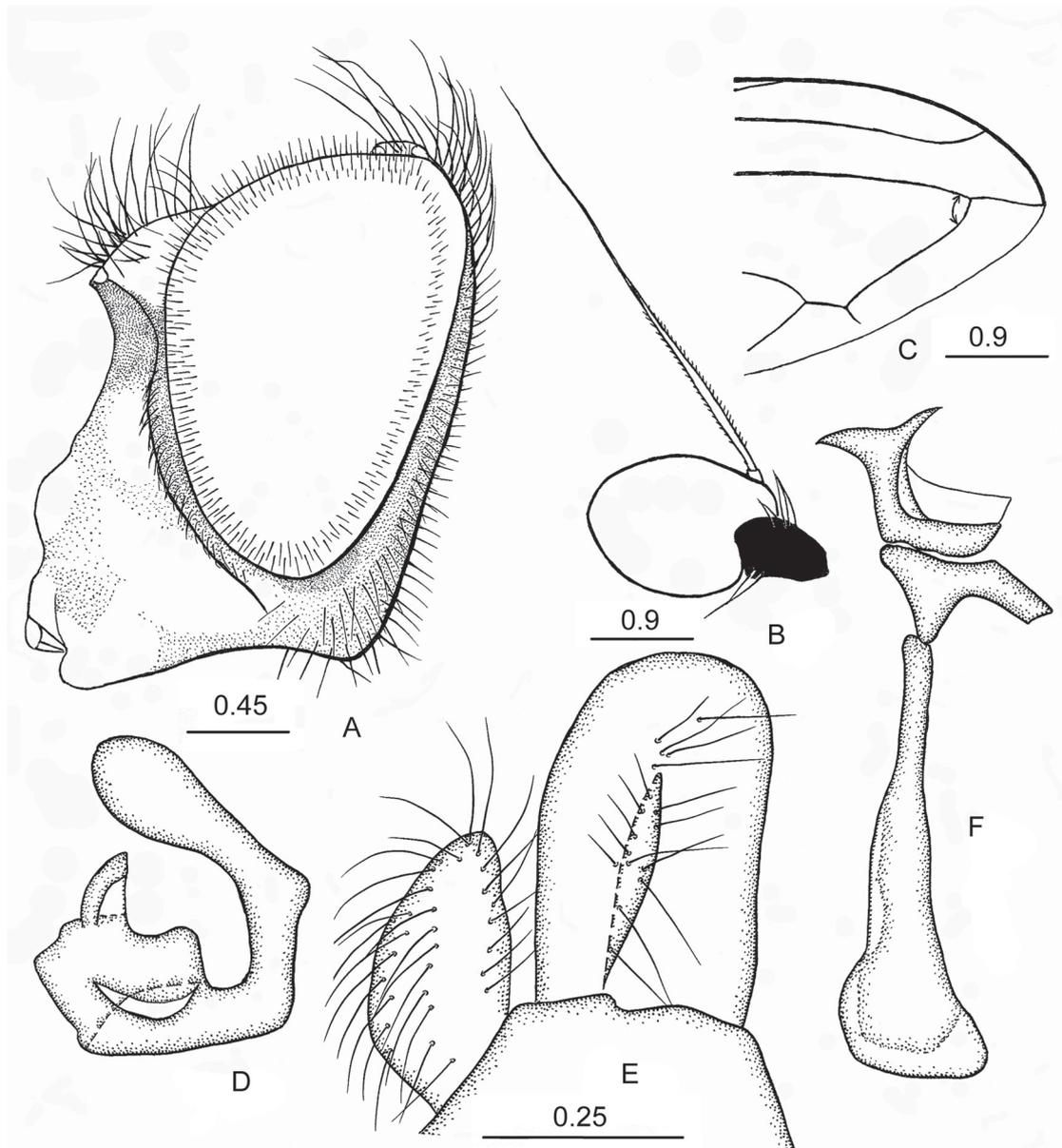


Fig. 7. *Cheilosia (Cheilosia) angusta* sp. nov., holotype, ♂ (IBSJW/NME). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Tip of wing. **D.** Superior lobe of hypandrium, lateral view. **E.** Surstylus and gonocercus, lateral view. **F.** Aedeagus and aedeagal apodeme, lateral view. Scale bars indicated in drawings.

Paratype

NEPAL • ♂; same data as for holotype; IBSJW/NME.

Description

Male

LENGTH. Body 10.2–11 mm, wing 10.0–10.5 mm.

HEAD. Face in lateral view distinctly protruded forward in ventral part; black, shiny but with fine grey pollinosity; non-pilose; facial tubercle small, distinctly compressed laterally; parafacia moderate in width, in broadest part about $\frac{3}{4}$ to $\frac{4}{5}$ of basoflagellomere width, grey pollinose and with short, white pilosity; genae narrow, finely grey pollinose, with moderately long white pilosity; lower occiput with fine grey pollinosity and white pilosity. Frons slightly inflated, shiny, grey pollinose near eye, long black pilose; frontal angle acute; lunule dusky yellow; antennal pits distinctly separated. Scape and pedicel dark-brown to black, basoflagellomere oval, orange to dusky orange (orange-brown); arista long, orange-yellow, with very short pilosity. Eye contiguity about 1.3 times as long as frons without lunule. Eye completely covered with comparatively long, dense, yellow pilosity. Vertex slightly inflated, shiny, covered with long black pilosity; ocellar triangle isosceles; upper occiput with long black pilosity.

THORAX. Postpronotum black, grey pollinose and yellow pilose. Scutum with fine puncturation, shiny, with finely grey pollinose laterally and on hind $\frac{1}{3}$ part; long, erect, black and yellow pilose, on posterior part longer black pilosity of which some pile is apically wavy. Postalar callus white pilose and with some long, but fine, black bristles. Scutellum black, with long, erect, black pilosity and shorter erect yellowish pilosity, on hind margin with many long black bristles or bristle-like pilosity as long as or longer than scutellum length; subscutellar fringe with long white pilosity. Pleurae grey pollinose, without shiny spots,

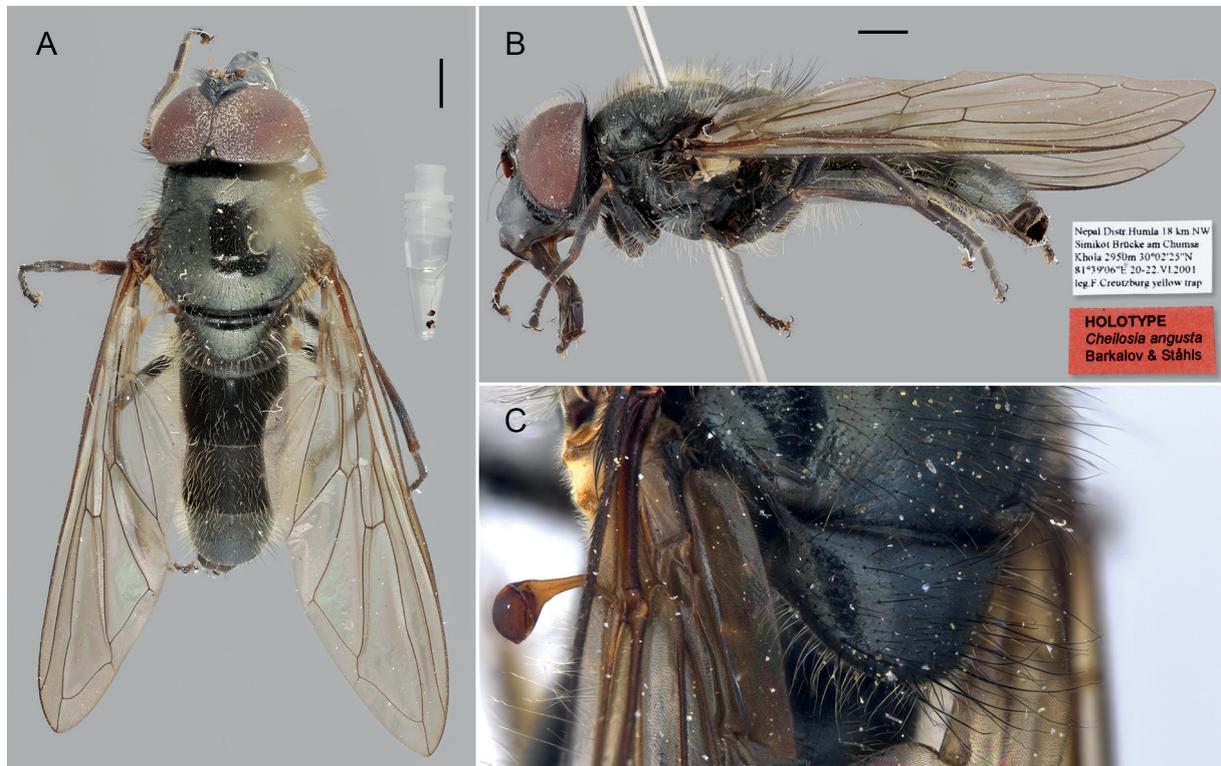


Fig. 8. *Cheilosia (Cheilosia) angusta* sp. nov. A–B. Holotype, ♂ (IBSJW/NME); dorsal and lateral views. C. Oblique view of scutellum of ♂, paratype (IBSJW/NME).

yellow pilose; posterior anepisternum and anterior anepimeron yellow pilose mixed with some fine black pile; katepisternum with dorsal and ventral yellow pile patches widely separated.

LEGS. Mostly black, only basal $\frac{1}{3}$ – $\frac{1}{2}$ and tips of tibiae brownish; fore coxa without baso-lateral spur; long pilosity on posterior side of fore femur mostly black with some yellow pilosity; long pilosity on posterior side of mid femur yellow with some black pilosity near tip; hind femur with long yellowish pilosity antero- and postero-ventrally, longer than width of hind femur, some long yellow apically wavy pilosity. Metasternum with long yellow pilosity.

WING. Elongated, slightly brownish, completely microtrichose; inner angle between M_1 and R_{4+5} almost right. Rs basally with 3–4 very short pile. Haltere yellow with darker (brownish) knob; calypter yellow with yellow pilosity.

ABDOMEN. Black, narrow, distinctly narrower than mesonotum at level of wing base; pollinose and matte medially and weakly pollinose and shiny laterally; covered with comparatively long but not dense, erect, yellow pilosity which is longest on lateral parts of tergites I–II, hind margin of tergite IV also with some black pilosity. Sternites I–II with long erect yellow pilosity, pilosity longest on sternite II. Sternites III–IV laterally with erect yellow pilosity, sternites III–IV medially with short appressed black pilosity. Pre-genital segments black pilose.

Female

Unknown.

Distribution

Nepal.

Cheilosia brevimontana sp. nov.

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Figs 9, 10A–B

Differential diagnosis

Cheilosia (Montanocheila) brevimontana sp. nov. has a strikingly dense pilosity of the body. Among the Nepalese taxa *C. (M.) brevimontana* sp. nov. is most similar to *C. (M.) nigella* sp. nov., for distinguishing characters see under *C. (M.) nigella* sp. nov. From this and all other congeners the new species can be distinguished by the following combination of characters: broad frons and gena, basoflagellomere broader than long, dense mesonotal pilosity with admixed shorter yellowish and long black pilosity, and dense pollinosity on medial parts of scutum and scutellum.

Etymology

The specific epithet is derived from the Latin ‘*brevis*’, meaning ‘short’ or ‘low’.

Material examined

Holotype

NEPAL • ♀; Prov. Nr. 3 East, Lager über Bibre [camp near Bibre]; 5430 m a.s.l.; 26 Jul.–9 Aug. 1964; Löffler leg.; ZSMC.

Description

Female

LENGTH. Body 13.7 mm, wing 12.4 mm.

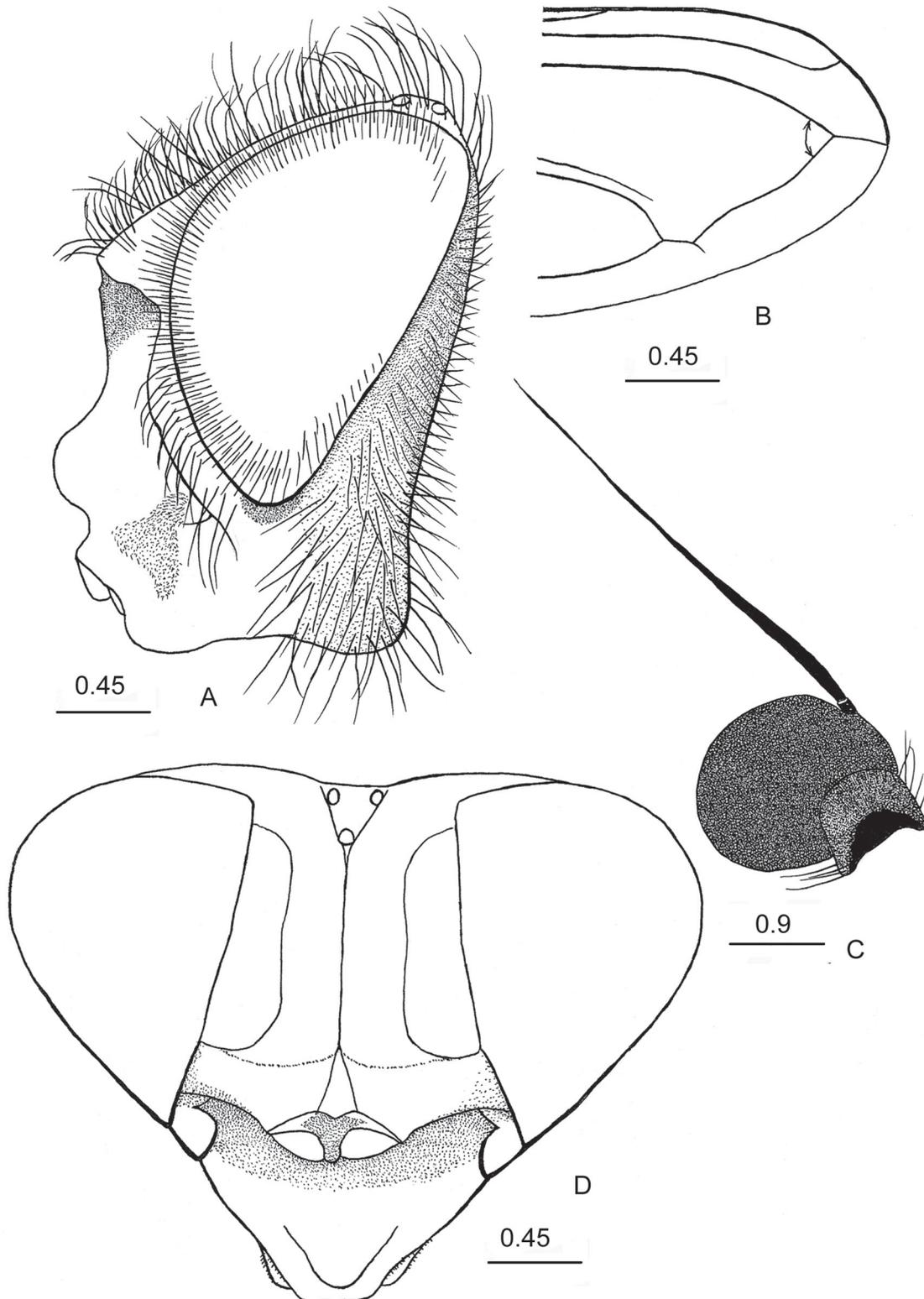


Fig. 9. *Cheilosia (Montanocheila) brevimontana* sp. nov., holotype, ♀ (ZSMC). **A.** Head, lateral view. **B.** Tip of wing. **C.** Antenna, lateral view of pedicel and basoflagellomere. **D.** Head, dorsal view. Scale bars indicated in drawings.

HEAD. Face broad, in anterior view moderately widening ventrally, in lateral view moderately protruded, black, slightly pollinose and shiny, with denser grey pollinosity ventral to antenna and a stripe extending from lower mouth margin to parafacia; non-pilose; facial tubercle moderate in size; parafacia broad, width about $\frac{2}{3}$ of basoflagellomere width, shiny black dorsally and grey pollinose ventrally, with long black pilosity of about equal length as eye pilosity; gena moderately broad, black, brown pollinose, long black and pale (white) pilose. Frons broad, with almost parallel sides, with two lateral furrows and a medial furrow which are distinct, densely grey pollinose and comparatively long and very densely black and white pilose; lunule dark-brown, antennal pits distinctly separated. Scape and pedicel black, shiny medially and grey dusted laterally; basoflagellomere broader than long, black, with brownish postero-ventral corner, densely brown pollinose; arista very long, black, seemingly bare. Eye entirely long black pilose. Vertex with mixed yellow and black pilosity; ocellar triangle isosceles. Occiput along all length black and yellow pilose.

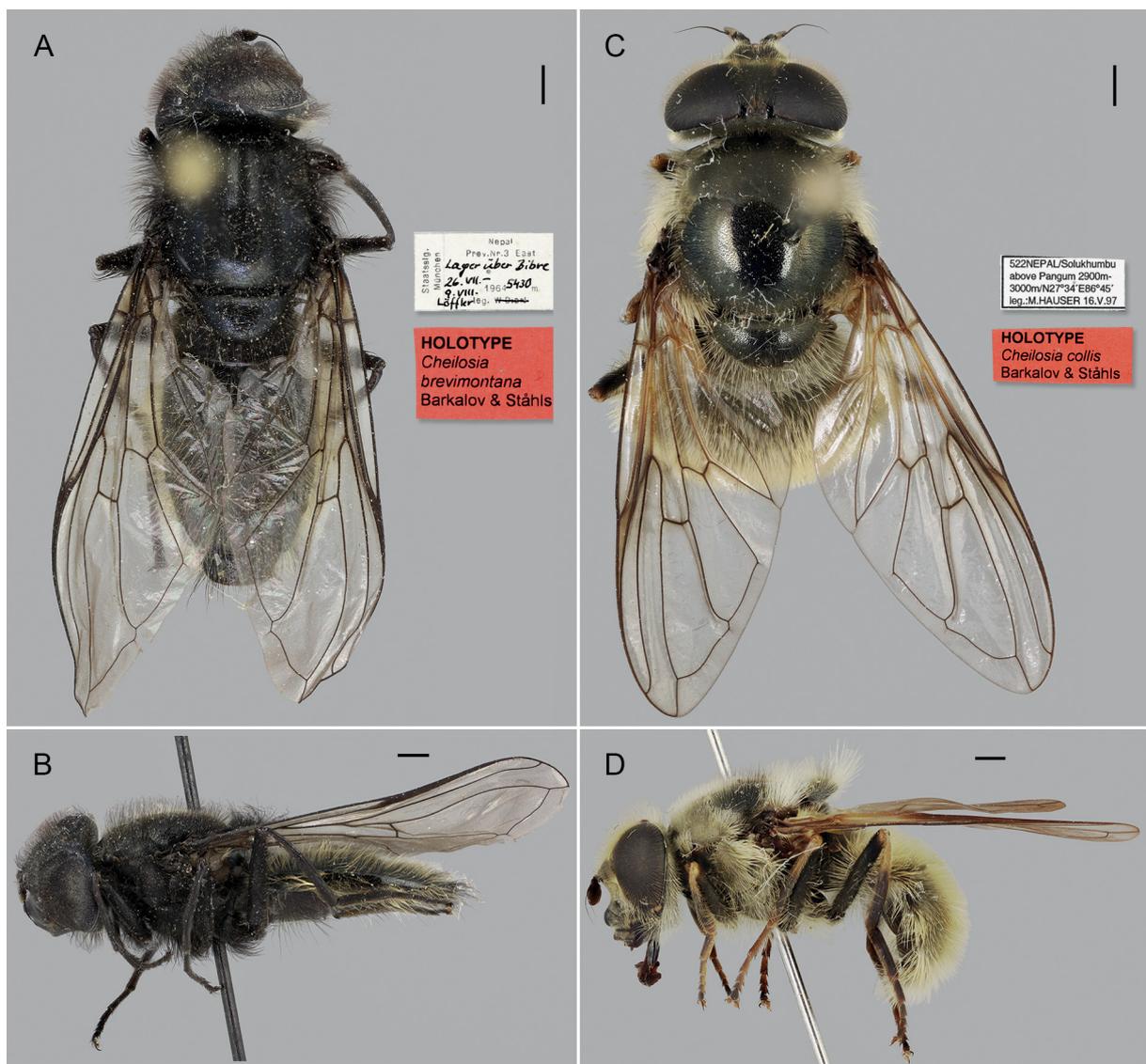


Fig. 10. A–B. *Cheilosia* (*Montanocheila*) *brevimontana* sp. nov., holotype, ♀ (ZSMC); dorsal and lateral views. – C–D. *Cheilosia* (*Floccocheila*) *collis* sp. nov., holotype, ♀ (CSCA); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

THORAX. Scutum black, fine-punctured, densely grey pollinose but posterior part and postero-laterally shiny; with black and whitish pilosity of equal lengths on anterior half, in other parts with short yellowish and 2–3× longer black and yellow pilosity, no distinct lateral black bristles. Scutellum brown pollinose medially and laterally shiny, long black pilose, scutellum margin lacking strong bristles; subscutellar fringe with mixed whitish and black pilosity. Pleura black, grey-brown pollinose, with long, dense, black pilosity; katepisternum contiguously (entirely) black pilose; metasternum with long black pilosity.

LEGS. Entirely black, but knees and basal part of tibia narrowly brownish, long pilosity on femora black; fore coxa black, without baso-lateral spur, with greyish-brown pollinosity and black pilosity. Hind femur ventrally and antero-ventrally with long black pilosity, longest pile 1.5× femur width.

WING. Translucent with contrasting dark-brown to black veins, entirely microtrichose; Rs with many short erect pile; inner angle between veins M_1 and R_{4+5} acute. Haltere yellow, knob black; calypter yellowish-brown with darker rim and yellow fringe.

ABDOMEN. Elongated, oval, in broadest part almost as broad as scutum at level of wing base; shiny black with bluish reflection; covered with dense, erect, mostly yellow pilosity, some black pile on antero-lateral corner of tergite I and antero- and postero-lateral corners of tergite III, tergite IV on hind margin with almost continuous band of semi-appressed long black pilosity. Sternites pollinose; with erect black and yellow pilosity on sternites I–III and laterally on tergites IV–V, yellow pilosity longer on lateral parts of sternites, and short semi-appressed to appressed black pilosity mainly on posterior parts of sternites II–V.

Male

Unknown.

Distribution

Nepal.

Cheilosia collis sp. nov.

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Fig. 10C–D

Differential diagnosis

Cheilosia (Floccocheila) collis sp. nov. differs from all known members of *Floccocheila* by the combination of the following characters: basoflagellomere brownish-orange, face without pilosity, scutum yellowish pilose with a broad transverse band of black pilosity of different lengths at level of wing bases, scutellum yellowish pilose with an area of black pilosity centrally, and pleura and abdomen densely yellow pilose. *Cheilosia (F.) collis* sp. nov. is similar to the Nepalese species *C. (F.) illustratoides* sp. nov. and *C. (F.) leucozonoides* sp. nov., from which it differs in having tergite III with only yellow pilosity (vs tergite III laterally with black pilosity in *C. (F.) illustratoides* sp. nov. and black pilose in *C. (F.) leucozonoides* sp. nov.).

Etymology

The specific epithet is from the Latin ‘*collis*’ meaning ‘hill’.

Material examined

Holotype

NEPAL • ♀; Solukhumbu above Pangum; 27°34' N, 86°45' E; 2900–3000 m a.s.l.; 16 May 1997; M. Hauser leg. [522]; CSCA.

Description

Female

LENGTH. Body 11.9 mm, wing 11.8 mm.

HEAD. Face very broad, in anterior view distinctly broadened ventrally, black, non-pilose; densely grey pollinose except tip of facial tubercle, with longer microtrichia medio-laterally and with shiny stripes lacking pollinosity ventrally; facial tubercle well-developed, rather narrow; parafacia very broad, in broadest part about equal to $\frac{1}{2}$ width of basoflagellomere, densely yellowish-grey pollinose along eye and long, yellow pilose; gena broad, densely grey pollinose and long yellow pilose, with a brown macula ventral to eye. Frons rather narrow, distinctly broadened anteriorly, densely yellow pilose, with distinct lateral furrows and almost invisible central furrow, in anterior $\frac{1}{3}$ with a narrow, transverse stripe of grey dusting; lunule brown; antennal pits distinctly separated. Antenna: scape and pedicel shiny black, mostly black pilose, pedicel ventrally also with some yellow pile, basoflagellomere orange-brown, darker in antero-dorsal part, densely grey pollinose; arista long, shiny-black with short pile. Eye completely covered with long, dense, yellow pilosity. Vertex convex, grey pollinose and yellow pilose, ocellar triangle equilateral.

THORAX. Postpronotum densely pollinose, yellow pilose. Scutum fine-punctured, densely grey pollinose on anterior $\frac{1}{3}$ anterior to transverse suture, along suture and on scutum hind margin anterior to scutellum, medially shiny with bluish reflection; pilosity erect, long, dense yellow, also with short and $2\times$ longer black pilosity on area between wing bases, no black bristles laterally; scutellum with narrow stripe of pollinosity anteriorly and otherwise shiny without pollinosity, with erect, shorter black and longer yellow pilosity; scutellum hind margin without black bristles. Subscutellar fringe with yellow, long, dense pile. Pleura black, grey pollinose, denser on dorsal part, with long, dense, pale-yellow pilosity, posterior anepisternum dorsally without black bristles; long yellow pilosity on katepisternum confluent; metasternum long, yellow pilose.

LEGS. Fore coxa without baso-lateral spur; black; grey pollinose and yellow pilose; femora shiny black with yellow tips; long pilosity of fore femur completely yellow, mid femur ventrally with black pilosity in apical half, hind femur antero-ventrally with long yellow pilosity $2\times$ as long as width of femur, basally a few long black pile, ventrally short black pilose, in apical $\frac{1}{3}$ with short black pile dorsally; tibia mainly black, fore tibia and hind tibia basally yellow in $\frac{1}{3}$ and at tip, mid tibia yellow on basal $\frac{2}{3}$ and on tip; fore and hind tarsi black dorsally and yellow ventrally, mid tarsi with segments 1–3 yellow, segment 4 brown and segment 5 black.

WING. Completely microtrichose, translucent, veins brown and basal part with yellow veins; Rs with comparatively dense and long yellow pile; inner angle between veins M_1 and R_{4+5} right. Haltere with yellow stem and black knob; calypter yellowish with yellow rim and fringe.

ABDOMEN. Broadly oval, black, tergites I–II grey pollinose, with long, dense, yellow, erect pilosity, tergites III–IV antero-laterally also with a patch of black pile. Sternites I–II densely pollinose with long, erect yellow pilosity, III–IV weakly pollinose, shiny, with long erect and shorter semi-adpressed yellow pilosity, mixed with short, semi-adpressed to appressed black pilosity, hind margin of sternite IV with almost only short, appressed black pile.

Male

Unknown.

Distribution

Nepal.

Cheilosia crassata sp. nov.

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Figs 11–12

Differential diagnosis

Cheilosia (Floccocheila) crassata sp. nov. is more robust but otherwise similar to the Palearctic species *Cheilosia (F.) illustrata* (Harris, 1780). *Cheilosia (F.) crassata* sp. nov. can be discerned from all other members of subgenus *Floccocheila* by the distinctly protruded face.

Etymology

The specific epithet is from the Latin ‘*crassus*’ meaning ‘stout’, referring to the robust habitus of the species.

Material examined

Holotype

NEPAL • ♂; Prov. Nr. 3 East, Dingpoche; 4400 m a.s.l.; 3 Jun. 1964; W. Dierl leg.; ZSMC.

Paratypes

NEPAL • 1 ♂; Prov. Nr. 3 East, Chukhung; 4800–5000 m a.s.l.; 8 Jun. 1964; W. Dierl leg.; ZSMC • 1 ♂; same data as for holotype; ZSMC • 1 ♀; Khumbu, Lobuche; 4900 m a.s.l.; 5 Jul. 1962; G. Ebert and H. Falkner leg.; ZSMC.

Description

Male

LENGTH. Body 9.3–12.6 mm, wing 8.8–10.6 mm.

HEAD. Face in anterior view slightly broadened ventrally, in lateral view distinctly protruded, black, silvery pollinose except on extreme tip of facial tubercle and a broad shiny stripe extending from parafacia to lower oral margin; non-pilose. Facial tubercle in lateral view moderately protruding; gena relatively broad, densely, silvery pollinose and long, white pilose, with some black pilosity anteriorly. Parafacia broad, nearly as broad as basoflagellomere width (ca 4/5 of width); shiny, with some pollinosity in ventral part; long, white pilose in dorsal part and black pilose in ventral part, pilosity longer than eye pile. Frons moderately inflated, densely, long, silvery pollinose; white pilose mixed with some black pile antero-laterally. Frontal angle distinctly obtuse. Lunule bright yellow, antennal pits broadly separated. Scape and pedicel yellowish-brown, basoflagellomere comparatively big, rounded or with slightly developed antero-dorsal angle, bright-orange with anterior and dorsal margin slightly dark-brown; arista long, black, bare. Eye entirely long, dense, black pilose; length of eye contiguity slightly shorter than length of frons without lunule. Vertex somewhat inflated with long white pilosity, ocellar triangle isosceles. Occiput with long and short white pilosity.

THORAX. Postpronotum black with brown anterior margin, white pilose. Scutum black with blue reflections, fine-punctured; with four longitudinal stripes of grey-brown pollinosity not reaching scutum hind margin; with long, dense, erect pilosity of same length, white on anterior parts and near scutellum, mixed with black pilosity on medial and lateral parts; postalar callus mostly white pilose mixed with a few black pile, scutum and postalar callus lacking strong bristles; scutellum shiny with bluish reflection, long, densely white pilose, scutellar margin lacking strong bristles. Subscutellar fringe with long, dense, white pilosity. Pleura predominantly black pilose; antero-dorsal corner of anepisternum, antero-dorsal corner of katepisternum and all area from wingbase to base of mid coxa brown in colour; with long,

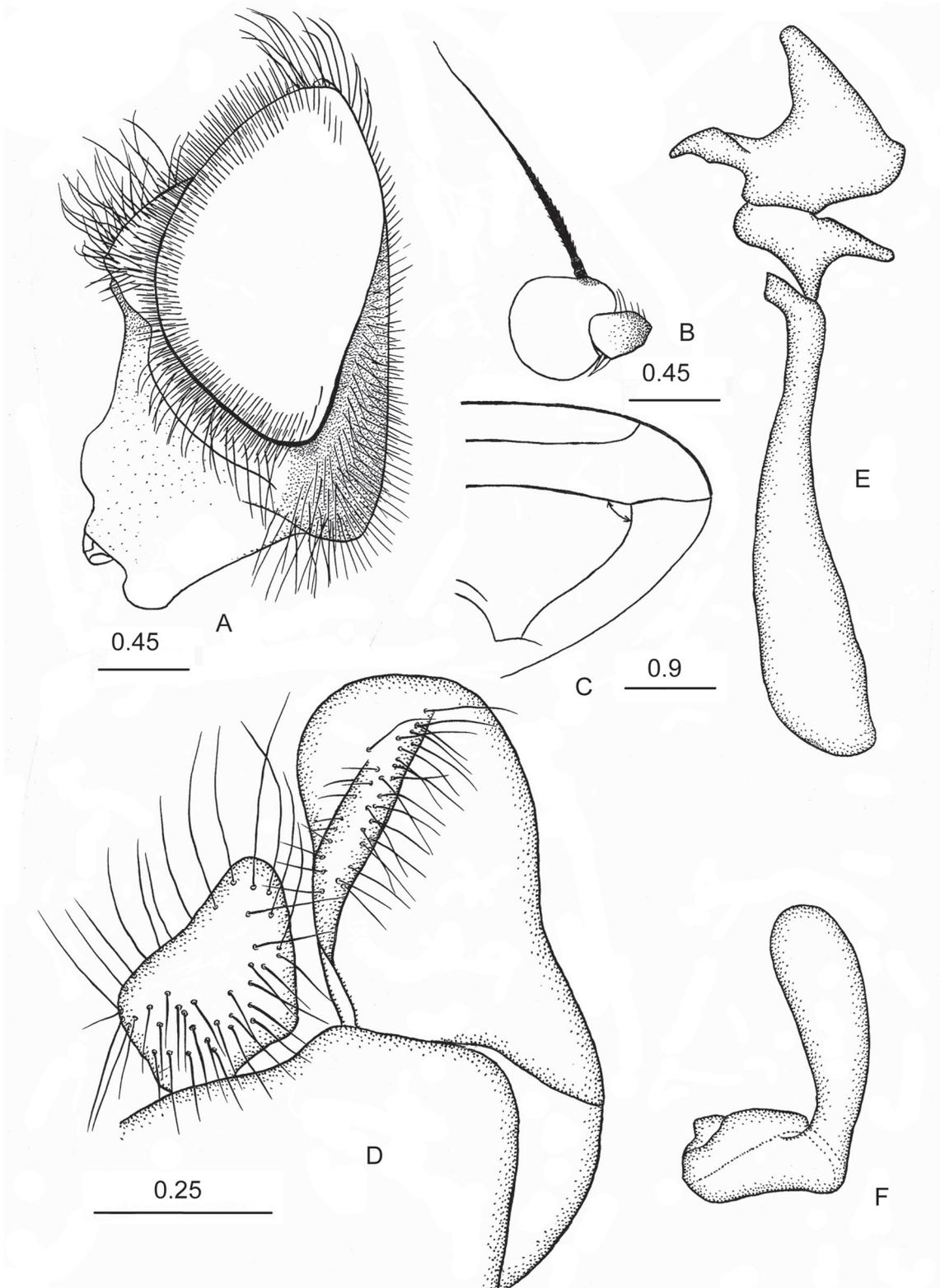


Fig. 11. *Cheilosia (Floccocheila) crassata* sp. nov., holotype, ♂ (ZSMC). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Tip of wing. **D.** Surstylus and gonocercus, lateral view. **E.** Aedeagus and aedeagal apodeme, lateral view. **F.** Superior lobe of hypandrium, lateral view. Scale bars indicated in drawings.

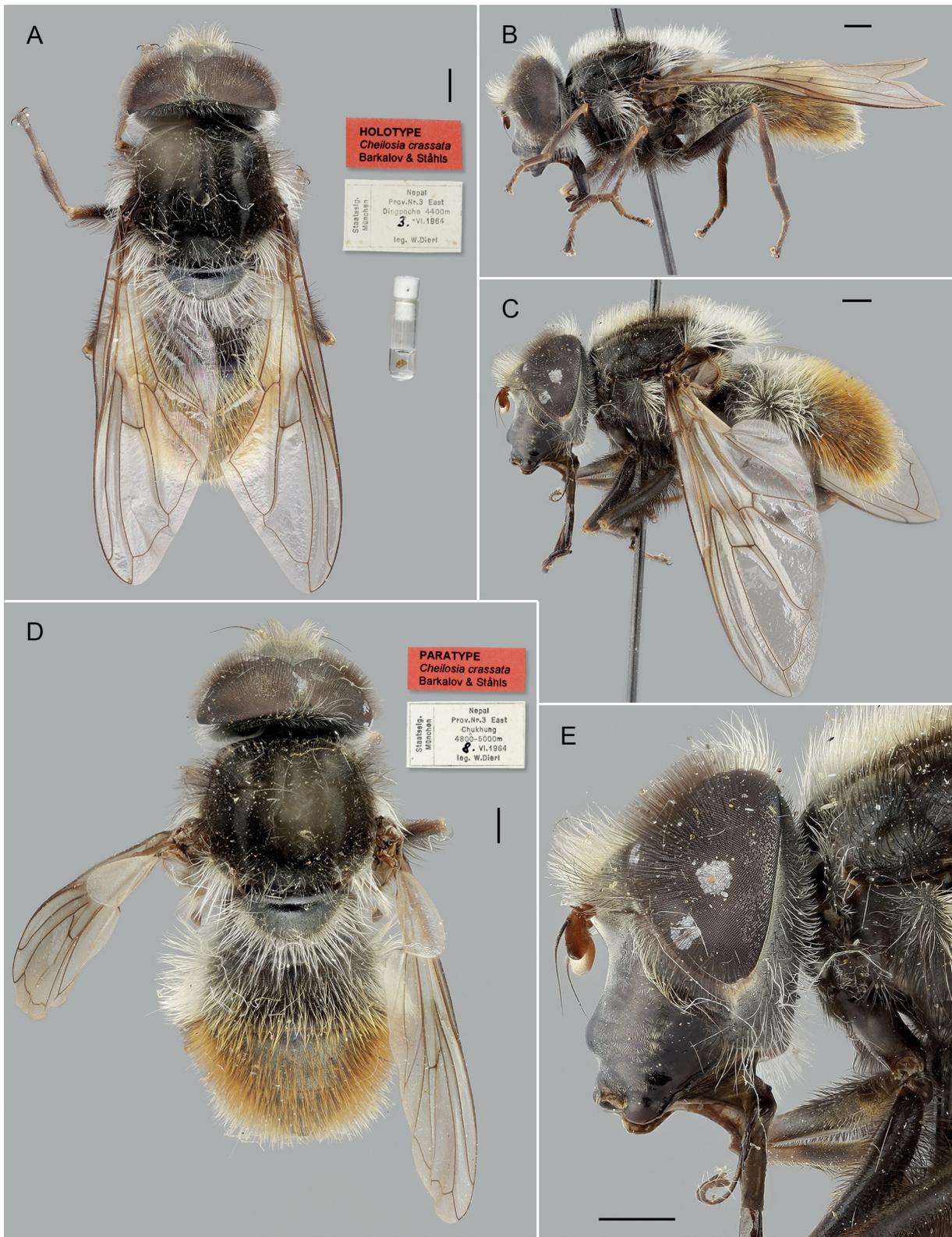


Fig. 12. *Cheilosia (Floccocheila) crassata* sp. nov. A–B. Holotype, ♂ (ZSMC); dorsal and lateral views. C–E. Paratype, ♂ (ZSMC); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

dense, erect pilosity, white on posterior parts of anepisternum, katepisternum and anepimeron, pilosity otherwise black; pilosity on katepisternum confluent; metasternum black pilose.

LEGS. Fore coxa brown, without baso-lateral spur, white pollinose and black pilose; femora black with tips more or less yellow, long pilosity on posterior part of fore and mid femur and antero-ventral part of hind femur black, hind femur with numerous long, black pile on anterior and antero-dorsal part; fore and mid tibia orange-yellow with more or less developed black annulus medially, hind tibia with yellow-brownish basal third and tip, otherwise black; tarsi bright orange ventrally, dorsally fore and hind tarsi black, mid tarsi yellow except for fifth segment darkbrown or black.

WING. Slightly brownish along transversal veins, entirely microtrichose, Rs with some yellow pilosity; inner angle between veins M_1 and R_{4+5} right. Haltere yellow with black knob; calypter greyish-white with brownish rim and white fringe.

ABDOMEN. Broad, oval, in its broadest part approximately equal to scutum width at level of wing base, black with bluish reflection on tergites I–II; covered with dense, erect, long pilosity, white on tergites I–II and bright orange in other parts. Sternites pollinose, with erect, black pilosity, longest on sternites II–III, sternite IV with semi-appressed black pilosity.

Female

Unknown.

Distribution

Nepal.

Cheilosia difficilis Hervé-Bazin, 1929

Figs 13, 14A

Chilosia (*Cheilosia*) *difficilis* Hervé-Bazin, 1929: 97. Type locality: China: Vallée du Yang-Tse-Kiang: Chang-Hai (holotype, ♂, MNHN) (not examined).

Cheilosia (*Cheilosia*) *difficilis* Hervé-Bazin, 1929 – Barkalov & Cheng 2004: 296. — Barkalov & Ståhls 2005: 186.

Differential diagnosis

Cheilosia (*C.*) *difficilis* is a species with partly pilose eye and pilose face. Among the Nepalese species it is closest to *Cheilosia* (*C.*) *pica* sp. nov., from which it differs in having femora more extensively black than in *C. pica* sp. nov.

Material examined

NEPAL • 1 ♀; Prov. Mechi, Tablejung; 29°21'17" N, 87°40'04" E; 1800 m a.s.l.; 30 Mar. 2003; J. Weipert leg.; IBSJW/NME • 1 ♀; Bhojpur Phedi to Dilkharka; 27°25' N, 87°00' E; 1500–1900 m a.s.l.; 26 May 1997; M. Hauser leg. [538]; CSCA • 1 ♂; Ktmd [Kathmandu], Godavari; 5000 ft a.s.l.; 23 Jul. 1967; Can. Nep. Exp.; CNC.

Distribution

China, Nepal.

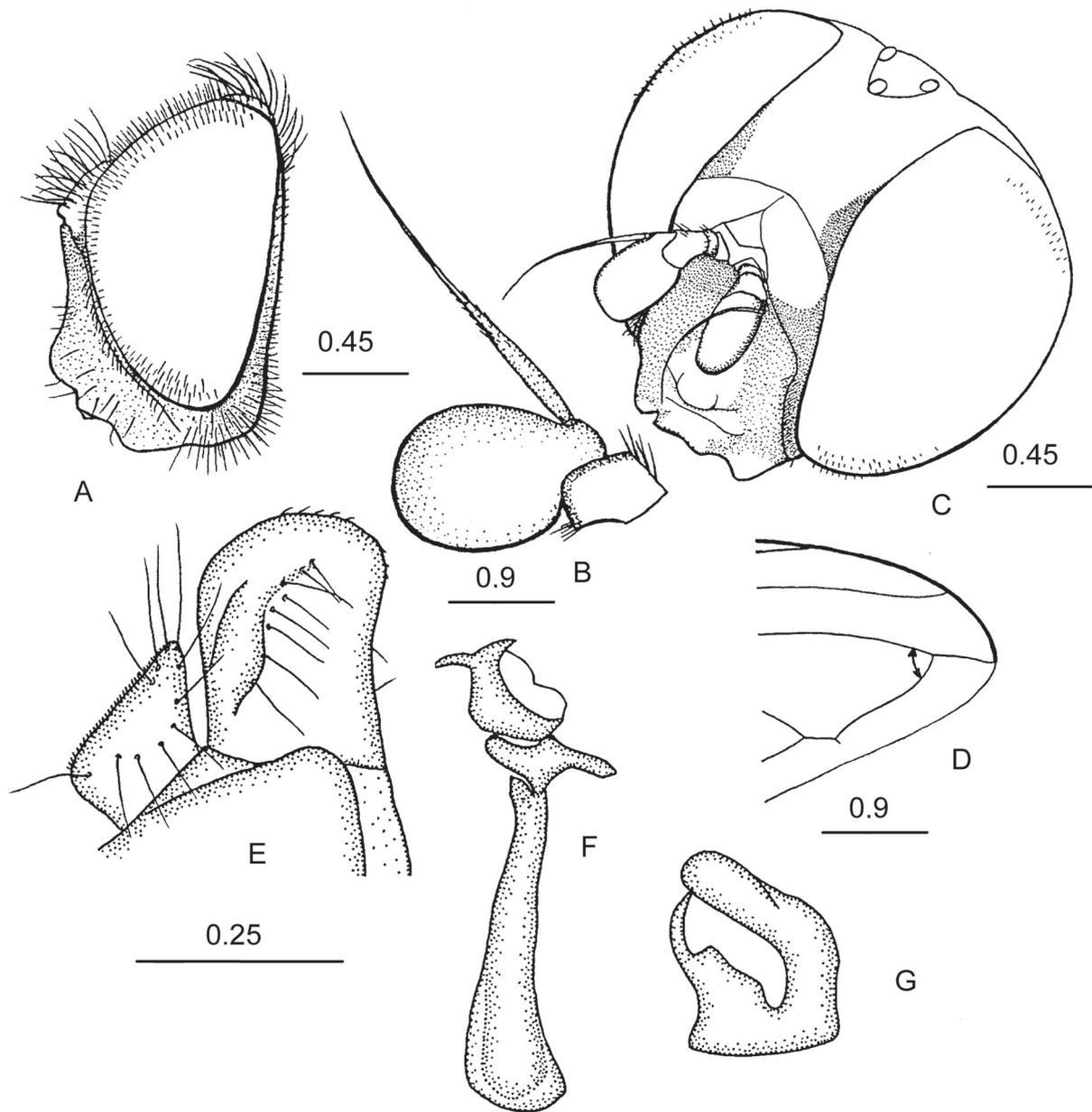


Fig. 13. *Cheilosia (Cheilosia) difficilis* Hervé-Bazin, 1929. **A.** Head of ♂, lateral view. **B.** Antenna of ♂, lateral view of pedicel and basoflagellomere. **C.** Head of ♀, antero-dorsal view. **D.** Tip of wing. **E.** Surstylus and gonocercus, lateral view. **F.** Aedeagus and aedeagal apodeme, lateral view. **G.** Superior lobe of hypandrium, lateral view. Scale bars indicated in drawings.

Cheilosia distincta Barkalov & Cheng, 1998
Figs 15–16

Cheilosia (Montanocheila) distincta Barkalov & Cheng, 1998: 313. Type locality: China: Sichuan: Xiangcheng (holotype, ♂, ZICAS).

Cheilosia (Montanocheila) distincta – Barkalov & Cheng 2004: 297.

Differential diagnosis

Cheilosia (M.) distincta is among the Nepalese species closest to *C. (M.) erratica*. *Cheilosia erratica* differs by having tergite III entirely yellowish pilose, while *C. distincta* has tergite III black pilose.

Material examined

NEPAL • 1 ♂; Solukhumbu, Shibuche; 27°34' N, 86°46' E; 2700–2300 m a.s.l.; 18 May 1997; M. Hauser leg. [524]; CSCA • 1 ♀; Ramechhap Mohabir Khola E of Shivalaya; 2500–2600 m a.s.l.; 27°35' N, 86°19' E; 6–7 May 97; Hauser leg.; CSCA • 1 ♀; Westnepal, Distr. Humla, Simikot, 12 km S of Raya;

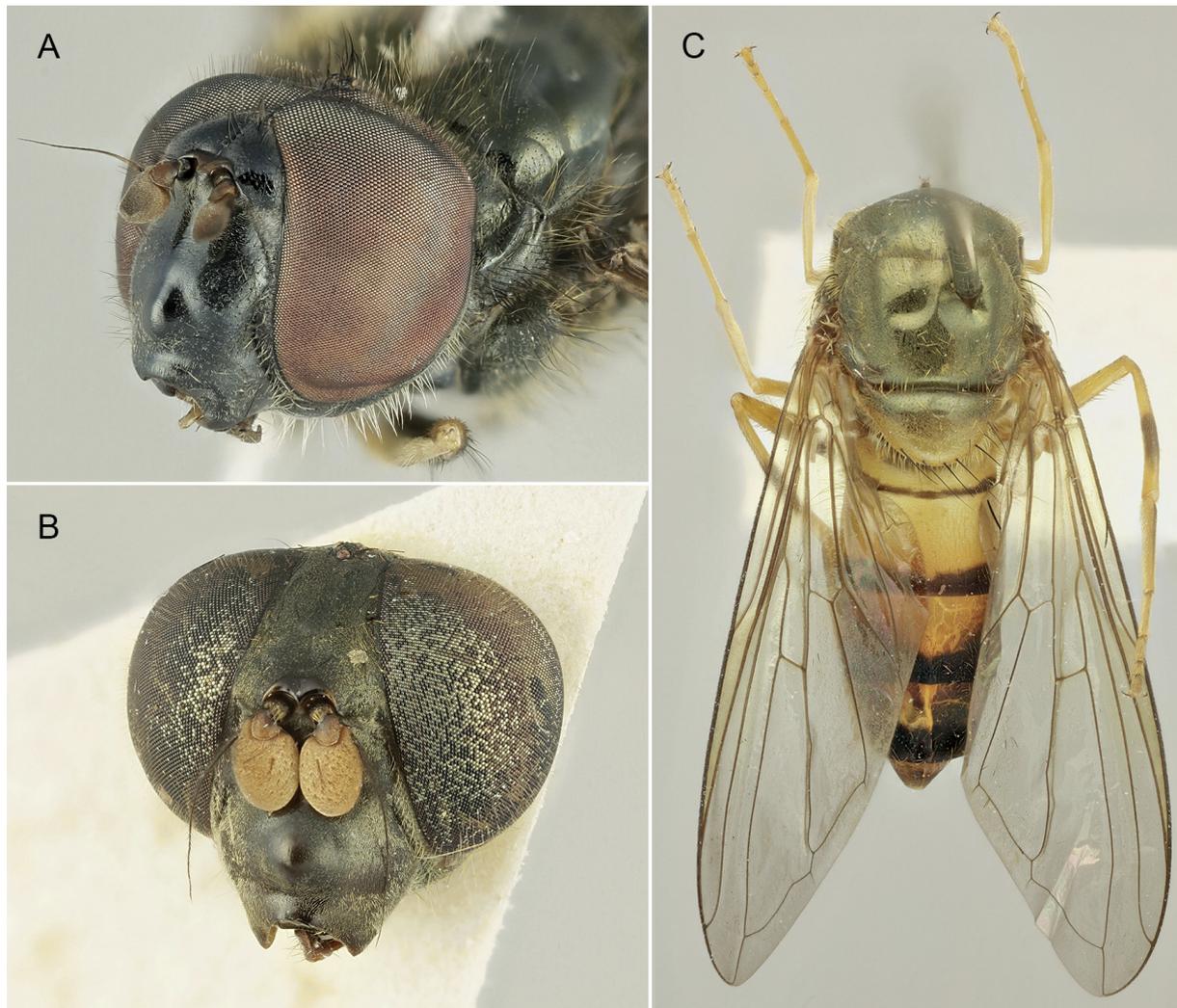


Fig. 14. A. *Cheilosia (Cheilosia) difficilis* Hervé-Bazin, 1929, ♂ (CNC); head. – B–C. *Cheilosia (Rubrocheila) egregia* Barkalov & Cheng, 1998, ♂ (CSCA); head and body, dorsal views. Not to scale.

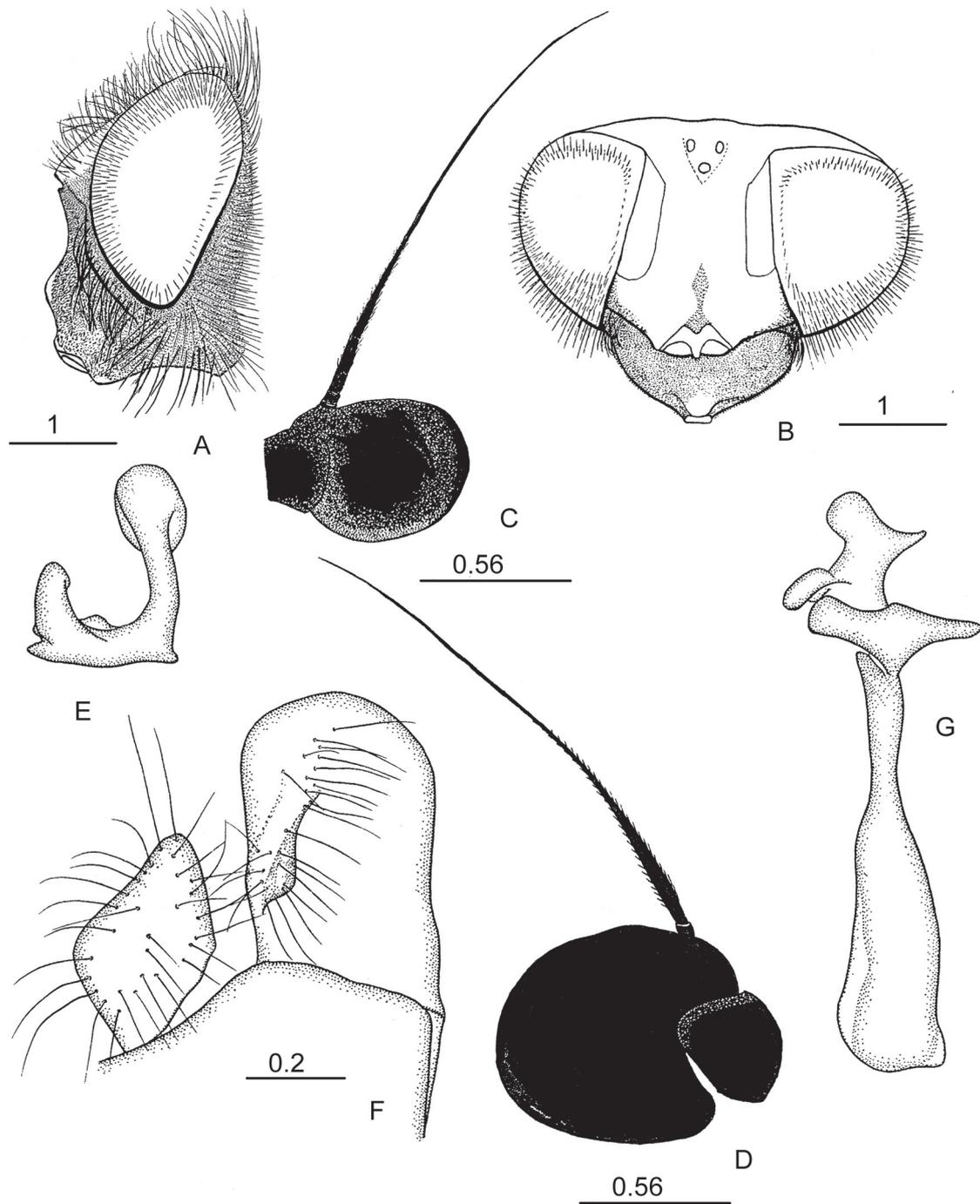


Fig. 15. *Cheilosia (Montanocheila) distincta* Barkalov & Cheng, 1998. **A.** Head of ♂, lateral view. **B.** Head of ♀, dorsal view. **C.** Antenna of ♂, lateral view of pedicel and basoflagellomere. **D.** Antenna of ♀, lateral view of pedicel and basoflagellomere. **E.** Superior lobe of hypandrium, lateral view. **F.** Surstylus and gonocercus, lateral view. **G.** Aedeagus and aedeagal apodeme, lateral view. After Barkalov & Cheng 1998. Scale bars indicated in drawings.

29°52'29" N, 81°51'57" E; 2400 m a.s.l.; 8 Jul. 2001; F. Creutzburg leg.; IBSJW/NME • 3 ♀♀; Kathmandu S, Phulchoki; 27°35'09" N, 85°22'50" E; ca 1800 m a.s.l.; 18 Jul. 2001; F. Creutzburg leg.; IBSJW/NME • 1 ♀; Prov. Karnali, Gothigaon, Flussufer; 29°14.55' N, 82°18.48' E; 2600 m a.s.l.; 14 Jun. 1997; J. Weipert leg.; IBSJW/NME.



Fig. 16. *Cheilosia (Montanocheila) distincta* Barkalov & Cheng, 1998. **A–B.** ♂ (CSCA); dorsal and lateral views. **C.** ♀ (IBSJW/NME); dorsal and lateral view. Not to scale.

Taxonomic remark

The description of *Cheilosia (M.) distincta* Barkalov & Cheng, 1998 agrees with the description of *Cheilosia hirticincta* Brunetti, 1915 in almost all described characteristics. The studied specimens from Nepal, one male and six females, have basoflagellomere reddish-brown with light greyish dusting and blackish dorsal margin (described as black with greyish dusting in *Cheilosia distincta* and *C. hirticincta*). The NHM (London) has six male specimens identified as *Cheilosia hirticincta* Brunetti. The structure of the male genitalia of *Cheilosia (M.) distincta* and *C. hirticincta* is very similar. However, we have not been able to locate and study the type material of *C. hirticincta* to evaluate a possible synonymy of *C. distincta*.

Distribution

China, Nepal.

Cheilosia egregia Barkalov & Cheng, 1998 Figs 14B–C, 17

Cheilosia (Rubrocheila) egregia Barkalov & Cheng, 1998: 314. Type locality: “China: Sichuan: Emei Shan, 3000–3200 m” (holotype, ♀, ZICAS).

Cheilosia (Rubrocheila) egregia – Barkalov & Cheng 2004: 298 (description of male).

Differential diagnosis

Cheilosia egregia is the single taxon of the subgenus *Rubrocheila* Barkalov, 2002. The species is easily distinguished from all congeners by the following combination of characters: abdominal terga orange in anterior $\frac{2}{3}$ parts, and black in posterior $\frac{1}{3}$, basoflagellomere with a dusky yellow colour and arista with distinct pilosity.

Material examined

NEPAL • 1 ♀; Bhoipur Valley, NW of Phedi; 27°24' N, 86°57' E; 1900 m a.s.l.; 25 May [19]97; Hauser leg.; CSCA.

Distribution

China, Nepal.

Cheilosia erratica Barkalov & Peck, 1997 Figs 18–19

Cheilosia erratica Barkalov & Peck, 1997a: 1173. Type locality: “Okrestnosti Choroga, Botanicheskij sad, Tadzikistan” (holotype ♂, ZMMGU).

Cheilosia (Montanocheila) nigriventris Barkalov & Cheng, 2004: 327. Type locality: “China, Xizang [Autonomous Republic of Tibet], Yadong, 2800 m” (holotype ♂, ZICAS). **Syn. nov.**

Cheilosia erratica – Barkalov & Peck 1997b: 1375. — Barkalov 2020: 248.

Differential diagnosis

Cheilosia (Montanocheila) erratica is most similar to *C. (M.) distincta*, and differs by having yellow and black pilosity ventrally on the apical part of hind femur (vs only yellow pilosity in *C. distincta*).

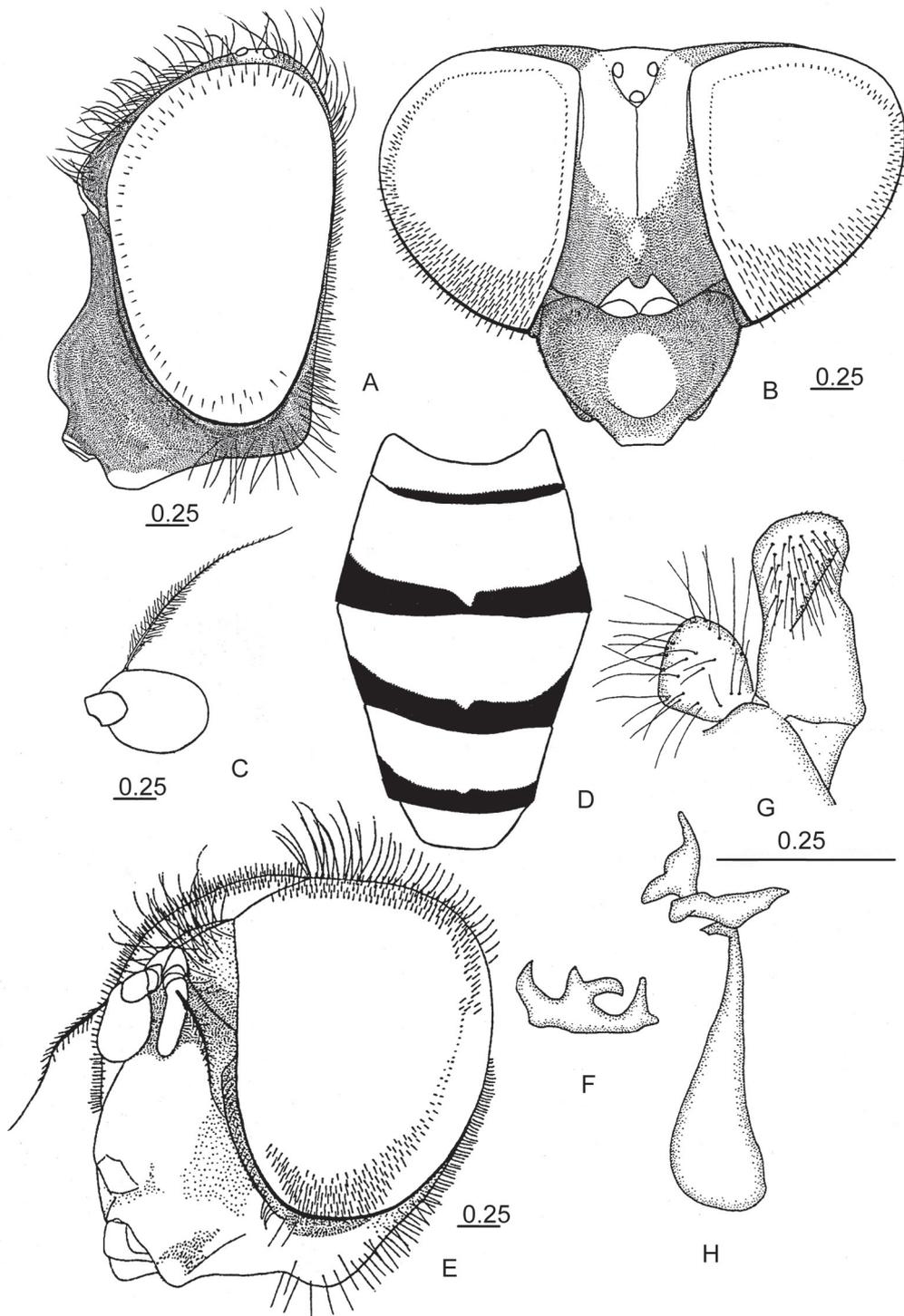


Fig. 17. *Cheilosia (Rubrocheila) egregia* Barkalov & Cheng, 1998. **A.** Head of ♀, lateral view. **B.** Head of ♀, dorsal view. **C.** Antenna of ♀, lateral view of pedicel and basoflagellomere. **D.** Abdomen of ♀, dorsal view. **E.** Head of ♂, anterior view. **F.** Superior lobe of hypandrium, lateral view. **G.** Surstylus and gonocercus, lateral view. **H.** Aedeagus and aedeagal apodeme, lateral view. After Barkalov & Cheng 2004. Scale bars indicated in drawings.

Material examined

NEPAL • 1 ♂, 3 ♀♀; Maharigaon, Nördl.; 29°20'24" N, 82°23'21" E; 3400 m a.s.l.; 20 Jun. 1997; Creutzburg leg.; on *Euphorbia* sp.; NME • 1 ♂; near Kathmandu, Bhurumche; 8500–9500 ft a.s.l.; 10 May 1967; Can. Nepal Exped.; Oak forest; CNC • 2 ♂♂; Prov. Bagmati, Langtang-Himal, Rimche to Ghora Tabela; 2500–3000 m a.s.l.; 12 Apr. 2004; J. Weipert leg.; “KF”; IBSJW/NME • 1 ♂; Prov. Mahakali, Hochlager vor Api bis Lager an Chamliya Khola bei Shinae [high camp before Api to camp at Chamliya Khola near Shinae]; 3400–2800 m a.s.l.; 10 Jun. 2005; J. Weipert leg.; IBSJW/NME • 1 ♂; Prov. Gandaki, Bhimtang to Yak Kharka; 3700–3000 m a.s.l.; 24 May 2013; J. Weipert leg.; labcode MZH_Y2506; IBSJW/NME • 2 ♀♀; same data as for preceding; labcodes MZH_Y2503, MZH_Y2504; IBSJW/NME • 1 ♀; same data as for preceding; IBSJW/NME • 1 ♂; Prov. Gandaki, Lho Bazar to Sama; 3100–3680 m a.s.l.; 17 May 2013; J. Weipert leg.; IBSJW/NME • 1 ♀; Solukhumbu Junbesi to Ringmo; 27°34' N, 86°35' E; 2700–3000 m a.s.l.; 12 May 97; Hauser leg. [515]; CSCA.

Description**Female**

LENGTH. Body 9.4–13.4 mm, wing 8.8–10.9 mm.

HEAD. Face broad, in anterior view distinctly widened ventrally, antero-ventrally protruded, shiny black, covered with fine grey pollinosity; facial tubercle moderate in size, laterally compressed and distinct; parafacia relatively broad, ventrally shiny adjacent to face and dorsally grey pollinose, long yellow pilose; gena broad, with slight grey pollinosity and long pale (yellow) pilosity. Frons anteriorly broad and posteriorly narrower, with densely punctured lateral furrows and very fine medial furrow, in anterior ¼ with narrow stripes of pollinosity adjacent to eyes, covered with rather short, dense, yellow pilosity; lunule brownish or yellow, antennal pits separated. Scape black or brownish, pedicel basally black and pale-brown apically, basoflagellomere oval, distinctly enlarged, orange basally and brownish apically, arista long, narrow, black, bare. Vertex with yellow pilosity, ocellar triangle equilateral. Occiput with yellow pilosity.

THORAX. Postpronotum black, grey pollinose and yellow pilose. Scutum fine-punctured, shiny black, grey pollinose only laterally anterior to transverse suture; covered with dense, long, erect yellow pilosity, without black bristles laterally; scutellum with longer yellow pilosity, sometimes also with a few black pilosity on disc. Pleura moderately densely greyish-yellow pollinose, and with dense, erect, long, yellow pilosity.

LEGS. Fore coxa black, densely grey pollinose and yellow pilose, without baso-lateral spur; femora shiny black with yellow tips, fore and mid femur posteriorly and hind femur antero-ventrally with long yellow pilosity; tibia mostly yellow, fore and mid tibia brownish in apical part, hind tibia yellow in basal ⅓ and on tip and brownish-black in other part; all tarsi yellow ventrally, dorsally fore and hind tarsi black, mid tarsus yellow with black 5th segment.

WING. Slightly brownish anteriorly, completely covered with microtrichia, Rs with short yellow and black pilosity along all length, inner angle between veins M₁ and R₄₊₅ right. Haltere and calypter yellow.

ABDOMEN. Broadly oval, in broadest part slightly broader than scutum at level of wing base, shiny black with erect, yellow pilosity, laterally longer on tergites and shorter medially.

Taxonomic remark

Barkalov & Peck (1997) described *Cheilosia erratica* based on one male from Tajikistan. No subgeneric classification was indicated, but the authors noted that among the species known from Tadzikistan, *C. erratica* was most similar to *C. (Montanocheila) heptapotamica* Stackelberg, 1963.

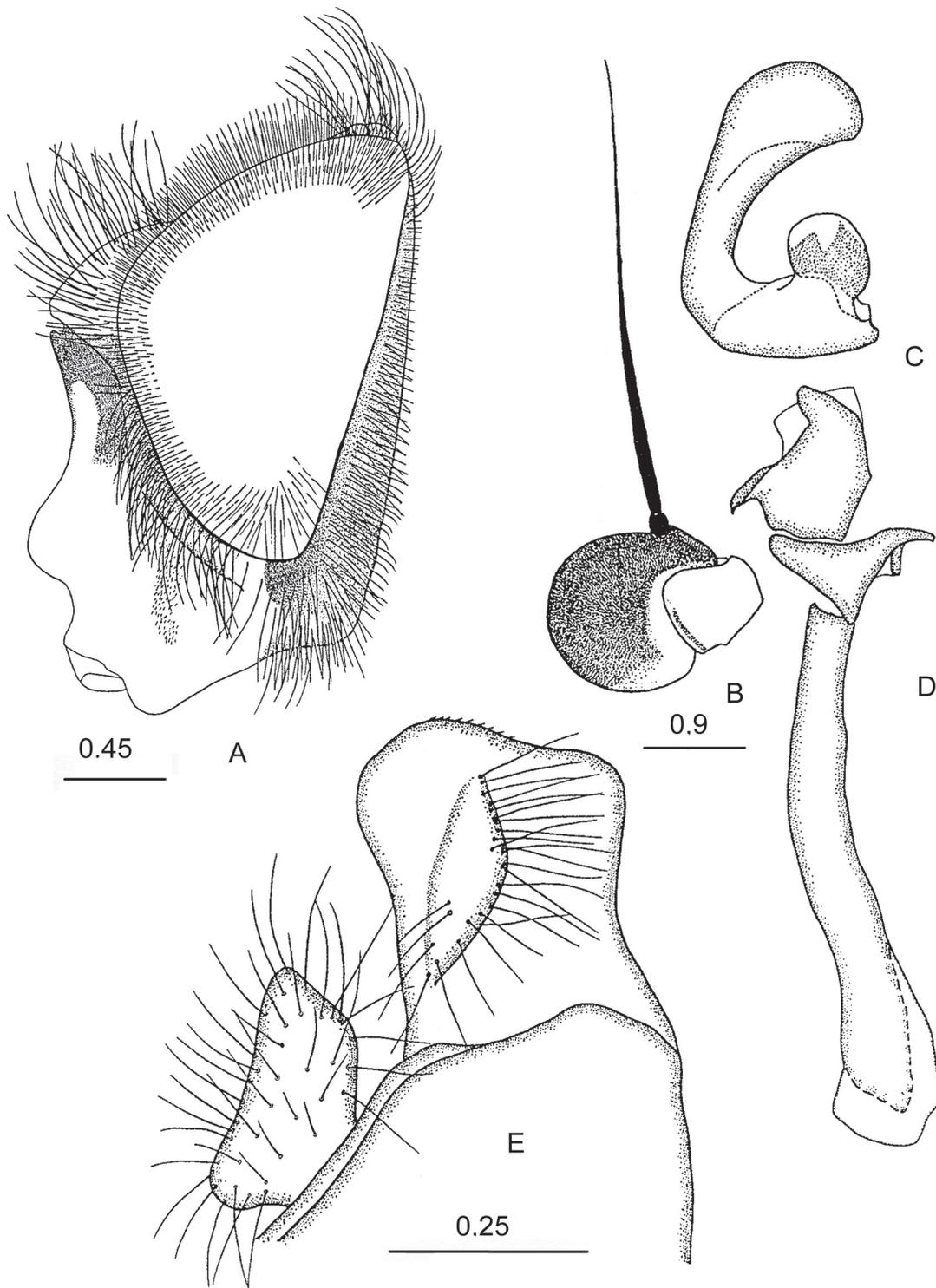


Fig. 18. *Cheilosia (Montanocheila) erratica* Barkalov & Peck, 1997, ♂. **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Superior lobe of hypandrium, lateral view. **D.** Aedeagus and aedeagal apodeme, lateral view. **E.** Surstylus and gonocercus, lateral view. After Barkalov & Peck 1997. Scale bars indicated in drawings.

Barkalov & Cheng (2004: 327) described *Cheilosia (Montanocheila) nigriventris* from China, Xizang [Autonomous Republic of Tibet], based on a male holotype and one male paratype. Body lengths of *C. erratica* and *C. nigriventris* are 12.7 mm and 11–11.5 mm, respectively. The colour of the pilosity of abdominal terga are reddish yellow in *C. erratica*, but yellowish in *C. nigriventris*. Both described taxa share the same, distinct structure of the male genitalia, especially of the superior lobe. The mtDNA COI barcode is identical among the tested samples of *C. erratica* from Tajikistan and *C. nigriventris* from Nepal (Fig. 1). Based on the high similarity of structures of male genitalia and the identical DNA barcode sequences we consider *C. nigriventris* a junior synonym of *C. erratica*. We here provide the description of the female sex of *Cheilosia erratica* based on specimens from Nepal (provinces Maharigaon, Bagmati and Mahakali, and Kathmandu area) and Tajikistan.

Remarks

Male specimens from Nepal differ from the type material from China by having almost only yellow pilosity on abdomen but only with black pilosity present posteriorly on tergite IV and sometimes at posterior corner of tergite III (one specimen with posterior $\frac{2}{3}$ of tergite IV with black pilosity). The character of pilosity on wing vein Rs shows sexual dimorphism, males with only a few short pilosity (1–3) on basal half, while females have pilosity along all length of Rs.

Distribution

China, Nepal, Tajikistan.

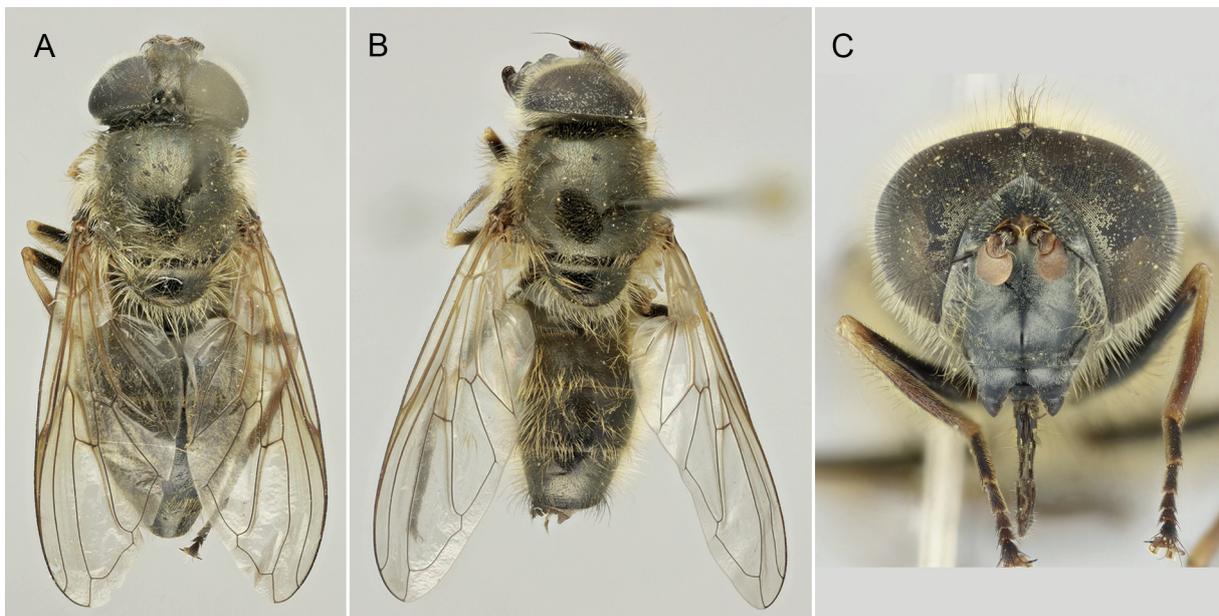


Fig. 19. *Cheilosia (Montanocheila) erratica* Barkalov & Peck, 1997. **A.** ♀ (IBSJW/NME), dorsal view. **B.** ♂ (IBSJW/NME), dorsal view. **C.** Male head (IBSJW/NME), anterior view.

Cheilosia falcata sp. nov.

urn:lsid:zoobank.org:act:5AA76D6D-C495-41C5-8BA2-43429114D43B

Figs 20–21

Differential diagnosis

The character combination of protruded face, presence of distinct baso-lateral spur on fore coxa, broad parafacia and very characteristic structure of male genitalia separates *Cheilosia (Cheilosia) falcata* sp. nov. from all congeners. See also under *Cheilosia (Cheilosia) spinosa* sp. nov.

Etymology

The specific epithet is from the Latin ‘*falcatus*’ meaning ‘sickle-shaped’ and refers to the facial tubercle.

Material examined

Holotype

NEPAL • ♂; Jumla Distr., N. Ludku; 2500–2900 m a.s.l.; 11 Jun. 1998; G. Miksch leg.; SMNS.

Paratypes

NEPAL • 1 ♂; Maharigaon Nördl; 29°20'24" N, 82°23'21" E; 3400 m a.s.l.; 20 Jun. 1997; Creutzburg leg.; “Weißschale”; NME • 1 ♂; same collection data as for preceding; labcode MZH_G412; IBSJW/NME.

Description

Male

LENGTH. Body 9.8–11.5 mm, wing 9.1–10.0 mm.

HEAD. Face in lateral view strongly protruded forward, black, bare, except tip of facial tubercle and mouth edge; densely grey pollinose; facial tubercle moderate in size and laterally compressed; parafacia broad, in broadest part approximately equal to basoflagellomere width, with dense silvery pollinosity and dense, short, semi-erect, white pilosity; gena narrow, with dense silvery pollinosity and comparatively long white pilosity. Lower part of occiput with dense silvery pollinosity and white pilosity. Frons slightly inflated, small, with silvery pollinosity and long black pilosity; frontal angle acute (distinctly <90°). Lunule dirty yellow, medial prong with a clear dividing central furrow; antennal pits distinctly separated. Antenna black; basoflagellomere small, rounded, black, with brownish pollinosity; arista long with very short pilosity. Eye all densely pilose, pile long and pale-yellow. Eye contiguity almost twice the length of frons without lunule. Vertex shiny black, flat, covered with long black pilosity; ocellar triangle equilateral. Occiput dorsally with long black and short yellow pilosity.

THORAX. Postpronotum black, densely grey pollinose and black pilose; scutum fine-punctured, shiny black, matte antero-laterally in front of transverse suture and narrowly anterior to scutellum, notopleural area grey pollinose, with short semi-appressed yellow and 2–3 times longer erect black pilosity; postalar callus with many long, black, fine bristles; scutellum matte on anterior and posterior margins, shiny otherwise, with short semi-appressed and long, erect, black pilosity; subscutellar fringe long, dense, white. Pleura densely grey pollinose and with long semi-appressed white pilosity; postero-dorsal corner of posterior anepisternum and dorsal part of anterior anepimeron with some black pilosity, dorsal and ventral pile patches of katepisternum separated, ventral pile patch with white, erect pilosity; metasternum with a few white pile.

LEGS. Coxa black, densely silvery pollinose, fore coxa with baso-lateral spur; trochanter shiny black; femur black except yellow on extreme tips; tibia mainly black, basal 1/3 of fore tibia, basal 2/3 and apical 1/3 of mid tibia yellowish; tarsi black dorsally; long pilosity on posterior part of fore femur mostly black, some pale pilosity near base; long pilosity on posterior part of mid femur mostly white with some black pilosity; hind femur with a row of short black bristles ventrally, and white, long, fine white pilosity antero-ventrally.

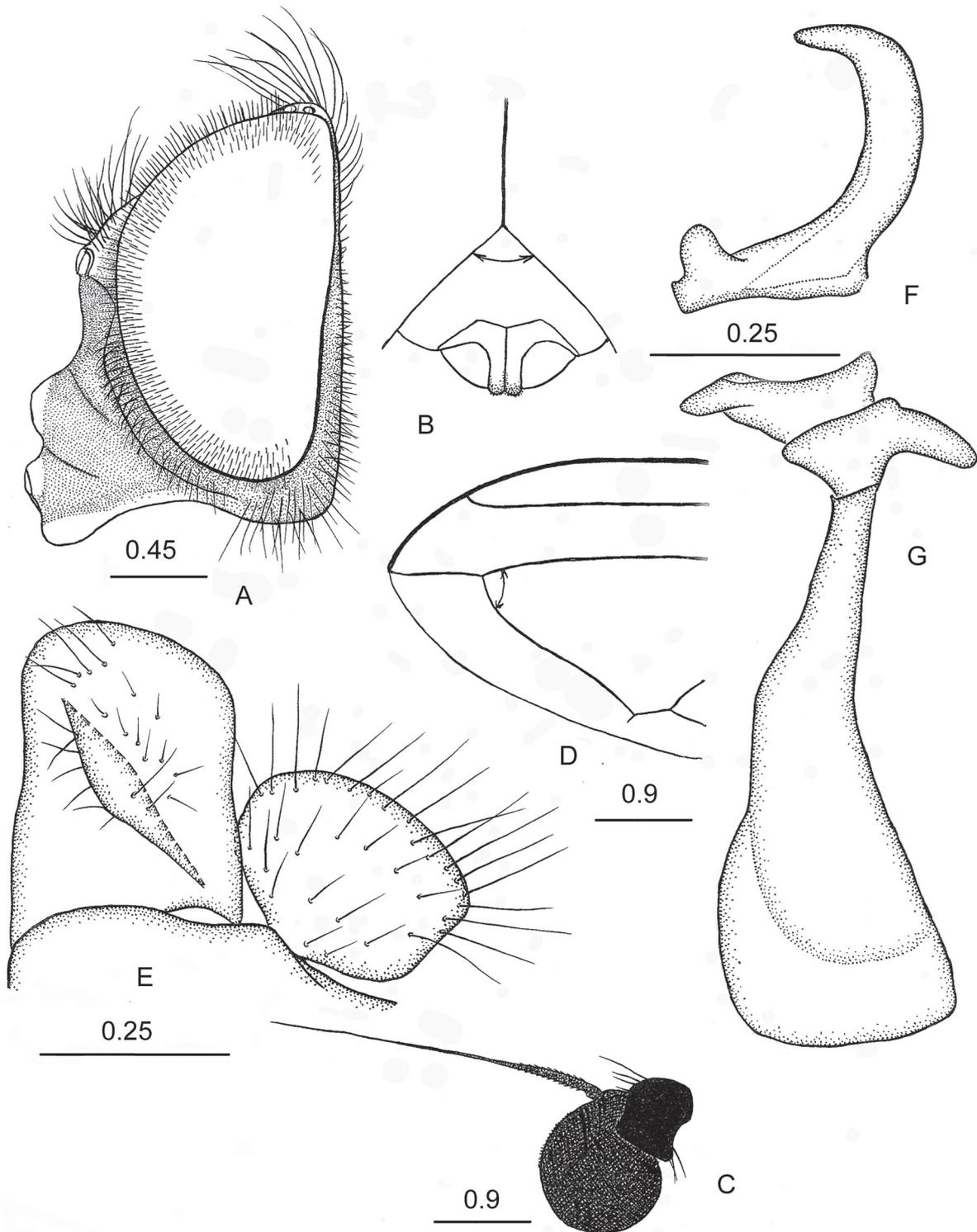


Fig. 20. *Cheilosia (Cheilosia) falcata* sp. nov., holotype, ♂ (SMNS). **A.** Head, lateral view. **B.** Angle approximation of eyes (indicated by bent arrow). **C.** Antenna, lateral view of pedicel and basoflagellomere. **D.** Tip of wing. **E.** Surstylus and gonocercus, lateral view. **F.** Superior lobe of hypandrium, lateral view. **G.** Aedeagus and aedeagal apodeme, lateral view. Scale bars indicated in drawings.

WING. Elongated, with brownish tinge, entirely microtrichose; vein Rs without short pile; vein M_1 meeting vein R_{4+5} obliquely. Haltere yellow, with knob partly black. Calypter white with brown base, rim and pile yellow.

ABDOMEN. Narrow, elongated, in broadest part distinctly narrower than scutum at level of wing base; terga black, laterally shiny, finely brownish pollinose medially; with long, erect, white pilosity laterally and short, appressed, black pilosity medially; some black long pilosity on tip of tergite IV. Sternites densely grey pollinose, sternites I–II with only erect white pilosity, sternites III–IV with long, erect, white and short semi-erect white and black pilosity. Genitalia as in Fig. 20, note the short left process and bent right process of the superior lobe.

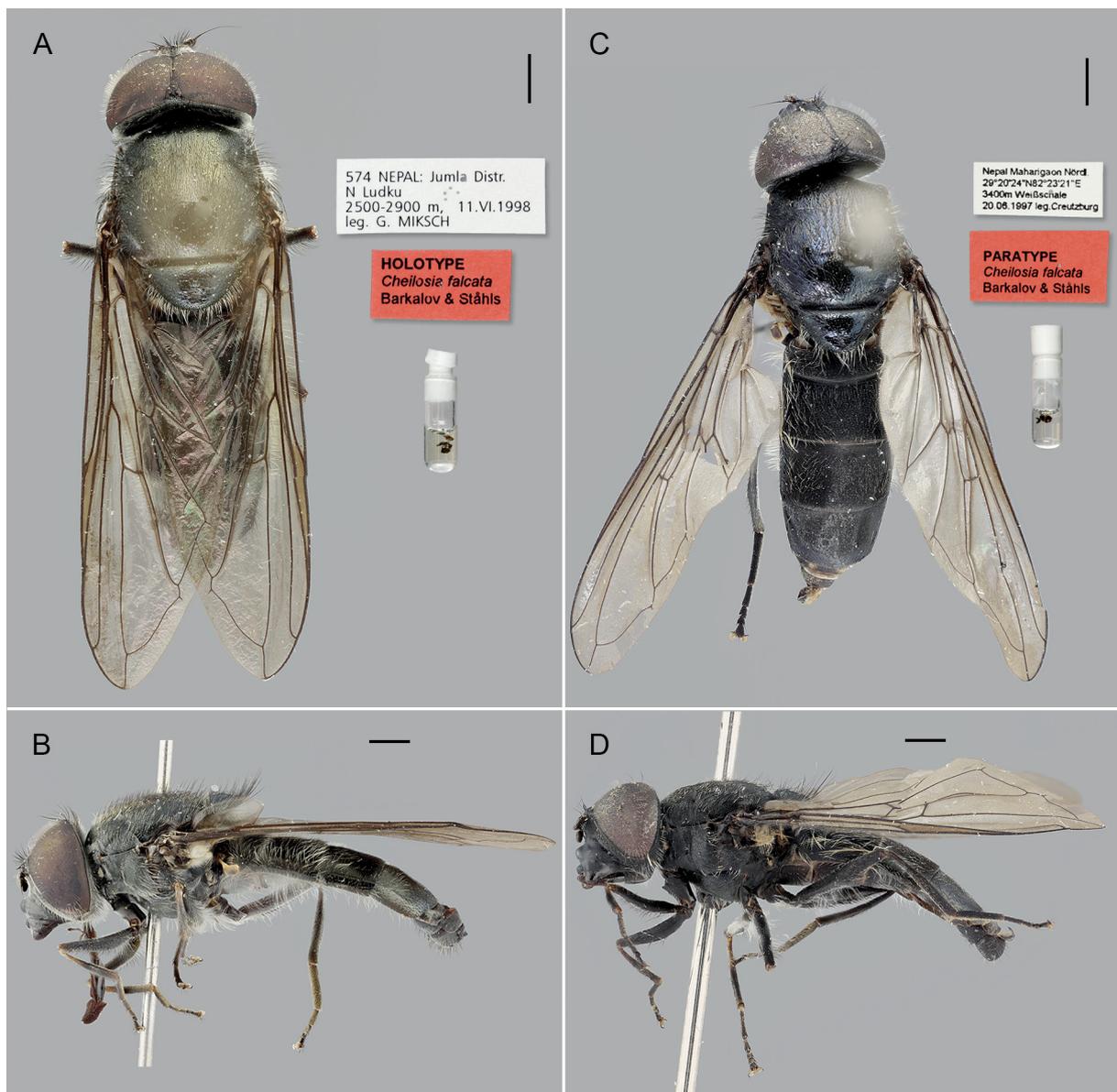


Fig. 21. *Cheilosia (Cheilosia) falcata* sp. nov. **A–B.** Holotype, ♂ (SMNS); dorsal and lateral views. **C–D.** Paratype, ♂ (IBSJW/NME); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

Female

Unknown.

Distribution

Nepal.

***Cheilosia flavigena* sp. nov.**

urn:lsid:zoobank.org:act:8491EE88-41DC-4217-BF15-FD7133A05566

Figs 22–23

Differential diagnosis

Cheilosia flavigena sp. nov. is described from a single female specimen. As the male sex of the new species remains unknown, a subgeneric placement of the new taxon is not proposed. Characteristics like yellow parafacia, eye short pilose, separated antennal pits and brown colour of body separates *C. flavigena* sp. nov. from all other known species of the genus *Cheilosia*. See also under *C. versa*.

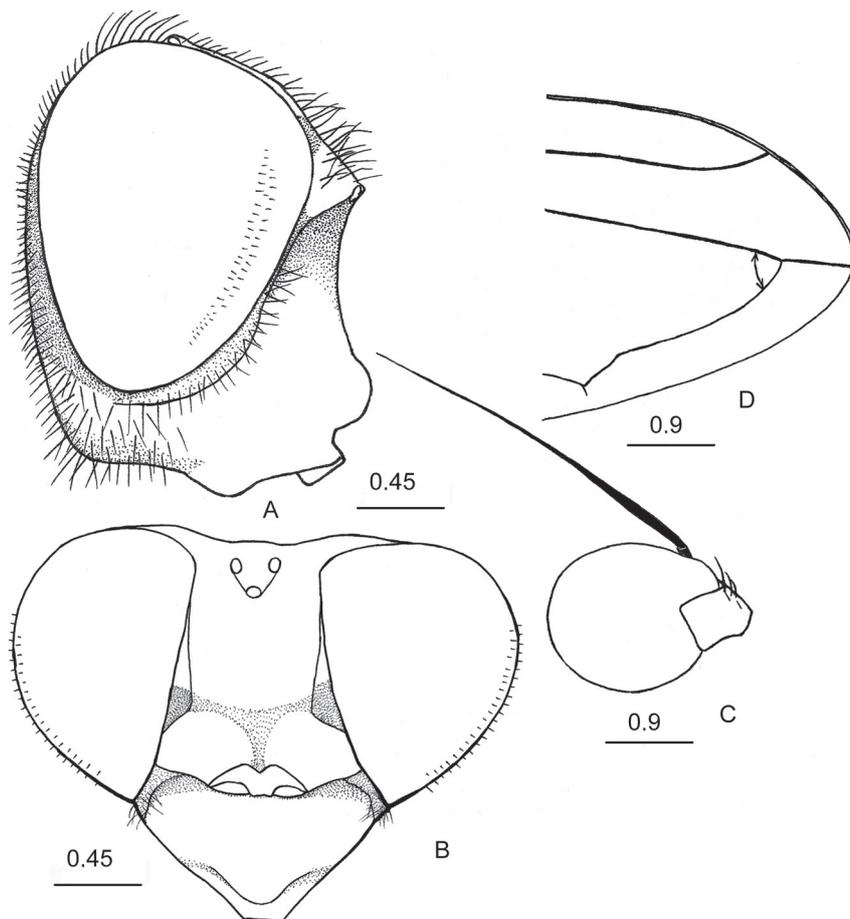


Fig. 22. *Cheilosia flavigena* sp. nov., holotype, ♀ (CNC). **A.** Head, lateral view. **B.** Head, dorsal view. **C.** Antenna, lateral view of pedicel and basoflagellomere. **D.** Tip of wing. Scale bars indicated in drawings.

Etymology

The specific epithet '*flavigena*' is from Latin and refers to the yellow colour of gena.

Material examined

Holotype

NEPAL • ♀; 29°00' N, 85°00' E; 9900 ft a.s.l.; 27 May 1967; Can. Nepal Exped.; Malaise trap 7; CNC.

Description

Female

LENGTH. Body 8.0 mm, wing 8.2 mm.

HEAD. Face comparatively narrow with almost parallel sides, shiny, black, with pollinosity ventral to antennal base and with slight dusting laterally, dorsally close to parafacia with some moderately long, erect, pale pile; facial tubercle small, well protruded; parafacia very narrow, with $\frac{1}{4}$ to $\frac{1}{5}$ of width of basoflagellomere, yellow, with white pollinosity and short, scattered yellow pile. Gena moderate in width, shiny, black but narrowly yellow ventral to eye, with short, white pile. Frons inflated, brownish, moderate in width, with strong transversal depression anteriorly, with longitudinal depression between median prong of lunule and transverse depression, and with lateral longitudinal furrows near eye, lateral longitudinal furrows with yellow macula anteriorly, frons covered with anteriorly directed, moderately long and dense black pilosity. Lunule bright yellow, antennal pits broadly separated. Antenna bright yellow, basoflagellomere large, oval, with some sensory pits in basal half; arista unusually long and

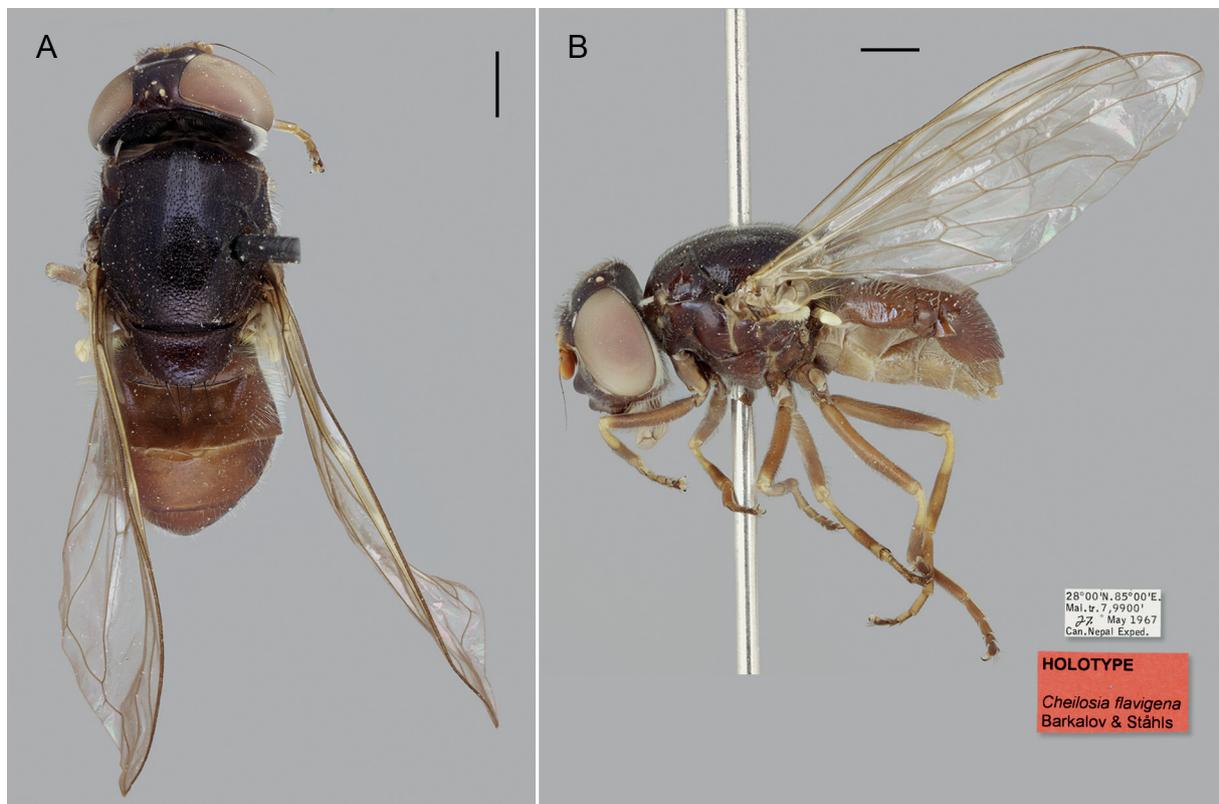


Fig. 23. *Cheilosia flavigena* sp. nov., holotype, ♀ (CNC); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

narrow, bare, yellow in basal $\frac{1}{5}$ and otherwise black. Eye with very short white pilosity. Vertex shiny, with black pilosity. Occiput shiny with short black pile, ocellar triangle isosceles.

THORAX. Postpronotum shiny-brown with short, pale pile. Scutum shiny, dark-brown, with coarse punctuation, with four vittae of grey pollinosity, two medial vitta extend from anterior part of scutum to mid part, and lateral vitta extend from transverse suture to end of postalar callus; pilosity black, short, semi-erect; postalar callus with 2–3 strong black bristles. Scutellum brown, shiny, with short black pilosity, hind margin with four strong, long, black bristles and some shorter bristles. Subscutellar fringe of short pale and black pile. Pleura brown, shiny, with very fine grey pollinosity, with small yellow macula on antero-dorsal corner of anterior anepisternum; pleura covered with short, scattered yellow pile, with some black pile on dorsal part of anepimeron; katepisternum with dorsal and ventral pile patches narrowly separated; metasternum with yellow pilosity.

LEGS. Coxa brownish-yellow, fore coxa without baso-lateral spur; femora brown with yellow tips, long pilosity mostly yellow, with some black pile dorso-apically; tibia yellow, with more or less broad brown rings; tarsi ventrally yellow, dorsally fore and mid tarsi with yellow segments 1–4 and brown apical segment 5; hind tarsus brown dorsally.

WING. Translucent with yellow stigma and veins, completely microtrichose; vein Rs with short, black pile; M_1 meets R_{4+5} in an acute angle. Calypter brownish with yellow fringe; haltere bright yellow.

ABDOMEN. Oval, in broadest part slightly broader than thorax at level of wing base, shiny-brown with short, erect, white pilosity, longer on sides of tergites I–II. Sternites shiny, yellow, with short semi-erect white pilosity.

Male

Unknown.

Distribution

Nepal.

Cheilosia gilva sp. nov.

urn:lsid:zoobank.org:act:A937C4FF-9377-4B0A-85B8-0A6FBA8C2523

Figs 24–26

Differential diagnosis

Cheilosia (*Montanocheila*) *gilva* sp. nov. differs from all members of subgenus *Montanocheila* by very unusual and distinct structure of male genitalia (Fig. 24C–E) and by presence of pilosity on face and eye, and lacking long, strong bristles on scutum and scutellum.

Etymology

The specific epithet is from the Latin ‘*gilvus*’, meaning ‘pale-yellow’ and refers to the yellowish pilosity.

Material examined

Holotype

NEPAL • ♂; Solukhumbu Tragdobuk; 27°34' N, 86°31' E; 3200–3000 m a.s.l.; 11 May 97; Hauser leg. [513]; CSCA.

Paratypes

NEPAL • 2 ♀♀; same data as for holotype; CSCA • 1 ♀; Solukhumbu Junbesi to Ringmo; 27°34' N, 86°35' E; 2700–3000 m a.s.l.; 12 May [19]97; M. Hauser leg. [515]; CSCA • 1 ♀; Ramechap Mohabir Khola E of Shivalaya; 27°35' N, 86°19' E; 2500–2600 m a.s.l.; 6–7 May [19]97; Hauser leg.; CSCA • 1 ♂, 2 ♀♀; Solukhumbu above Nunthala; 27°35' N, 86°38' E; 2500–2300 m a.s.l.; 13 May [19]97; Hauser leg. [517]; CSCA • 1 ♂; Solukhumbu above Pangum; 27°34' N, 86°45' E; 2900–3000 m a.s.l.; 16 May [19]97; M. Hauser leg. [522]; CSCA • 1 ♂; Solukhumbu, E of Pangkongma La; 27°34' N, 86°45' E; 3000 m a.s.l.; 17 May 1997; M. Hauser leg. [523]; CSCA • 1 ♀; 27°57' N, 84°59' E; 10 100 ft a.s.l.; 25 May 1967; Can. Nepal Exped.; Malaise trap; CNC • 1 ♀; 28°00' N, 85°00' E; 9900 ft a.s.l.; 26 May 1967; Can. Nepal Exped.; Malaise trap; CNC • 1 ♂; Prov. Bagmati Langtang-Himal, Rimche to Ghora Tabela; 2500–3000 m a.s.l.; 12 Apr. 2004; J. Weipert leg.; “KF”; IBSJW/NME • 1 ♂; Prov. Mahakali, Shine bis Lager am Chamliya Khola bei Batar [Shine to camp on Chamliya Khola near Batar]; 2000 m a.s.l.; 11 Jun. 2005; J. Weipert leg.; IBSJW/NME • 1 ♀; Prov. Karnali, Hochtal Gothichaur [Gothichaur valley]; 29°12.10' N, 82°18.56' E; 2900 m a.s.l.; 9 Jun. 1997; J. Weipert leg.; IBSJW/NME.

Description

Male

LENGTH. Body 7.5–8.6 mm, wing 7.0–8.5 mm.

HEAD. Face in anterior view broad, black, grey pollinose, except tip of facial tubercle shiny non-pollinose; with long, scattered yellow and black pilosity; facial tubercle distinct but small; parafacia moderate in width, in broadest part nearly equal to basoflagellomere width, densely grey pollinose and long yellow pilose (sometimes also with some black pilosity intermixed), length of longest pile longer than eye pilosity; gena comparatively broad, grey pollinose and long yellow pilose. Lower part of occiput broad, densely covered with white pollinosity and whitish or yellowish pilosity. Frons slightly inflated, broad, densely grey pollinose and long yellow pilose; frontal angle slightly obtuse; lunule dark-brown, antennal pits distinctly separated. Scape and pedicel black shiny, basoflagellomere roundish, dusky orange and slightly whitish pollinose; arista long, black, bare. Eye with long, dense, yellow and some black pilosity; eye contiguity approximately equal to length of frons without lunule. Vertex slightly inflated, covered with long yellow pilosity; ocellar triangle equilateral. Occiput with long yellow and some long black pilosity, and short yellow pilosity.

THORAX. Postpronotum black, grey pollinose with yellow pilosity. Scutum finely punctured, shiny-black, with whitish-grey pollinosity on notopleural area and narrowly along anterior margin; with dense, long, erect yellow pilosity of approximately equal length, mixed with erect black pilosity laterally and posteriorly, lacking strong bristles anterior or posterior to transverse suture and on postalar callus. Scutellum shiny-black, with dense, long, black pilosity, and shorter yellow pilosity on anterior margin, hind margin lacking strong bristles. Subscutellar fringe pilosity long, pale-yellow. Pleura densely whitish-grey pollinose and long, dense, yellow pilose; anepisternum postero-dorsally also with patch of black pilosity; dorsal and ventral pile patches on katapisternum narrowly connected anteriorly; metasternum with long yellow pilosity.

LEGS. Fore coxa without baso-lateral spur; coxa dark-brown or black with dense whitish pollinosity and comparatively long yellow pilosity; femora black with tips narrowly yellow; fore and mid tibia yellow with more or less well developed black annulus medially, hind tibia slightly curved, yellow in basal $\frac{1}{3}$ and on tip and black otherwise; tarsi of fore and mid legs with yellowish basal segments 1–4 and last segment dorsally dark, hind tarsi dorsally blackish; long pilosity on posterior part of fore and mid femora yellow in basal half and black in apical half; ventral side of hind femur with long yellow pilosity, longest pile up to $1.5 \times$ width of hind femur.

WING. Brownish infuscated (sometimes slightly yellow in basal $\frac{1}{3}$), veins yellow or brownish, cross-veins brownish infuscated and sometimes with brownish weakly infuscated brown patch medially, completely covered with microtrichia, Rs with some black pile in basal $\frac{2}{3}$, inner angle between veins M_1 and R_{4+5} right. Calypter yellow with yellow fringe; haltere yellow with dark-brown to blackish knob.

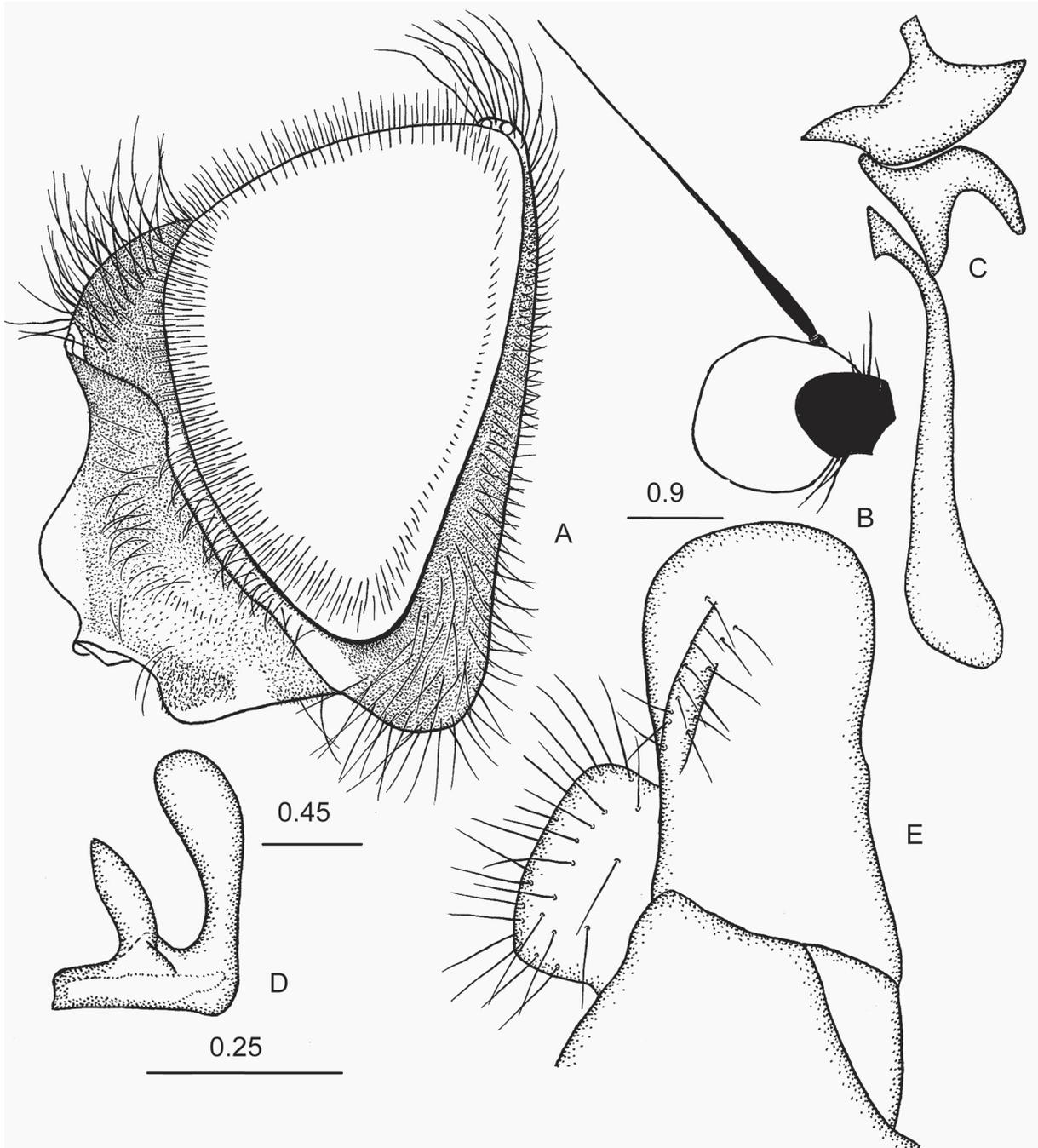


Fig. 24. *Cheilasia (Montanocheila) gilva* sp. nov., holotype, ♂ (CSCA). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Aedeagus and aedeagal apodeme, lateral view. **D.** Superior lobe of hypandrium, lateral view. **E.** Surstylus and gonocercus, lateral view. Scale bars indicated in drawings.

ABDOMEN. Black, oval, broad, in broadest part broader than scutum at level of wing base, shiny with yellowish pilosity, lateral sides of tergites I–II with dense, much longer, white and orange-yellow pilosity, tergite III with some appressed black pilosity postero-laterally, tergite IV with appressed black pilosity along posterior margin. Sternites densely grey pollinose and long yellow pilose.

Female

LENGTH. Body 8.4–9.1 mm, wing 7.4–8.1 mm.

HEAD. Frons comparatively narrow with distinct, grey pollinose lateral furrows, on anterior $\frac{1}{3}$ with a transverse, narrow stripe of grey pollinosity, pilosity comparatively short, erect, yellow. Lunule bright

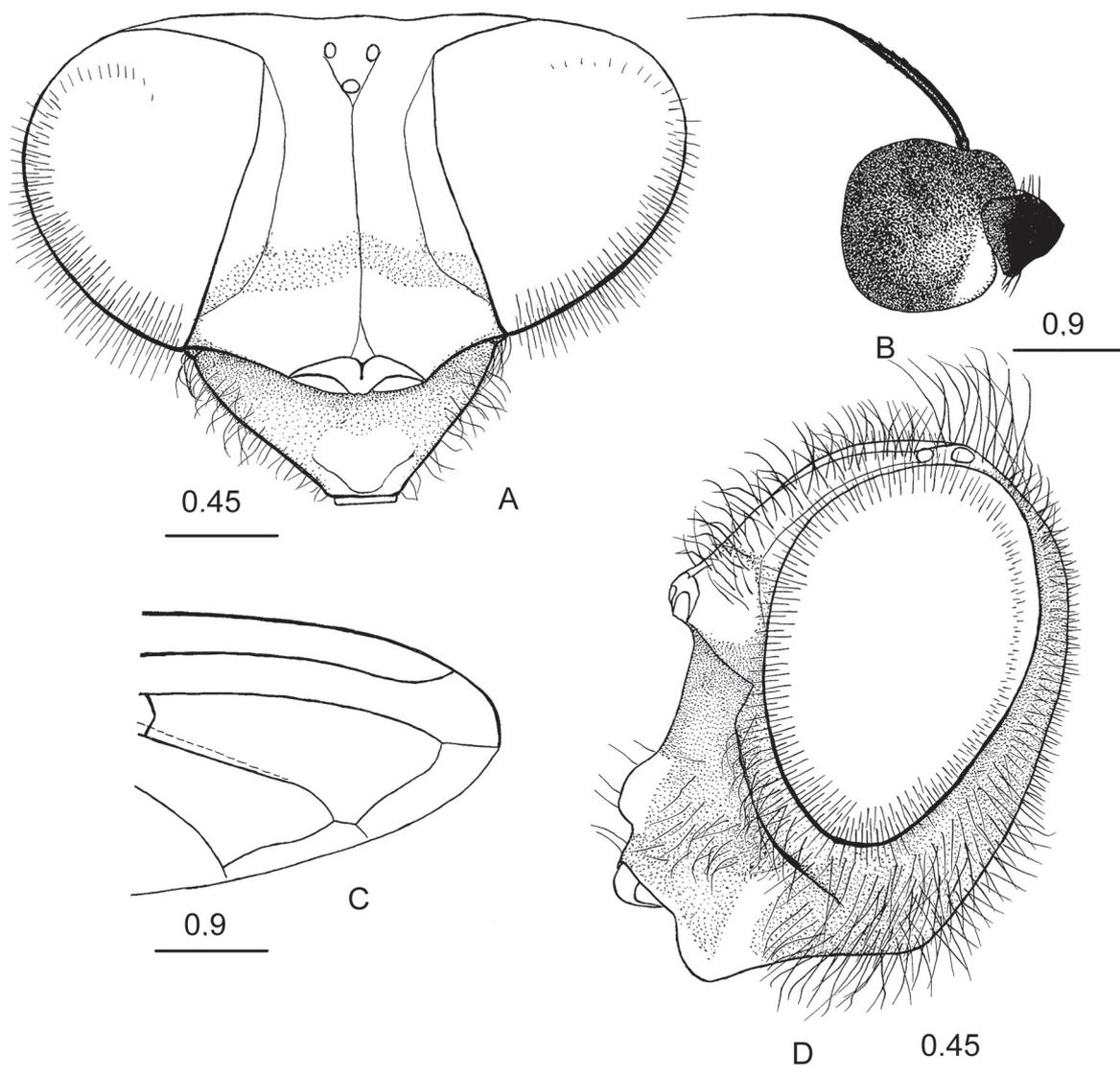


Fig. 25. *Cheilosia (Montanocheila) gilva* sp. nov., paratype, ♀ (CSCA). **A.** Head, dorsal view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Tip of wing. **D.** Head, lateral view. Scale bars indicated in drawings.

yellowish or orange. Basoflagellomere orange-brown, somewhat bigger than in male, slightly darkened anteriorly.

THORAX. Scutum with moderately long, erect, yellow pilosity, with some black pilosity intermixed on posterior half, scutellum with yellow pilosity, and some black pilosity on disc, hind margin with yellow pilosity, some of which are longer.

LEGS. Fore and mid femora with only yellow pilosity on posterior part; yellow pilosity on ventral part of hind femur relatively short but at most equal to width of femur; tibia completely bright yellow, only hind tibia with indistinct brownish stripe dorsally, colour of tarsi as in male but the yellow colour is brighter.

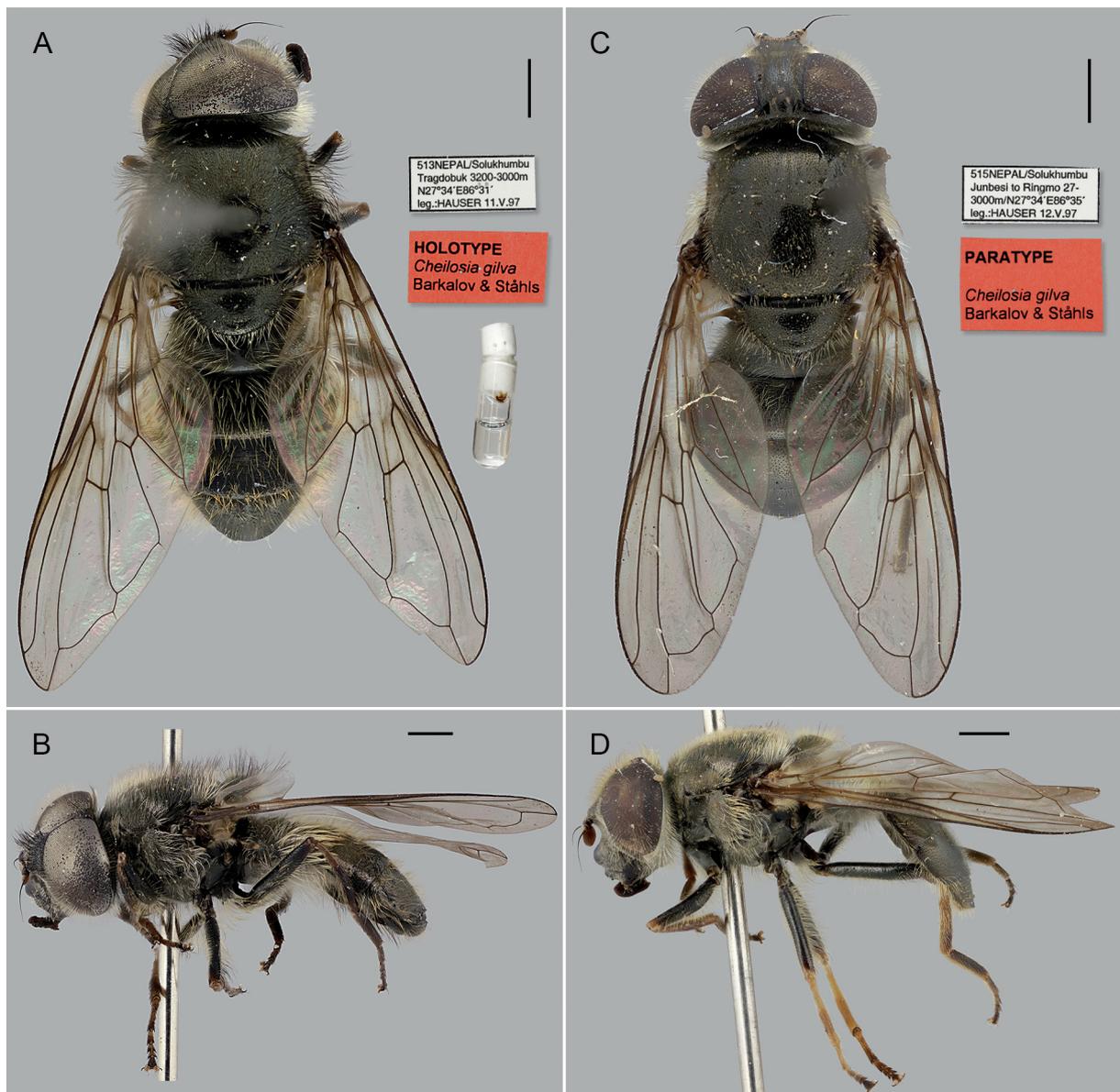


Fig. 26. *Cheilosia (Montanocheila) gilva* sp. nov. A–B. Holotype, ♂ (CSCA); dorsal and lateral views. C–D. Paratype, ♀ (CSCA); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

ABDOMEN. Broadly oval, shiny with bluish reflection, tergite I with grey pollinosity; pilosity as in male, but slightly shorter.

Distribution

Nepal.

Cheilosia hauseri sp. nov.

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Figs 27–28

Differential diagnosis

Cheilosia (Cheilosia) hauseri sp. nov. shares the following characters with other members of *Cheilosia* s. str.: antennal pits broadly separated, eye densely pilose, body pilosity not long and dense, body not bumble-bee like, and structural similarity of male genitalia. *Cheilosia hauseri* sp. nov. differs from other congeners by the unusual structure of the facial tubercle in combination with the colouration of femora.

Etymology

The new species is named after and in honour of Dr Martin Hauser, who collected an impressive amount of Syrphidae in Nepal and allowed us to study the *Cheilosia* material.

Material examined

Holotype

NEPAL • ♂ (genitalia prepared and stored in vial on same pin); Solukhumbu, above Gudel; 27°29' N, 86°51' E; 2000–2500 m a.s.l.; 22 May 1997; Hauser leg. [531]; CSCA.

Paratypes

NEPAL • 1 ♀; same data as for holotype; CSCA • 3 ♂♂ (genitalia prepared and stored in vial on same pin); Solukhumbu, Sanam; 27°27' N, 86°53' E; 2700–2800 m a.s.l.; 22–23 May 1997; Hauser leg. [532]; CSCA • 1 ♀; Solukhumbu, Nashing Dingma, W. Surike La; 2700 m a.s.l.; 20 May 1997; Hauser leg. [526]; CSCA • 7 ♀♀; 28°00' N, 85°00' E; 9900 ft a.s.l.; 1 Jun. 1967; Can. Nepal Exped.; Malaise trap 7; CNC • 3 ♂♂; same data as for preceding; Can. Nepal Exped.; CNC • 4 ♂♂; 28°00' N, 85°00' E; 10 500 ft a.s.l.; 1 Jun. 1967; Can. Nepal Exped.; Malaise trap 6; CNC • 1 ♀; same data as for preceding; Can. Nepal Exped.; CNC • 1 ♂, 1 ♀; 27°58' N, 85°00' E; 10 500 ft a.s.l.; 26 May 1967; Can. Nepal Exped.; Malaise trap 6; CNC • 4 ♀♀; 28°00' N, 85°00' E; 9900 ft a.s.l.; 26 May 1967; Can. Nepal Exped.; Malaise trap 7; CNC.

Description

Male

LENGTH. Body 8.0–9.5 mm, wing 9.0–9.7 mm.

HEAD. Face moderately protruded, black, bare, except tip of facial tubercle and anterior mouth margin grey pollinose, non-pilose; facial tubercle dorso-ventrally elongated and laterally appressed; parafacia moderate in width, dark-brown, densely silvery pollinose, with short, semi-erect white pilosity; gena narrow, grey pollinose, with comparatively short white pilosity; lower part of occiput with dense white pilosity. Frons slightly inflated, shiny but thinly pollinose, with narrow stripes of denser grey pollinosity along eye, black pilose; frontal angle acute (but close to right). Lunule yellowish to brown, antennal pits broadly separated. Scape and pedicel brown, basoflagellomere oval, orange; arista long, narrow, yellow, with very short pilosity. Eye with comparatively long, dense, yellow pilosity; length of eye contiguity

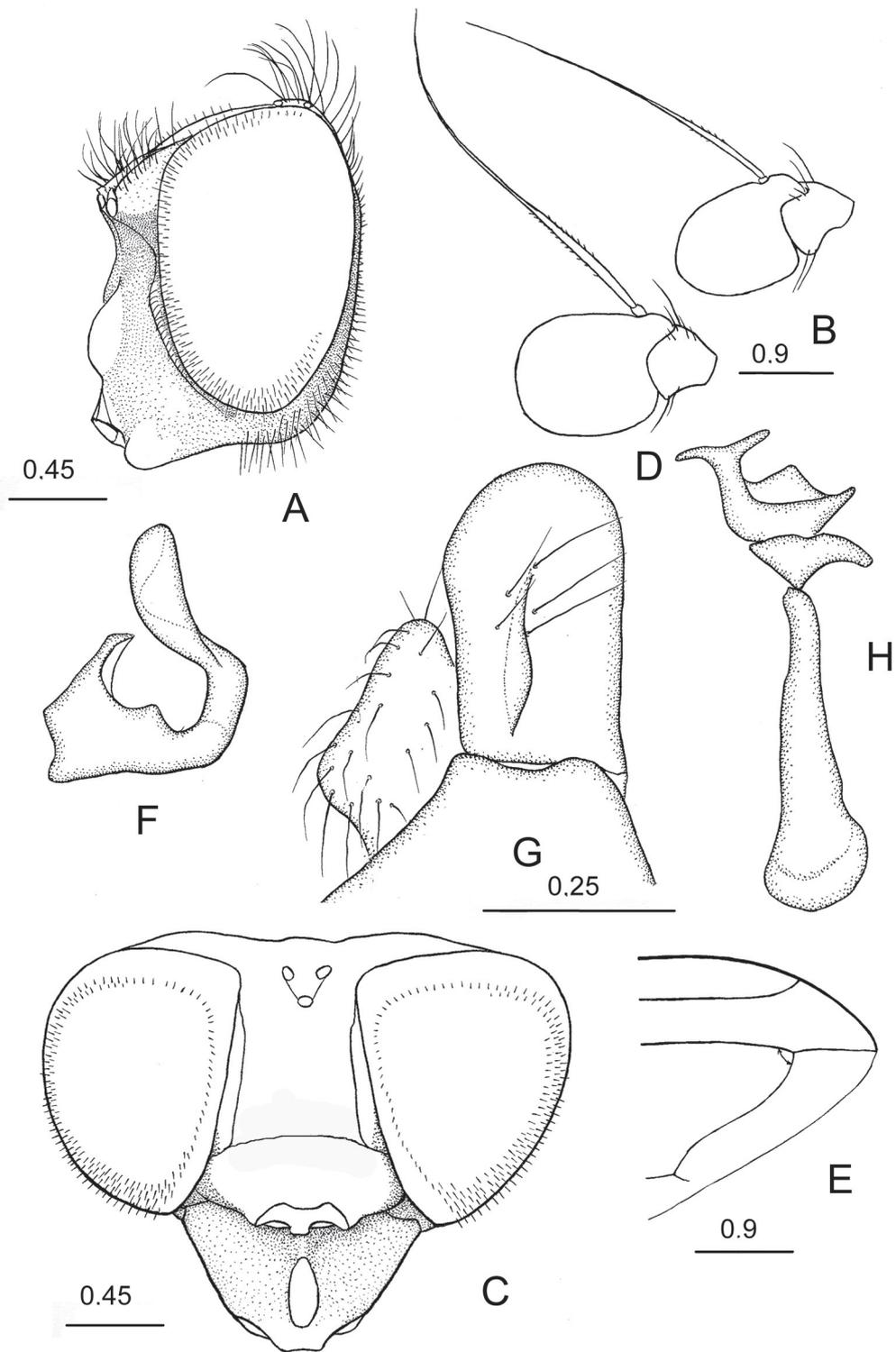


Fig. 27. *Cheilosia (Cheilosia) hauseri* sp. nov.; A–B, E–H = holotype, ♂ (CSCA), C–D = paratype, ♀ (CNC). A. Head, lateral view. B, D. Antenna, lateral view of pedicel and basoflagellomere. C. Head, dorsal view. E. Tip of wing. F. Superior lobe of hypandrium, lateral view. G. Surstylus and gonocercus, lateral view. H. Aedeagus and aedeagal apodeme, lateral view. Scale bars indicated in drawings.

longer than length of frons without lunule. Vertex slightly inflated, long black pilose; ocellar triangle equilateral. Dorsal part of occiput very narrow, with long black and short yellow pilosity.

THORAX. Postpronotum black, densely greyish pollinose, yellow pilose. Scutum shiny black, matt antero-laterally in front of transverse suture and narrowly anterior to scutellum; fine-punctured, with comparatively long, erect yellow pilosity medially and black pilosity laterally, posteriorly with some

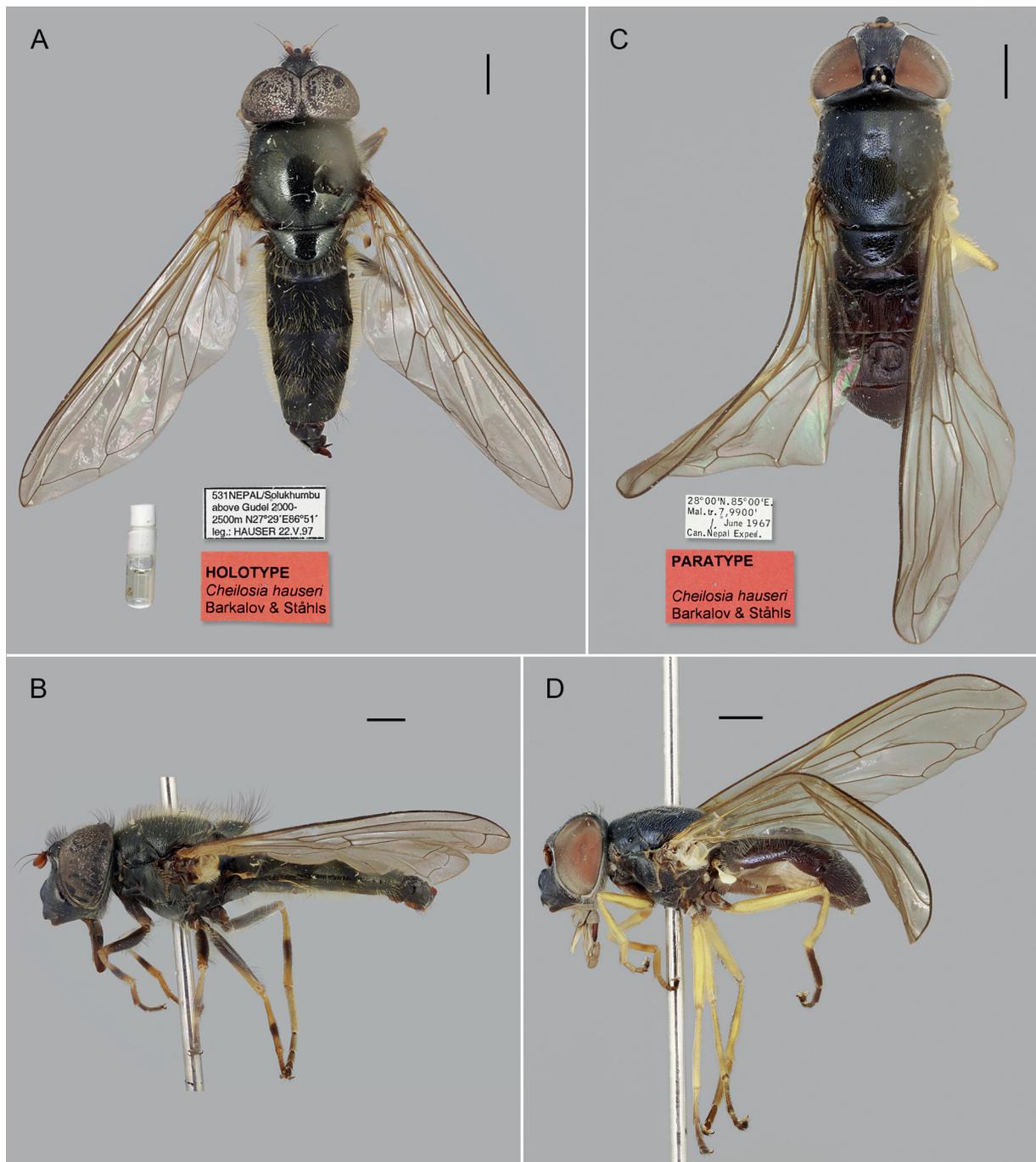


Fig. 28. *Cheilosia (Cheilosia) hauseri* sp. nov. **A–B.** Holotype, ♂ (CSCA); dorsal and lateral views. **C–D.** Paratype, ♀ (CNC); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

long black pilosity; postalar callus with very long black bristles and shorter yellowish pilosity; scutellum shiny but thinly pollinose, with short yellow and long black erect pilosity, hind margin shiny with many long black bristles (some longer than length of scutellum); subscutellar fringe long yellow. Pleura shiny, finely pollinose and yellow pilose, anepimeron dorso-posteriorly with some black pilosity; katapisternum with dorsal and ventral pile patches broadly separated; metasternum yellow pilose.

LEGS. Fore coxa without baso-lateral spur, light-brown, mid and hind coxae black; trochanters yellow; femora narrowly yellow basally, dark-brown to blackish, tips yellow posteriorly and with yellow stripe in apical $\frac{1}{3}$ – $\frac{1}{2}$ anteriorly; long pilosity on posterior surface of fore and mid femora yellow in basal part and black in apical part, long pilosity antero-ventrally on hind femur yellow, in apical half ventrally with short, black, strong pile; tibiae yellow with black annulus medially, bigger on hind tibia, hind tibia with some black pile longer than width of tibia antero-medially; tarsi mostly black, fore and mid metatarsus yellow.

WING. Basally yellowish, veins brown, completely covered with microtrichia; Rs with a few pile or lacking pile; vein M_1 meeting vein R_{4+5} almost perpendicularly. Calypter white, with yellow rim and pilosity. Haltere yellow, with brown spot on knob, knob ventrally with short yellow pile.

ABDOMEN. Narrow, in broadest part distinctly narrower than scutum at level of wing base, black, brownish pollinose medially and shiny laterally, on tergites II and III pollinosity more dense in large, indistinct macula laterally; yellow pilose, long, erect on tergites I–II and on sides of tergites III–IV, and semi-appressed medially on tergites III–IV. Sternites shiny but completely, thinly pollinose, sternites I–II with long erect yellow pilosity, sternites III–IV with shorter, semi-appressed, yellow pilosity.

Female

LENGTH. Body 7.3–8.8 mm, wing 8.0–9.3 mm.

HEAD. Face more protruded forward than in male; facial tubercle of same shape but more prominent. Eye margin orange, densely silvery pollinose, with short, semi-appressed, white pilosity. Frons narrow, slightly broadened anteriorly; lateral furrows distinct and dulled by integumental rugosity and some erect pale pilosity, medial furrow invisible, but anterior to transverse furrow visible, distinct transverse furrow in anterior part of frons; shiny without pollinosity, covered with short, semi-appressed white pilosity, ocellar triangle equilateral. Lunule bright yellow, antennae completely yellow, basoflagellomere slightly bigger than in male.

THORAX. Scutum black, shiny with bluish sheen, with distinct but fine puncturation, with short semi-appressed white pilosity; postalar callus anteriorly and posteriorly yellow, with two black bristles; scutellum hind margin with comparatively strong black bristles shorter than length of scutellum.

LEGS. Yellow but hind femur sometimes darker; hind femur in apical part ventrally with some short, black, strong pile; the three apical segments of fore and mid tarsi and dorsal surface of hind tarsus all black.

ABDOMEN. Slightly broader than mesonotum, shiny black, without pollinosity, with short, erect and semi-erect white pilosity, on sides of tergites I–II with longer pilosity.

Otherwise as the male.

Distribution

Nepal.

Cheilosia illustratoides sp. nov.

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Figs 29–30

Differential diagnosis

Cheilosia (*Floccocheila*) *illustratoides* sp. nov. is close to *Cheilosia indistincta* sp. nov. and *C. vellea* sp. nov., and from these species *C. illustratoides* differs by mostly long yellow pilosity of femora (vs predominantly black in *C. indistincta* sp. nov. and *C. vellea* sp. nov.), *Cheilosia indistincta* sp. nov. differs from *C. vellea* sp. nov. by having only yellow pilosity on lateral margin of tergite I (vs with black pilosity in *C. vellea* sp. nov.), all species differ by structure of male genitalia.

Etymology

The specific epithet ‘*illustratoides*’ is from the Latin ‘*illustrates*’, meaning ‘clear, enlightened’, referring to the resemblance of the new species with the Palearctic *Cheilosia illustrata* (Harris, 1780).

Material examined

Holotype

NEPAL • ♂; Westnepal, Distr. Bajura, Simikot, 19 km W of Kuwad Khola; 29°53'14" N, 81°38'40" E; 3500 m a.s.l.; 5 Jul. 2001; Creutzburg leg.; NME.

Paratypes

NEPAL • 1 ♂; 21 Dolakha Distr., SW of Kalinchok Mt.; 3100 m a.s.l.; 19–23 Apr. 1995; Iglesias leg.; ZSMC • 1 ♀; Distr. Humla, 20 km NW of Simikot, 3.8 km SE of Chala; 29°58'49" N, 81°38'23" E; 3500 m a.s.l.; 27–28 Jun. 2001; Creutzburg leg.; juniper meadows; NME • 1 ♀; Westnepal, Distr. Humla, Simikot, 12 km S of Raya; 29°52'29" N, 81°51'57" E; 2400 m a.s.l.; 8 Jul. 2001; Creutzburg leg.; NME • 1 ♀; Prov. Karnali, Umg. Lager oberhalb Maharigaon [surroundings of camp above Maharigaon]; 29°20.24' N, 82°23.21' E; 3300–3400 m a.s.l.; 20 Jun. 1997; J. Weipert leg.; IBSJW/NME.

Description

Male

LENGTH. Body 11–12.5 mm, wing 9–10 mm.

HEAD. Face in anterior view moderately broad, ventrally wider, black, almost completely covered with dense yellowish pollinosity, pollinosity denser in dorsal part of face; non-pilose (but with some distinct microtrichia latero-medially); facial tubercle small, not prominent; parafacia relatively broad, clearly broader than ½ width of basoflagellomere, grey pollinose along eye and shiny towards face, long yellow pilose in dorsal half and ventral half with mixed very long black and yellow pilosity. Gena broad, densely grey pollinose and long yellow pilose. Frons broad and convex, grey pollinose and long yellow and black pilose, laterally with short yellow pilosity; frontal angle obtuse; lunule brownish-yellow; antennal pits broadly separated. Antenna black; basoflagellomere blackish, grey pollinose, rounded; pedicel ventrally with some black and yellow pile as long as width of pedicel; arista narrow, long, black, with very short but distinct pilosity. Eye completely densely black pilose; eye contiguity longer than length of frons without lunule; eye ventrally with narrow orange spot. Vertex black, grey pollinose and long, black and yellow pilose; ocellar triangle isosceles. Occiput yellow pilose.

THORAX. Postpronotum black, grey pollinose, mixed black and yellow pilose. Scutum black, very finely punctured, mixed black and yellow pilose; whitish pollinose anterior to transverse suture, scutum with two short longitudinal vittae of grey pollinosity on anterior ¼; mainly black pilose on lateral parts posterior to transverse suture; postalar callus long yellow pilose and slightly grey pollinose; scutellum anteriorly

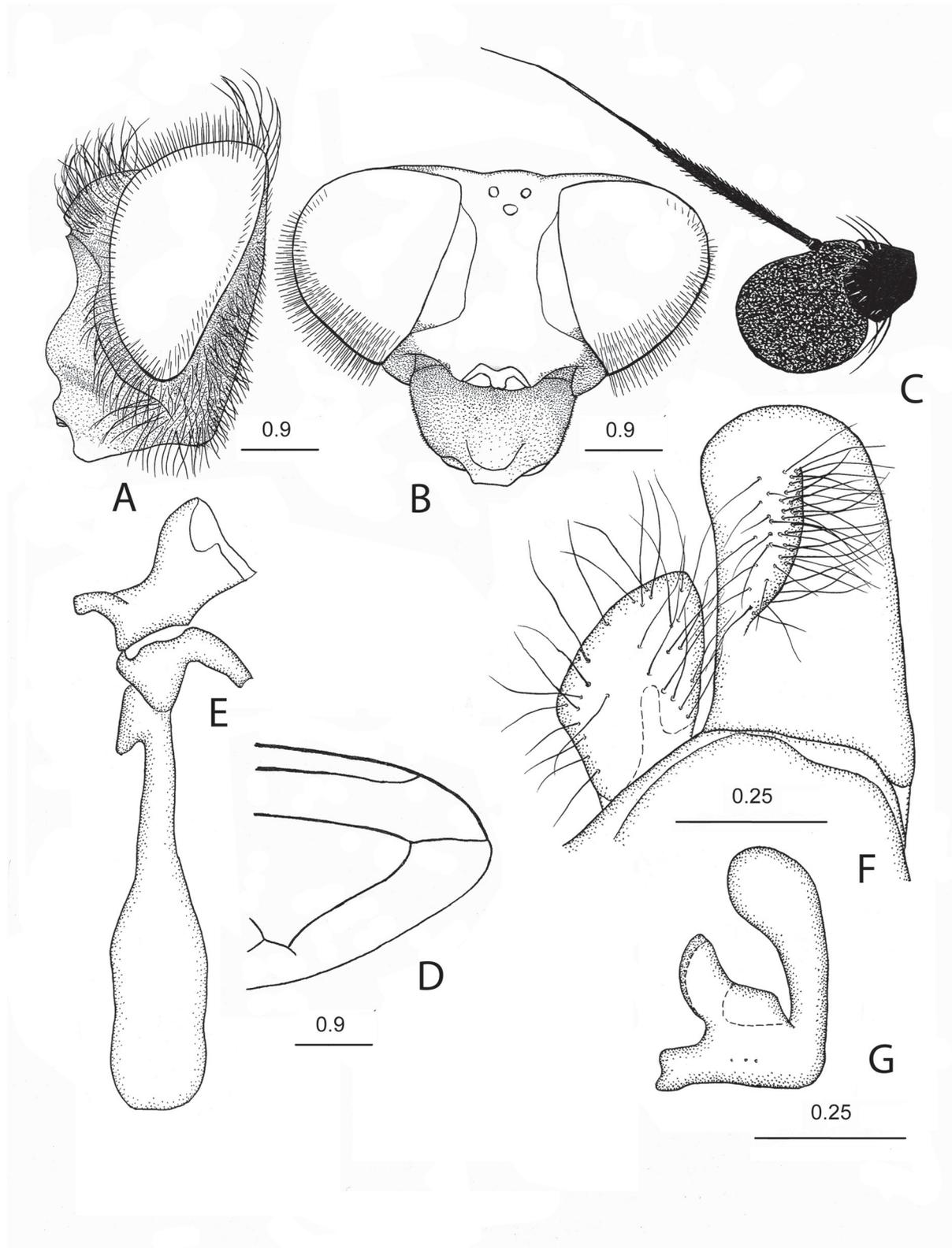


Fig. 29. *Cheilosia (Floccocheila) illustratoides* sp. nov.; A, C–G = holotype, ♂ (NME), B = paratype, ♀ (NME). **A.** Head, lateral view. **B.** Head, dorsal view. **C.** Antenna, lateral view of pedicel and basoflagellomere. **D.** Tip of wing. **E.** Aedeagus and aedeagal apodeme, lateral view. **F.** Surstylus and gonocercus, lateral view. **G.** Superior lobe of hypandrium, lateral view. Scale bars indicated in drawings.

narrowly grey pollinose, long yellow pilose and with some fine black shorter pile medially; scutellum margin lacking strong bristles, with long yellow and black pilosity of length up to length of scutellum. Subscutellar fringe long, dense, yellow. Pleura grey pollinose, with very long yellow pilosity; anterior anepisternum with slight pollinosity, non-pilose, posterior anepisternum without strong bristles, yellow pilose with a few black pile; katepisternum contiguously yellow pilose. Metasternum yellow pilose.

LEGS. Coxa black, grey pollinose and long yellow pilose, without baso-lateral spur; femora black with narrowly yellow tips, fore and mid femora ventrally with mixed long black and yellow pilosity, hind femur in basal $\frac{2}{3}$ anteriorly with very long yellow pilosity and apically with shorter black pilosity, ventrally with very long yellow pilosity and short black pilosity; tibiae brownish yellow with broad black annulus

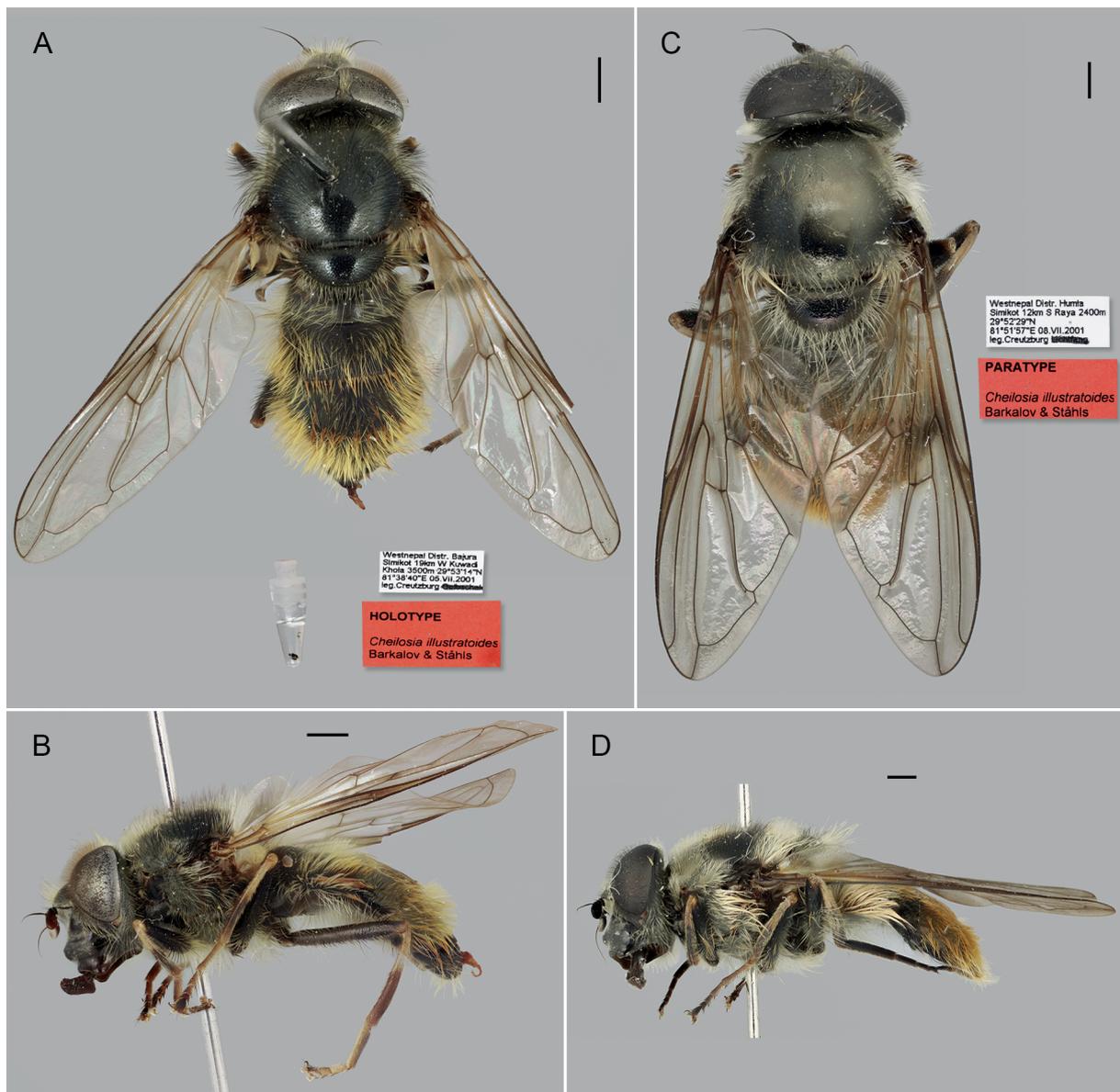


Fig. 30. *Cheilosia (Floccocheila) illustratoides* sp. nov. A–B. Holotype, ♂ (NME); dorsal and lateral views. C–D. Paratype, ♀ (NME); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

medially which is incomplete dorsally; fore and hind tarsi dorsally black, mid tarsus with two basal segments yellowish and apical segments dark.

WING. Entirely microtrichose, slight brownish, veins yellowish brown; vein Rs with black and yellow pile in basal $\frac{2}{3}$; M_1 meeting R_{4+5} in an obtuse angle. Calypter yellowish with yellow fringe; haltere dark-brown with black knob.

ABDOMEN. Abdomen broad, about as broad as mesonotum at level of wing base, black, finely punctured, grey pollinose, with dense, long, erect pilosity; tergite I with yellow pilosity medially and laterally with orange pilosity, tergite II foxy-orange pilose, tergites III–IV foxy-orange pilose with black pilosity along lateral margin of tergite III, and sometimes with some black pile postero-laterally on tergite III. Sternites grey pollinose, long erect yellow pilose, sternites III and IV also with shorter, erect black pilosity.

Female

LENGTH. Body 11–11.5 mm, wing 9–10 mm.

HEAD. Face slightly pollinose, except shiny on lower mouth margin. Parafacia relatively broad, about $\frac{2}{3}$ of width of basoflagellomere. Frons broad, anteriorly wider, shiny, antero-laterally grey pollinose, in anterior $\frac{1}{3}$ with a transverse pollinose band; with long erect yellow and black pilosity; ldsateral furrows broad, medial furrow invisible. Antenna black; basoflagellomere blackish with postero-ventral margin indistinctly reddish-brown, grey pollinose, rounded.

THORAX. Postpronotum and notopleural area densely whitish-grey pollinose; notopleural area yellow pilose and with a few black pile.

ABDOMEN. Tergite I yellow pilose, tergite II with long reddish pilosity medially and laterally with long white pilosity, tergites III–IV foxy-orange pilose medially and laterally black pilose, tergite V foxy-orange pilose. Sternite V medially with appressed black pile, laterally with semi-erect yellow pile. Other characters as in male.

Distribution

Nepal.

Cheilosia (Endoiasimyia) indiana (Bigot, 1883)

Figs 31, 32A

Endoiasimyia indiana Bigot, 1883 in Brunetti, 1923: 153.

Endoiasimyia indiana Bigot, 1882 [sic] – Ghorpadé 2015: 6.

Differential diagnosis

Cheilosia (Endoiasimyia) indiana shares the diagnostic characters of eye and face with pilosity, a plumose arista and proepisternum of propleuron with a dorso-lateral spur with other members of the subgenus. Wing with faint brownish-black cloud from about mid of discal cell to wing tip. *Cheilosia (E.) indiana* differs from other members of the subgenus by scutum lacking brown pollinose vittae anterior and posterior to transverse suture.

Material examined

NEPAL • 1 ♂; Ktm. [Kathmandu] Pulchauk; 6600 ft a.s.l.; 21 Jul. 1967; Can. Nepal Exped.; CNC • 1 ♀; Ktm. [Kathmandu] Godavari; 6000 ft a.s.l.; 15 July 1967; Can. Nepal Exped.; CNC • 1 ♀; 28°00' N,

85°00' E; 11 100 ft a.s.l.; 17 May 1967; Can. Nepal Exped.; CNC • 1 ♀; Solukhumbu above Pangum; 2500 m a.s.l.; 27°35' N, 86°43' E; 14–15 May 1997; Hauser leg. [522]; CSCA.

Distribution

India, Nepal.

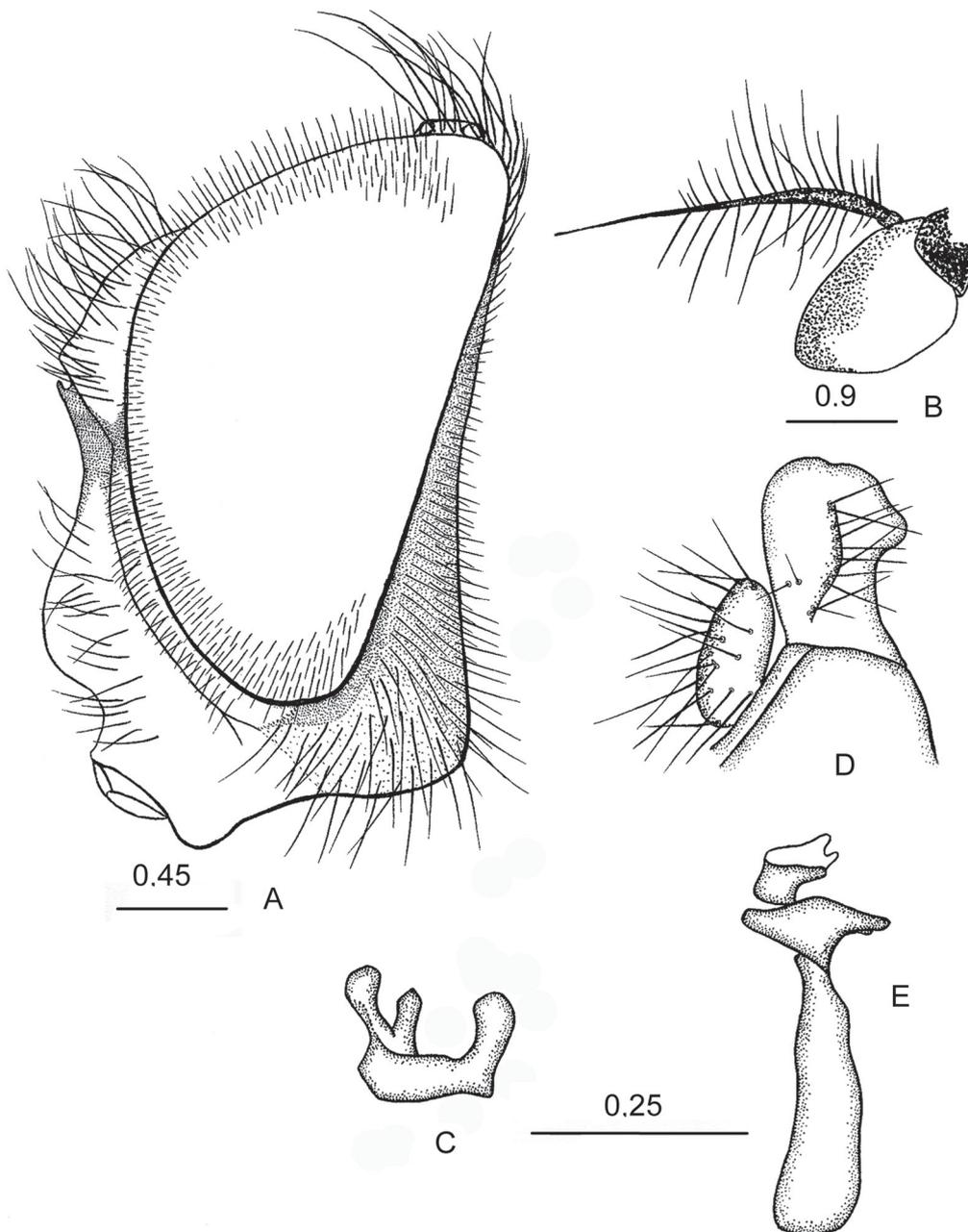


Fig. 31. *Cheilosia (Endoiasimyia) indiana* (Bigot, 1883). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Superior lobe of hypandrium, lateral view. **D.** Surstylus and gonocercus, lateral view. **E.** Aedeagus and aedeagal apodeme, lateral view. After Barkalov & Cheng 2004. Scale bars indicated in drawings.

Cheilosia indistincta sp. nov.

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Figs 32B–C, 33

Differential diagnosis

Cheilosia (Floccocheila) indistincta sp. nov. agrees with the other members of the subgenus in the following characters: a broad, densely pilose body, antennal pits separated, wing infuscated, eye pilose, and scutum without strong bristles. *Cheilosia (F.) indistincta* sp. nov. is similar to *C. (F.) illustratoides* sp. nov. and *C. (F.) vellea* sp. nov. for distinguishing characters see under *C. (F.) illustratoides* sp. nov.

Etymology

The specific epithet is from the Latin ‘*indistinctus*’, and refers to the fact that the species is obscure (hard to distinguish from morphologically similar species).

Material examined

Holotype

NEPAL • ♂; Prov. Seti, 25 km SW of Simikot, Kuwadi Khola E of Saipal; 29°53.4' N, 81°36.2' E; 3600 m a.s.l.; 4 Jul. 2001; J. Weipert leg.; IBSJW/NME.

Paratype

NEPAL • ♂; Westnepal, Distr. Bajura, Simikot 19 km W of Kuwadi Khola; 29°53'14" N, 81°38'04" E; 3500 m a.s.l.; 5 Jul. 2001; Creutzburg leg.; NME.

Description

Male

LENGTH. Body 12–13 mm, wing 10–11 mm.

HEAD. Face in anterior view broad, broadest medially with cheek moderately convex latero-medially; in lateral view moderately protruded; black, non-pilose, slightly grey pollinose, except shiny along ventral mouth margin and area around facial tubercle; facial tubercle of moderate size, not distinct; parafacia broad, in broadest part almost equal to width of basoflagellomere, grey pollinose and long, yellow pilose in dorsal $\frac{2}{3}$, with mixed yellow and black pilosity on ventral $\frac{1}{3}$, pilosity longer than eye pilosity; gena broad, grey pollinose and long yellow pilose. Frons moderately convex, grey pollinose, more densely pollinose narrowly along eye, with long yellow and black pilosity; frontal angle approximately right; lunule yellow or brown, antennal pits distinctly separated. Antenna blackish-brown, basoflagellomere oval, densely brown pollinose; arista long, black, with very short pile (clearly shorter than width of arista at broadest point). Eye with dense, moderately long black pilosity; eye contiguity almost equal to length of frons without lunule. Vertex inflated, grey pollinose and long yellow pilose, ocellar triangle equilateral. Occiput densely grey pollinose, yellow pilose.

THORAX. Postpronotum black, grey pollinose and yellow pilose. Scutum with moderately strong puncturation, shiny black, grey pollinose on anterior part and notopleural area, and narrowly at postalar calli and anterior to scutellum; with dense, long, yellow pilosity on pollinose parts and long, black pilosity on shiny part forming a broad black band between wing bases, black pilosity longer in posterior part; without strong black bristles. Scutellum medially shiny on disc, all margins grey pollinose, with dense yellow and black pilosity, scutellar margin without strong bristles. Subscutellar fringe with long yellow pilosity. Pleura densely grey pollinose, with long dense yellow pilosity, anepisternum on posterior part also with black pilosity, katepisternum completely and contiguously yellow pilose, but ventrally also with some black pile; anepimeron with mixed yellow and black pilosity. Metasternum yellow pilose, mixed with a few black pile.

LEGS. Coxa black, grey pollinose and black and yellow pilose; fore coxa without baso-lateral spur; femora black with yellowish tips, antero-ventrally with dense, long black pilosity up to 1.5–2× longer than width of femur, and some yellow pile on postero-basal 1/3 part, hind femur antero-ventrally and ventrally with

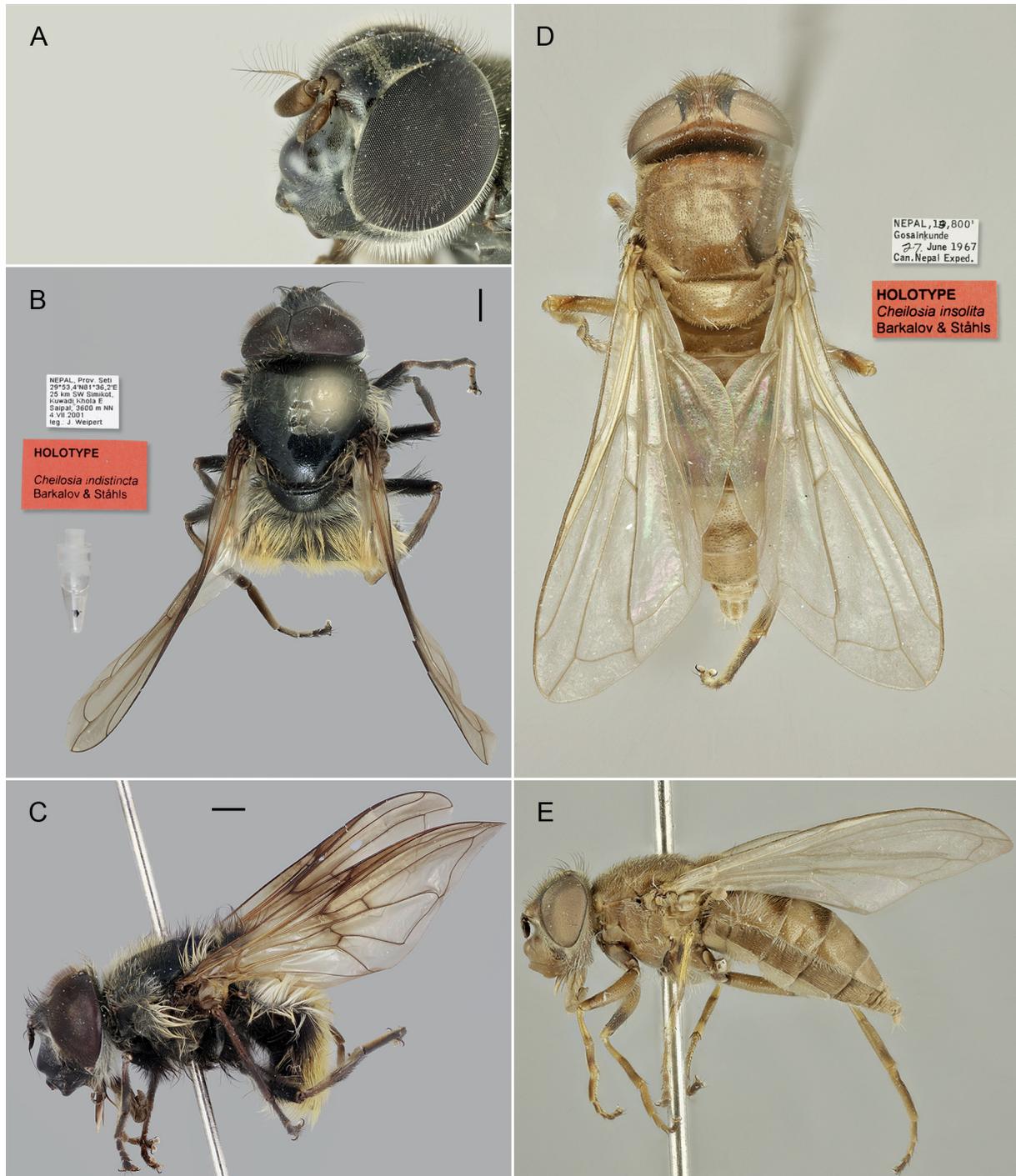


Fig. 32. A. *Cheilosia (Endoiasimyia) indiana* (Bigot, 1883), female head (CNC). – B–C. *Cheilosia (Floccocheila) indistincta* sp. nov., holotype, ♂ (IBSJW/NME); dorsal and lateral views. – D–E. *Cheilosia insolita* sp. nov., holotype, ♀ (CNC); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

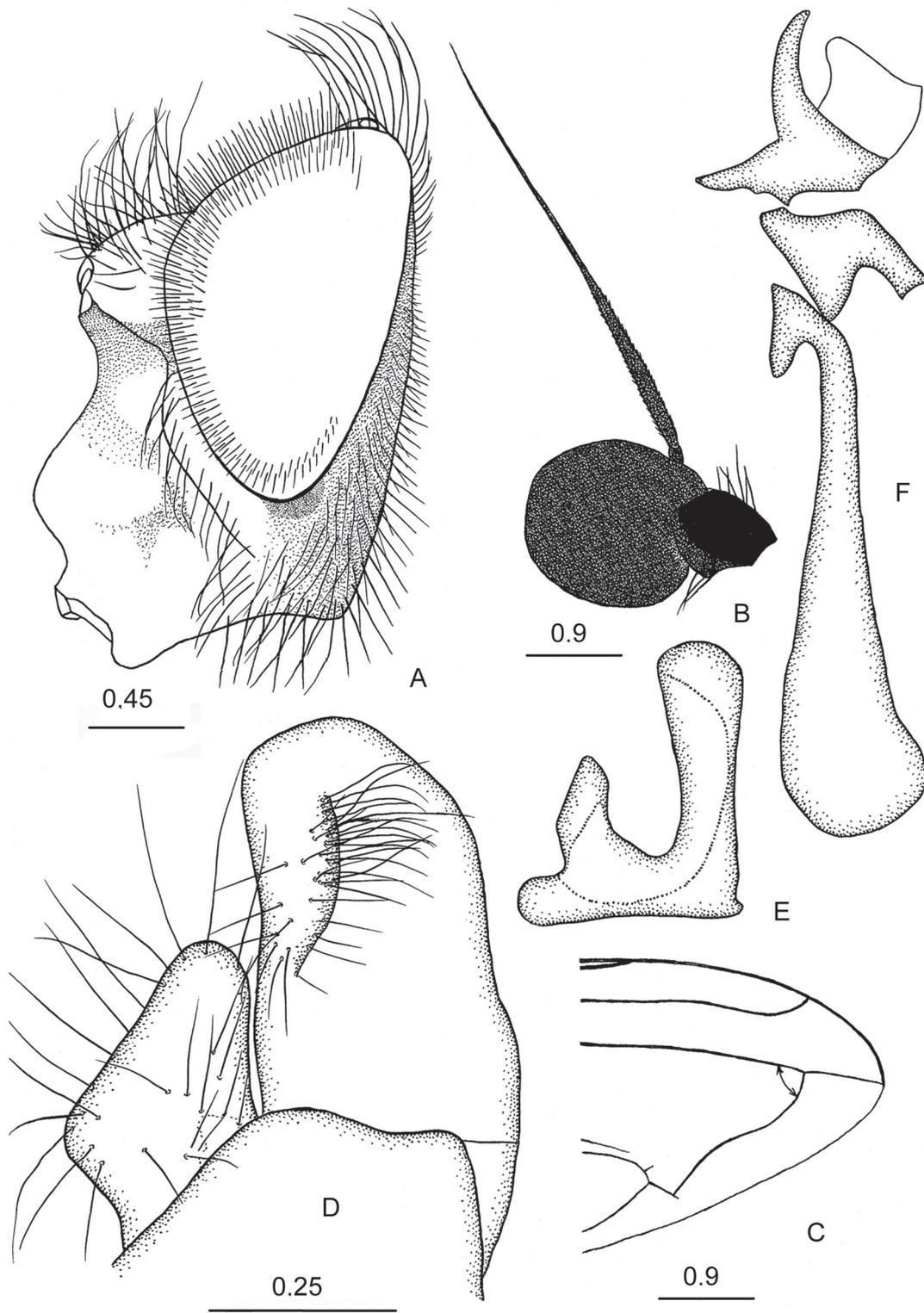


Fig. 33. *Cheilosia (Floccocheila) indistincta* sp. nov., holotype, ♂ (IBSJW/NME). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Tip of wing. **D.** Surstylus and gonocercus, lateral view. **E.** Superior lobe of hypandrium, lateral view. **F.** Aedeagus and aedeagal apodeme, lateral view. Scale bars indicated in drawings.

long whitish pilosity in basal $\frac{2}{3}$; tibia brown on basal $\frac{1}{3}$ – $\frac{1}{2}$ and on tips and black otherwise, with black pilosity; tarsi black dorsally and yellow ventrally.

WING. Entirely microtrichose; finely brownish in apical half and along cross veins; inner angle between veins M_1 and R_{4+5} right; Rs with about four short, black pile. Calypter mostly yellow, black basally, fringe yellow. Haltere with stem yellow and black knob, knob ventrally with some short black pile.

ABDOMEN. Broadly oval, in broadest part broader than scutum at level of wing base, brownish-black; tergite I densely grey pollinose and yellow pilose, tergite II with long reddish and yellowish pilosity, tergites III and IV with long, black pilosity on lateral margin extending from anterior margin to $\frac{2}{3}$ of margin, and long yellow pilose otherwise. Sternites black-brown, pollinose, with mixed long black and yellow pilosity, sternite I only with long, whitish pilosity.

Female

Unknown.

Distribution

Nepal.

Cheilosia insolita sp. nov.

urn:lsid:zoobank.org:act:7DE2FE7F-5F7E-44C7-87D9-1C56D24083FA

Figs 32D–E, 34

Differential diagnosis

The presence of for the genus *Cheilosia* unusual characters such as pale yellowish-brownish body colour, the colour pattern of frons (Fig. 34B), and a whitish stigma of wing, distinguishes *C. insolita* sp. nov. from all other congeners. The taxon is here placed as incertae sedis within the genus *Cheilosia* (meaning that the subgeneric placement is unclear) while no male specimen is available for study, and the structures of male genitalia provides critical characteristics for establishing a subgeneric rank of this species.

Etymology

The specific epithet is from the Latin ‘*insolitus*’, meaning ‘unusual, rare’, referring to the unusual colour of the species.

Material examined

Holotype

NEPAL • ♀; Gosainkunde; 19 800 ft a.s.l.; 27 Jun. 1967; Can. Nepal Exped.; CNC.

Description

Female

LENGTH. Body 8.0 mm; wing 7.3 mm.

HEAD. Face broad, in anterior view distinctly broadened ventrally, in lateral view protruded forward; pale-brown; finely grey pollinose except shiny on facial tubercle and along mouth margin, and in dorsal part near parafacia; facial tubercle moderate in size; parafacia very broad, in broadest part approximately equal to width of basoflagellomere, dark-brown, densely grey pollinose, with long, dense whitish pilosity mixed with some shorter dark-brown, semi-erect pilosity. Gena broad, pale-brown, densely grey pollinose and comparatively long white pilose; ventral part of occiput along eye densely grey pollinose, with dense white pilosity. Frons broad, distinctly broadened anteriorly, yellow in anterior and medial part and

black within lateral furrows; with dense, erect and semi-erect, comparatively long, black pilosity mixed with shorter yellowish pilosity (some long black pile inclined towards either eye). Lunule bright yellow, antennal pits distinctly separated. Antenna all black; basoflagellomere rounded, densely grey pollinose and with a small brownish spot in postero-ventrally; arista short, black, shiny, bare. Vertex flat, shiny, long black pilose. Dorsal part of occiput pale-brown, shiny, with long black and short yellow pilosity.

THORAX. Postpronotum yellow, with yellow pilosity. Scutum pale-brown, shiny, covered with comparatively short black pilosity, erect in anterior half and semi-erect in posterior half. Postalar callus yellow, with short, bristle-like, black pilosity. Scutellum yellowish, with short yellow and some black pilosity; scutellum hind margin with short yellow pilosity and with two black fine bristles. Subscutellar fringe short, yellow. Pleura pale brown, finely grey pollinose, without shiny spots, with erect white

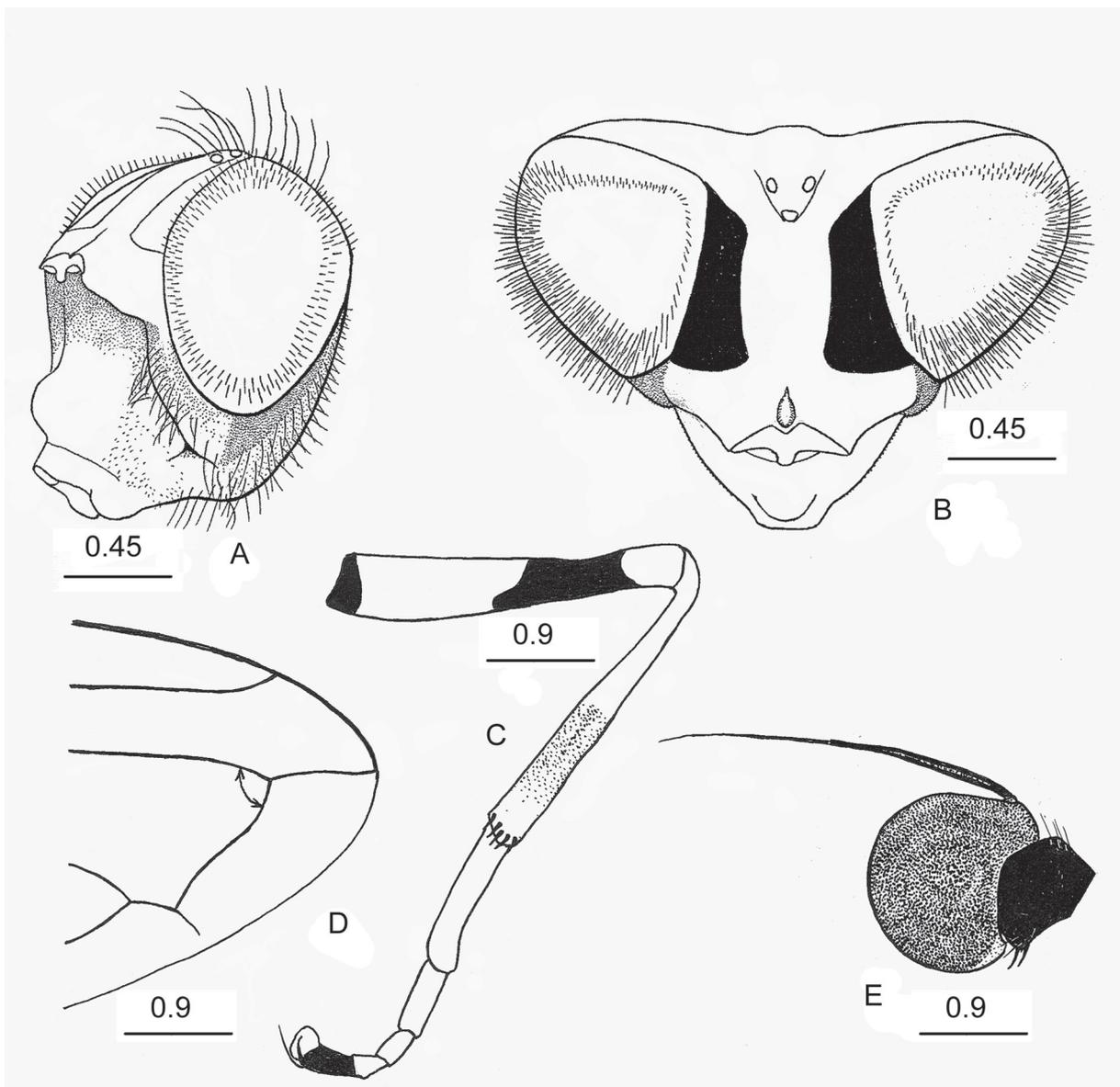


Fig. 34. *Cheilosia insolita* sp. nov., holotype, ♀ (CNC). **A.** Head, anterior view. **B.** Head, dorsal view. **C.** Mid leg, anterior view. **D.** Tip of wing. **E.** Antenna, lateral view of pedicel and basoflagellomere. Scale bars indicated in drawings.

pilosity, postero-dorsal corner of posterior anepisternum with black pilosity. Metasternum with long white pilosity.

LEGS. Fore trochanter dark-brown, without baso-lateral spur; mid trochanter dark-brown anteriorly and pale-brown dorsally and posteriorly; hind trochanter pale-brown. Fore and mid femora anteriorly basally narrowly black, and with broader black annulus apically, with yellow tip; posteriorly **entirely** yellowish-brown; hind femur yellowish-brown, antero-basally with small black spot and with incomplete annulus in apical third; long pilosity on posterior part of fore and mid femora mostly white with some black pilosity at base and tip; ventral part of hind femur with short black and yellow pilosity. Tibiae yellow in basal $\frac{1}{3}$ – $\frac{1}{2}$ and on tips, otherwise brown. Fore and hind tarsi black dorsally, 1–3 segments of mid tarsus yellow, 4–5 segments black; all tarsi yellow ventrally.

WING. Comparatively broad, light with white stigma and all veins pale-yellow in basal half; **entirely** microtrichose; inner angle between venae M_1 and R_{4+5} right. Calypter white with yellow rim and pilosity; haltere yellow.

ABDOMEN. Comparatively narrow, in broadest part almost equal to width of mesonotum at level of wing base; shiny, pale-brown, with dark spots on postero-medial part of tergites II–III; laterally with short erect pilosity and with semi-erect white pilosity on other parts. Sternites pale-brown, with short white pilosity.

Male

Unknown.

Distribution

Nepal.

Cheilosia leucozonoides sp. nov.

urn:lsid:zoobank.org:act:BEED388F-15FA-4176-97A0-3FBD85867296

Figs 35–36

Differential diagnosis

Cheilosia (Floccocheila) leucozonoides sp. nov. is a large sized species with long and dense body pilosity like most subcongeneres. From all other members of the subgenus *C. (F.) leucozonoides* sp. nov. differs by the following combination of characters: eye pilosity black, basoflagellomere blackish in colour, and presence of black pile on tergites III–IV.

Etymology

The specific epithet '*leucos*' is from the Greek, and refers to the pale wing veins of the species.

Material examined

Holotype

NEPAL • ♀; 27°57' N, 84°59' E; 10 100 ft a.s.l.; 30 May 1967; Can. Nepal Exped.; Malaise trap; CNC.

Paratypes

NEPAL • 1 ♀; 27°57' N, 84°59' E; 10 500 ft a.s.l.; 14–21 May 1967; Can. Nepal Exped.; Malaise trap; CNC • 1 ♀; Prov. Nr 2, East Thodun; 3200 m a.s.l.; 14–21 Apr. 1964; W. Dierl leg.; ZSMC • 1 ♀; Solukhumbu above Pangum; 27°34' N, 86°45' E; 2900–3000 m a.s.l.; 16 May 1997; M. Hauser leg. [522]; CSCA.

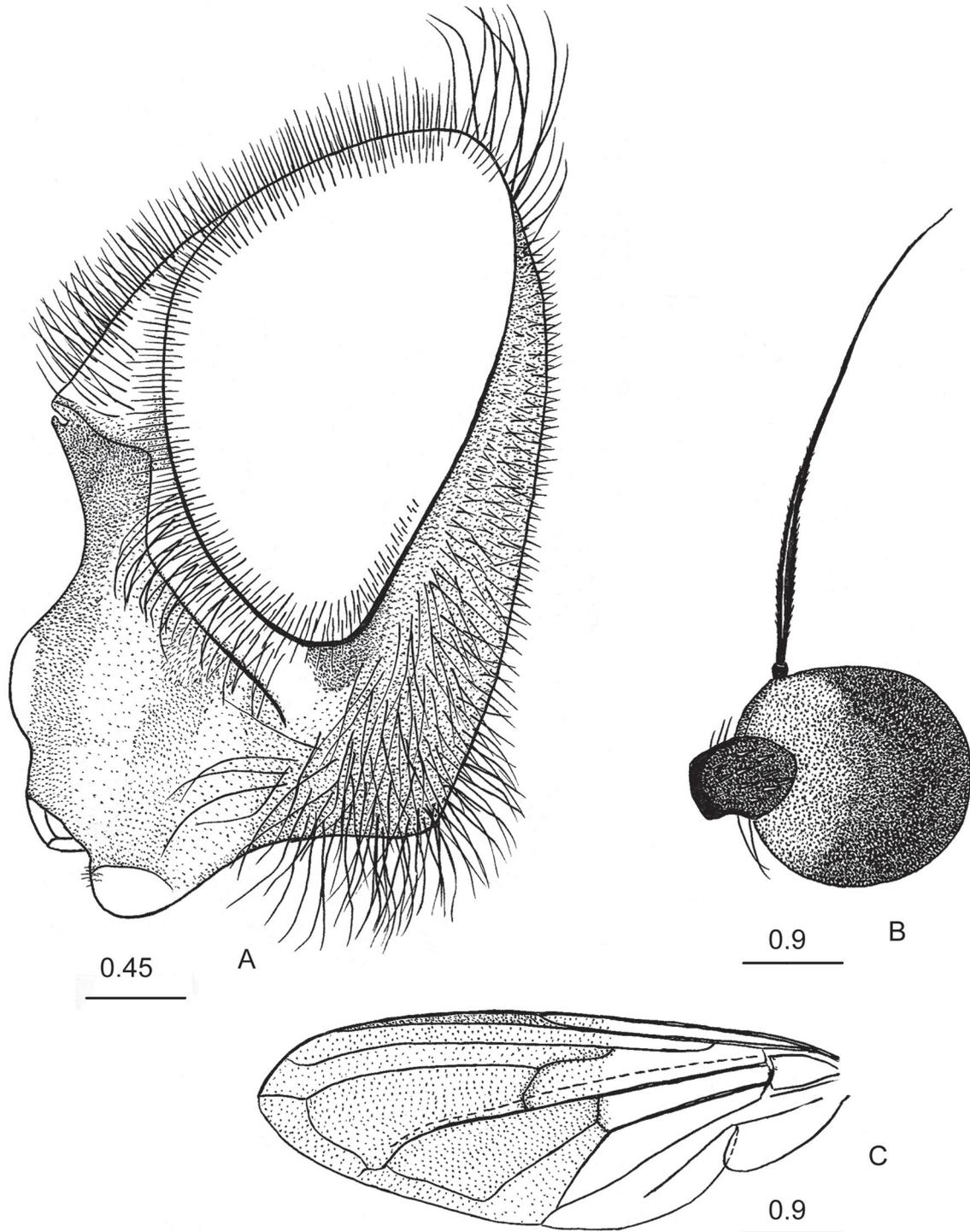


Fig. 35. *Cheilosia (Floccocheila) leucozonoides* sp. nov., holotype, ♀ (CNC). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Wing. Scale bars indicated in drawings.

Description

Female

LENGTH. Body 11.9–12.6 mm, wing 10.9–11.4 mm.

HEAD. Face very broad, in anterior view distinctly widened ventrally; densely grey pollinose and microtrichose except tip of facial tubercle and a broad shiny stripe from parafacia to oral margin; non-pilose; facial tubercle small, laterally compressed; parafacia very broad, about as broad as $\frac{2}{3}$ of basoflagellomere width, brownish or blackish with greyish-yellow pilosity and very fine, long, black pilosity, also some yellow pilosity on dorsal part; gena broad, densely, grey pollinose and long, yellow pilose, with some black pilosity anteriorly; ventral to eye a brown macula and dense, yellow pollinosity. Frons broad, distinctly broadened anteriorly, with two distinct lateral furrows, medial furrow invisible, in medial $\frac{1}{3}$ with narrow band of grey pollinosity, covered with dense, long, erect black or black and yellow

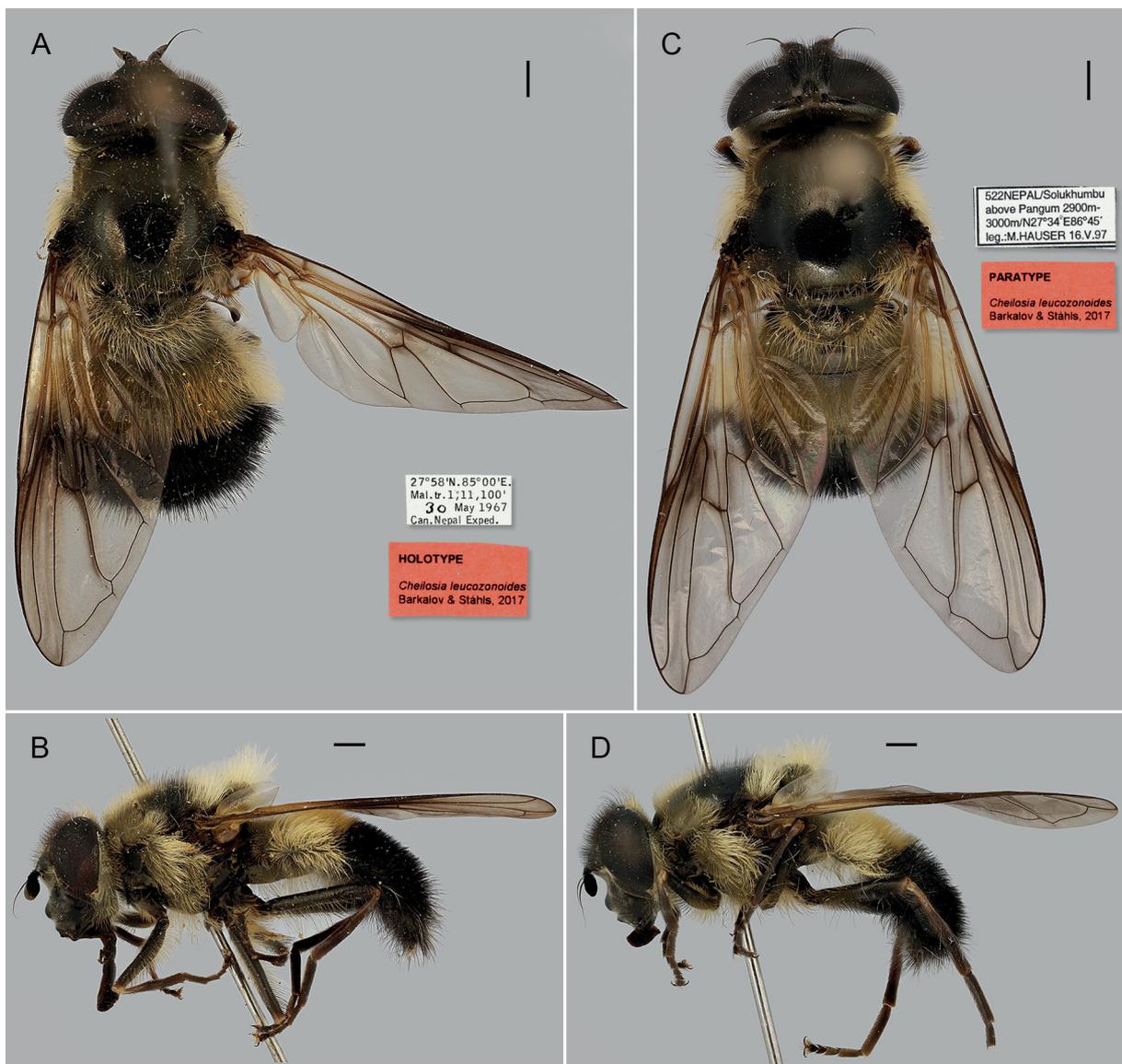


Fig. 36. *Cheilosia (Floccocheila) leucozonoides* sp. nov. **A–B.** Holotype, ♀ (CNC); dorsal and lateral views. **C–D.** Paratype, ♀ (CSCA); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

pilosity; lunule narrow, brown or yellow; antennal pits separated. Antenna black, basoflagellomere big, rounded, with small brown macula on ventro-dorsal part, covered with dense, yellow-brown pollinosity; arista long, bare, black. Vertex slightly inflated, with fine grey pollinosity and with long black and yellow pilosity. Ocellar triangle equilateral. Eye with dense, long pilosity, dorsally black and ventrally brown. Occiput with only yellow pilosity.

THORAX. Postpronotum black, densely, grey pollinose and yellow pilose. Scutum fine-punctured, black with dense, grey pollinosity in anterior $\frac{1}{3}$ (anterior to transverse suture) and shiny with bluish reflection in posterior $\frac{2}{3}$, covered with dense, long pilosity, yellow in anterior part and near scutellum, and with short band of long, black pilosity between wings, no lateral black bristles; scutellum only with long, dense, yellow pilosity. Subscutellar fringe long, dense, yellow. Pleura black with dense, yellowish-grey pollinosity and long, dense, yellow pilosity; dorsal and ventral hair patches on katepisternum dorsally connected; metasternum with dense, long, yellow pilosity.

LEGS. Fore coxa black, with grey pollinosity and yellow or black and yellow pilosity; fore coxa without lateral spur; tibia brownish black with paler basal $\frac{1}{3}$ and tip; tarsi black; femora black with yellow tips, fore and mid femora posteriorly with mainly long yellow pilosity and with variable amount of black pilosity in apical part, hind femur with antero-ventral yellow pilosity very long, about $1.5 \times$ the width of femur, and shorter black pilosity of variable lengths (not longer than yellow pile).

WING. Entirely microtrichose, yellowish in basal part and medially with distinctly infuscated (brownish) wing veins and stigma; tibia brownish black with paler basal $\frac{1}{3}$ and tip; tarsi black. Rs along all length with many short, black pile; inner angle between veins M_1 and R_{4+5} right. Haltere brownish with black pilosity, calypter brownish with brown rim and yellow fringe.

ABDOMEN. Oval, distinctly broader than scutum at level of wing base, black with dense, grey pollinosity on tergites I–II and shiny black otherwise, covered with long, dense, erect pilosity, yellow on tergites I–II and black on tergites III–V. Sternites with pilosity as on tergites.

Male

Unknown.

Distribution

Nepal.

Cheilosia lucida Barkalov & Cheng, 1998

Figs 37–38

Cheilosia (Convocheila) lucida Barkalov & Cheng, 1998: 318. Type locality: China: Sichuan: Emei Shan (holotype, ♂, ZICAS).

Cheilosia (Convocheila) lucida – Barkalov & Cheng 2004: 317 (description of female). — Huang & Cheng 2012: 390.

Cheilosia lucida – Suk 2018: 41.

Differential diagnosis

Barkalov & Cheng (1998) described *Cheilosia lucida* based on the male sex, and the taxon was placed in the subgenus *Convocheila* Barkalov, 2002. Barkalov & Cheng (2004) described the female. The structure of the distiphallus (apical sclerite of the aedeagus) and the shapes of the strongly asymmetric superior lobes and surstylus are very different from other species of *Convocheila* (see Barkalov 2002: 230;

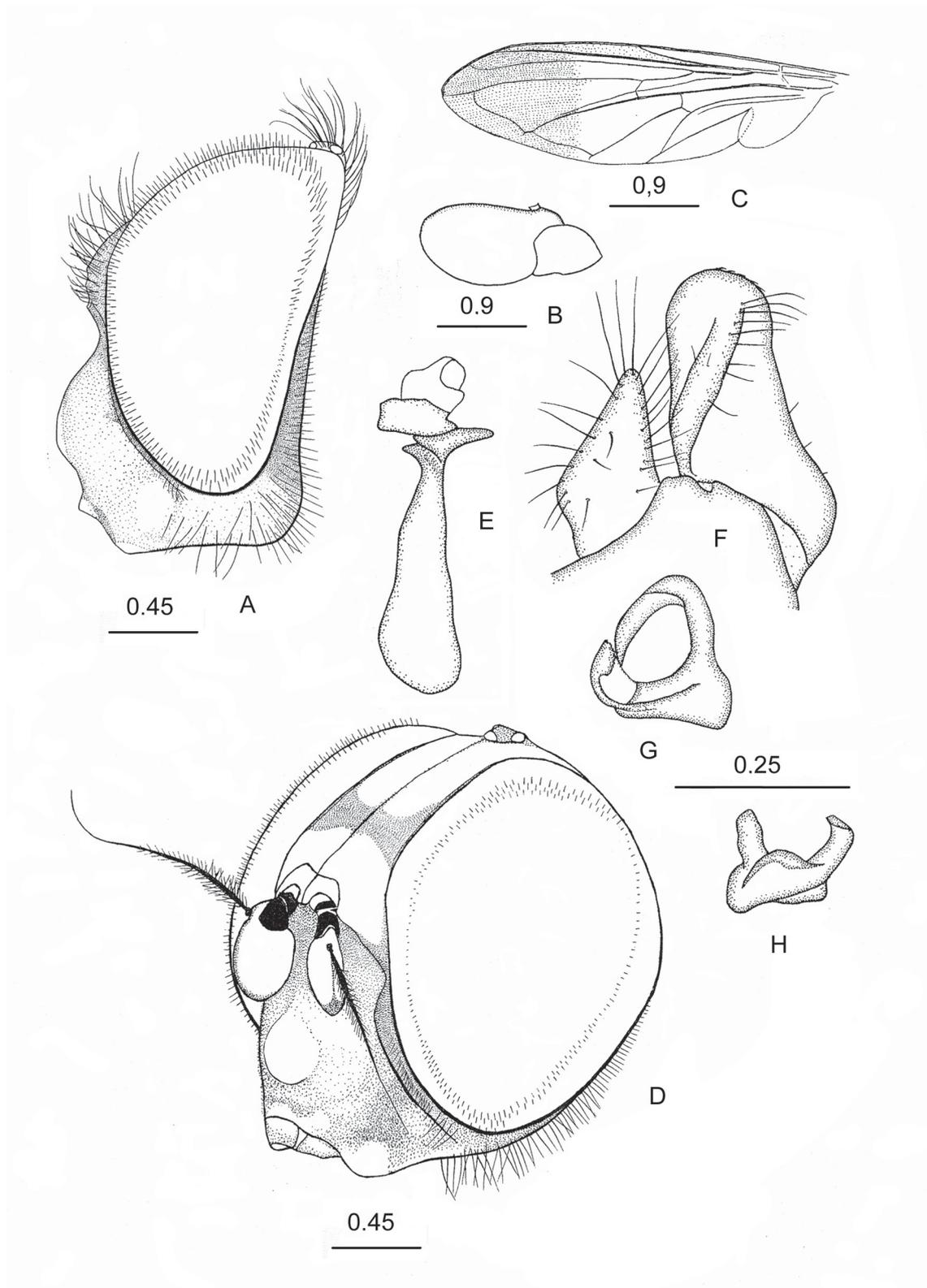


Fig. 37. *Cheilosia lucida* Barkalov & Cheng, 1998. **A.** Head of ♂, lateral view. **B.** Antenna of ♂, lateral view of pedicel and basoflagellomere. **C.** Wing. **D.** Head of ♀, anterior view. **E.** Aedeagus and aedeagal apodeme, lateral view. **F.** Surstylus and gonocercus, lateral view. **G–H.** Superior lobes of hypandrium, lateral view. After Barkalov & Cheng 2004. Scale bars indicated in drawings.

Barkalov & Cheng 2004: 395; Radenkovic *et al.* 2020). In addition, *Cheilosia lucida* has a characteristic lustrous green shine (reflection) of the thorax and strong black bristles on scutellum margin, characteristics not shared by other members of the subgenus *Convocheila*. Thus, the subgeneric classification of this species requires further study. From all species of *Cheilosia*, *C. lucida* differs by the combination of the mentioned characters.

Material examined

NEPAL • 1 ♂; Solukhumbu, above Nunthala; 27°35' N, 86°38' E; 2500–2300 m a.s.l.; 13 May 1997; M. Hauser leg. [517]; CSCA • 2 ♀♀; Bhojpur valley, NW of Phedi; 27°24' N, 86°57' E; 1900 m a.s.l.; 25 May 1997; M. Hauser leg.; CSCA • 1 ♂; Bhojpur, NW of Phedi; 27°24' N, 86°59' E; 1900–1500 m a.s.l.; 26 May 1997; M. Hauser leg. [537]; CSCA • 1 ♀; 27°58' N, 85°00' E; 11 400 ft a.s.l.; 31 May 1967; Can. Nepal Exped.; CNC • 1 ♀; Kathmandu, Pulchauki; 8000 [feet] a.s.l.; 27 Jul. 1967; Can. Nepal Exped.; CNC.

Distribution

China, Korea, Nepal.

Cheilosia maculata sp. nov.

urn:lsid:zoobank.org:act:8209AF68-052A-46CB-8501-F15B7143C151

Figs 39–40

Differential diagnosis

The new species belongs to the nominal subgenus (*Cheilosia* s. str.), where it is close to *Cheilosia* (*Cheilosia*) *albohirta* Hellén, 1930, from which it differs as follows: frons shiny, with stripes of grey pollinosity adjacent to eye, basoflagellomere orange, with dark antero-dorsal margin, pleura with some black pile and long black bristles. In *C. albohirta* the frons is densely grey pollinose, basoflagellomere black with reddish postero-ventral corner and pleura only whitish pilose.



Fig. 38. *Cheilosia lucida* Barkalov & Cheng, 1998, ♂ (CSCA); lateral view.

Etymology

The specific epithet is from the Latin ‘*macula*’ and means ‘spotted’, referring to the lateral greyish maculae of abdominal tergites.

Material examined

Holotype

NEPAL • ♂; Prov. Nr. 3, East Khumjung; 3800 m a.s.l.; 24 May 1964; W.D. Dierl leg.; ZSMC.

Paratypes

NEPAL • 1 ♂; Prov. Nr. 3, East Dingpoche; 4600 m a.s.l.; 3 May 1964; W.D. Dierl leg.; ZSMC • 1 ♂; Gosainkunde; 13 800 ft a.s.l.; 27 Jun. 1967; Can. Nepal. Exped.; CNC.

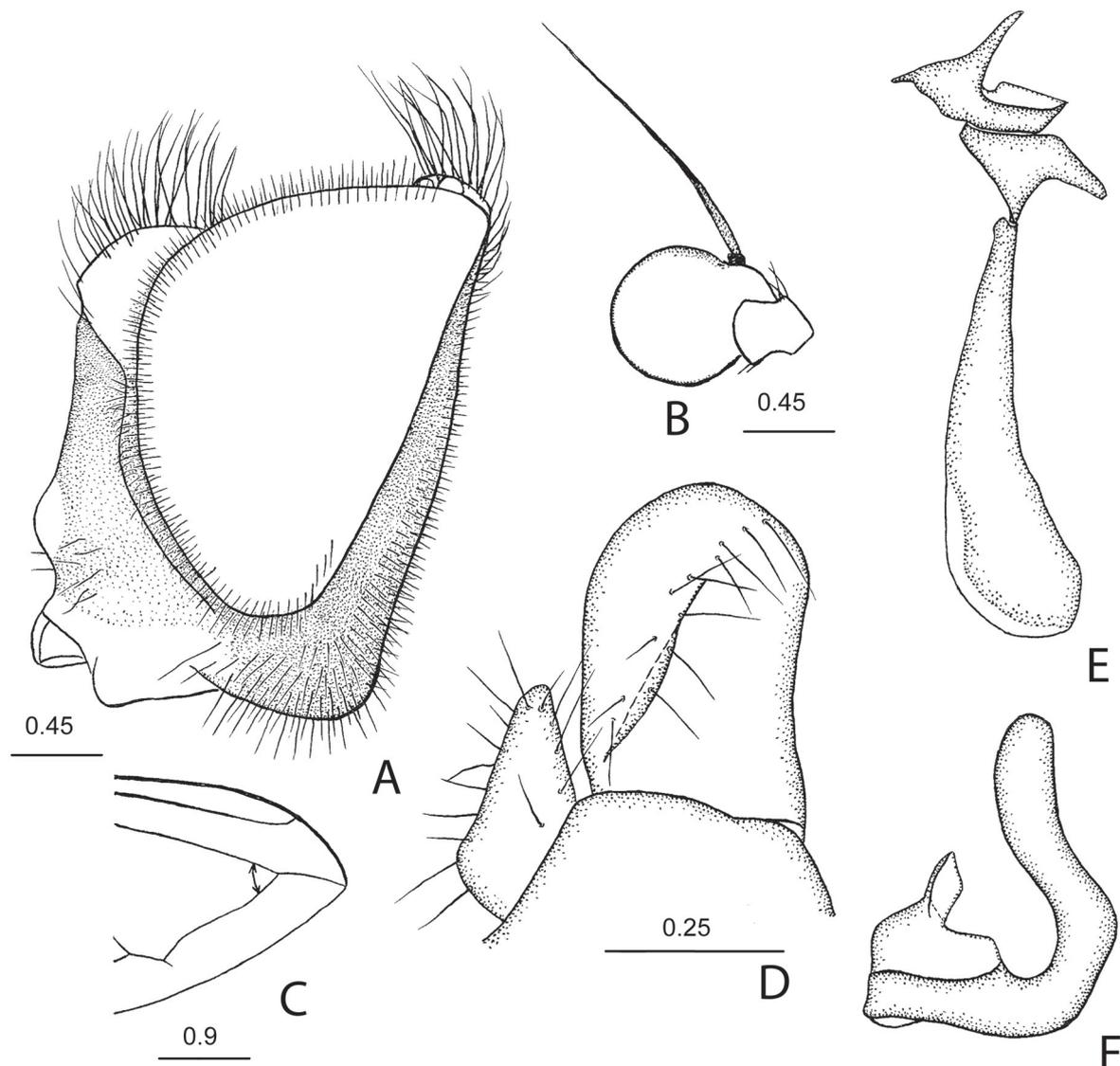


Fig. 39. *Cheilosia (Cheilosia) maculata* sp. nov., holotype, ♂ (ZSMC). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Tip of wing. **D.** Surstylus and gonocercus, lateral view. **E.** Aedeagus and aedeagal apodeme, lateral view. **F.** Superior lobe of hypandrium, lateral view. Scale bars indicated in drawings.

Description

Male

LENGTH. Body 8.5–8.6 mm, wing 7.4–7.8 mm.

HEAD. Face broad, in lateral view moderately protruded forwardly; blackish brown, black pilose and slightly grey pollinose except for facial tubercle and mouth margin; facial tubercle small; parafacia comparatively broad, clearly broader than half of the width of basoflagellomere, blackish brown, densely silvery pollinose and short white pilose; gena black or brown, comparatively broad, finely white pollinose, with moderately long white pilosity; lower part of occiput densely white pollinose and silvery white pilose. Frons convex, shiny, with stripes of grey pollinosity adjacent to eye, black pilose; frontal angle distinctly obtuse. Lunule yellow, antennal pits broadly separated. Antennae: scape and pedicel brown, basoflagellomere orange, with darker antero-dorsal margin, rounded to squarish; arista long, yellow, bare. Eye with dense, long, yellow pilosity; eye contiguity 1.3–1.5 times as long as length of frons without lunule. Vertex flat, covered with long black pilosity; ocellar triangle equilateral; dorsal part of occiput very narrow, blackish, pilosity long black and short yellow.

THORAX. Postpronotum black with brown posterior angle, grey pollinose and black pilose. Scutum and scutellum smooth, densely grey pollinose, medially with longitudinal stripes of brown pollinosity; scutum covered with comparatively long, black and yellow pilosity, postalar callus with long yellow and black pilosity and one stronger, long black bristle; pilosity on scutellum longer, on hind margin many long bristle-like pile, as long as or slightly longer than length of scutellum; subscutellar fringe long, yellow. Pleurae densely grey pollinose; anepisternum with mixed black and yellow pilosity, posteriorly mainly black pilose and with one or few stronger black bristles; anepimeron with mixed yellow and black pilosity, pile is apically wavy; katepisternum white pilose with dorsal and ventral pile patches well separated; metasternum white pilose.

LEGS. Coxae brown, white pollinose and white pilose, metacoxa posteriorly also with a few black pile, fore coxa without baso-lateral spur; femora black with yellow extreme tips, fore femur posteriorly with long black pilosity, basally with some white pilosity; mid femur posteriorly with long white pilosity in

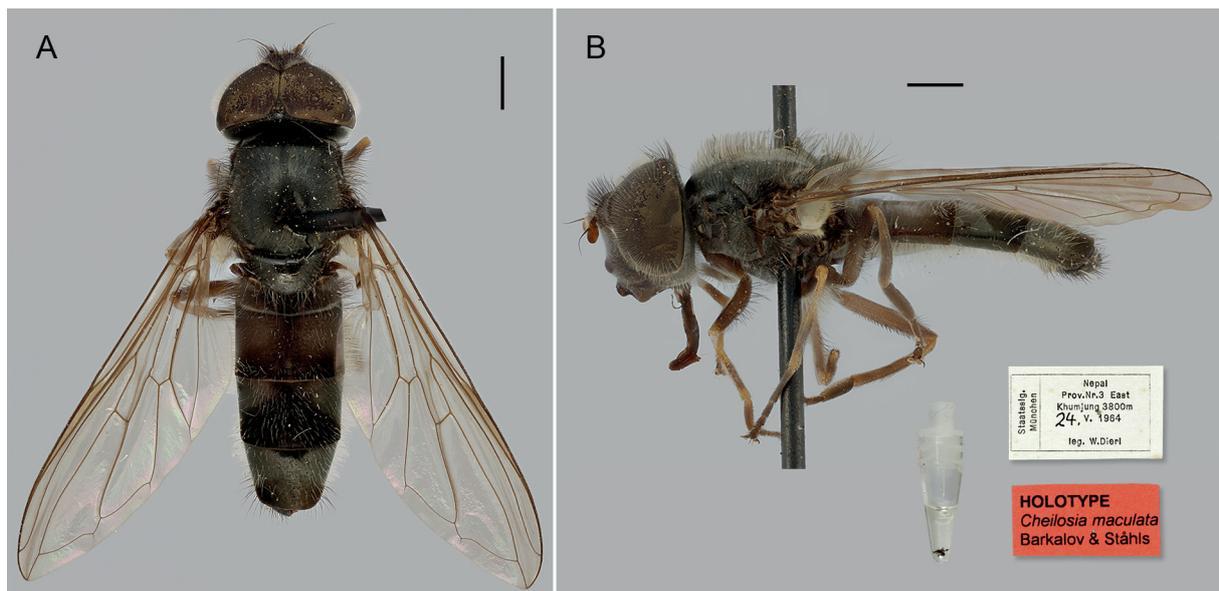


Fig. 40. *Cheilosia (Cheilosia) maculata* sp. nov., holotype, ♂ (ZSMC); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

basal $\frac{2}{5}$ and black pilosity otherwise; metafemur with long white antero-ventral pilosity and with a tuft of long, black pilosity antero-dorsally. Tibiae yellow with broad brown annulus medially; tarsi dorsally brown and ventrally yellow.

WING. Narrow, pale-brown, veins darker, completely microtrichose; inner angle of M_1 and R_{4+5} acute, R_s non-pilose. Haltere yellow with black knob; calypter white, with white fringe.

ABDOMEN. Black, narrow, in broadest part narrower than scutum at level of wing base, pollinose; tergites I–IV brownish with shiny macula with bronze tinge antero-laterally; tergites white pilose, long erect on sides of tergites and appressed medially; lateral margins of tergite I and tergite IV laterally and posteriorly with erect black pilosity. Sternites with grey pollinosity and white pilose. Pre-genital segments black pilose.

Note: The paratypes differ slightly from the holotype as follows: frons completely covered with fine grey pollinosity; gena and lower part of occiput brownish; scutum without brownish pollinosity in posterior half. In one paratype fore coxa yellowish.

Female

Unknown.

Distribution

Nepal.

Cheilosia minuscula sp. nov.

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Figs 41–42

Differential diagnosis

Cheilosia (Montanocheila) minuscula sp. nov. has a similar structure of the male genitalia as the other members of the subgenus *Montanocheila*, but differs strikingly in its small size and narrow body. From all members of the genus *C. minuscula* sp. nov. differs by following characters: small size, eye pilose, face non-pilose, antennal pits separated, scutellum without bristles, male genitalia with gonopod (superior lobes) lacking a left process and with a well-developed right process. *Cheilosia minuscula* sp. nov. is here tentatively placed in the subgenus *Montanocheila*.

Etymology

The specific epithet is from the Latin ‘*minuscula*’ meaning ‘small’, and refers to the small size of the species.

Material examined

Holotype

NEPAL • ♀; Solukhumbu Junbesi to Ringmo; 27°34' N, 86°35' E; 2700–3000 m a.s.l.; 12 May [19]97; Hauser leg. [515]; CSCA.

Paratypes

NEPAL • 1 ♂ (specimen broken, head, abdomen and legs glued onto locality label); same data as for holotype; CSCA • 1 ♀; Solukhumbu, Sanam; 27°27' N, 86°53' E; 2700–2800 m a.s.l.; 23 May 1997; Hauser leg. [532]; CSCA.

Description

Male

LENGTH. Body 5.2 mm, wing 4.5 mm.

HEAD. Face very broad, slightly widened ventrally, shiny black with slight grey pollinosity laterally and also with patches of microtrichia/pollinosity, no distinct pilosity, facial tubercle small and narrow; parafacia broad, approximately equal to width of basoflagellomere, brownish black, shiny, with white pilosity of moderate length; gena moderately broad, shiny, with few white pilosity. Frons slightly inflated, very broad, densely grey pollinose and black pilose, frontal angle distinctly obtuse ($>90^\circ$); lunule yellow,

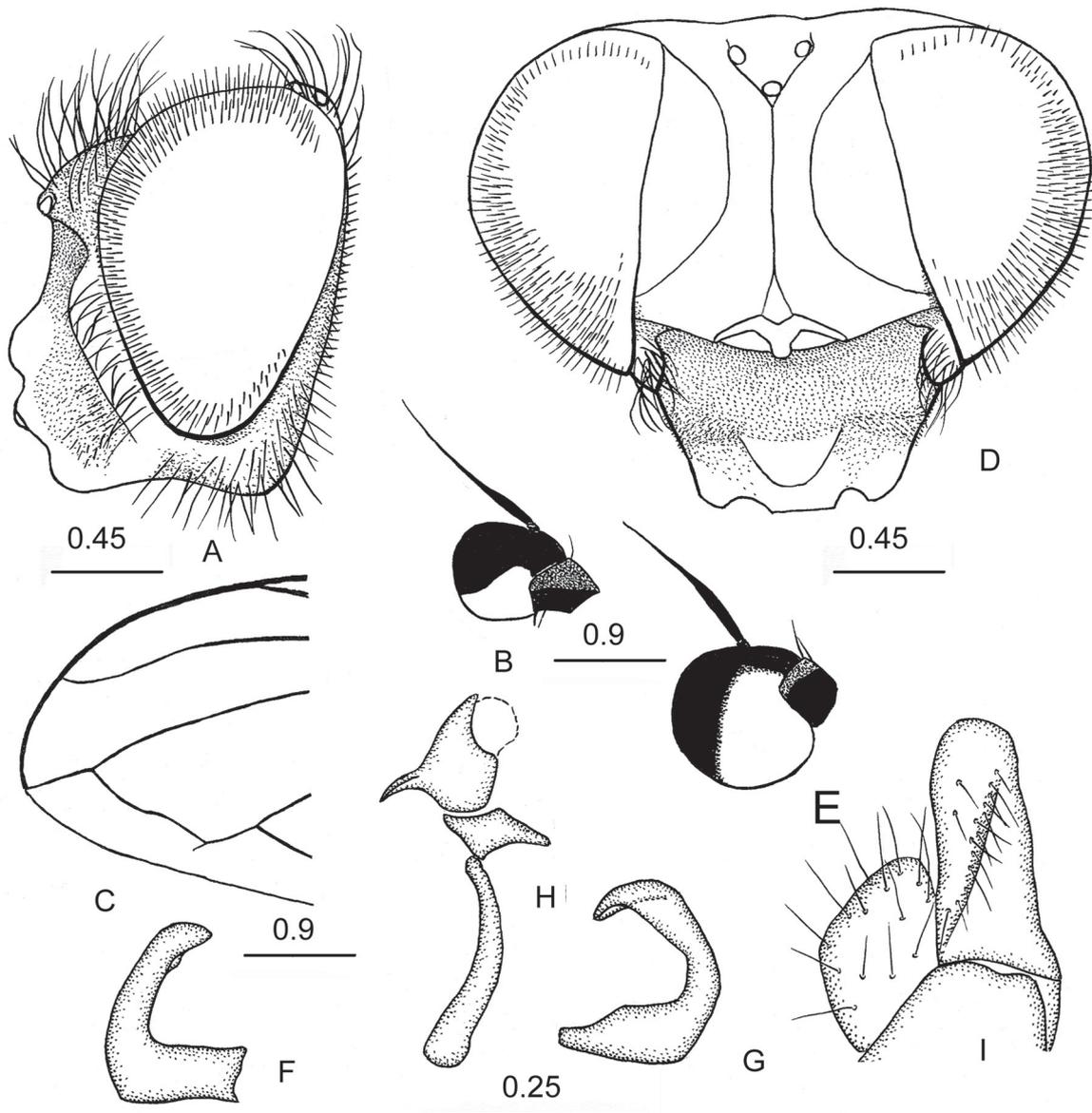


Fig. 41. *Cheilosia (Montanocheila) minuscula* sp. nov.; A–C, F–I = holotype, ♀ (CSCA), D–E = paratype, ♂ (CSCA). A. Head, lateral view. B, E. Antenna, lateral view of pedicel and basoflagellomere. C. Tip of wing. D. Head, dorsal view. F–G. Superior lobes of hypandrium, lateral view. H. Aedeagus and aedeagal apodeme, lateral view. I. Surstylus and gonocercus, lateral view. Scale bars indicated in drawings.

antennal pits separated. Antenna: scape black, pedicel brown, basoflagellomere black in antero-dorsal part and orange in postero-ventral part, rounded; arista short, black, almost bare. Eye entirely with long, dense, white pilosity, eye contiguity almost equal to length of frons without lunule. Vertex slightly inflated, covered with black pilosity, ocellar triangle obtuse. Occiput with black pilosity.

THORAX. Postpronotum black, finely pollinose and short white pilose. Scutum and scutellum black, smooth, very fine-punctured, shiny black with bluish reflection, with white and black pilosity, black

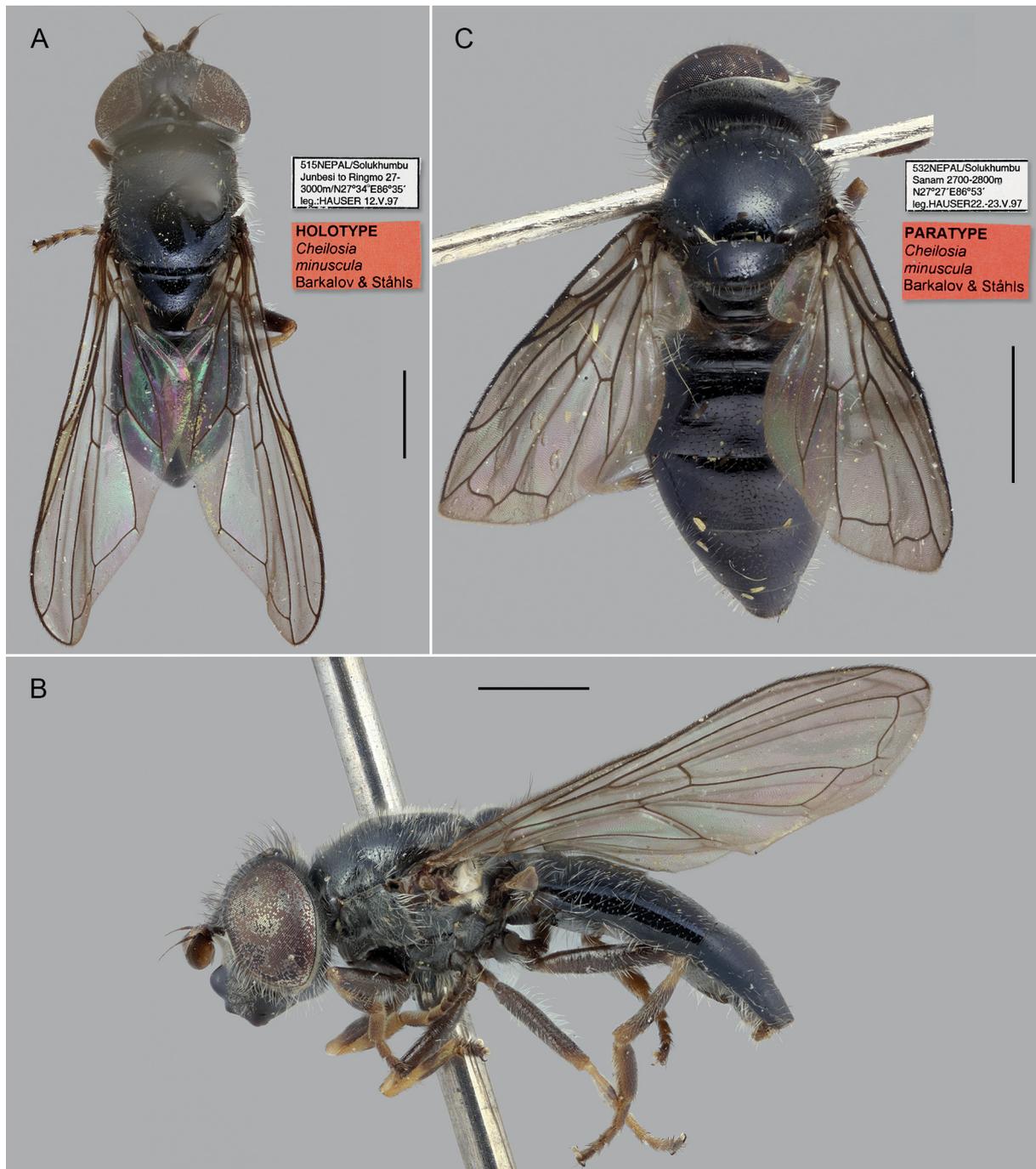


Fig. 42. *Cheilosia (Montanocheila) minuscula* sp. nov. **A–B.** Holotype, ♀ (CSCA); dorsal and lateral views. **C.** Paratype ♀ (CSCA); dorsal view. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

pile longer, especially on hind part of scutum and scutellum; postalar callus with some black pilosity; scutellum hind margin with some long, bristle-like black pilosity. Subscutellar fringe with not very dense white pilosity. Pleura black, with comparatively dense, grey pollinosity; posterior part of anepisternum with non-pollinose shiny patch, with whitish pilosity, postero-dorsal part of anepisternum with some black pilosity, dorsal and ventral white hair patches on katepisternum connected medially. Metasternum white pilose.

LEGS. Fore coxa without lateral spur, brown with grey pollinosity and white pilosity; femora dark-brown to blackish with yellow tips, long pilosity on posterior side of fore and mid femora white, with some black pilosity near tips, antero-ventral surface of hind femur without long pilosity; tibiae yellow with narrow black annulus, hind tibia with broader blackish annulus; tarsi yellow ventrally, dorsally fore and hind tarsi black, mid tarsi with segments 1–3 yellow, segment 4 brown and segment 5 black.

WING. Translucent, entirely microtrichose, Rs with 1–2 yellow, short pile; inner angle between veins M_1 and R_{4+5} right. Haltere yellow, with unusually big, black knob; calypter white, with yellow rim and white fringe.

ABDOMEN. Narrow, in broadest part approximately as broad as scutum at level of wing base, brownish black with some brown pollinosity, laterally and most of tergite IV shiny, white pilose, pilosity long, erect laterally and short, appressed medially. Sternites brown, shiny, sternite I with grey pollinosity, with long, white pilosity on sternites I–II and laterally on sternites III–IV, and with semi-erect, black pilosity medially on sternites III–IV which is shorter medially and longer on posterior margins. Genitalia as in Fig. 41F–I.

Female

LENGTH. Body 4.6–5.1 mm, wing 4.3–4.6 mm.

HEAD. Parafacia broad, approximately equal to half of basoflagellomere width, brown, paler ventrally, with long, pale-yellow pilosity. Frons broad, slightly broadened anteriorly, shiny black with two distinct lateral furrows and rather indistinct medial furrow, covered with short black and white pilosity. Basoflagellomere bigger than in male, of same shape and colour.

THORAX. Scutum and scutellum with short, erect white pilosity, and with ca 2× longer black pilosity in the posterior half, postalar callus with short, black bristles; scutellum hind margin with two longer black bristles in addition to some short bristles. Pleura with only white pilosity.

ABDOMEN. Non-pollinose, shiny. Other characters as in male.

Distribution

Nepal.

Cheilosia nepalensis sp. nov.

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Figs 43–44

Differential diagnosis

Cheilosia (*Taeniochilosia*) *nepalensis* sp. nov. shares the structure of the genitalia of males, especially that of the gonopods (superior lobes of the hypandrium), with the other members of the subgenus *Taeniochilosia*, but is the only species with entirely pilose eyes. In one additional taxon, *C. aff. faucis* from Bulgaria, the females have eye with very short and scattered pilosity. From all other species it differs by the following combination of characters: eye pilose, antennal pits confluent or nearly so, and legs black.

Etymology

The specific epithet is from the Latin, and refers to the country of Nepal.

Material examined

Holotype

NEPAL • ♂; 27°58' N, 85°00' E; 11 100 ft a.s.l.; 26 May 1967; Can. Nepal Exped.; CNC.

Paratypes

NEPAL • 2 ♂♂; same data as for holotype; CNC • 4 ♂♂; 20°00' N, 84°59' E; 12 000–13 000 ft a.s.l.; 20 Jun. 1967; Can. Nepal Exped.; CNC • 4 ♂♂, 1 ♀; 27°58' N, 85°00' E; 11 100 ft a.s.l.; 18 Jun. 1967; Can. Nepal Exped.; CNC • 1 ♀; 27°58' N, 85°00' E; 11 100 ft a.s.l.; 20 Jun. 1967; Can. Nepal Exped.; CNC.

Description

Male

LENGTH. Body 5.7–8.2 mm, wing 6.0–8.5 mm.

HEAD. Face rather broad, in anterior view ventrally moderately widened, black, almost completely densely grey pollinose except on tip of facial tubercle and partly near lower mouth margin; facial tubercle distinct, laterally compressed and narrow; parafacia very broad, approximately equal to basoflagellomere width, densely grey pollinose, with dense, short, semi-erect, white pilosity; gena wide, densely grey pollinose and long, dense, yellow pilose, a yellowish spot ventral to eye. Frons slightly inflated, densely grey pollinose and black pilose, frontal angle slightly $>90^\circ$; lunule black, antennal pits distinctly confluent. Antenna black; scapus and pedicel with grey pollinosity; basoflagellomere quadrate to subquadrate in shape, densely grey pollinose; arista very long, black, shiny, with short pilosity. Eye entirely, densely, yellow pilose; eye contiguity slightly shorter than length of frons without lunule. Vertex inflated, black, with grey pollinosity and long, black pilosity; ocellar triangle isosceles. Occiput posteriorly with black pilosity, anteriorly with yellow pilosity.

THORAX. Postpronotum black, densely grey pollinose and short, yellow pilose. Scutum fine-punctured, black with grey pollinosity and five longitudinal stripes of dense brown pollinosity, anteriorly and posteriorly (near scutellum) yellow pilose, otherwise black pilose, laterally with some moderately strong black bristles; scutellum brownish-grey pollinose and short yellow and long black pilose; scutellum margin with 2–3 long, fine black bristles. Subscutellar fringe long, yellow. Pleura densely grey pollinose and moderately long, scattered yellow pilose; postero-dorsal corner of anepisternum with some black, bristle-like pilosity; dorsal and ventral pile patches of katapisternum broadly separated, metasternum with yellow pilosity.

LEGS. Fore coxa without lateral spur, black with yellowish tip, densely grey pollinose and short yellow pilose; femora black with yellow tips, fore femur slightly inflated, pilosity on fore and mid femur comparatively short, yellow, hind femur without antero-ventral pilosity; tibia orange-yellow with black rings on apical half; tarsi dull, black, or segments 1–2 of mid tarsus yellowish.

WING. Distinctly brownish with black veins, completely covered with microtrichia. Vein Rs dorsally with some short, black pilosity; inner angle between veins M_1 and R_{4+5} acute. Haltere brown with black knob; calypter yellow with brown rim and yellow pilosity.

ABDOMEN. Elongate, oval, in broadest part narrower than mesonotum at level of wing base, black with bluish reflection and fine grey pollinosity, mainly yellow pilose, pilosity longer laterally, and with some black, appressed pilosity on hind margin of tergites III–IV. Sternites densely grey pollinose, with long and short yellow pilosity, some black pilosity postero-laterally on sternite IV. Pre-genital segments black pilose.

Female

LENGTH. Body 7.6–8.0 mm, wing 7.5–8.1 mm.

HEAD. Parafacia broader than in male, and gena very broad. Frons moderate in width, distinctly broadened anteriorly, with three longitudinal furrows, covered with dense greyish-brown pollinosity and short, semi-erect yellow and longer erect black pilosity.

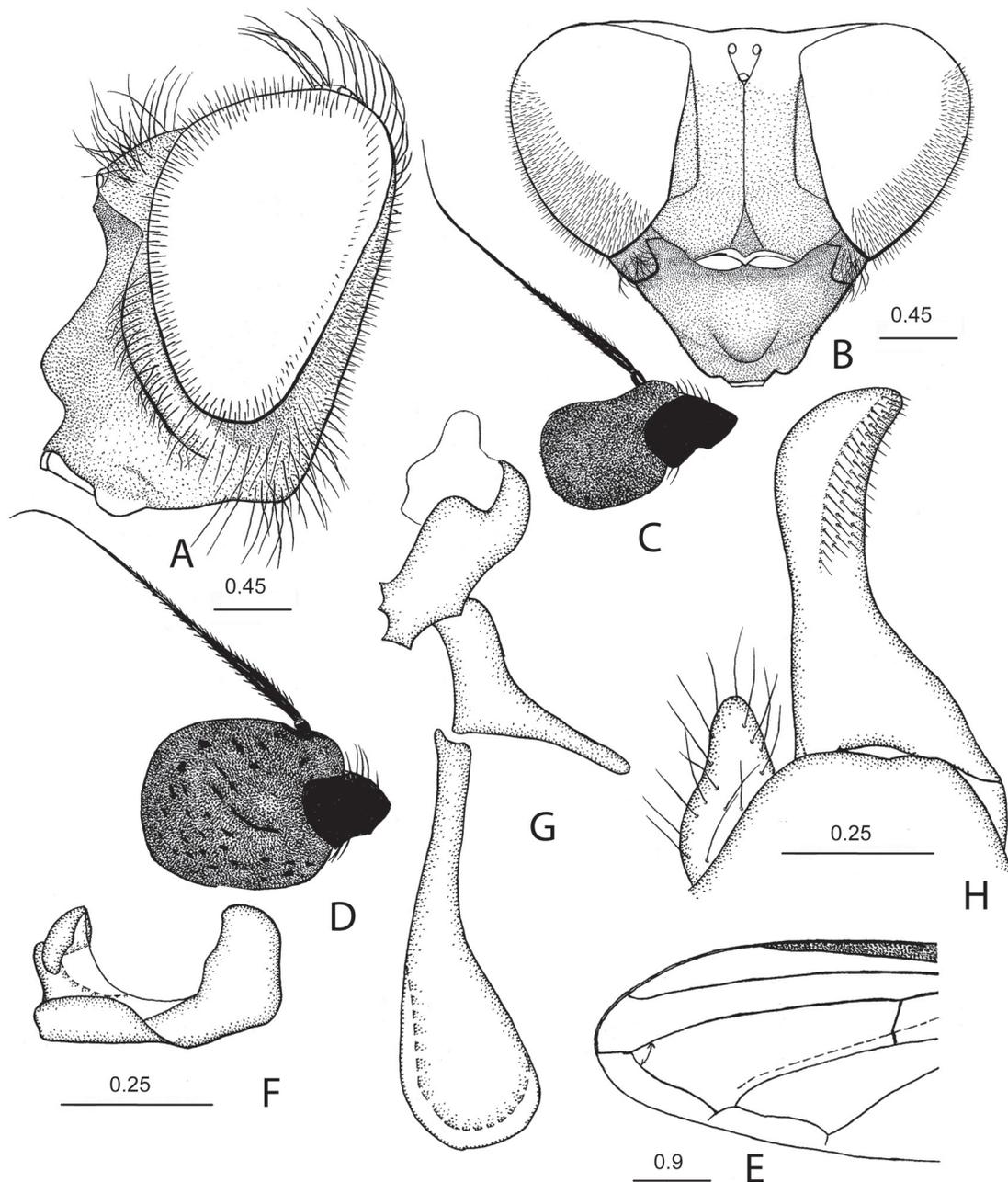


Fig. 43. *Cheilosia (Taeniochilosia) nepalensis* sp. nov.; A, C, E–H = holotype, ♂ (CNC), B, D = paratype, ♀ (CNC). A. Head, lateral view. B. Head, dorsal view. C–D. Antenna, lateral view of pedicel and basoflagellomere. E. Tip of wing. F. Superior lobes of hypandrium, lateral view. G. Aedeagus and aedeagal apodeme, lateral view. H. Surstylus and gonocercus, lateral view. Scale bars indicated in drawings.

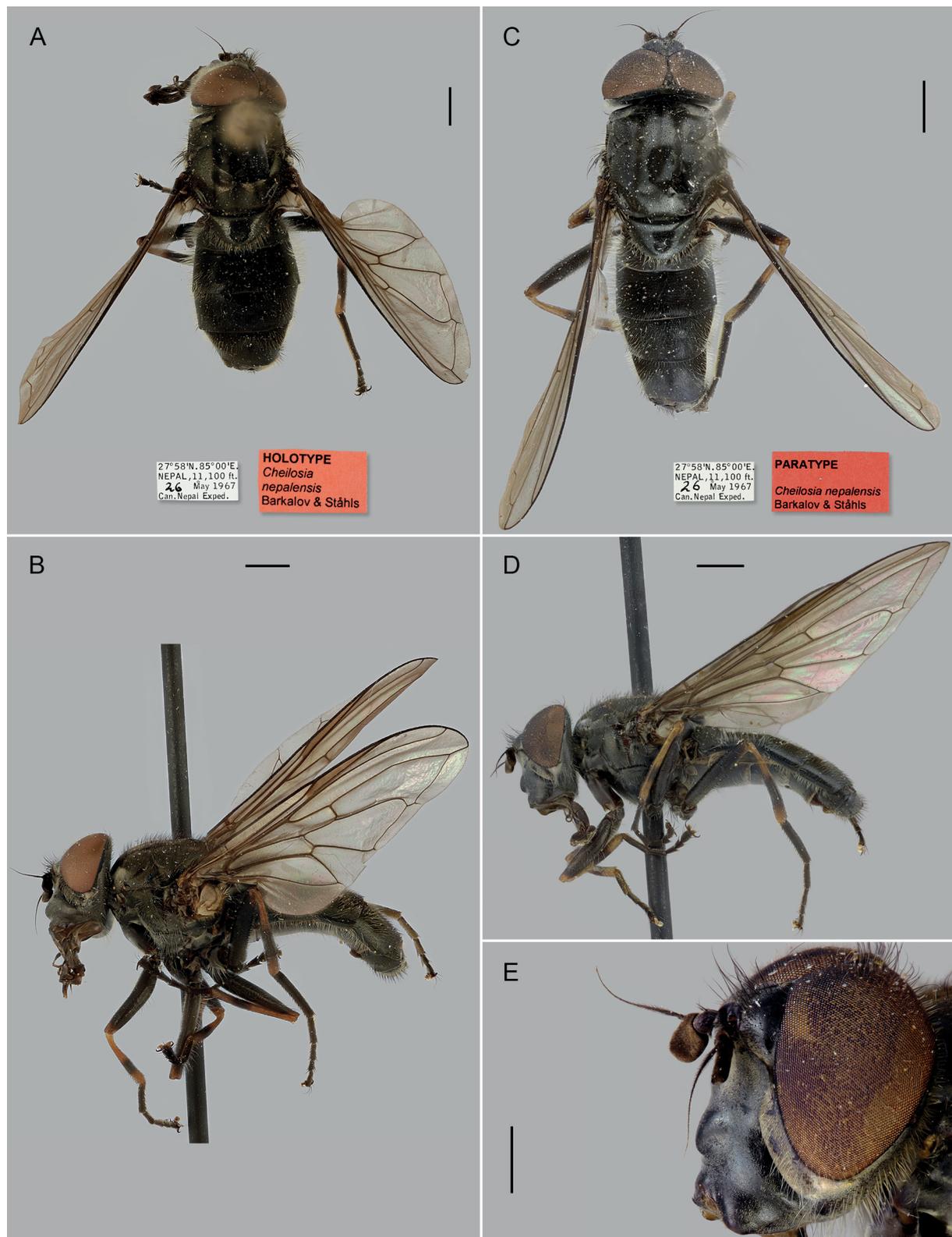


Fig. 44. *Cheilosia (Taeniochilosia) nepalensis* sp. nov. A–B. Holotype, ♂ (CNC); dorsal and lateral views. C–D. Paratype ♂ (CNC), dorsal and lateral views. E. Holotype, head. Photo: Pekka Malinen, FMNH Luomus. Scale bars: A–D = 1 mm; E = 0.5 mm.

THORAX. Scutum with pollinosity as in male, with short semi-erect yellow and black pilosity and some long, erect black pilosity on posterior $\frac{1}{3}$; laterally with strong, long black bristles, scutellum with semi-erect short, yellow pilosity, hind margin with 2–4 strong, long black bristles.

LEGS. Paler in colour than in male, fore and mid tibia yellow with brownish tinge, mid basitarsus yellowish, tarsomeres 1–3 of hind tarsus with yellowish tip.

ABDOMEN. Oval, in broadest part approximately equal to or slightly broader than mesonotum at level of wing base, densely grey pollinose, pilosity yellow and black, laterally longer and medially shorter. Otherwise as the male.

Distribution

Nepal.

Cheilosia nigella sp. nov.

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Figs 45, 46A–B

Differential diagnosis

Cheilosia (Montanocheila) nigella sp. nov. shares the characters like dense, long pilosity of body, big size, broad body and structure of male genitalia with the other members of the subgenus. Among the Nepalese taxa *C. (M.) nigella* sp. nov. is most similar to *C. (M.) brevimontana* sp. nov., but differs by having mostly yellow pilosity of scutellum (vs black in *C. brevimontana* sp. nov.), mostly orange pilosity of abdomen (vs mainly yellowish in *C. brevimontana* sp. nov.) and brownish basal parts of tibiae (vs black in *C. brevimontana* sp. nov.).

Etymology

The specific epithet is from the Latin ‘*nigellus*’ and is the diminutive form of ‘*niger*’, meaning ‘blackish’.

Material examined

Holotype

NEPAL • ♂; Distr. Humla, 14 km W of Simikot 3 km NW of Sankha La; 29°57'18" N, 81°39'30" E; 4300 m a.s.l.; 29–30 Jun. 2001; F. Creutzburg leg.; “[Kante Tragant]”; NME.

Description

Male

LENGTH. Body 13.5 mm, wing 12.5 mm.

HEAD. Face rather broad, convex, in anterior view ventrally slightly broadened, black, almost completely covered with dense grey pollinosity except tip of facial tubercle and lower part near mouth margin only slightly pollinose or bare, pollinosity dense in dorsal part of face; non-pilose (but with some distinct microtrichia latero-medially); facial tubercle small, not prominent; parafacia relatively broad, clearly broader than $\frac{1}{2}$ width of basoflagellomere, grey pollinose along eye and shiny towards face, long yellow pilose in dorsal $\frac{1}{3}$ and otherwise with very long black pilosity. Gena broad, densely grey pollinose and comparatively short black pilose. Frons broad and convex, finely grey pollinose and long black pilose; frontal angle obtuse; lunule black; antennal pits broadly separated. Antenna black; basoflagellomere grey pollinose, rounded, ventral margin obscurely brownish-red; arista narrow, long, black, bare. Eye completely densely black pilose; eye contiguity about equal to length of frons without lunule; narrow

orange spot ventral to eye. Vertex black, grey pollinose and long, black pilose; ocellar triangle isosceles. Occiput laterally black pilose, medially yellow pilose.

THORAX. Postpronotum black, black pilose. Scutum black, very finely punctured, black pilose; slightly pollinose; with four longitudinal vittae of grey pollinosity, lateral vittae extend from anterior part of scutum almost to postalar calli, medial vittae extend from anterior margin to $\frac{2}{3}$ of scutum; mainly long yellow pilose, mixed with scattered black pilosity, mainly black pilose on lateral parts; postalar calli long yellow pilose; scutellum long yellow pilose and with some fine black shorter pile medially; scutellum margin lacking black bristles, length of yellow pilosity up to length of scutellum. Subscutellar

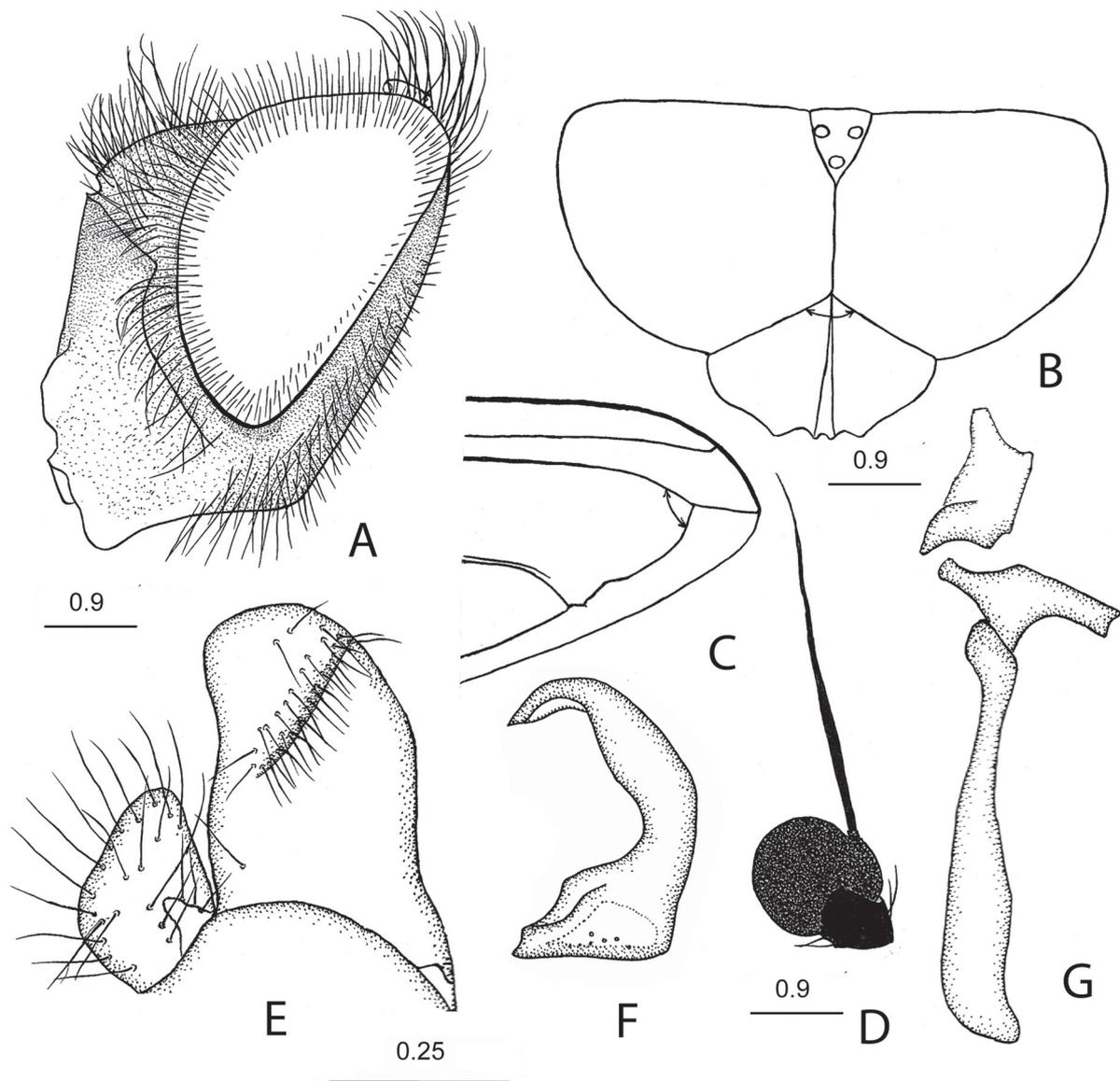


Fig. 45. *Cheilosia (Montanocheila) nigella* sp. nov., holotype, ♂ (NME). **A.** Head, lateral view. **B.** Same, dorsal view. **C.** Tip of wing. **D.** Antenna, lateral view of pedicel and basoflagellomere. **E.** Surstylus and gonocercus, lateral view. **F.** Superior lobe of hypandrium, lateral view. **G.** Aedeagus and aedeagal apodeme, lateral view. Scale bars indicated in drawings.

fringe long, dense, yellow. Pleura slightly shiny but grey pollinose, with long black pilosity; anterior anepisternum non-pilose, posterior anepisternum without strong bristles; katepisternum completely black pilose. Metasternum black pilose.

LEGS. Coxa black; fore coxa grey pollinose, fore coxa without baso-lateral spur; femora black with narrowly yellow tips, long, black pilose; tibia brownish on basal $\frac{1}{2}$ – $\frac{1}{3}$ and narrowly on tips, black in other parts; tarsi dorsally black.

WING. Completely covered with microtrichia, slight brownish, veins yellow in basal $\frac{1}{3}$ and black in apical $\frac{2}{3}$; vein Rs with a few black pile; M_1 meeting R_{4+5} in an obtuse angle. Calypter pale-brown with yellow fringe; haltere dark-brown to black.

ABDOMEN. Comparatively narrow, narrower than mesonotum at level of wing base, black, finely punctured, grey pollinose, with dense, long, erect pilosity; tergites I–II with black pilosity medially, laterally with

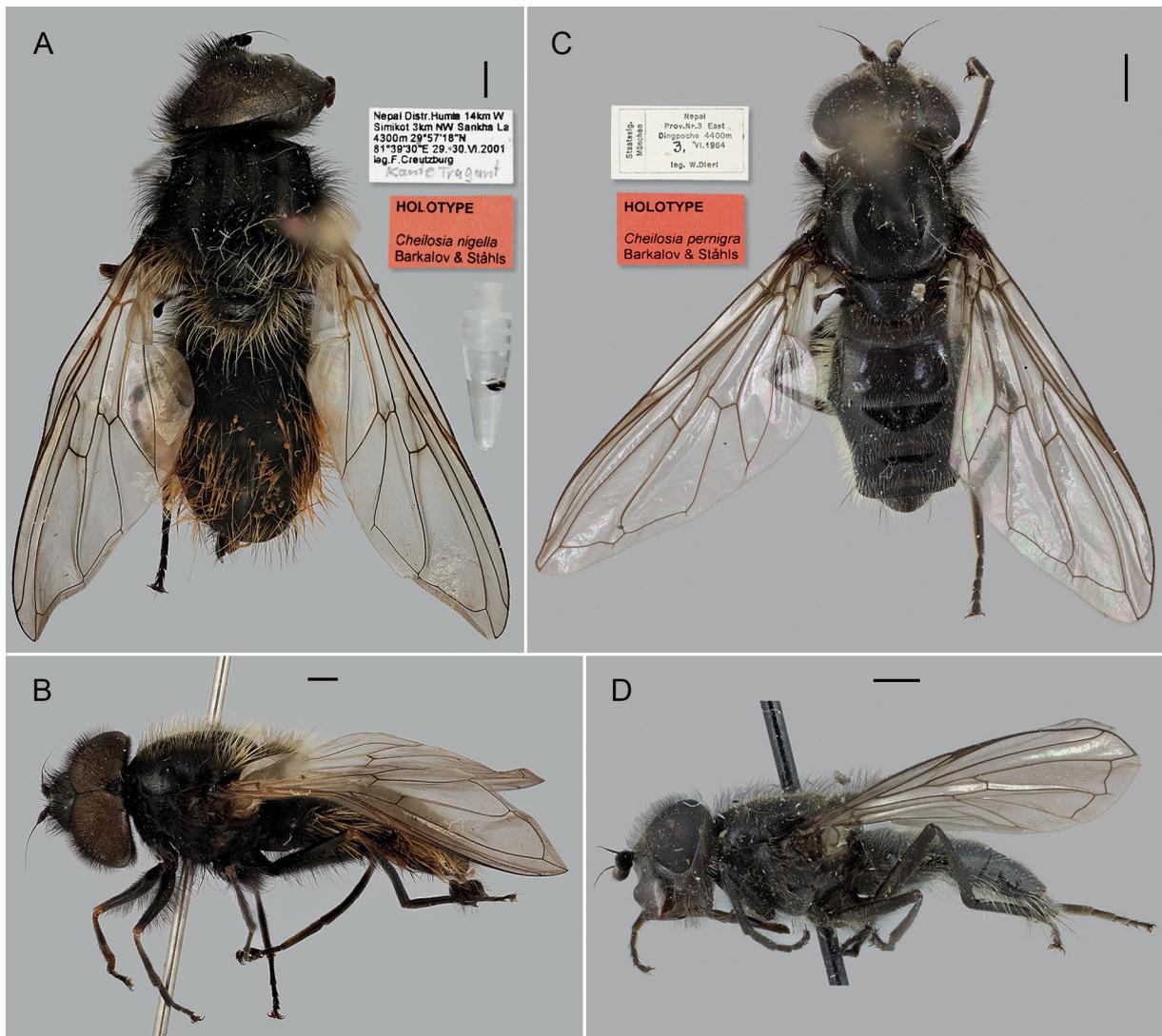


Fig. 46. A–B. *Cheilosia* (*Montanocheila*) *nigella* sp. nov., holotype, ♂ (NME); dorsal and lateral views. – C–D. *Cheilosia* (*Montanocheila*) *pernigra* sp. nov., holotype ♀ (ZSMC); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

yellow pilosity, posterior parts of tergite II with some orange pile; tergites III–IV foxy-orange pilose; all tergites also with long black pilosity along lateral margins. Sternites grey pollinose, long black pilose, sternites III and IV with short, adpressed black pilosity postero-medially. Pre-genital segments black pilose. Gonopod of male genitalia lacks the left process and with a long, bent right process.

Female

Unknown.

Distribution

Nepal.

***Cheilosia pernigra* sp. nov.**

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Figs 46C–D, 47

Differential diagnosis

Cheilosia (Montanocheila) pernigra sp. nov. is most similar to *C. (M.) brevimontana*. It differs by having yellowish pilosity on tarsi, hind femur, ventral part of anepisternum and katepisternum, while *C. (M.) brevimontana* sp. nov. has only black pilosity on legs and pleura.

Etymology

The specific epithet is from the Latin ‘*per-niger*’, meaning ‘completely black’ and refers to the colour of the species.

Material examined

Holotype

NEPAL • ♀; Prov. Nr. 3, East Dingpoche; 4400 m a.s.l.; 3 Jun. 1964; W. Dierl leg.; ZSMC.

Description

Female

LENGTH. Body 8.5 mm, wing 7.7 mm.

HEAD. Face broad, distinctly broadened ventrally, shiny brown with dense, grey pollinosity ventral to antennal base and slight pollinosity laterally, non-pilose; facial tubercle small and rather narrow. Parafacia broad, broader than $\frac{1}{2}$ basoflagellomere width, shiny black with fine grey pollinosity in ventral half, with moderately long, fine, black and yellow pilosity; gena broad, dorsally with fine grey pollinosity, long yellowish and black pilose. Frons moderately broad, almost parallel sided in posterior $\frac{2}{3}$ and distinctly broadened in anterior $\frac{1}{3}$, with three distinct furrows; brownish medially and black laterally; with moderately long black and yellow pilosity; lunule brownish, posterior margin darker, antennal pits broadly separated. Antenna black, scape and pedicel shiny, basoflagellomere comparatively oval, with brownish postero-ventral part, densely grey pollinose; arista moderately long, shiny, black, bare. Eye entirely with dense, long, brownish pilosity, paler in ventral half. Vertex moderately inflated, grey dusted with long, black and some shorter yellow pilosity, ocellar triangle isosceles. Occiput posteriorly covered with black and yellow pilosity.

THORAX. Postpronotum black, shiny anteriorly and pollinose posteriorly, with black and yellow pilosity. Scutum fine-punctured, shiny black with bluish reflection, with two stripes of grey pollinosity medially, with short, semi-erect yellow and $4\times$ longer black erect pilosity, no lateral black bristles on scutum. Scutellum with fine brownish pollinosity, with short yellow and long black pilosity, hind margin with

long, black pilosity, lacking distinct bristles. Subscutellar fringe long, yellow. Pleura black, with brownish pollinosity and long yellow and black pilosity, dorsal and ventral pile patches on katepisternum separated posteriorly, metasternum with some yellow pilosity.

LEGS. Mainly black, only knees slightly brownish; fore coxa without baso-lateral spur; fore and mid femur posteriorly with long, black pilosity, antero-ventrally black pilosity mixed with a few yellow pile.

WING. Translucent with brownish veins; entirely microtrichose; Rs with a few brownish, short pile; vein M_1 meeting R_{4+5} in an acute angle. Haltere brownish, knob black. Calypter grey, with brown rim and fringe of white pilosity.

ABDOMEN. Narrow, in broadest part equal in width to scutum at level of wing base; shiny, black; medially with brownish pollinosity; yellow pilose, pilosity long, erect laterally and short semi-erect or appressed

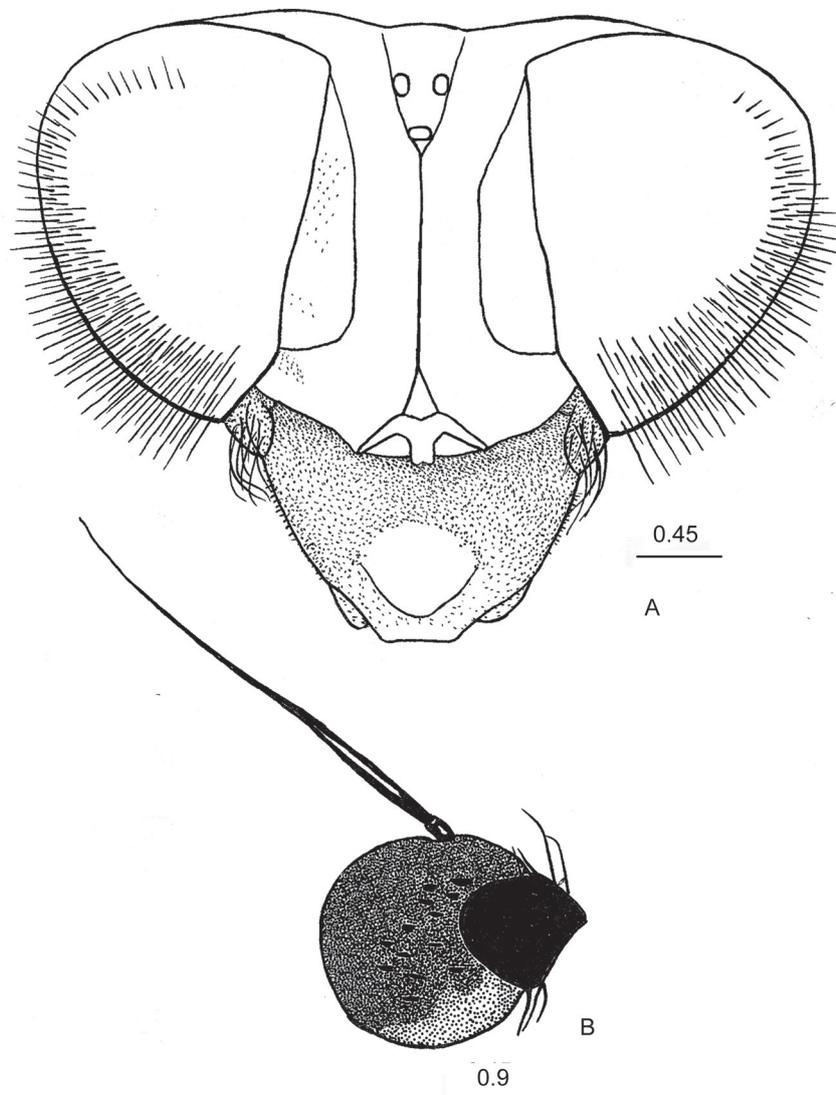


Fig. 47. *Cheilosia (Montanocheila) pernigra* sp. nov., holotype, ♀ (ZSMC). **A.** Head, dorsal view. **B.** Pedicel, basoflagellomere and arista, lateral view. Scale bars indicated in drawings.

pilosity medially; postero-lateral corners of tergites IV–V with a few long black pile. Sternites black, finely brown pollinose; pilosity yellow, mixed long erect and short semi-appressed; hind margins of sternites IV–V also with black semi-appressed pilosity.

Male

Unknown.

Distribution

Nepal.

Cheilosia pica sp. nov.

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Figs 48–49

Differential diagnosis

The species is a member of the nominotypical subgenus where it is close to the group of species near *C. (C.) albohirta*. In this group *C. (C.) pica* sp. nov. is close to *C. (C.) difficilis*, but differs by having femora anteriorly yellow in apical $\frac{1}{3}$ – $\frac{1}{2}$, and posteriorly black in basal $\frac{3}{4}$ (in *C. difficilis* femora are black, with only tips narrowly yellow), and completely different shapes of the hypandrial gonopods (superior lobes) of male terminalia.

Etymology

The specific epithet is from the Latin '*piceus*', meaning 'pitchblack'.

Material examined

Holotype

NEPAL • ♂; Solukhumba, E of Pangkongma La; 27°34' N, 86°45' E; 3000 m a.s.l.; 17 May 1997; M. Hauser leg. [523]; CSCA.

Paratypes

NEPAL • 9 ♀♀; same data as for holotype; CSCA • 1 ♀; Solukhumbu, Sanam; 27°27' N, 86°53' E; 2700–2800 m a.s.l.; 23 May 1997; M. Hauser leg. [532]; CSCA • 2 ♀♀; 28°00' N, 85°00' E; 9900 ft a.s.l.; 20 May 1967; Can. Nepal Exped.; Malaise trap 7; CNC • 1 ♂, 6 ♀♀; 28°00' N, 85°00' E; 11 400 ft a.s.l.; 21 May 1967; Can. Nepal Exped.; Malaise trap 3; CNC • 1 ♀; 27°58' N, 85°00' E; 11 100 ft a.s.l.; 25 May 1967; Can. Nepal Exped.; CNC • 1 ♂, 1 ♀; 27°58' N, 85°00' E; 10 500–11 100 ft a.s.l.; 26 May 1967; Can. Nepal Exped.; CNC • 1 ♀; 27°58' N, 85°00' E; 11 100 ft a.s.l.; 27 May 1967; Can. Nepal Exped.; Malaise trap 7; CNC • 1 ♀; 27°57' N, 84°59' E; 10 100 ft a.s.l.; 30 May 1967; Can. Nepal Exped.; Malaise trap 5; CNC • 1 ♀; 27°57' N, 85°00' E; 11 400 ft a.s.l.; 31 May 1967; Can. Nepal Exped.; Malaise trap 3; CNC • 4 ♂♂, 1 ♀; 28°00' N, 85°00' E; 10 500 ft a.s.l.; 1 Jun. 1967; Can. Nepal Exped.; Malaise trap 6; CNC • 1 ♀; 27°58' N, 85°00' E; 10 500 ft a.s.l.; 3–5 Jun. 1967; Can. Nepal Exped.; Malaise trap 1; CNC • 1 ♂; 28°00' N, 85°00' E; 10 500 ft a.s.l.; 27 May–2 Jun. 1967; Can. Nepal Exped.; Malaise trap 1; CNC.

Description

Male

LENGTH. Body 7.2–8.7 mm, wing 7–8.5 mm.

HEAD. Face black, moderately broad, shiny, with fine grey pollinosity laterally and dense pollinosity ventral to antenna, tip of facial tubercle and mouth edge shiny, without pollinosity; face long black pilose; facial tubercle large but not very broad; parafacia moderate in width, in broadest part slightly broader than

half of basoflagellomere width, brownish, grey pollinose, with short yellow pilosity about same length as eye pilosity; gena narrow, black, grey pollinose and with comparatively short yellow pilosity; lower part of occiput densely grey pollinose and light-yellow pilose. Frons distinctly convex, black, shiny, with fine grey pollinosity and black pilosity; angle of approximation of eyes approximately right. Lunule brown, antennal pits broadly separated. Scape and pedicel brownish, basoflagellomere rounded, orange; arista long, brown in basal half and black in apical half, with very short pilosity. Eye completely covered with dense, pale pilosity; eye contiguity slightly longer than length of frons without lunule. Vertex inflated, covered with black pilosity, ocellar triangle isosceles. Occiput very narrow, with long black pilosity.

THORAX. Postpronotum black, brownish pollinose and yellow pilose. Scutum fine-punctured, black, completely brown pollinose; medially with erect, long yellow pilosity, laterally intermixed with long black pilosity, postalar callus with mixed pilosity and a few strong black bristles. Scutellum densely pollinose along anterior margin, otherwise slightly pollinose; black with yellow and black pilosity, hind margin with numerous long black bristle-like pilosity up to same length as length of scutellum; scutellar fringe long, yellow. Pleura shiny but grey pollinose and mainly yellow pilose; posterior anepisternum brownish pollinose, postero-dorsally with yellow and black pilosity; anepimeron yellow pilose, postero-dorsal part also with black pile; katepisternum with dorsal and ventral pile patches widely separated, dorsal pile patch with mixed yellow and black pilosity, ventrally only yellow pilose.

LEGS. Fore coxa without baso-lateral spur, black, with brownish tip, grey pollinose and pale pilose; mid and hind coxae black, yellow pilose; trochanters black; femora black with dorsal third yellow posteriorly, in anterior side yellow up to medial part of femora; long pilosity on posterior side of fore femur basally yellow, and black otherwise; long pilosity posteriorly on mid femur yellow, with some black pilosity near tip; long pilosity on ventral part of hind femur yellow; tibiae yellow with narrow black annulus medially, black annulus on hind tibia broader; tarsi with two basal segments of fore tarsi brownish dorsally, other segments black, three basal segments of mid tarsi yellow and others segments black, hind tarsi black dorsally, all tarsi ventrally yellow.

WING. Long, narrow, brownish, completely covered with microtrichia, inner angle between veins M_1 and R_{4+5} right, R_s with a few yellow pile, sometimes non-pilose. Haltere yellow with black knob; calypter brownish.

ABDOMEN. Narrow, distinctly narrower than mesonotum at level of wing base, black, fine-punctured, brownish pollinose with shiny yellowish reflections laterally, yellow pilose, pilosity long erect laterally and shorter semi-erect medially, some black pilosity antero-laterally on tergite II and postero-laterally on III; posterior part of tergite IV and genitalia with black pilosity. Sternite I matte with erect yellow pilosity, sternites II–III shiny without any pollinosity, sternite II with erect yellow pilosity, sternite III with erect yellow pilosity laterally and with appressed short black pilosity medially; sternite IV with grey pollinosity and appressed short black pilosity.

Female

LENGTH. Body 5.3–7.7 mm, wing 5.7–7.2 mm.

HEAD. Facial tubercle small, face with scattered short, pale pilosity, medio-laterally with brown spot; parafacia narrow, brownish or yellow in lower part, with short yellow pile. Frons narrow, slightly broadened anteriorly, short erect yellow pilose, shiny with small spots of grey pollinosity near eyes; with three longitudinal furrows, the lateral furrows close to an eye, in anterior third there with a transversal furrow. Antenna and lunule yellow, basoflagellomere sometimes with blackish anterior margin. Vertex shiny, ocellar triangle equilateral.

THORAX. Postpronotum variable in colour from completely black to brownish in most part, yellow pilose and grey pollinose; scutum shiny on medial part, whitish-grey pollinose laterally, covered with short erect yellow pilosity; two black bristles on postalar calli; scutellum hind margin with black bristles.

LEGS. Fore coxa brownish-yellow; femora dark-brown to black in basal third to half, otherwise yellow; hind femur sometimes yellow also basally; tibiae completely yellow or yellow with narrow dark annulus medially; fore and mid tarsi yellow, with apical 4–5 segments dark, hind tarsus dorsally black, but segments 2–3 brown.

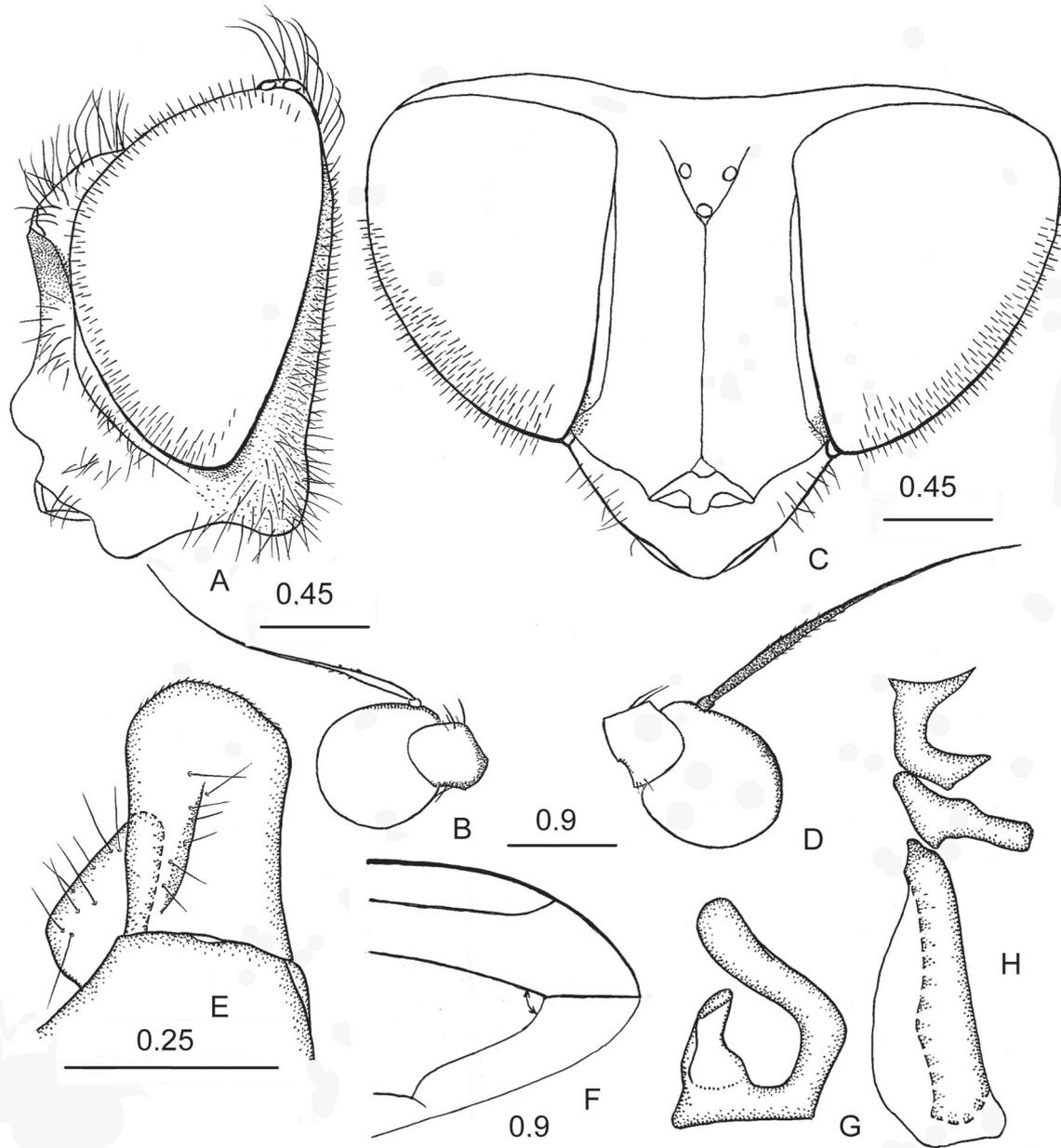


Fig. 48. *Cheilosia (Cheilosia) pica* sp. nov. A–B, E–H = holotype, ♂ (CSCA), C–D = paratype, ♀ (CNC). A. Head, lateral view. B, D. Antenna, lateral view of pedicel and basoflagellomere. C. Head, dorsal view. E. Surstylus and gonocercus, lateral view. F. Tip of wing. G. Superior lobe of hypandrium, lateral view. H. Aedeagus and aedeagal apodeme, lateral view. Scale bars indicated in drawings.

ABDOMEN. Oval, comparatively narrow, width of tergite II posteriorly equal to mesonotum width at level of wing base, shiny laterally and grey-brown pollinose medially on all tergites, covered with comparatively short white, erect pilosity laterally and short white and black adpressed pilosity medially. Other characters as in male.

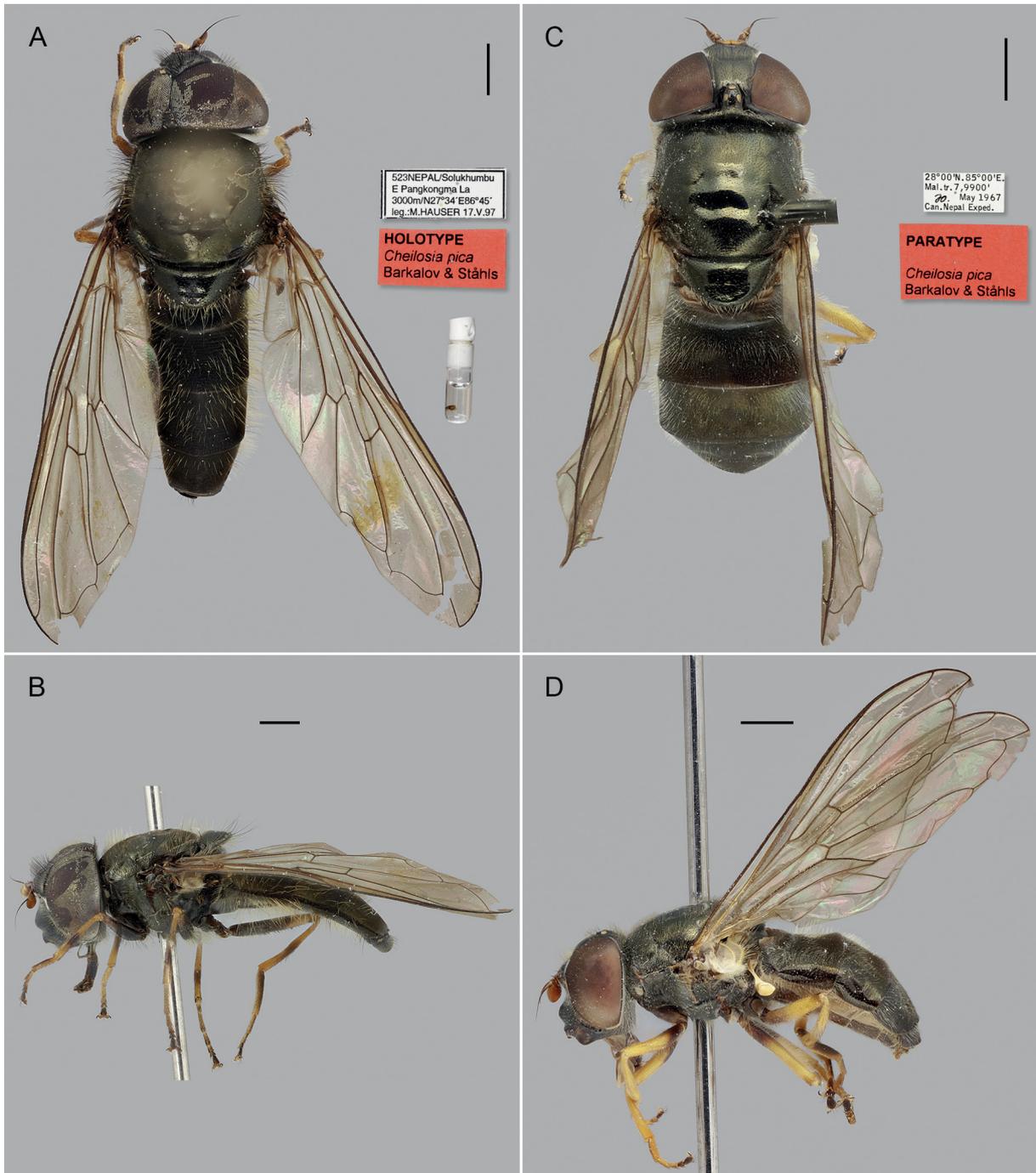


Fig. 49. *Cheilosia (Cheilosia) pica* sp. nov. **A–B.** Holotype, ♂ (CSCA); dorsal and lateral views. **C–D.** Paratype, ♀ (CNC); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

Remark

The colour of the femora in the female varies from predominantly black to predominantly yellow.

Distribution

Nepal.

Cheilosia picta sp. nov.

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Figs 50–51

Differential diagnosis

Cheilosia (Montanocheila) picta sp. nov. is similar to *C. (M.) albipicta* sp. nov., for distinguishing characters see under that species.

Etymology

The specific epithet is from the Latin '*pictus*', meaning 'colourfully painted', referring to the body pilosity pattern.

Material examined

Holotype

NEPAL • ♂; 27°58' N, 85°00' E; 11 100 ft a.s.l.; 18 May 1967; Can. Nepal Exped.; CNC.

Paratypes

NEPAL • 1 ♀; 27°58' N, 85°00' E; 11 400 ft a.s.l.; 31 May 1967; Can. Nepal Exped.; CNC • 1 ♀; Prov. Karnali, Umgebung Churta; 2900–3500 m a.s.l.; 18/19 May 1995; J. Weipert leg.; IBSJW/NME.

Description

Male

LENGTH. Body 11 mm, wing 10 mm.

HEAD. Face broad, distinctly broadened ventrally, black, without distinct pilosity; grey pollinose with longer microtrichia latero-medially, and with a shiny non-pollinose stripe latero-ventrally at mouth margin; facial tubercle small but distinct; parafacia very broad, equal to or somewhat broader than width of basoflagellomere, shiny black and slightly pollinose, with stripe of denser grey pollinosity along eye, with very long yellow pilosity clearly longer than eye pile; gena broad, densely grey pollinose and long, densely yellow pilose, with small, brown fascia ventral to eye. Frons convex, black, finely grey pollinose, denser near eye, dense black pilose; frontal angle distinctly obtuse; lunule yellow, narrowly connected with process of face and antennal pits thus narrowly separated. Scape and pedicel black, basoflagellomere with antero-dorsal angle, orange with darkened antero-dorsal part; arista black, long, with very short pilosity. Eye pilosity long, dense, yellow, postero-medially with bare stripe; length of eye contiguity distinctly shorter than length of frons without lunule. Occiput shiny-black, with comparatively short, black pilosity; ocellar triangle isosceles. Vertex yellow pilose.

THORAX. Postpronotum black, grey pollinose and yellow pilose. Scutum grey pollinose on anterior third and anterior to scutellum, densely pollinose on notopleural area, with long, dense pilosity, area between wingbases shiny and only slightly pollinose with a stripe of black pilosity extending across scutum, lacking strong black bristles on lateral parts; scutellum mostly with black pilosity, anterior margin with grey pollinose stripe and yellow pilosity, hind margin with long mixed yellow and black pilosity about

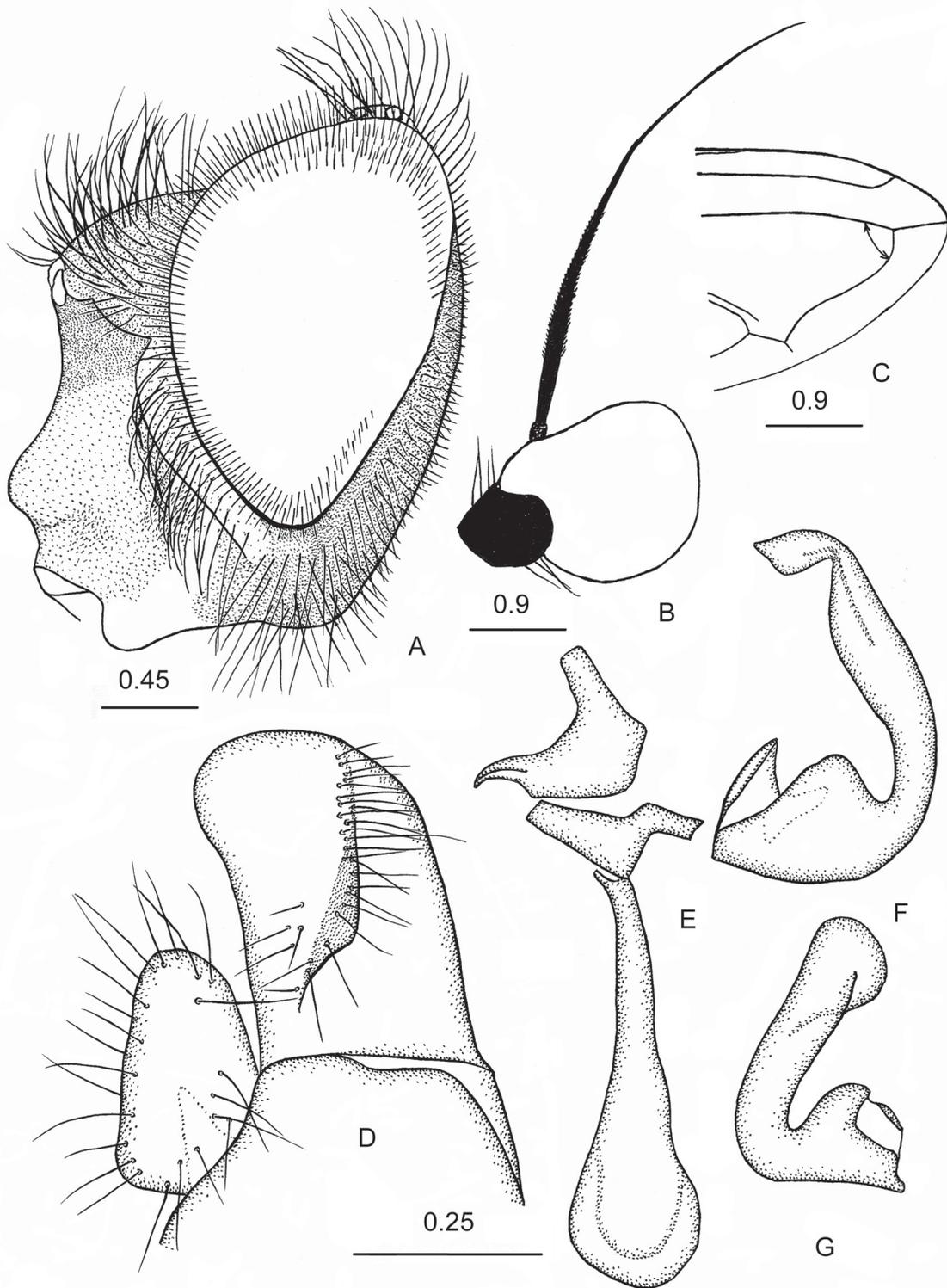


Fig. 50. *Cheilosia (Montanocheila) picta* sp. nov., holotype, ♂ (CNC). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Tip of wing. **D.** Surstylus and gonocercus, lateral view. **E.** Aedeagus and aedeagal apodeme, lateral view. **F–G.** Superior lobe of hypandrium, lateral view. Scale bars indicated in drawings.

as long as scutellum length, lacking strong bristles. Pleura black, grey pollinose, with brown spots on anteriodorsal corner of katepisternum and on anterior part of katepimeron; posterior anepisternum and anepimeron with mixed, long, black and yellow pilosity, anterior anepisternum non-pilose, katepisternum completely with long, yellow pilosity. Metasternum yellow pilose.

LEGS. Fore coxa without baso-lateral spur, black, grey pollinose and yellow pilose; femora black, densely grey pollinose, long pilosity on posterior part of fore and mid femora black, hind femur anteriorly and ventrally with long yellow pilosity up to 2× longer than width of femur and some black gradually shortening pilosity on apical 1/5; tibiae brownish-yellow in basal half and at tip, hind tibia yellowish-brown

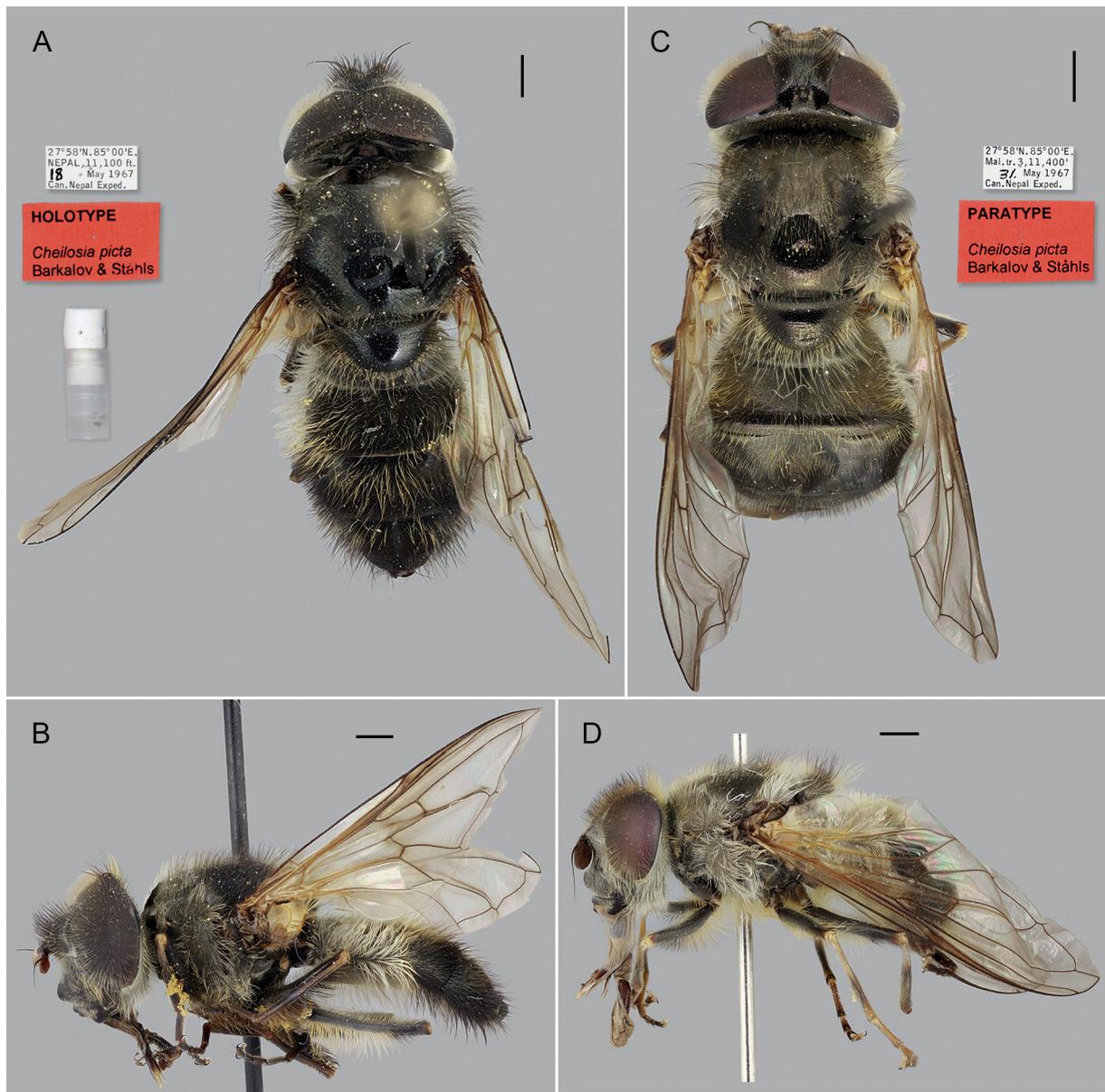


Fig. 51. *Cheilosia (Montanocheila) picta* sp. nov. **A–B.** Holotype, ♂ (CNC), dorsal and lateral views. **C–D.** Paratype, ♀ (CNC), dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

in basal third and otherwise black; protarsus and hind tarsus dorsally black, mid tarsus with segments 1–4 brown and 5th segment black.

WING. Slightly brownish, transverse veins brown infuscated, entirely microtrichose; Rs in basal $\frac{2}{3}$ with a few black pile; inner angle of veins M_1 and R_{4+5} obtuse. Haltere with stem yellow and knob yellow and dorsally brownish, calypter yellowish-brown, with yellow rim and pilosity.

ABDOMEN. Oval, width approximately equal to scutum width at level of wing base, black with bluish reflection, laterally shiny and broadly brownish pollinose medially, with long, dense, erect pilosity, yellow on tergites I–II and in medial parts of tergites III–IV, tergites III–IV laterally black pilose, tergite V laterally with black pilosity. Sternites grey pollinose, long yellow pilose, sternite IV also with semi-appressed black pilosity postero-medially. Genitalia with the asymmetrical gonopods (superior lobes).

Female

LENGTH. Body 9 mm, wing 8.5 mm.

HEAD. Frons broad, with clear lateral furrows, on anterior $\frac{1}{3}$ with a transverse, very broad band of grey pollinosity, with erect mixed black and yellow pilosity. Basoflagellomere orange-brown, very big, slightly darkened on anterior margin.

THORAX. Scutum with moderately long, erect, yellow pilosity, with some black pilosity intermixed antero-laterally and on posterior half, scutellum with yellow pilosity, and some black pilosity on disc, hind margin with yellow pilosity, some of which are longer than length of scutellum.

LEGS. Femora yellow pilose and apico-posteriorly and apico-ventrally with black pilosity; yellow pilosity on ventral part of hind femur somewhat shorter than in male but at most $2 \times$ width of femur; tibia completely bright yellow, only hind tibia with indistinct brownish ring, colour of tarsi as in male. Haltere stem yellow, knob brown.

ABDOMEN. Broadly oval, yellow pilose; tergite I and anterior part of tergite II grey pollinose, posterior half of tergite II and tergites II–IV shiny, slightly pollinose, yellow pilose, tergites II–IV yellow pilose anteriorly and black pilose posteriorly, tergite V shiny, black pilose. Sternites grey pollinose, sternites I–III yellow pilose, sternites IV–V laterally with yellow pilosity, medially broadly black pilose. In other characters as the male.

Distribution

Nepal.

Cheilosia pilivena sp. nov.

urn:lsid:zoobank.org:act:75FCCE63-8716-4F07-8B2B-74C2F6F04086

Figs 52, 53A–C

Differential diagnosis

Structure of male genitalia (shape of apical sclerite of aedeagus and superior lobe of hypandrium) is similar to other members of the nominal subgenus. The new species has pilosity on vein Rs, which in combination with other characters (very broad parafacia and absence of black bristles on scutellum hind margin) easily separates the taxon from all other members of the subgenus.

Etymology

The specific epithet is from the Latin '*pilosus*' meaning 'hairy' and '*vena*' meaning 'vein', and refers to the pile present dorsally on wing vein Rs, unusually long in the species.

Material examined

Holotype

NEPAL • ♂; 27°58' N, 85°00' E; 11 100 ft a.s.l.; 26 May 1967; Can. Nepal Exped.; CNC.

Paratypes

NEPAL • 1 ♀; Solukhumbu, Junbesi to Ringmo; 27°34' N, 86°35' E; 2700–3000 m a.s.l.; 12 May 1997; Hauser leg. [515]; CSCA • 1 ♂; Prov. Karnali, Hochtal Gothichaur; 29°12,10' N, 82°18,56' E; 2900 m a.s.l.; 13 Jun. 1997; J. Weipert leg.; "[WS]"; IBSJW/NME.

Description

Male

LENGTH. Body 9.6 mm, wing 8.9 mm.

HEAD. Face broad, in anterior view clearly broadened ventrally, shiny black, pollinose ventral to antenna, and small patches of pollinosity laterally, without distinct pilosity; facial tubercle characteristic, not very broad nor high, with two small, uneven callosities; parafacia very broad, slightly broader than basoflagellomere width, brownish-black with denser grey pollinosity in dorsal part and less dense in ventral part, with dense, comparatively long yellow pilosity mostly longer than eye pilosity; gena moderately broad, grey pollinose and dense yellow pilose. Frons flat, coarsely punctured; shiny with narrow stripes of grey pollinosity adjacent to eye, with yellow and black pilosity; frontal angle obtuse; lunule dark-brown, antennal pits separated. Scape and pedicel shiny brown, basoflagellomere slightly elongate, bright yellow, arista long, yellow, bare. Eye completely covered with long, dense, brown pilosity; eye contiguity approximately equal to length of frons without lunule. Vertex slightly inflated, with long yellow pilosity, ocellar triangle equilateral. Occiput with yellow pilosity.

THORAX. Postpronotum black, finely grey pollinose and yellow pilose. Scutum shiny black, laterally with slight pollinosity, fine-punctured, covered with comparatively long, not very dense predominantly yellow pilosity, medially between wing bases a large patch of long black pilosity, no distinct lateral bristles; scutellum shiny black, disc with short and 4–5× longer black pilosity, laterally with long yellow pilosity longer than length of scutellum. Subscutellar fringe with very long and dense yellow pilosity. Pleura black, fine grey pollinose, long yellow pilose except posterior half of anepisternum with mixed black and yellow pilosity; pleura with a brownish integumental stripe extending from wing base to mid coxa; katepisternum with broadly separated yellow pile patches, and with small brownish spot postero-dorsally; metasternum long yellow pilose.

LEGS. Fore coxa without baso-lateral spur, brown, grey pollinose and long yellow pilose; femora black with yellow tips, length of long pilosity on posterior part of fore femur 2× width of femora, mostly black with some yellow pilosity basally; mid femur on posterior part with long, mostly yellow pilosity, some black pilosity on apical 1/3, antero-ventral part of hind femur with very some very long yellow pile, and with some black pilosity on apical 1/3; tibia mostly yellow with more or less broad black rings; tarsi dorsally brownish and ventrally yellow, apical two segments clearly darker.

WING. Slightly brownish, without distinct spot medially, completely covered with microtrichia, vein Rs with 2–4 distinct, rather long pile; inner angle between veins M₁ and R₄₊₅ right. Haltere all yellow, calypter pale yellow with yellow rim and fringe.

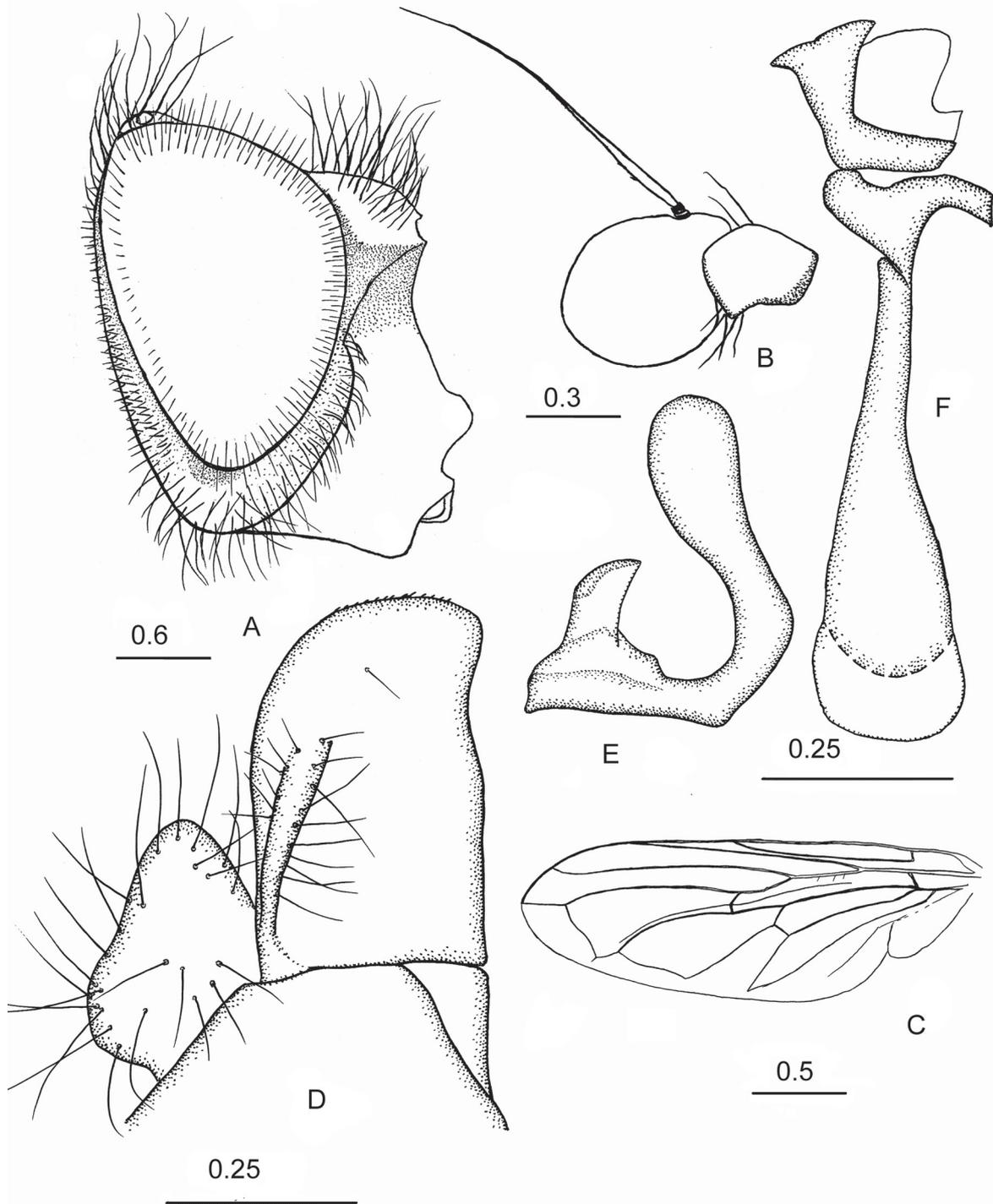


Fig. 52. *Cheilosia (Cheilosia) pilivena* sp. nov., holotype, ♂ (CNC). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Wing. **D.** Surstylus and gonocercus, lateral view. **E.** Superior lobe of hypandrium, lateral view. **F.** Aedeagus and aedeagal apodeme, lateral view. Scale bars indicated in drawings.

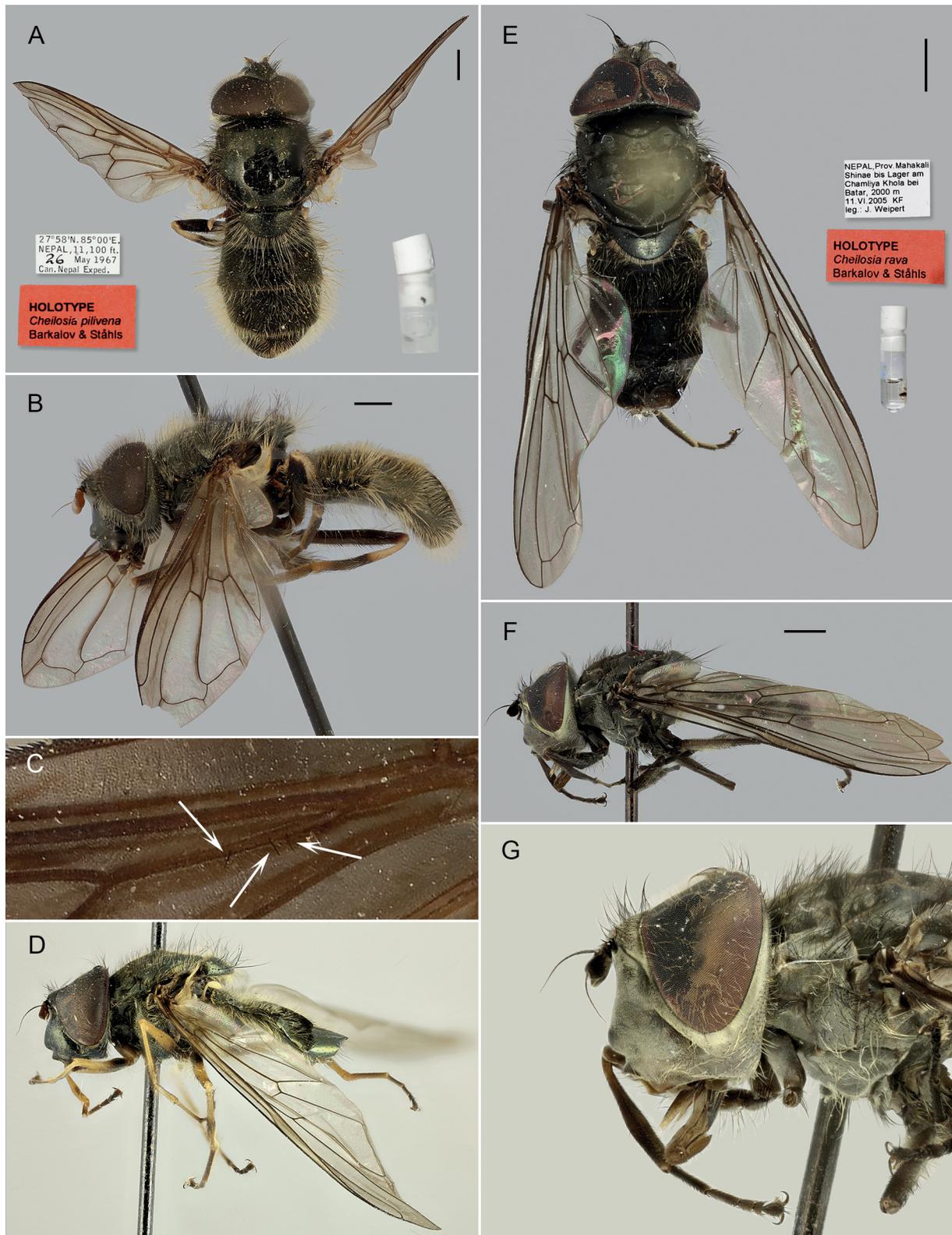


Fig. 53. A–C. *Cheilosia (Cheilosia) pilivena* sp. nov., holotype, ♂ (CNC). A–B. Habitus, dorsal and lateral views, C. Wing, vein Rs with pile (indicated by white arrows). – D. *Cheilosia (Pollinocheila) quinta* Barkalov & Cheng (IBSJW/NME); lateral view. – E–G. *Cheilosia (Pollinocheila) rava* sp. nov., holotype, ♂ (IBSJW/NME); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

ABDOMEN. Elongate, oval, in broadest part slightly narrower than mesonotum at level of wing base; black with slight bluish reflections, brownish pollinose medially and shiny laterally; with dense, erect yellow pilosity, pilosity longer laterally on tergite II and posteriorly on tergite IV; sternites brownish-black, slightly pollinose, with long erect and short semi-appressed to appressed pale-yellow pilosity.

Female

LENGTH. Body 8.5 mm, wing 8 mm.

HEAD. Face as in male, parafacia very broad, about as broad as basoflagellomere width, brownish-black with denser grey pollinosity in dorsal part and in ventral part reddish-brown and only slightly pollinose, with dense, comparatively long yellow pilosity longer or as long as eye pilosity. Frons broad, slightly broadened anteriorly, black with rather coarse puncturation except area around ocellar triangle, with two densely punctured longitudinal furrows, shiny with triangular grey pollinose maculae at antero-lateral corners, covered with short, erect yellowish pilosity. Antenna with basoflagellomere slightly bigger than in male, orange-yellow; arista yellow, long, with very short pilosity. Eye with scattered, long, yellowish or whitish pilosity.

THORAX. Scutum, scutellum and postalar callus shiny black, with erect, yellowish pilosity, scutellum with longest pilosity of same length as scutellum. Pleura all yellow pilose, katepisternum with dorsal and ventral pile patches broadly separated. Femora black, narrowly yellow basally and yellow apically; tibiae yellow with black annulus of $\frac{1}{4}$ – $\frac{1}{3}$ of tibia length. For and mid legs yellow pilose, tarsi with basal four segments yellow and apical segment brown. Hind femur with a few scattered long yellow pile along its length, apico-ventrally with short black pilosity, otherwise yellow pilose; hind tarsus dorsally dark.

WING. Brownish, especially along veins.

ABDOMEN. Black, broad, shiny, with yellow erect pilosity on lateral parts of tergites, and medially slightly pollinose on tergites I–III with adpressed or semi-adpressed yellow pilosity. In other characters as the male.

Distribution

Nepal.

Cheilosia procera sp. nov.

urn:lsid:zoobank.org:act:F166A6F1-1804-463A-9111-73A6A332BC27

Figs 54–55

Differential diagnosis

Cheilosia (Eucartosyrphus) procera sp. nov. shares the following characters with other species of the subgenus: eye bare, antennal pits confluent, scutum with long, black bristles and the structure of the male genitalia. *Cheilosia procera* sp. nov. is the only species of subgenus *Eucartosyrphus* known from Nepal.

Etymology

The specific epithet is from the Latin '*procerus*', meaning 'long', referring to the habitus of the species.

Material examined

Holotype

NEPAL • ♂; Maharigaon Nördl.; 29°20'24" N, 82°23'21" E; 3400 m a.s.l.; 20 Jun. 1997; Creutzburg leg.; "Weißschale"; IBSJW/NME.

Paratypes

NEPAL • 1 ♂; Maharigaon, nördl.; 29°21'30" N, 82°23'46" E; 3700 m a.s.l.; 16 Jun. 1997; Creutzburg leg.; IBSJW/NME • 2 ♂♂; same label data as for holotype; IBSJW/NME • 1 ♂; Umg. Dillichaur [surroundings of Dillichaur], Jumla; 2500 m a.s.l.; 2 Aug. 1997; Creutzburg leg.; IBSJW/NME • 6 ♂♂; Prov. Karnali, Umg. Mahariagon [surroundings of Mahariagon]; 29°20' N, 82°23' E; 2800–3200 m a.s.l.; 21 Jun. 1997; J. Weipert leg.; “KF”; IBSJW/NME • 3 ♂♂; Maharigaon, nördl.; 29°20'24" N, 82°23'21" E; 3400 m a.s.l.; 20 Jun. 1997; Creutzburg leg.; on *Euphorbia* spec.; IBSJW/NME • 2 ♂♂; Prov. Karnali, 20 km NW of Simikot, Sol-Khola-Ufer; 30°02'2" N, 81°39'0" E; 2900 m a.s.l.; 22 Jun. 2001; J. Weipert leg.; IBSJW/NME • 1 ♀; Prov. Seti, Ghatganga Khola NE Shima bis nahe Panshera; 29°46'48" N, 81°25'47" E; 2300–2900 m a.s.l.; 20 Jun. 2009; J. Weipert leg.; IBSJW/NME • 1 ♂; Khumbu, Khumdzung; 3900 m a.s.l.; 11 Jul. 1962; G. Eber and H. Falkner leg.; “Staatsslg. München”; “[*Cheilosia* sp. indet. m#. (prob. new sp.) det. R. L. Coe, 1963]”; ZSMC • 2 ♀♀; same label data as for preceding; ZSMC.

Description

Male

LENGTH. Body 7.1–8.3 mm, wing 7.4–7.7 mm.

HEAD. Face comparatively narrow, black, shiny, except facial tubercle fine grey pollinose, non-pilose; facial tubercle very broad and bulging, occupying face between parafacia; parafacia narrow and up to about $\frac{1}{3}$ of width of basoflagellomere, densely silvery pollinose and short white pilose; gena narrow, grey pollinose and white pilose; lower part of occiput densely silvery pollinose and white pilose. Frons slightly inflated, black, with narrow stripes of grey pollinosity near eyes, covered with long black pilosity; angle of approximation of eyes acute. Lunule dark-brown, antennal pits confluent. Antennae black, basoflagellomere elongated, grey pollinose, with reddish spot postero-ventrally; arista long, in basal half with distinct pilosity, length of longest pilosity of about width of arista in its widest part. Vertex slightly inflated, ocellar triangle isosceles, black pilose. Eye bare, length of eye contiguity distinctly longer than length of frons without lunule.

THORAX. Postpronotum black, brown pollinose and black pilose. Scutum and scutellum black, with brown pollinosity on scutum forming three more or less clear stripes medially from anterior margin up to midscutum, hind part of scutum shining with very slight pollinosity and narrow area anterior to scutellum with pollinosity; with comparatively long black pilosity, postalar calli with a few very long black bristles; scutellum slightly pollinose anteriorly, with shorter yellow and longer black pilosity, scutellum hind margin with many strong, long, black bristles, longest bristles longer than length of scutellum; subscutellar fringe long, white. Pleura black, shiny with fine but dense grey-brown pollinosity, without shiny non-pollinose spots; mixed black and yellow pilose; katapisternum predominantly yellow pilose, dorsal pile patch large and narrowly separated from smaller ventral pile patch; anepimeron black pilose; metasternum yellow pilose.

LEGS. Fore coxa dark brownish, grey pollinose and yellow pilose, mid and hind coxa dark-brown to black, pilosity black and white; femora black with yellow extreme tips, long pilosity on anterior surface black and yellowish; tibiae yellow in basal third and narrowly yellow apically, black otherwise; with long black pilosity anteriorly slightly longer than width of tibia; tarsi black dorsally, only mid basitarsus basally narrowly yellow.

WING. Narrow, translucent, completely covered with microtrichia; inner angle between veins M_1 and R_{4+5} acute, R_s with some black short pile. Calypter white with yellow rim and pilosity; haltere yellow with brownish-yellow knob.

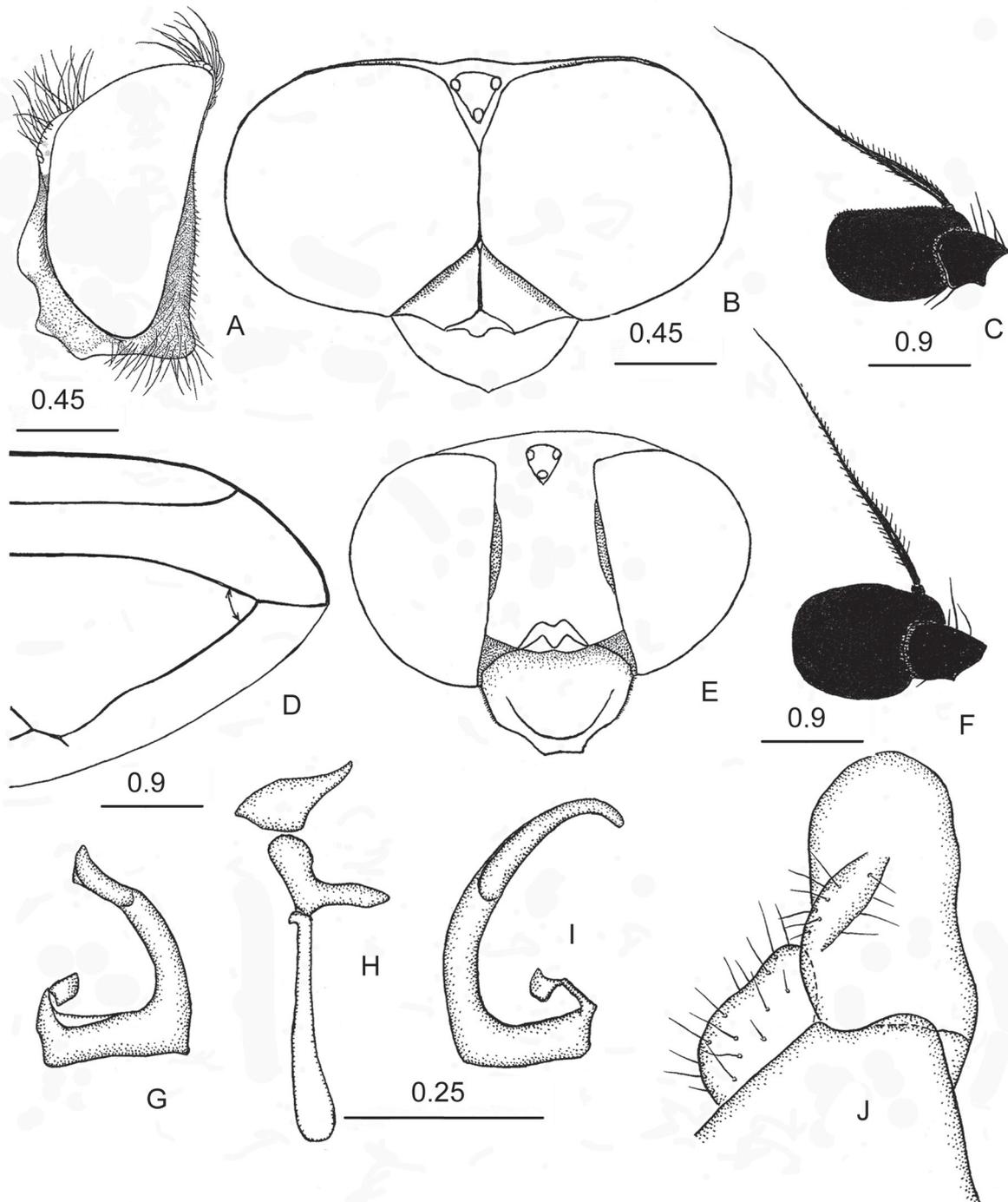


Fig. 54. *Cheilosia (Eucartosyrphus) procera* sp. nov.; A–D, G–J = paratype, ♂ (IBSJW/NME), E–F = paratype, ♀ (IBSJW/NME). **A.** Head, lateral view. **B, E.** Head, dorsal view. **C, F.** Antenna, lateral view of pedicel and basoflagellomere. **D.** Tip of wing. **G, I.** Superior lobes of hypandrium, lateral view. **H.** Aedeagus and aedeagal apodeme, lateral view. **J.** Surstylus and gonocercus, lateral view. Scale bars indicated in drawings.

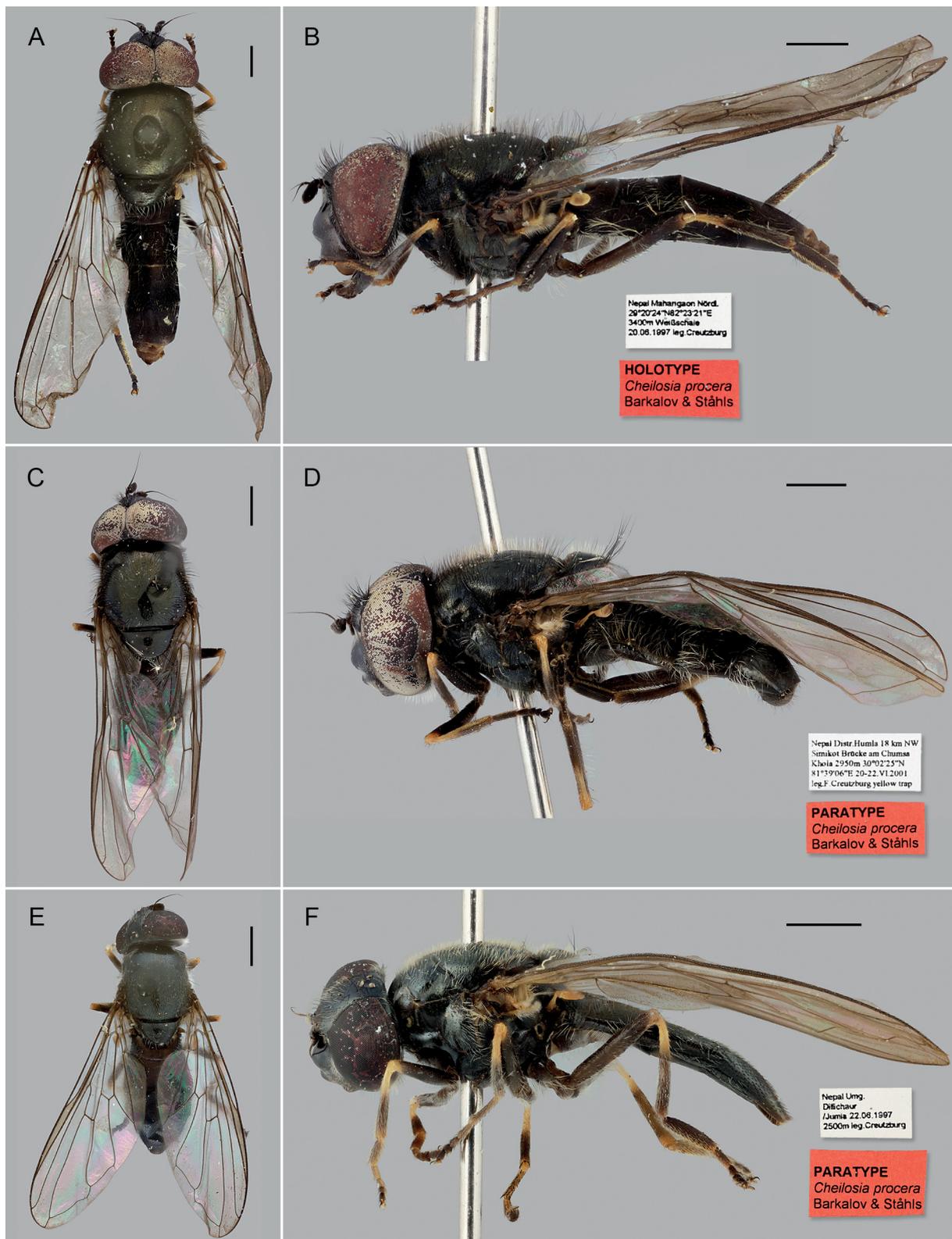


Fig. 55. *Cheilosia (Eucartosyrphus) procera* sp. nov. A–B. Holotype, ♂ (IBSJW/NME); dorsal and lateral views. C–D. Paratype, ♂ (IBSJW/NME); dorsal and lateral views. E–F. Paratype, ♀ (IBSJW/NME), dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

ABDOMEN. Narrow, in broadest part narrower than scutum at level of wing base, black with brownish pollinosity, with long, erect yellow pilosity on lateral parts of tergites I–IV which is longer on tergites I–II and shorter on tergites III–IV, and short, semi-appressed, black and white pilosity on medial parts of all tergites, sometimes with a few long black pile on anterior and posterior angles of tergite II. Sternites grey pollinose, long yellow pilose on sternites I–II, sternites III–IV with long yellow pilosity laterally and short adpressed black pilosity medially, black pilosity postero-medially longer.

Female

LENGTH. Body 6.8–8.0 mm, wing 6.6–7.8 mm.

HEAD. Basoflagellomere in one specimen as in male, in other specimens of slightly shorter length. Frons almost parallel-sided, comparatively narrow, lateral furrows almost invisible, with grey pollinose stripe near eye; with black pilosity which is anteriorly directed. Ocellar triangle isosceles. Upper part of occiput broader than in male, shiny, without pollinosity.

THORAX. Scutum black, shiny with grey pollinosity laterally and medially shiny without pollinosity; covered with short appressed black and yellow pilosity, some short erect black pilosity on hind half; postalar callus and scutellum hind margin with long, strong, black bristles.

ABDOMEN. In broadest part approximately equal to width of scutum at level of wing base; black, brown pollinose, with bluish shiny reflections on parts without pollinosity. Otherwise as male.

Distribution

Nepal.

Cheilosia quinta Barkalov & Cheng, 2004

Figs 53D, 56

Cheilosia (Pollinocheila) quinta Barkalov & Cheng, 2004: 341. Type locality: China: Yunnan: Lushui (holotype, ♂, ZICAS).

Differential diagnosis

Cheilosia quinta belongs to the subgenus *Pollinocheila*. It is closest to *C. aterrima* Sack, 1927, but differs in male by frons with dense grey pollinosity, by arista with long pile and by structure of parts of male genitalia (in *C. aterrima* frons is shiny and arista bare). Female of *C. quinta* has anteriorly blackish basoflagellomere and arista with long pile (*C. aterrima* has completely yellow basoflagellomere and bare arista).

Material examined

NEPAL • 1 ♂; Prov. Karnali, Hochtal Gothichaur [Gothichaur valley]; 29°12.10' N, 82°18.56' E; 2900 m a.s.l.; 9 Jun. 1997; J. Weipert leg.; “WS”; IBSJW/NME? • 2 ♂♂; Prov. Karnali; 29°12.10' N, 82°18.56' E; Hochtal Gothichaur [Gothichaur valley]; 2900 m a.s.l.; 9 Jun. 1997; J. Weipert leg.; IBSJW/NME • 1 ♂; Prov. Karnali, Churta Lager W bis Gothichaur Hochtal [Churta camp W of Gothichaur valley]; 3000–2800 m a.s.l.; 5 Jun. 2007; J. Weipert leg.; IBSJW/NME.

Distribution

China, Nepal.

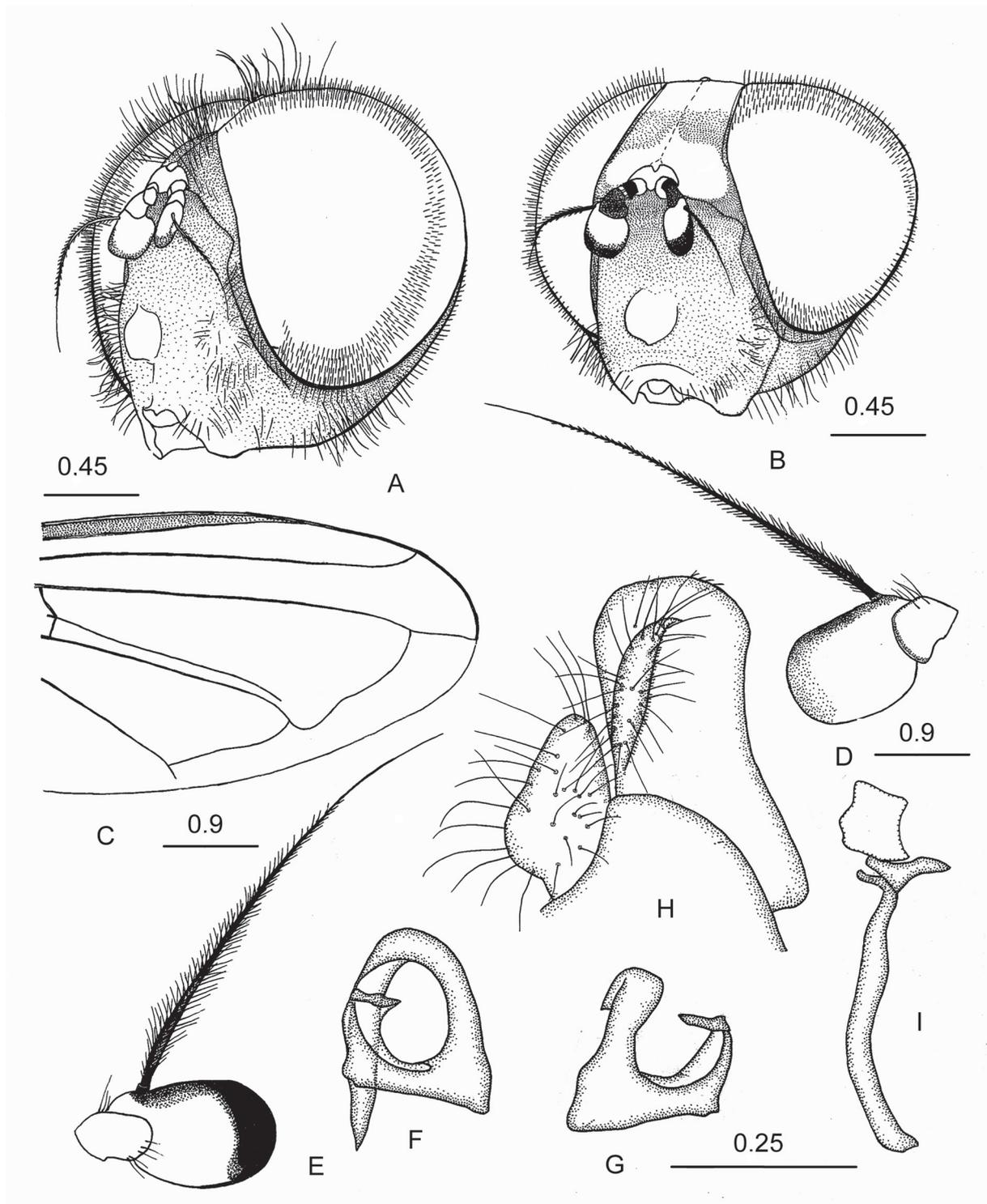


Fig. 56. *Cheilosia (Pollinocheila) quinta* Barkalov & Cheng, 2004. **A.** Head of ♂, anterior view. **B.** Same of ♀. **C.** Tip of wing. **D.** Antenna of ♂, lateral view of pedicel and basoflagellomere. **E.** Same of ♀. **F–G.** Superior lobes of hypandrium, lateral view. **H.** Surstylus and gonocercus, lateral view. **I.** Aedeagus and aedeagal apodeme, lateral view. After Barkalov & Cheng 2004. Scale bars indicated in drawings.

Cheilosia rava sp. nov.

urn:lsid:zoobank.org:act:C365C81B-6759-464D-A03B-83B8D3170F24

Figs 53E–G, 57

Differential diagnosis

Cheilosia (*Pollinocheila*) *rava* sp. nov. shares the following characters with the other Palearctic members of the subgenus: male genitalia with surstylus broad in basal part and apically narrower; superior lobes of hypandrium asymmetric; the left process of superior lobe undeveloped, only with a small plate; apical sclerite of aedeagus (distiphallus) with characteristic shape. From all other members of the subgenus *C. (P.) rava* sp. nov. differs by a combination of the following characters: black, rounded basoflagellomere; distinct shape of face with facial tubercle small and area between antennal pits and facial tubercle less excavated; a completely pollinose body and by structure of male genitalia (these characters partly different in other members of the subgenus).

Etymology

The specific epithet is from the Latin ‘*ravus*’ meaning ‘dark-grey’ referring to the distinct grey pollinosity of the species.

Material examined

Holotype

NEPAL • ♂; Prov. Mahakali, Shinae bis Lager am Chamliya Khola bei Batar [Shinae to camp on Chamliya Khola near Batar]; 2000 m a.s.l.; 11 Jun. 2005; J. Weipert leg.; “KF”; IBSJW/NME.

Description

Male

LENGTH. Body 6.8 mm, wing 7.3 mm.

HEAD. Face broad, in anterior view distinctly broadened antero-ventrally, black, densely grey pollinose, except extreme tip of facial tubercle and lower mouth margin shining in narrow stripe; face latero-ventrally with some long yellow pilosity; facial tubercle in lower part of face, small; parafacia moderate in width, width about half width of basoflagellomere; comparatively short yellow pilose and densely grey pollinose; gena broad, densely grey pollinose and yellow pilose; lower part of occiput densely grey pollinose and white pilose. Frons slightly convex, densely grey pollinose and long black pilose, angle of approximation of eyes obtuse. Lunule brown, antennal pits narrowly separated. Antenna black, basoflagellomere rounded, brown pollinose; arista long, black, with very short pilosity. Eye with dense, comparatively long, brown pilosity, length of eye contiguity approximately equal to length of frons without lunule. Vertex slightly convex, long black pilose, ocellar triangle equilateral. Occiput in dorsal part with long and short black pilosity.

THORAX. Postpronotum black, densely grey pollinose and black pilose. Scutum and scutellum black, fine-punctured, with dense brown pollinosity, lateral sides of scutum grey pollinose; with long, not very dense, erect, black pilosity, notopleural area also with long black bristles and one very strong black bristle, scutum posterior of transverse suture with two strong black bristles; scutellum hind margin with very long black bristles longer than scutellum length. Subscutellar fringe with long yellow pilosity. Pleurae densely grey pollinose and mostly yellow pilose, postero-dorsal angle of posterior anepisternum and antero-dorsal angle of anterior anepimeron also with black pilosity, katapisternum with dorsal and ventral pile patches well separated.

LEGS. Mostly black, only basal third of hind tibia brownish; fore coxa without baso-lateral spur; fore femur with black long pilosity posteriorly; mid femur posteriorly with long yellow pilosity in basal part and long black pile apical part; pilosity on anterior part of hind femur yellow in basal half and black in apical half, ventrally with short black pile; all tarsi black.

WING. Long, narrow; entirely microtrichose; slightly brownish, with dark-brown veins; Rs without pilosity; inner angle between veins M_1 and R_{4+5} nearly right. Calypter white, with brown rim and yellow pilosity; haltere yellow, with blackish knob.

ABDOMEN. Black, brown pollinose, matte; yellow pilose, pilosity longer on tergites I–II and laterally, tergites II–III medio-posteriorly with some short black pile, hind margin of tergite IV with long black

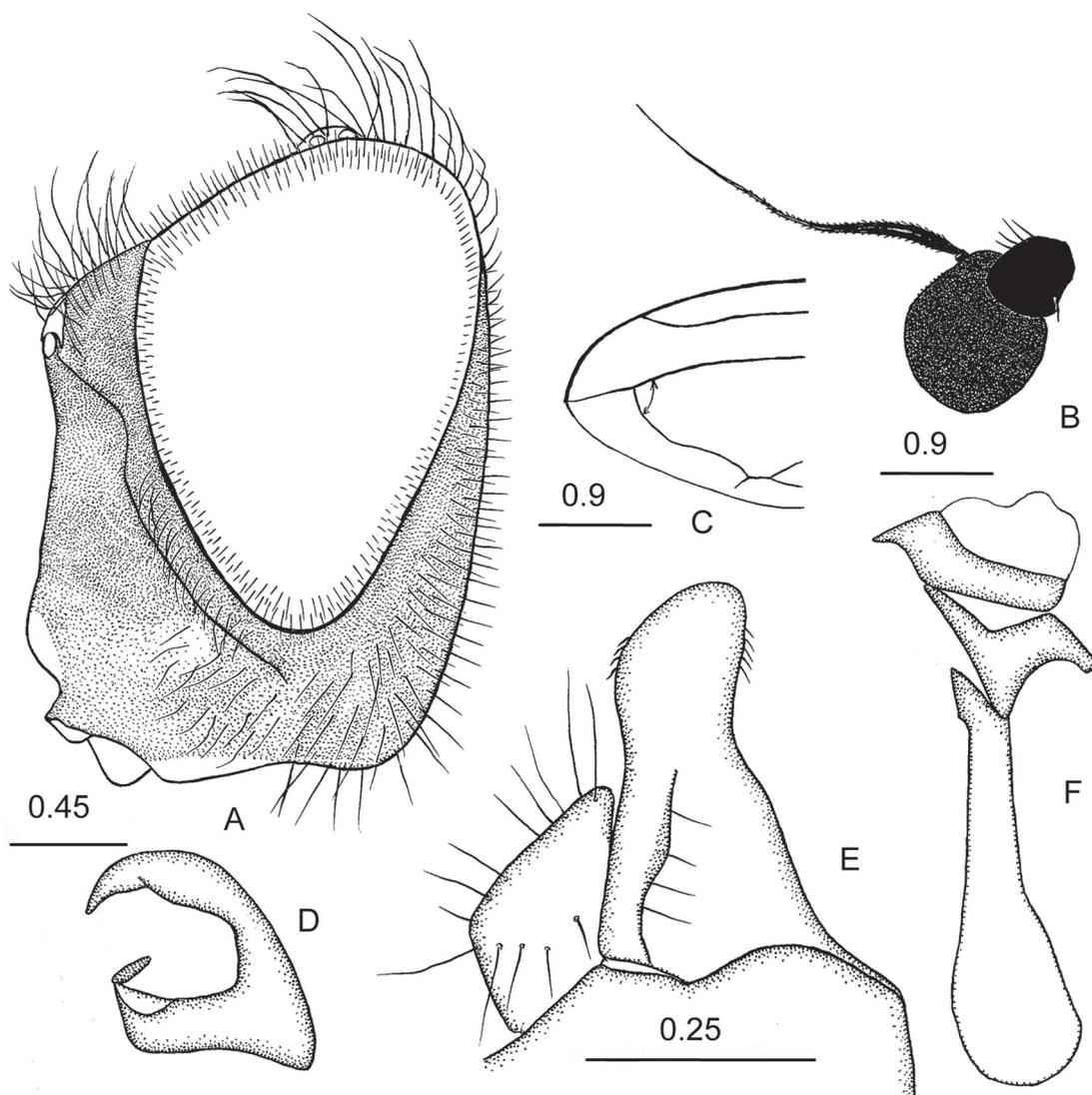


Fig. 57. *Cheilosia (Pollinocheila) rava* sp. nov., holotype, ♂ (IBSJW/NME). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Tip of wing. **D.** Superior lobe of hypandrium, lateral view. **E.** Surstylus and gonocercus, lateral view. **F.** Aedeagus and aedeagal apodeme, lateral view.

pilosity; sternite IV laterally with densely grey pollinose triangular macula. Sternites densely grey pollinose and yellow pilose.

Female

Unknown.

Distribution

Nepal.

Cheilosia spinosa sp. nov.

urn:lsid:zoobank.org:act:820003D3-1D4B-4B52-874D-A31CE817B6FD

Figs 58–59

Differential diagnosis

Cheilosia (Cheilosia) spinosa sp. nov. is most similar to Nepalese species *Cheilosia (C.) spuria* sp. nov. and to *C. (C.) nadiae* Barkalov & Cheng, 2004 described from China. *Cheilosia (C.) spinosa* sp. nov. is distinguished by having an orange basoflagellomere, semi-erect to appressed pilosity on mesonotum and abdomen, a broader frons in anterior part and shorter pilosity on eye. In *C. (C.) spuria* sp. nov. and *C. (C.) nadiae* the basoflagellomere is black, mesonotum and abdomen mostly with erect pilosity, and frons narrower in anterior part, and pilosity of eye is longer. *C. (C.) spuria* sp. nov. is most similar to *C. (C.) nadiae*, from which it differs in pattern of pollinosity of face and differences of male genitalia.

Etymology

The specific epithet is from the Latin ‘*spinus*’ meaning ‘spiny’ and refers to the presence of a basolateral spur on the fore coxa.

Material examined

Holotype

NEPAL • ♂; Prov. Karnali, Umg. Lager oberhalb Maharigaon [surroundings of camp above Maharigaon]; 29°20'24" N, 82°23'21" E; 3300–3400 m a.s.l.; 20 Jun. 1997; J. Weipert leg.; BSJW/NME.

Paratypes

NEPAL • 1 ♀; same data as for holotype; BSJW/NME • 1 ♀; Maharigaon Nördl.; 29°20'24" N, 23°21' E; 3400 m a.s.l.; 20 Jun. 1997; Creutzburg leg.; “Weißschale”; IBSJW/NME.

Description

Male

LENGTH. Body 8.1 mm, wing 8.0 mm.

HEAD. Face moderately broad, slightly widened ventrally, shiny, whitish-grey pollinose ventral to antennal base and medio-laterally; facial tubercle distinct, rounded; parafacia moderate in width, approximately $\frac{3}{4}$ of width of basoflagellomere, brownish to dark-brown, paler in ventral $\frac{2}{3}$, densely silvery pollinose and short white pilose; gena narrow, grey pollinose with white, dense pilosity of moderate length. Frons slightly convex, densely grey pollinose and black pilose, frontal angle slightly obtuse; lunule pale-brown, with a clear dividing grey pollinose medial furrow, antennal pits separated. Antenna: scape black; pedicel brown medially and black along basal, anterior and ventral margins; basoflagellomere pale-brown with postero-ventral orange spot; arista long, brown, bare (short, inconspicuous, adpressed pilosity visible under very high magnification). Eye short white pilose, eye contiguity distinctly longer than length of

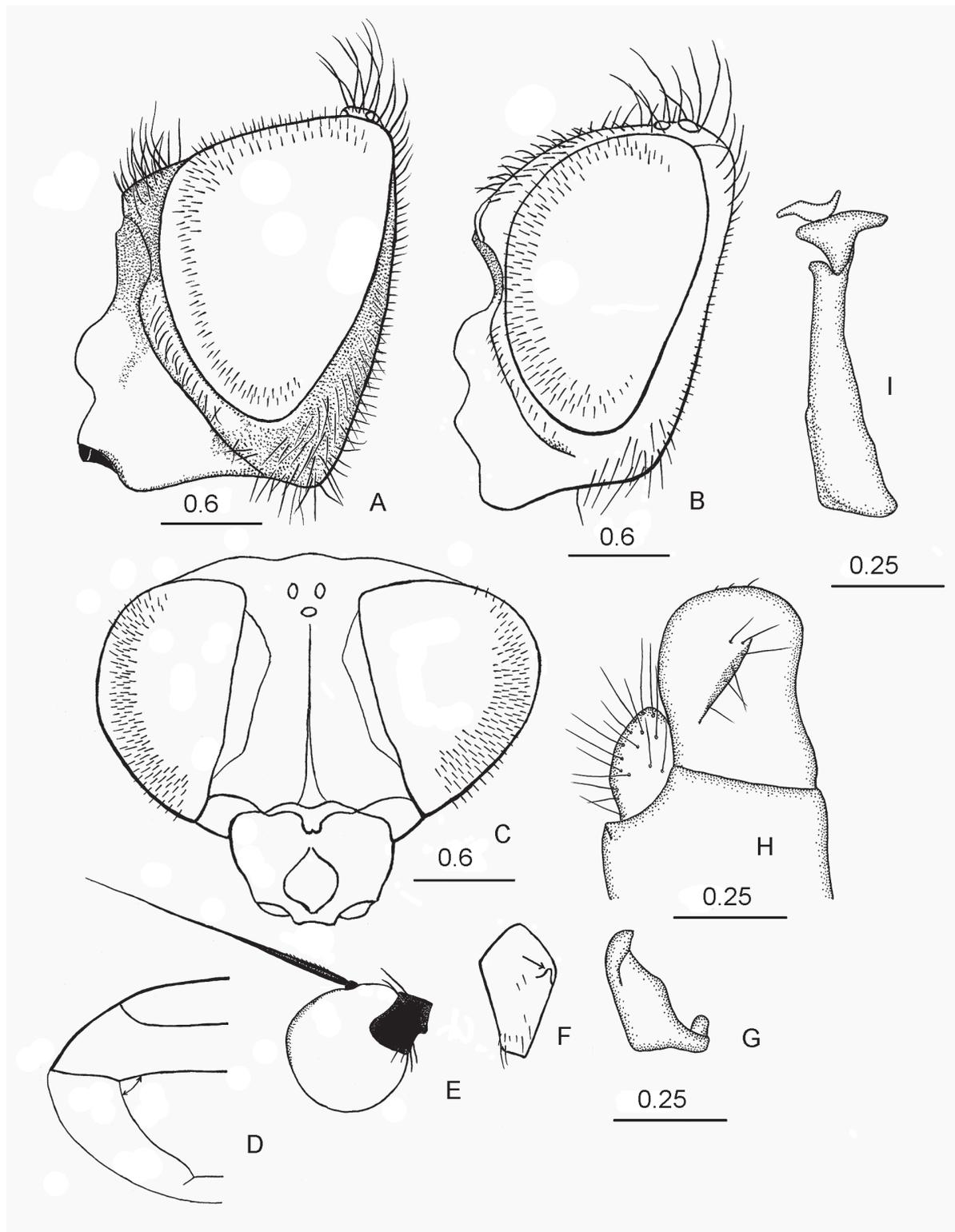


Fig. 58. *Cheilosia (Cheilosia) spinosa* sp. nov.; A, E–I = holotype, ♂ (BSJW/NME), B–D = paratype, ♀ (BSJW/NME). A–B. Head, lateral view. C. Head, dorsal view. D. Tip of wing. E. Antenna, lateral view of pedicel and basoflagellomere. F. Fore coxa. G. Superior lobe of hypandrium, lateral view. H. Surstylus and gonocercus, lateral view. I. Aedeagus and aedeagal apodeme, lateral view. Scale bars indicated in drawings.

frons without lunule. Ocellar triangle isosceles. Vertex distinctly convex, with long, fine, black pilosity, dorsally with short white and long black pilosity.

THORAX. Postpronotum black, densely whitish-grey pollinose, with short white semi-erect pilosity. Scutum fine-punctured, black, mostly very shiny, grey pollinose on notopleural area, with short, semi-erect yellow and 2–5 × longer black and yellow pilosity, and laterally also with long, fine, black bristles; postalar callus narrowly yellow anteriorly and posteriorly, with shorter yellow pilosity and up to 5 × longer black bristles; scutellum with short appressed black pilosity and very long black bristles, hind margin with many long, strong, black bristles, longer than length of scutellum. Subcutellar fringe with long, dense, white pilosity. Pleura densely grey pollinose and mostly long white pilose, patch of black pilosity

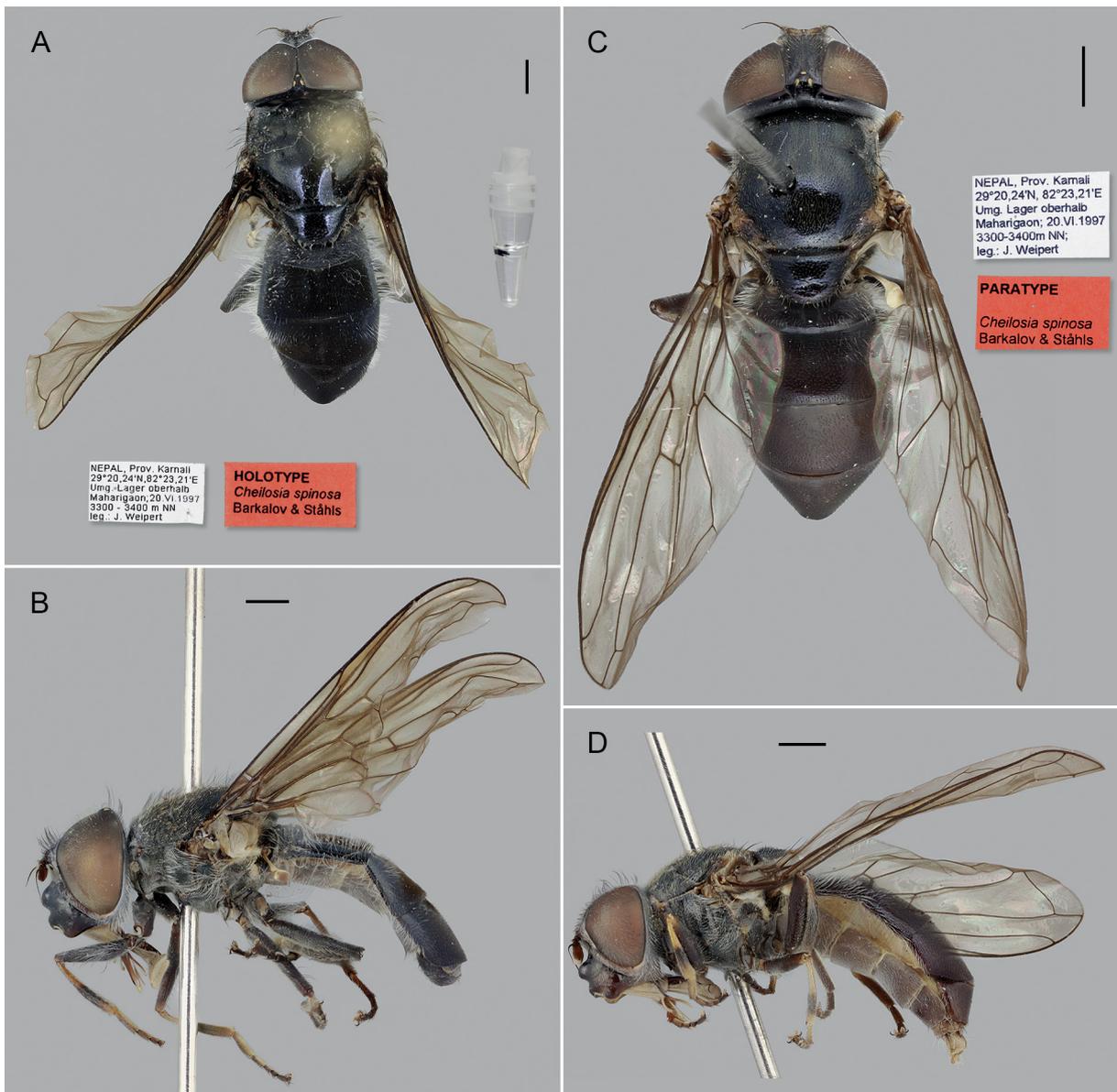


Fig. 59. *Cheilosia (Cheilosia) spinosa* sp. nov. **A–B.** Holotype, ♂ (BSJW/NME); dorsal and lateral views. **C–D.** Paratype, ♀ (BSJW/NME), dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

on postero-dorsal corner of anepisternum, katepimeron only white pilose, ventral and dorsal yellow pile patches of katepisternum distinctly separated. Metasternum short white pilose.

LEGS. Fore coxa black, densely grey pollinose, laterally with a distinct spur, short white pilose; femora black with extreme tips of fore and mid femora brownish, fore femur distinctly convex in basal $\frac{2}{3}$, posterior long pilosity white, mid femur posteriorly with white and some black pilosity near tip, hind femur ventrally without long pilosity, with strong black and brown bristles with length about $\frac{2}{3}$ of width of femur, anteriorly with some long white pile longer than width of femur; fore and mid tibia yellow with more or less broad black annulus in apical half, hind tibia mostly black, brownish in basal $\frac{1}{3}$; tarsi black dorsally, with only metatarsus of mid leg yellow in basal half.

WING. Entirely microtrichose, with brownish veins; Rs without pilosity; inner angle between veins M_1 and R_{4+5} nearly right. Haltere yellow, with knob dark-brown; calypter white with brownish-yellow rim and fringe.

ABDOMEN. Narrow, elongate, slightly narrower than scutum at level of wing base, black with bluish reflection, laterally about $\frac{1}{4}$ of tergites and posterior $\frac{3}{4}$ of tergite IV shiny, medially with dense brown pollinosity; with long white pilosity on tergites I–II and lateral parts of tergite III which, tergites I–III latero-medially also with short erect white pilosity, tergites III–IV medially with very short, appressed black pilosity. Sternites brownish, with grey pollinosity, sternites I–II only white pilose, sternite III white pilose on anterior half and with mixed appressed black and semi-erect white pilosity of different lengths on posterior half, sternite IV on anterior $\frac{1}{4}$ with appressed white pilosity and on posterior $\frac{3}{4}$ with appressed black pilosity. Genitalia with black pilosity.

Female

LENGTH. Body 10.2 mm, wing 8.5 mm.

HEAD. Face comparatively broad, distinctly broadened ventrally, moderately protruded forward, non-pilose; facial tubercle distinct, protruded, shiny; parafacia broad, somewhat broader than half of basoflagellomere width, black in dorsal $\frac{1}{3}$ and brownish-orange in lower $\frac{2}{3}$; finely grey pollinose, with appressed short white pilosity. Gena orange near eye and black otherwise, densely grey pollinose, and with white pilosity of moderate length. Lower part of occiput covered with grey pollinosity and white pilosity. Frons distinctly broadened anteriorly, with distinct lateral furrows, medially on anterior third with a short longitudinal furrow; grey pollinose near lunule and eye, otherwise shiny; covered with anteriorly inclined short yellow and black pilosity. Antennae: scape and pedicel dark-brown, basoflagellomere enlarged, rounded, orange to brownish orange, with darker antero-dorsal margin. Vertex flat, ocellar triangle isosceles; occiput in upper part shiny, without pollinosity, long black and short white pilose.

THORAX. Scutum with distinct puncturation, shiny, notopleural area slightly grey pollinose; with short appressed yellow and black pilosity, notopleura with one strong black bristle transverse suture postero-laterally and postalar callus with some moderately long and strong black bristles; scutellum shiny, with short, appressed black pilosity, hind margin with short and some long, strong black bristles not exceeding length of scutellum; scutellar fringe with mixed long and short white pilosity. Pleura densely grey pollinose, only posterior anepisternum and upper part anterior anepimeron with small macula without pollinosity; katepisternum with ventral and dorsal pile patches narrowly separated.

LEGS. Fore coxa with distinct spur, black, and anteriorly pollinose, brown and shiny posteriorly. Mid coxa brownish, grey pollinose and short white pilose. Hind coxa black, densely grey pollinose and long white pilose. Femora black with narrowly yellow base and tip, densely grey pollinose and comparatively short white pilosity; hind femur without long antero-ventral pilosity, with short black pile ventrally on apical

$\frac{2}{3}$. Fore and mid tibiae yellow, with black annulus in apical half; hind tibia black with brownish basal $\frac{1}{5}$ and tip. Tarsi black, but fore and mid metatarsi yellow.

WING. Elongated, brownish, entirely microtrichose, inner angle between venae M_1 and R_{4+5} acute. Haltere yellow with slightly darker knob; calypter pale yellow with yellowish rim and pile.

ABDOMEN. Elongated, broadest in posterior part of tergite II, shiny but tergite I completely and tergites II–IV medially with grey pollinosity, tergite V only very slightly pollinose antero-medially; pilosity white, long, erect on sides of tergites I–II and short, appressed otherwise; tergites IV–V also with some short black appressed pile postero-laterally. Sternites dark, densely grey pollinose; sternite V with appressed black pilosity. Other characters as in male.

Remarks

The presence of a baso-lateral spur baso-laterally on fore coxa is a distinct character present known in three Palearctic species of *Cheilosia*: *C. (C.) impressa* Loew, 1840, *C. (C.) schnabli* Becker, 1894 and *C. (C.) nadiiae* Barkalov & Cheng, 2004. This character is present in three additional species from Nepal, *C. (C.) falcata* sp. nov., *C. (C.) spinosa* sp. nov. and *C. (C.) spuria* sp. nov. The structure of the male genitalia (especially the superior lobes) are different in all these taxa.

Distribution

Nepal.

Cheilosia spuria sp. nov.

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Figs 60–61

Differential diagnosis

For characters distinguishing *Cheilosia (Cheilosia) spuria* sp. nov. from congenetics, see the identification key, and Differential diagnosis under *C. (C.) spinosa* sp. nov.

Etymology

‘*Spurius*’ is a Latin praenomen (personal name), with feminine form ‘*spuria*’, used during the period of the Roman Republic.

Material examined

Holotype

NEPAL • ♂; Solukhumbu, Shibuche; 27°34' N, 86°46' E; 2700–2300 m a.s.l.; 8 May 1997; M. Hauser leg. [524]; CSCA.

Paratypes

NEPAL • 1 ♂; same data as for holotype; CSCA • 1 ♂; Solukhumbu, Junbesi to Ringmo; 27°34' N, 86°35' E; 2700–3000 m a.s.l.; 12 May 1997; M. Hauser leg. [515]; CSCA • 1 ♀; Solukhumbu, E of Pangkongma; 27°34' N, 86°45' E; 3000 m a.s.l.; 17 May 1997; M. Hauser leg. [523]; CSCA • 1 ♂; same data as for preceding; labcode MZH_G412; CSCA • 2 ♂♂, 1 ♀; Solukhumbu, Sanam; 27°27' N, 86°53' E; 2700–2800 m a.s.l.; 22–23 May 1997; M. Hauser leg. [532]; CSCA • 1 ♂; Gandaki, Deng; 13 May 2013; J. Weipert leg.; labcode MZH_Y2505; IBSJW/NME.

Male

LENGTH. Body 6.8–8.8 mm, wing 7.5–8.2.

HEAD. Face bare, non-pilose, black, yellowish-grey pollinose, except facial tubercle and a small stripe at upper mouth edge shining, extreme tip of lower mouth edge also shining. Facial tubercle slightly laterally compressed, slightly more protruding than lower mouth edge. Face (frontal view) slightly divergent from level of antennal implantation to lower mouth edge; parafacia moderately broad, about $\frac{2}{3}$ of width of basoflagellomere, slightly grey pollinose, with moderately long, pale, apically decumbent pile. Frontal

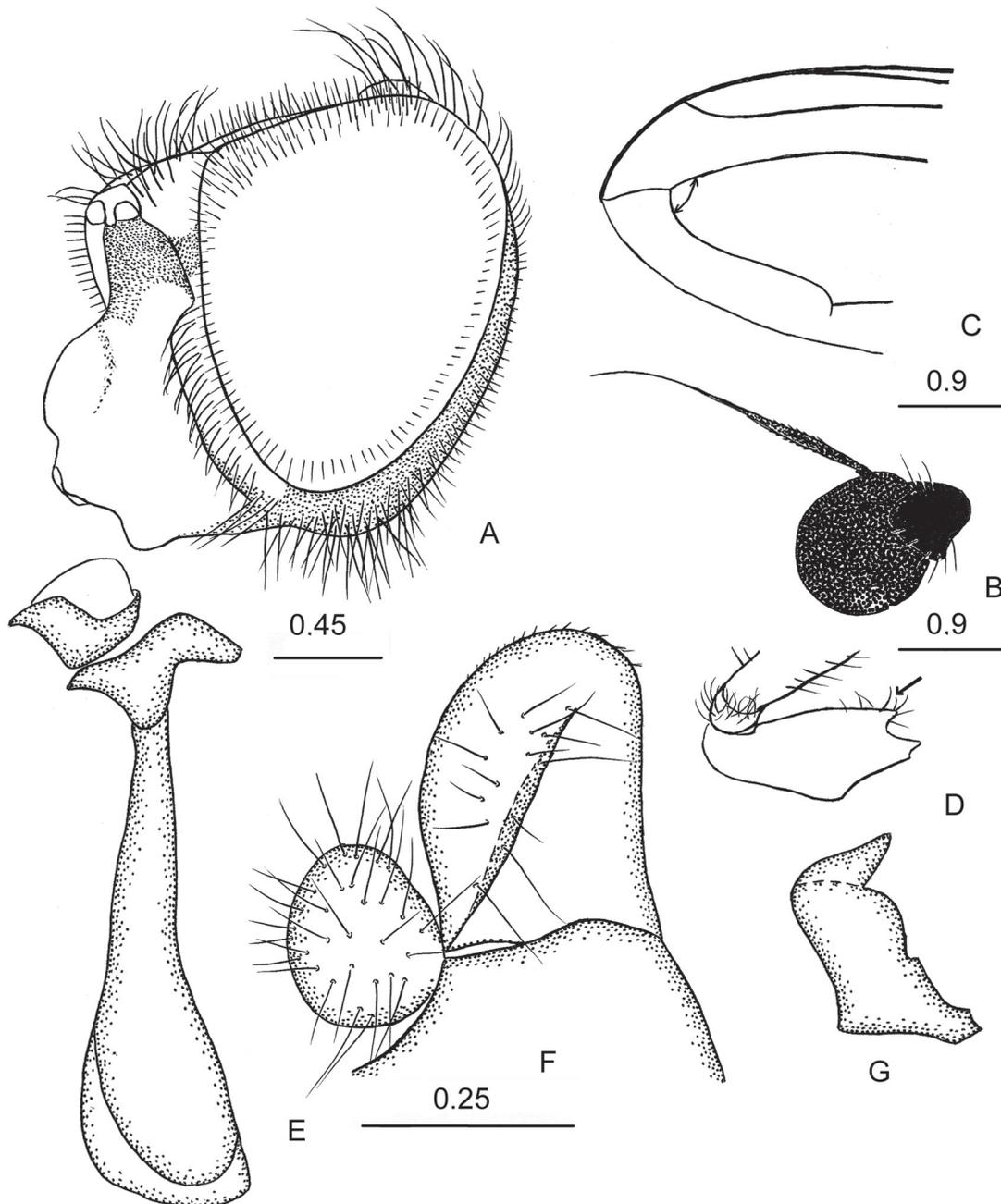


Fig. 60. *Cheilosia (Cheilosia) spuria* sp. nov., holotype, ♂ (CSCA). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Tip of wing. **D.** Fore coxa, with arrow indicating basolateral spur. **E.** Aedeagus and aedeagal apodeme, lateral view. **F.** Surstylus and gonocercus, lateral view. **G.** Superior lobe of hypandrium, lateral view. Scale bars indicated in drawings.

angle nearly right, black, slightly grey pollinose, especially laterally, median sulcus present or reduced to a small pit above frontal lunule, lunule dark yellow-brown to black, shining, antennal pits separated, vertical triangle black with long black pile, occiput black, only slightly pollinose dorsally, narrow stripe at vertical triangle shiny, sides heavily grey pollinose, occiput dorsally predominantly with long black pile with single pale pile intermixed; eye contiguity about $1.5\times$ as long as length of frons without lunule; eye with moderately long yellowish-grey pilosity, sometimes pilosity a little brownish dorsally; antenna black to blackish brown, pedicel apically with black pile dorsally and pale golden pile ventrally, basoflagellomere slightly longer than wide; arista black, bare.

THORAX. Scutum black, finely punctured, anterior one fifth and lateral parts in front of transverse suture slightly grey dusted, predominantly with long erect pale golden pilosity with intermixed scattered black pile of approximately same length, especially laterally anterior to transverse suture and anterior to scutellum, many bristly black pile laterally along wing base; scutellum shining black, occasionally base small grey pollinose, predominantly covered in long black pile, with pale pile intermixed to varying extent, hind margin with very many long black bristly pile; pleura black, completely and finely grey

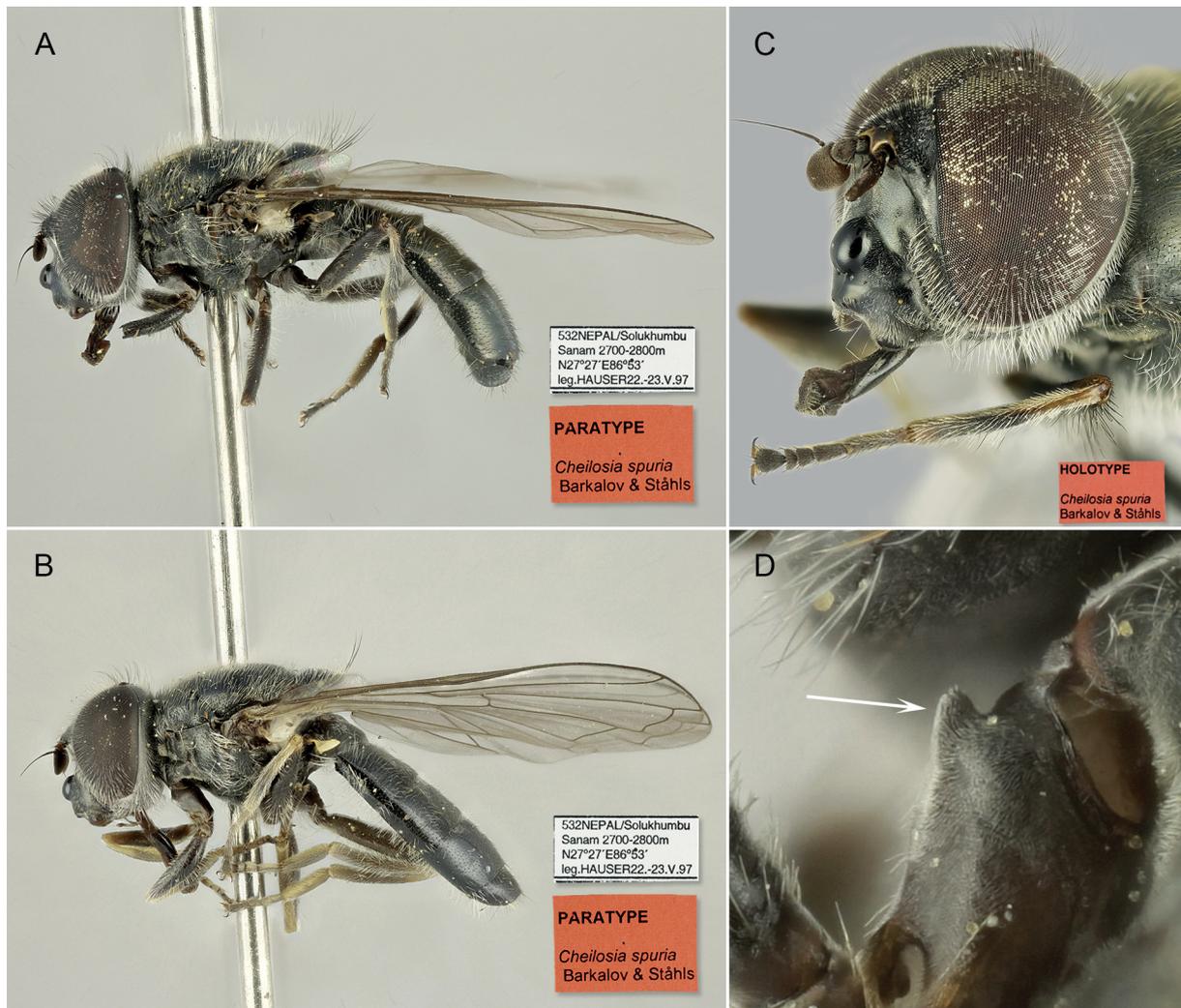


Fig. 61. *Cheilosia (Cheilosia) spuria* sp. nov. **A–B.** Paratype ♂ and ♀ (CSCA); lateral views. **C.** Holotype, ♂ (CSCA); head. **D.** Fore coxa with baso-lateral spur (CSCA). Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

pollinose, with fine yellowish-grey pilosity, except some long black bristly pile on postero-dorsal corner of anepisternum, and occasionally single black pile on antero-dorsal corner of anepimeron, katepisternum completely pilose (upper and lower pile patches connected). Metasternum with white pilosity.

LEGS. Fore coxa baso-laterally with a distinct spur; all coxa completely grey pollinose. Legs predominantly black, except extreme tip of fore and mid femur, basal $\frac{1}{3}$ and tip of fore tibia, basal $\frac{2}{5}$ and tip of mid tibia, basal $\frac{1}{4}$ of hind tibia, and mid basitarsus obscurely yellowish-brown (colour of legs variable); colour of pilosity variable, predominantly pale, except long whitish pilosity mixed with long black hairs posteriorly on apical $\frac{2}{3}$ of fore femur, some long black hairs dorsally on hind tibia and hind femur ventrally with short black pile in apical $\frac{1}{3}$.

WING. Hyaline, completely microtrichose, with blackish veins. Inner angle between M_1 and R_{4+5} nearly right. Calypter whitish with blackish rim; haltere pale brown with black knob.

ABDOMEN. Long oval; black; tergite I pale pollinose, tergites II–III slightly brownish pollinose on disc if viewed obliquely in anterior view, extreme hind margins of tergites and lateral margins shiny, tergite IV predominantly shiny, pregenital segments grey pollinose; tergites I–II predominantly pale pilose, except single black pile on the posterior corners of tergite II, tergite III with anterior margin and lateral margins with erect pale pilosity, medially and on hind margin with black adpressed pilosity, tergite IV predominantly black pilose, anteriorly and laterally with erect pale pile, black pilosity adpressed medially, but long and erect on posterior corners; pregenital segments black pilose. Sternites predominantly grey pollinose and pale pilose, except posterior half of sternite IV which is more and less shiny with adpressed black pilosity.

MALE GENITALIA. Gonostylus distinct, with only the left process developed.

Female

LENGTH. Body 7–8.2 mm, wing 6.5–8.0.

HEAD. Frons narrow, at level of antennal base about three times as wide as basoflagellomere, with fine pilosity and with narrow lateral furrows, without median furrow, but with a more or less distinct pit just above frontal lunule, lateral furrows grey dusted in anterior $\frac{1}{4}$, with a shallow transverse furrow posterior to lunule; pilosity of frons variable, from almost all black to almost all pale; occiput dorsally black shining; lunule may be paler, scape and pedicel reddish brown, basoflagellomere dark-brown and sometimes reddish postero-ventrally, larger than in male.

THORAX. Predominantly with erect pale pile, shorter than diameter of hind femur.

LEGS. Paler than in male, mid trochanter partly yellow. Calypter whitish with yellow-orange rim; haltere yellowish

ABDOMEN. More shiny than in male, with less black pilosity; sternites slightly less pollinose than in male.

Remarks

In male the pilosity of scutum is variable, with predominantly yellow pile mixes with some black, or with pilosity of mixed pale and black hairs.

Distribution

Nepal.

Cheilosia suspecta Barkalov & Cheng, 2004

Fig. 62

Material examined

NEPAL • 2 ♂♂; Gosainkunde; 14 800 ft a.s.l.; 27 Jun. 1967; Can. Nepal Exped.; CNC • 1 ♀; 27°58' N, 85°00' E; 11 100 ft a.s.l.; 26 Jun. 1967; Can. Nepal Exped.; CNC • 1 ♂; Prov. Gandaki, Namrung to Lho Baza; 2580–3100 m a.s.l.; 16 May 2013; J. Weipert leg.; labcode MZH_Y2672; BSJW/NME.

Remark

The specimens from Nepal differ from the description of *C. (C.) suspecta* by having dark colour of basoflagellomere in both male and female, dark-orange with darkened margin in the original description.

Distribution

China, Nepal.

Cheilosia vellea sp. nov.

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Figs 63, 64A–B

Differential diagnosis

Cheilosia (Floccocheila) vellea sp. nov. is morphologically close to *C. (F.) illustratoides* sp. nov. and *C. (F.) indistincta* sp. nov. For distinguishing characters, see Differential diagnosis under *C. (F.) illustratoides* sp. nov.

Etymology

The specific epithet is from the Latin 'vellus' meaning 'cut wool', referring to the dense pilosity of the species.

Material examined

Holotype

NEPAL • ♂; Prov. Karnali, SE Churta vor Pass; 3400 m a.s.l.; 5 May 1995; J. Weipert leg.; BSJW/NME.

Description

Male

LENGTH. Body 10 mm, wing 10 mm.

HEAD. Face broad, not very protruded, in anterior view distinctly broadened ventrally, black, non-pilose, densely grey pollinose, with longer microtrichia medio-laterally, with shiny stripes lacking pollinosity ventrally; facial tubercle not distinct, narrow; parafacia very broad, in broadest part almost equal to width of basoflagellomere, grey pollinose and long, yellow pilose, and with some black pilosity ventrally; gena broad, densely grey pollinose and long yellow pilose. Frons very broad, frontal angle obtuse (> 110°), grey pollinose, more dense pollinose along eye, and with long yellow and black pilosity; lunule brown, antennal pits distinctly separated. Antenna black, basoflagellomere rounded, densely brown pollinose; arista long, black, with very short pile (clearly shorter than width of arista at broadest point). Eye with dense, long black pilosity; eye contiguity shorter than length of frons. Vertex inflated, grey pollinose and long yellow pilose, ocellar triangle equilateral. Occiput densely grey pollinose, yellow pilose.

THORAX. Postpronotum black, grey pollinose and yellow pilose. Scutum grey pollinose on anterior part anterior to transverse suture, and narrowly at postalar calli and anterior to scutellum, shiny on posterior $\frac{2}{3}$ part; with dense, long pilosity – yellow on pollinose parts and black on shiny part, with a broad band of black pilosity between wing bases; without strong black bristles. Scutellum medially shiny on disc, all margins grey pollinose, with dense yellow and black pilosity, without strong bristles. Subscutellar fringe with long yellow pilosity. Pleura densely grey pollinose, with long dense pilosity, anepisternum antero-ventrally with black pile and otherwise yellow pilose, katepisternum completely covered with

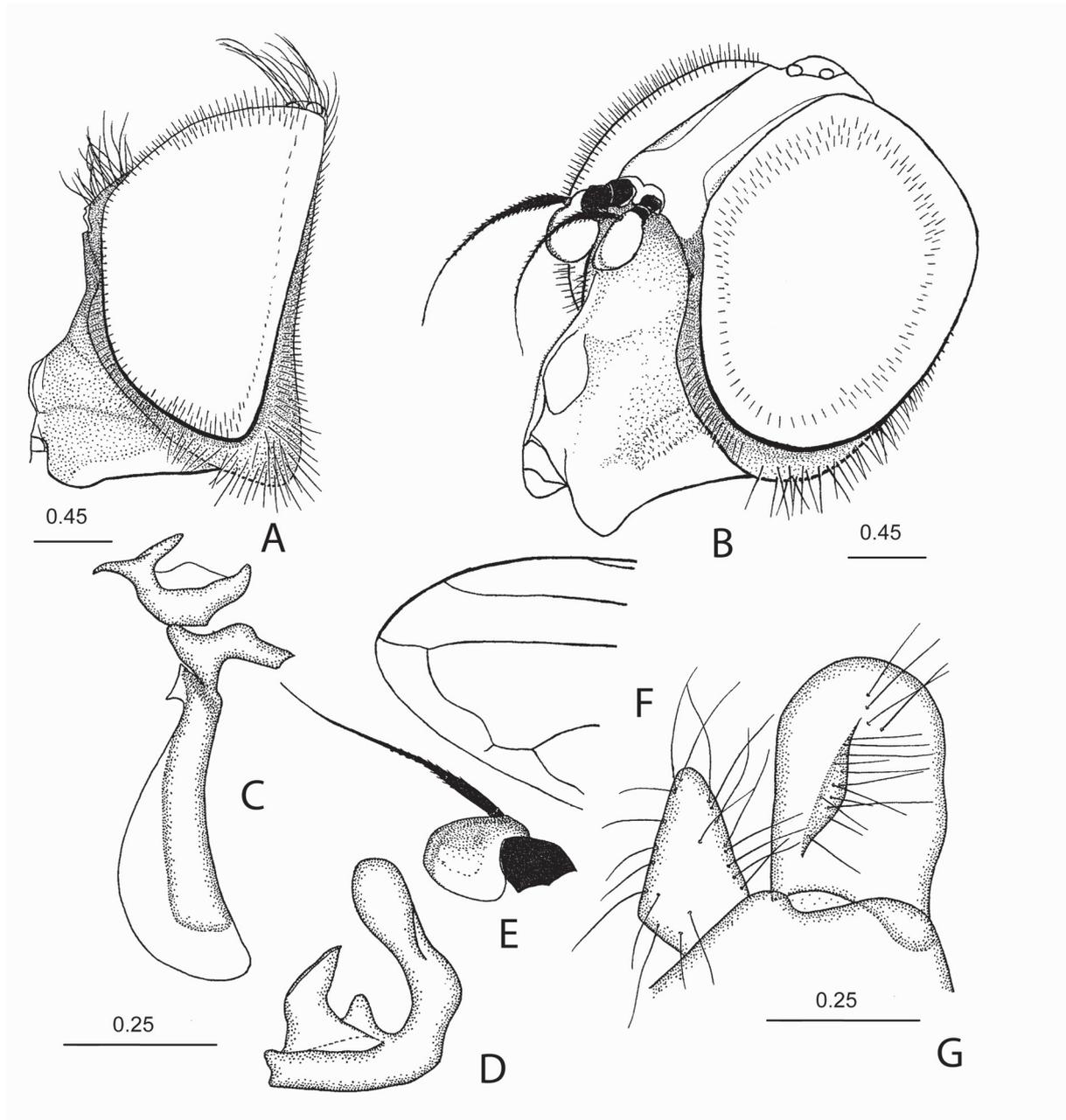


Fig. 62. *Cheilosia (Cheilosia) suspecta* Barkalov & Cheng, 2004. **A.** Male head, lateral view. **B.** Female head, anterior view. **C.** Aedeagus and aedeagal apodeme, lateral view. **D.** Superior lobe of hypandrium, lateral view. **E.** Basoflagellomere, lateral view. **F.** Tip of wing. **G.** Surstylus and gonocercus, lateral view. After Barkalov & Cheng 2004. Scale bars indicated in drawings.

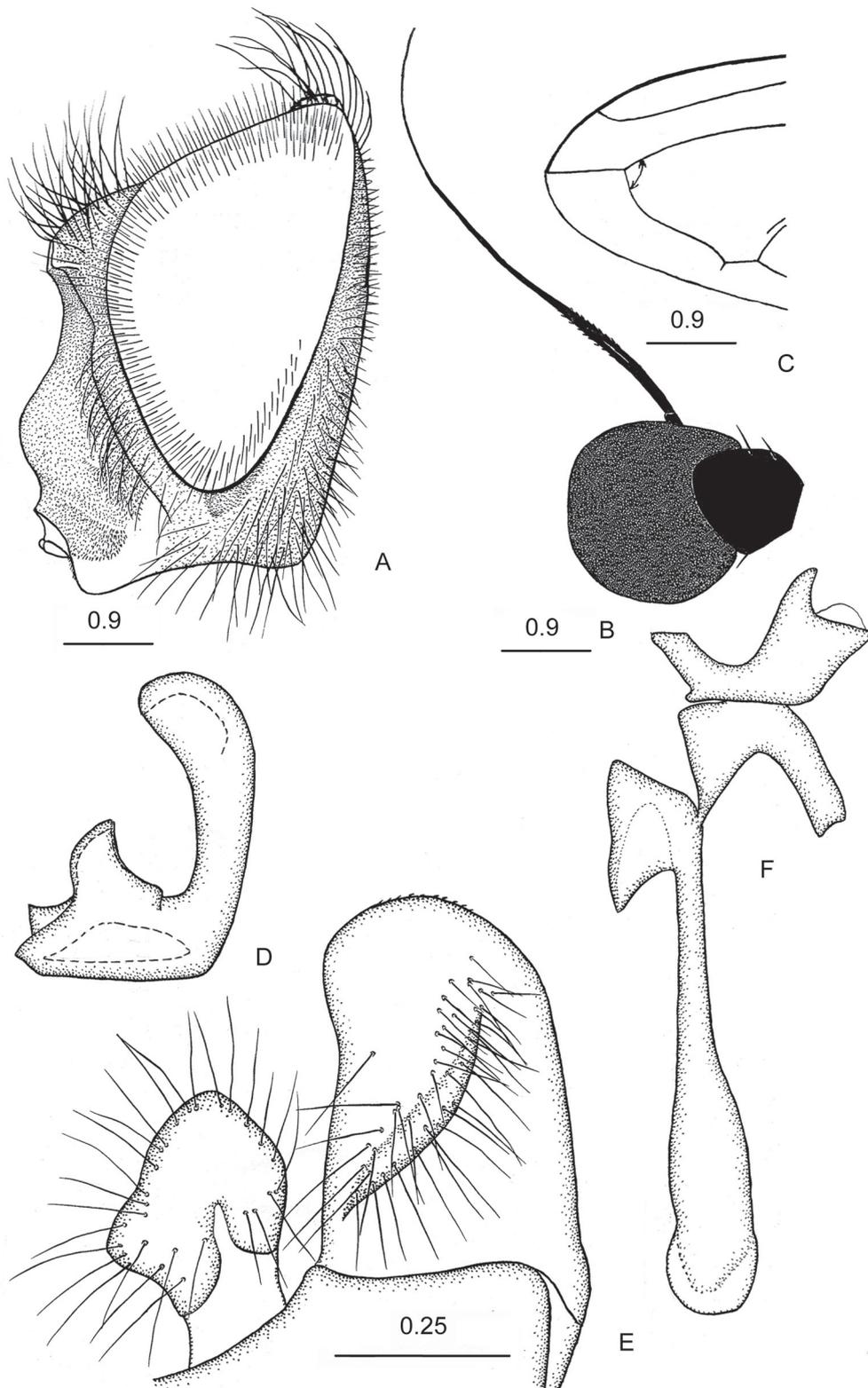


Fig. 63. *Cheilosia (Floccocheila) vellea* sp. nov., holotype, ♂ (IBSJW/NME). **A.** Head, lateral view. **B.** Antenna, lateral view of pedicel and basoflagellomere. **C.** Tip of wing. **D.** Superior lobe of hypandrium, lateral view. **E.** Surstylus and gonocercus, lateral view. **F.** Aedeagus and aedeagal apodeme, lateral view. Scale bars indicated in drawings.

mixed black and yellow pilosity, anepimeron with yellow pilosity. Metasternum with dense black pilosity, and a few long yellow pile.

LEGS. Coxa black, grey pollinose and black pilose, fore coxa without baso-lateral spur; femora black with yellowish tips, covered with dense long black pilosity anteriorly up to 1.5–2× longer than width of femur, and yellow pile on posterior-basal $\frac{2}{3}$ part; tibia brown on basal $\frac{1}{3}$ – $\frac{1}{2}$ and on tips and black otherwise, with black pilosity; tarsi black dorsally and yellow ventrally.

WING. Entirely microtrichose, finely brownish in anterior half and along cross veins, inner angle between veins M_1 and R_{4+5} right. Calypter mostly yellow, black basally, fringe yellow. Haltere with stem yellow and black knob, knob ventrally with some short pile.

ABDOMEN. Oval, in broadest part broader than scutum at level of wing base, brownish-black; tergite I grey pollinose and yellow pilose, and some black pilosity laterally, tergite II with yellow pilosity, tergite III with black pilosity antero-laterally and yellow pilose otherwise, tergite IV with only yellow pilosity [pilosity almost completely worn off medially on tergites II–IV]. Sternites black-brown with mostly black, long pilosity, sternite I mainly with long, yellow pilosity, and posterior margins of sternites I and III with some long yellow pile.

Female

Unknown.

Distribution

Nepal.

Cheilosia versa sp. nov.

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Figs 64C–E, 65

Differential diagnosis

Cheilosia versa sp. nov. is morphologically similar to *C. flavigena* sp. nov., but differs by having yellow pilosity on mesonotum (vs yellow and black in *C. flavigena* sp. nov.), presence of pilosity also on ventral part of face (vs only latero-dorsally in *C. flavigena* sp. nov.), basoflagellomere smaller and distinctly darkened antero-dorsally (vs larger in size and completely orange in *C. flavigena* sp. nov.), and bristles on scutellum margin shorter than length of scutellum (vs longer or almost as long in *C. flavigena* sp. nov.).

Cheilosia versa sp. nov. is also similar to *Cheilosia* (*Neocheilosia*) *komabaensis* Shiraki, 1968 (see figs in Barkalov & Ichige 2016), both species have longer pile latero-dorsally on the face, but *C. versa* sp. nov. differs by having pilosity in lower part of face and yellow maculae laterally on frons, and parafacia yellow pollinose. A subgeneric classification is not proposed as the taxon is described based on a single female.

Etymology

The specific epithet is from the Latin, meaning ‘with the order changed’ or ‘with the relations reversed’, referring to the unclear infrageneric placement.

Material examined

Holotype

NEPAL • ♀; Ktmd. [Kathmandu], Godavari; 6000 ft a.s.l.; 12 Aug. 1967; Can. Nepal Exped.; CNC.

Description

Female

LENGTH. Body 6.7 mm, wing 7.0 mm.

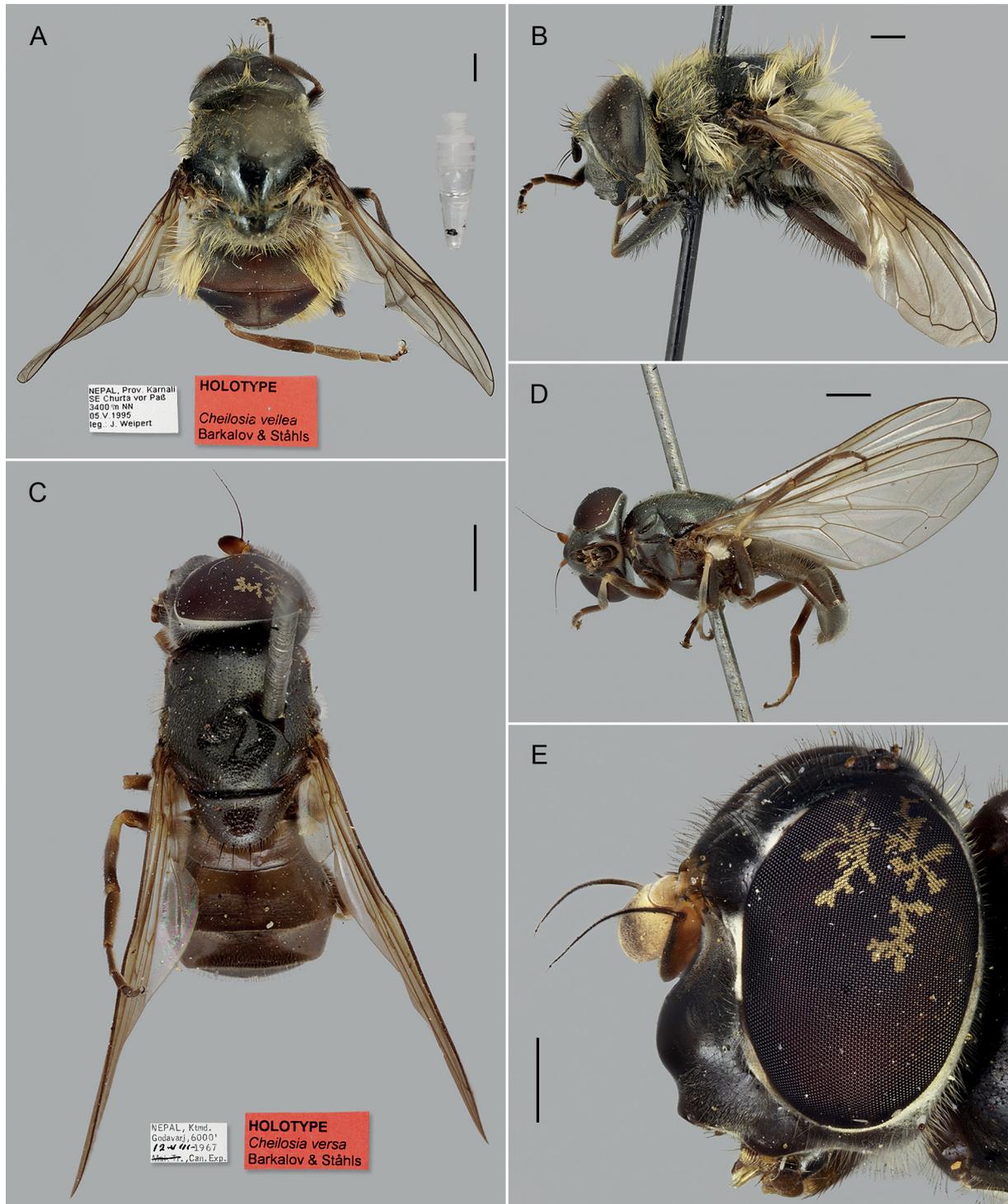


Fig. 64. A–B. *Cheilosia (Floccocheila) vellea* sp. nov., holotype ♂ (BSJW/NME); dorsal and lateral view. – C–E. *Cheilosia versa* sp. nov., holotype, ♀ (CNC); dorsal and lateral views. Scale bars: A–D = 1 mm; E = 0.5 mm.

HEAD. Face moderately broad, with parallel sides, shiny black, laterally and under antenna finely grey pollinose, and with short black pilosity on ventral half; facial knob broad, roundish, not very prominent; parafacia narrow, in broadest part almost equal half of basoflagellomere width, brownish and velvety silvery pollinose and with short, scattered white pilosity; gena narrow, black, finely grey pollinose with comparatively short white pilosity. Frons moderately broad, distinctly narrowed posteriorly, anterior $\frac{1}{3}$ inflated, shiny, with distinct transversal stripe of grey pollinosity, and elongated spots of brownish pollinosity near eyes; mid furrow developed on anterior inflated part, invisible in posterior part; covered with short pale pilosity. Lunule yellow, antennal pits distinctly separated. Antenna yellow, antero-dorsal margin of basoflagellomere distinctly darkened; basoflagellomere oval, moderate in size, arista long, black, with very short pilosity. Eye with very short, scattered white pilosity (visible under high magnification). Ocellar triangle equilateral, shiny, covered with short black pilosity. Occiput shiny, pilosity mainly white, intermixed with some black pile.

THORAX. Postpronotum brownish, shiny with short white pilosity. Scutum and scutellum, finely punctured, matte, anterior part of scutum with two longitudinal medial grey stripes extending about $\frac{2}{3}$ of length of scutum, with short, semi-erect, yellow pilosity; scutum posterior of transverse suture laterally with a few

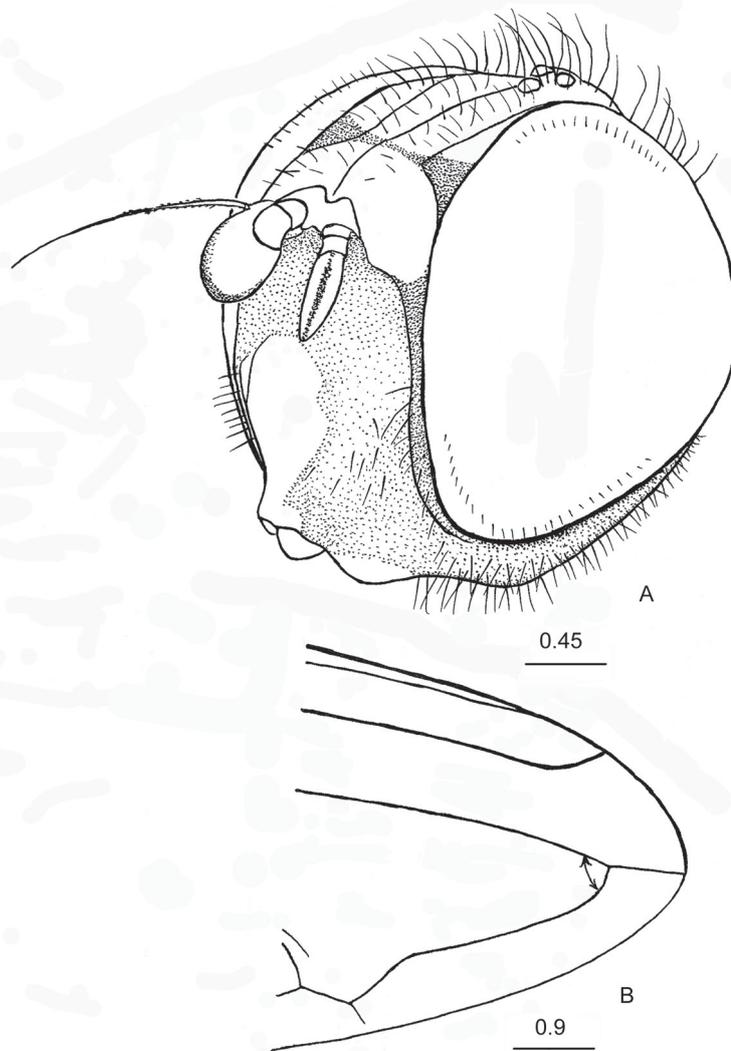


Fig. 65. *Cheilosia versa* sp. nov., holotype, ♀ (CNC). **A.** Head, lateral view. **B.** Tip of wing. Scale bars indicated in drawings..

black bristles; postalar callus with one fine black bristle; scutellum hind margin with six distinct black bristles, all shorter than length of scutellum. Subscutellar fringe short, yellow. Pleura brownish-black, finely grey pollinose and short white pilose; anterior anepisternum without longer pilosity, katepisternum largely covered with white pilosity except on anterior part; metasternum with short white pilosity.

LEGS. Coxae brownish-black with grey pollinose and white pilosity, fore coxa without baso-lateral spur; femora black with extreme tips yellow, covered with short yellow pilosity; tibia with yellow basal $\frac{1}{3}$ – $\frac{1}{2}$ and tips and blackish otherwise; fore and hind tarsi black dorsally, mid tarsus with segments 1–3 of yellowish-brown and segments 4–5 brownish-black.

WING. Hyaline with yellow veins, completely microtrichose, Rs without short pile, inner angle between veins M_1 and R_{4+5} right. Calypter white with yellow fringe, haltere yellow.

ABDOMEN. Oval, in broadest part distinctly broader than scutum at level of wing base; brownish-black, paler in colour medially, shiny, but completely covered with fine brown pollinosity with more or less indistinct patches of denser pollinosity laterally on tergites I–III; tergites II–III with erect, yellow short pilosity on lateral parts, and adpressed and semi-adpressed short black pilosity medially, tergites I and IV completely with short erect yellow pilosity. Sternites brownish, grey pollinose, with short yellow pilosity, posterior margin of sternite IV with a few black pile.

Male

Unknown.

Distribution

Nepal.

Cheilosia weiperti sp. nov.

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Figs 66–67

Differential diagnosis

Cheilosia (*Cheilosia*) *weiperti* sp. nov. is a slender, comparatively short species, with moderately long and dense pilosity, with a typical structure shared by taxa of *Cheilosa* s. str. of the distiphallus (apical sclerite of the aedeagus-complex). *Cheilosia* (*C.*) *weiperti* sp. nov. differs from all species of *Cheilosia* by set of the following characters: face protruded with facial tubercle in lower part, facial tubercle of distinct shape, scutellum with long, black, bristle-like pile (much longer than length of scutellum), antennae black, mesonotum black, fore coxa without baso-lateral spur. The species has a very pronounced sexual dimorphism, especially in colour of the legs. A similar shape of face, wing venation, and occurrence of males and females simultaneously at the same locality lends support to their conspecificity. *Cheilosia weiperti* sp. nov. is most similar to *C. suspecta* Barkalov & Cheng, 2004 (Fig. 62), and can be differentiated by characteristic shape of superior lobe.

Etymology

The species is named after and in honour of Dr Jörg Weipert (Plaue, Germany), who collected an impressive amount of *Cheilosia* spp. in Nepal and allowed us to study the material.

Material examined

Holotype

NEPAL • ♂; Prov. Mahakali, Shinae bis Hochebene vor Api bei Sare Duru [Shinae to plateau before Api near Sare Duru]; 3400–2800 m a.s.l.; 7 Jun. 2005; J. Weipert leg; BSJW/NME.

Paratypes

NEPAL • 19 ♂♂, 12 ♀♀; same data as for holotype; BSJW/NME • 9 ♂♂, 15 ♀♀; Prov. Mahakali, Lager an Chamliya Khola bei Shinae [camp at Chamliya Khola near Shinae]; 29°53'35" N, 80°56'30" E; 2800 m a.s.l.; 6–10 Jun. 2005; J. Weipert leg.; BSJW/NME • 17 ♂♂, 6 ♀♀; Prov. Mahakali, Hochlager vor Api bis Lager an Chamliya Khola bei Shinae [camp before Api to camp at Chamliya Khola near Shinae]; 3400–2800 m a.s.l.; 10 Jun. 2005; J. Weipert leg.; BSJW/NME • 1 ♂, 1 ♀; Prov. Mahakali, Hochlager vor Api bis Lager an Chamliya Khola bei Batar [camp before Api to camp at Chamliya Khola near Batar]; 2000 m a.s.l.; 11 Jun. 2005; J. Weipert leg.; BSJW/NME.

Description

Male

LENGTH. Body 6.5–7.3 mm, wing 8–9 mm.

HEAD. Face in anterior view narrow, in lateral view forwardly protruded; black, grey pollinose except shiny facial tubercle and areas around mouth margin; non-pilose; facial tubercle in lower part of face, not distinct, in lateral view gradually sloping; parafacia moderate in width, in broadest part almost equal to basoflagellomere width, densely grey pollinose and very short, white pilose; gena narrow, grey pollinose and short yellow pilose. Frons somewhat inflated, densely brown pollinose and black pilose; lunule brown, antennal pits broadly separated. Antenna black, basoflagellomere rounded, with dense brown pollinosity; arista long, black with very short pilosity; antennal pits separated. Eye completely covered with short, not dense pale pilosity; eye contiguity longer than length of frons without lunule. Vertex inflated with long, black pilosity, ocellar triangle equilateral. Occiput with long black and short yellow pilosity.

THORAX. Postpronotum black with paler posterior margin, densely greyish-yellowish pollinose and black pilose. Scutum fine-punctured, black, with bluish reflection, with slight grey-brown pollinosity; pilosity black, erect short and 2–3 × longer black pilosity, in posterior part pilosity distinctly longer, in anterior part also with some short yellow semi-erect pilosity; scutum laterally with some long black bristles; postalar callus with a few very strong black bristles; scutellum black pilose, hind margin with black pilosity longer than scutellum length. Subscutellar fringe long, dense yellow. Pleura black, with bluish reflection, grey pollinose and pilosity mixed black and yellow; anepisternum postero-dorsally with long and strong black bristles; katepisternum with dorsal and ventral pile patches widely separated; metasternum with some long yellow pilosity.

LEGS. Mainly black; fore coxa without baso-lateral spur; coxae brown or black, grey pollinose and yellow pilose; trochanter brown or pale brown; femora basally and in apical 1/3 brown; basal half of tibia and tips sometimes brownish; fore femur with posterior long pilosity black, mid femur with posterior pilosity black and yellow, hind femur with ventral pilosity black and yellow; all tarsi black, hind metatarsus very long, as long as or longer than total length of other tarsal segments.

WING. Long and narrow, slightly brownish, completely covered with microtrichia, inner angle of M_1 and R_{4+5} right, vein Rs with a few short black pile. Haltere and calypter bright yellow.

ABDOMEN. Elongate, in broadest part distinctly narrower than mesonotum at level of wing base, shiny black with bluish reflection laterally and on all of tergites I and IV, with dense brown pollinosity medially on tergites I–III, laterally shiny parts form large maculae; long yellow pilose, and some black pilosity on posterior part of tergite IV. Sternites shiny but slightly yellowish pollinose; long yellow pilose, sternite IV also with short, appressed black pilosity.

Female

LENGTH. Body 6–7 mm, wing 8–8.5 mm.

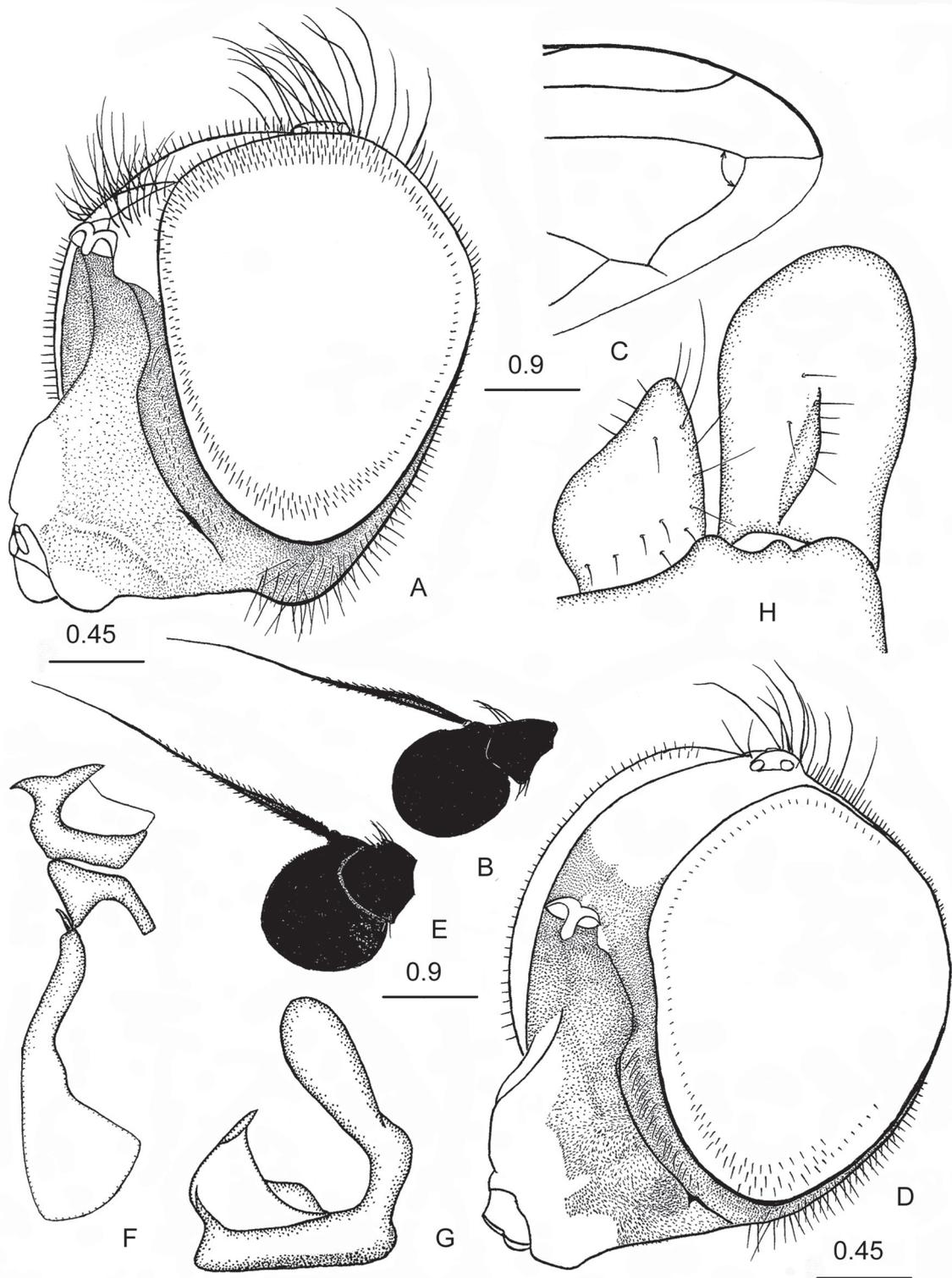


Fig. 66. *Cheilosia (Cheilosia) weiperti* sp. nov.; A–C, F–H = holotype, ♂ (BSJW/NME), D–E = paratype ♀ (BSJW/NME). A, D. Head, lateral view. B, E. Antenna, lateral view of pedicel and basoflagellomere. C. Tip of wing (bent arrow?). F. Aedeagus and aedeagal apodeme, lateral view. G. Superior lobe of hypandrium, lateral view. H. Surstylus and gonocercus, lateral view. Scale bars indicated in drawings.

HEAD. Face very narrow, in anterior view parallel-sided; parafacia black dorsally and blackish-brown or yellow ventrally, covered with slight pollinosity and very short (microtrichia-like) white pilosity; gena narrow, brown to black with whitish pollinosity and short, scattered yellow pilosity. Frons narrow, slightly broadened anteriorly, black, sometimes brownish near eye, with two longitudinal furrows, a medial furrow only visible at antennal base, shiny with spots of grey pollinosity at antero-lateral corners, covered with short semi-appressed yellow and scattered longer black, erect pilosity. Antenna with basoflagellomere slightly bigger than in male, black with dense brown pollinosity; arista long with distinct pilosity. Eye with very short white pilosity only visible under high magnification, length of pile 1–2× ommatidia width.

THORAX. Postpronotum black to yellow. Scutum black with bluish reflection, with dense brown pollinosity in anterior part, anteriorly with short appressed, yellow pilosity, otherwise with black short, appressed and semi-erect pilosity, laterally also with strong, long black bristles. Scutellum with short, mostly black

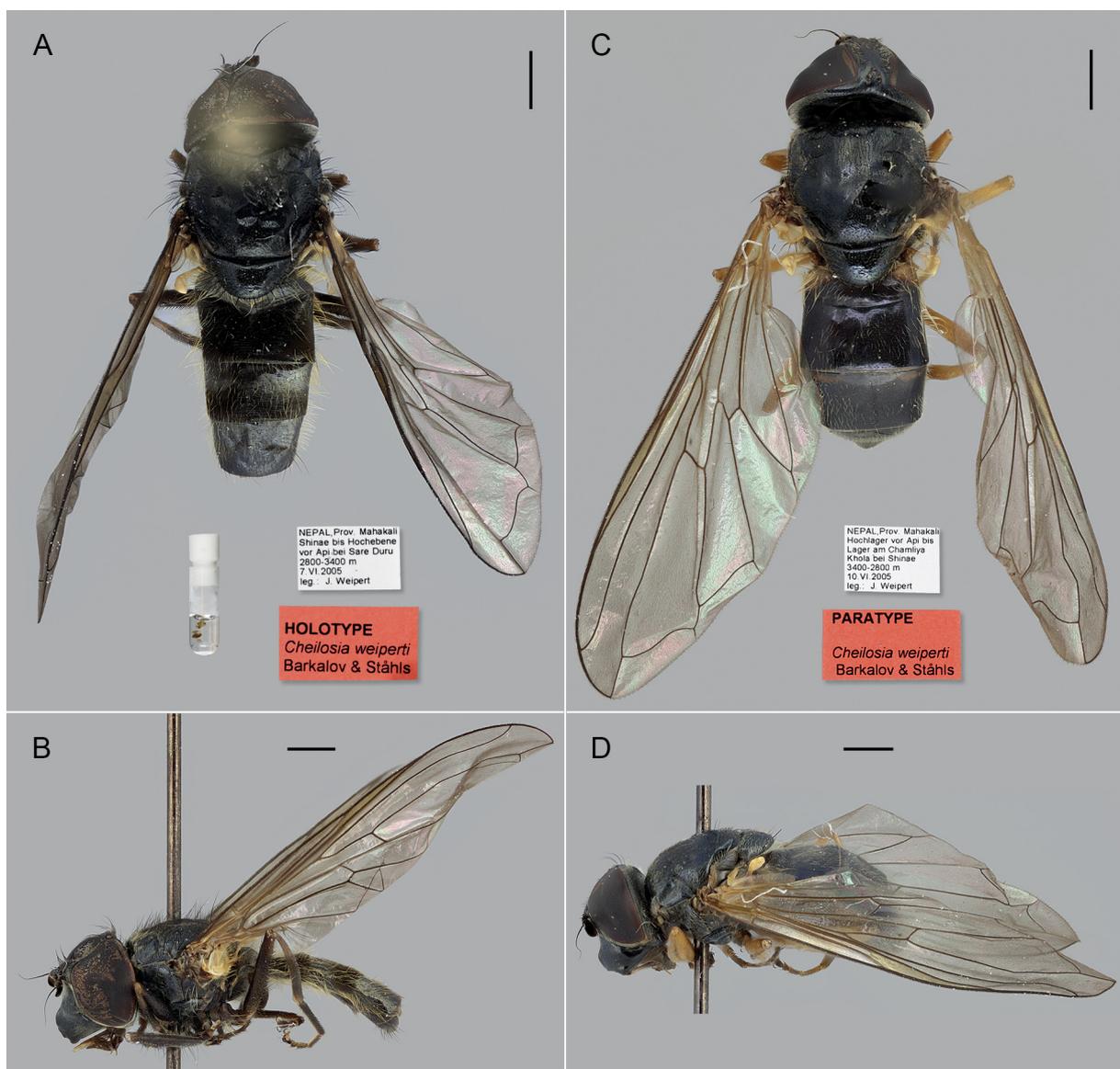


Fig. 67. *Cheilosia (Cheilosia) weiperti* sp. nov. **A–B.** Holotype, ♂ (BSJW/NME); dorsal and lateral views. **C–D.** Paratype, ♀ (BSJW/NME); dorsal and lateral views. Photo: Pekka Malinen, FMNH Luomus. Scale bars = 1 mm.

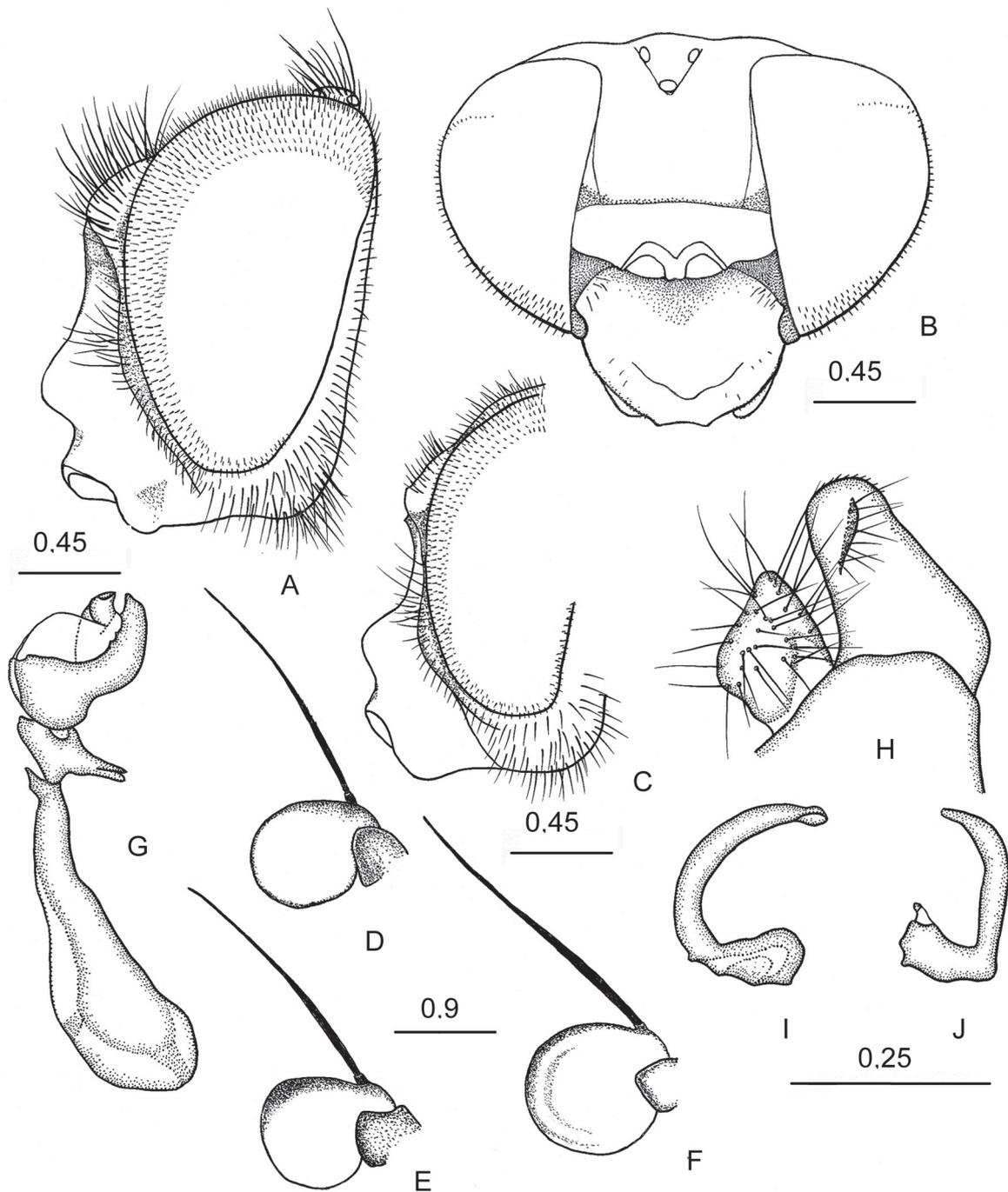


Fig. 68. *Cheilosia* (*Neocheilosia*) *komabaensis* Shiraki, 1968; A, D–E, G–J = ♂, B–C, F = ♀. A, C. Head, lateral view. B. Head, dorsal view. D–F. Antenna, lateral view of pedicel and basoflagellomere. G. Aedeagus and aedeagal apodeme, lateral view. H. Surstylus and gonocercus, lateral view. I–J. Superior lobes of hypandrium, lateral view. After Barkalov & Ichige 2016. Scale bars indicated in drawings.

pilosity mixed with some yellow pilosity, hind margin with two long and strong bristles, in addition to some shorter, less strong black bristles.

LEGS. Yellow, except tarsi dorsally variably blackish to brownish.

ABDOMEN. Black, narrow, tergites I–III slightly pollinose but shiny, tergites IV–V more densely pollinose; tergite I sometimes with small yellow maculae on antero-lateral corners, and tergite III with narrow yellow fasciae antero-laterally; sternites with slight pollinosity, and with yellow, adpressed pilosity. In other characters as the male.

Distribution

Nepal.

Discussion

The ML analysis of the COI barcode clusters the Nepalese species within the established subgenera or species groups of the Palearctic area (Fig. 1), only *C. yunnanensis* Barkalov & Ståhls, 2015 and *C. nuda* Shiraki, 1930 are not resolved as their members. Claussen & Weipert (2003) concluded that of the Syrphidae fauna studied by them of West Nepal (no species of *Cheilosia* included), a higher percentage of the species could be classified as Palearctic, or as closer allied with the Palearctic species, than to those classified as being primarily Oriental. A study by Barkalov (2020) on the *Cheilosia* fauna of the mountainous regions of Central Asia reported 38 species, and found similar proportions of species for the two first mentioned subgenera, 15 species of *Cheilosia* s. str. (11 species in the present study) and 14 species of *Montanocheila* (10), but the species number for subgenus *Taeniochilosia* was higher, totalling five species.

The shape of the facial tubercle is very variable in *Cheilosia* spp., ranging from very broad horizontally (occupying most of face) to very small and/or narrow and only slightly vertically extended. Species with strongly laterally compressed facial tubercles are not known from the Western Palearctic, but this character was observed for several species occurring in Nepal (e.g., *Cheilosia hauseri* sp. nov., *C. falcata* sp. nov., and *C. weiperti* sp. nov.).

The large number of new species proposed in this paper highlights the still prevailing incomplete knowledge of this speciose genus in the montane regions of the Palearctic and Oriental realms. Considering the number of species here described based on only one or two specimens and the higher subgeneric diversity, it is highly likely that there are many more undescribed species to be discovered in the Himalayan region sensu lato. Additionally, the material studied here originate from Western and Central Nepal, and the *Cheilosia* fauna of Eastern Nepal remains unexplored.

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Supplementary files

Supp. file 1. Data on species used for molecular analysis including GenBank codes.
<https://doi.org/10.5852/ejt.2022.829.1863.7317>

Supp. file 2. Neighbor-Joining distance tree for *Cheilosia* spp.
<https://doi.org/10.5852/ejt.2022.829.1863.7317>