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Monograph

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Taxonomic revision of the southern African *Colletes fasciatus* species group (Hymenoptera: Colletidae)

Tina ZABEL [1] & Michael KUHLMANN [2,*]

[1,2] Zoological Museum, University of Kiel, Hegewischstraße 3, D-24105 Kiel, Germany.

[*] Corresponding authors: mkuhlmann@zoolmuseum.uni-kiel.de
[1] Email: tina.zabel@gmx.de

[1] urn:lsid:zoobank.org:author:6EBE342F-BC68-43BA-B40C-A19CABF7B001
[2] urn:lsid:zoobank.org:author:B99AE0ED-FA89-4DFE-A658-1C8DF37F9FAB

Abstract. Fourteen new species of the *Colletes fasciatus* species group are described, all of them endemic to the winter rainfall area in South Africa: *C. ascopalis* sp. nov. ♀, *C. carolinae* sp. nov. ♀♂, *C. cedarbergensis* sp. nov. ♀, *C. fabiani* sp. nov. ♀♂, *C. fuscitergus* sp. nov. ♂, *C. khoisanorum* sp. nov. ♀, *C. kogelbergensis* sp. nov. ♀♂, *C. littoralis* sp. nov. ♀, *C. longitarsus* sp. nov. ♂, *C. peerboomi* sp. nov. ♀, *C. richtersveldensis* sp. nov. ♀, *C. ruschia* sp. nov. ♀♂, *C. spinipes* sp. nov. ♂, *C. troetroeensis* sp. nov. ♀. Two species are synonymized based on newly recognized sex associations: *C. katharinae* Kuhlmann, 2007 syn. nov. is synonymized with *C. infracognitus* Cockerell, 1937 and *C. bokkeveldi* Kuhlmann, 2007 syn. nov. with *C. zygophyllum* Kuhlmann, 2007. The previously unknown female of *C. inornatus* Cockerell, 1946 is described for the first time and new records of already described species are added. All of the currently known 37 species of the *C. fasciatus*-group are imaged and included in a key to facilitate their identification.

Keywords. *Colletes*, bees, South Africa, new species, taxonomy.

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Introduction

The highest diversity of species of wild bee is found in arid, warm, Mediterranean climate regions (Michener 2007; Danforth *et al.* 2019) that are characterized by mild, rainy winters and hot, dry summers (Cowling *et al.* 1996). One of these hotspot regions is the Greater Cape Floristic Region (GCFR) (Fig. 1) (Kuhlmann 2005, 2009) comprising the winter rainfall region of western South Africa and southwestern Namibia (Fig. 2) (Jürgens 1997; Born *et al.* 2007; Linder *et al.* 2010). The GCFR is composed of two biomes, the Cape Floristic Region (CFR) of the fynbos biome and the Succulent Karoo biome (Born *et al.* 2007), both plant diversity hotspots of global importance (Myers *et al.* 2000). However, this area is equally a center of bee diversity (Kuhlmann 2009), with 95 % of the species found in the winter rainfall region being strictly endemic to the area (Kuhlmann 2005).

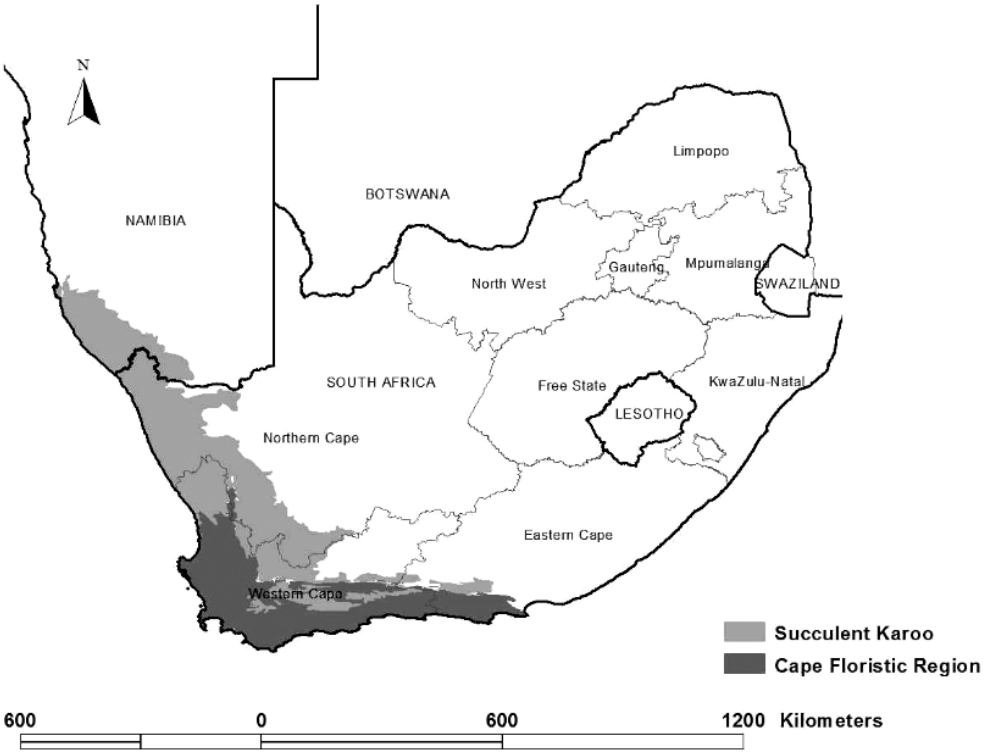

Fig. 1. The Greater Cape Floristic Region consisting of the Core Cape Floristic Region and the Succulent Karoo (after Brownlie *et al*. 2005, modified).

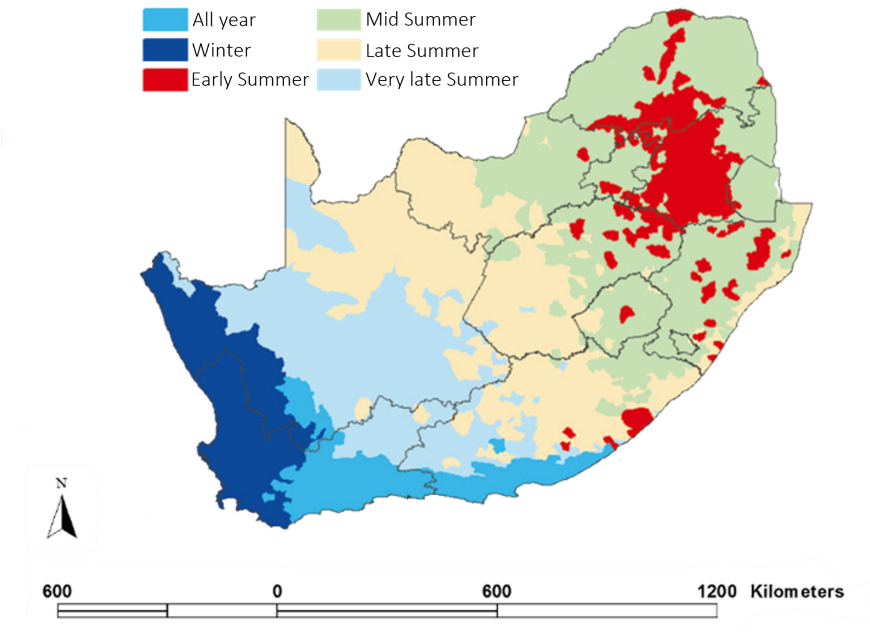

Fig. 2. Rainfall seasonality in South Africa (after Garnas *et al*. 2016, modified).

Pollinators have played a major role in speciation in the GCFR (van der Niet & Johnson 2009). As bee-plant interactions are vulnerable to disruption caused by climate change this could potentially increase the risk of extinction in plants and also bees (Kuhlmann *et al.* 2012). Thus, it is essential for effective conservation and understanding evolutionary processes to document the largely understudied wild bee fauna of the GCFR and to make it accessible for further research by providing taxonomic revisions, including the description of the numerous new species, and illustrated keys for identification.

One of the most species-rich bee genera in the GCFR is *Colletes* Latreille, 1802 with at least 63 species recorded, most of them endemic. This includes the 37 species of the *C. fasciatus*-group treated in this publication and 26 species of other species groups, of which at least nine are undescribed (Kuhlmann unpubl.). *Colletes* are distributed almost worldwide except Antarctica, Australia, Madagascar and most of Southeast Asia (Michener 2007; Kuhlmann *et al.* 2009). Currently, 521 species of *Colletes* have been described (Ascher & Pickering 2022), with the total number estimated to exceed 700 species (Kuhlmann unpubl.). Thus, the relatively small area of the GCFR harbours a significant portion of the global diversity of the species comparable to the size of the fauna of *Colletes* of entire Europe (Nieto *et al.* 2014).

A defining feature of *Colletes* is the second recurrent vein, which is sigmoidally bent outward in the posterior part (Fig. 3A), while a bilobate glossa (Fig. 3B) is typical for the family Colletidae Lepeletier, 1841 (Michener 1989, 2007). A morphological feature by which the genus *Colletes* can be distinguished

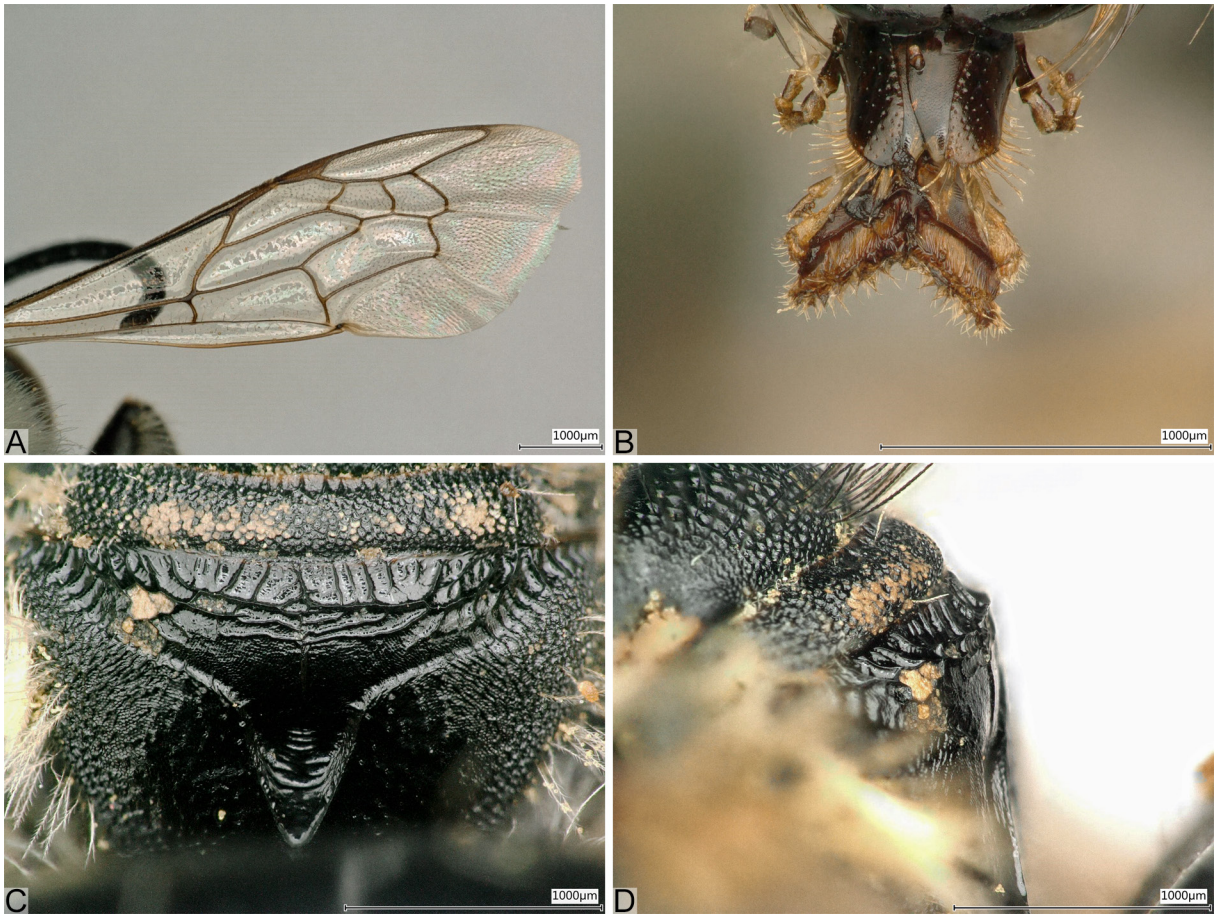

Fig. 3. Morphological characters defining the bee genus *Colletes*. **A**. Fore wing, *C. fasciatus* Smith, 1853, ♂. **B**. Glossa, *C. watmoughi* Kuhlmann, 2007, ♀. **C**. Propodeum, *C. ruschia* sp. nov., ♀, paratype (CMK), posterior view. **D**. Propodeum, *C. ruschia* sp. nov., ♀, paratype (CMK), lateral view.

from other Colletinae Lepeletier, 1841 is the base of the propodeum that is subhorizontal and usually divided by longitudinal carinae or low sinuous rugae (Fig. 3C–D) (Ferrari & Packer 2021). Posteriorly, this zone may be limited by a transverse carina, a sharp change in slope or sculpture (Michener 1989, 2007). In sub-Saharan Africa, *Colletes* is easily identified because it is the only abundantly hairy colletid bee genus with three submarginal cells in the forewing (Michener 2007).

The *C. fasciatus*-group is endemic to the GCFR and was first defined and revised by Kuhlmann (2007). Females of eleven species in this group are unusual because they have a reduced scopa that is unique within the genus *Colletes* (Kuhlmann 2006). Since then, new species have been discovered and additional specimens have become available. In the same period of time, particularly western South Africa increasingly suffered from drought conditions culminating in the Cape Town water crisis in 2017–2018. Due to significantly reduced flower availability, drought can have detrimental effects on bee populations including local extinction (Mayer & Kuhlmann 2004), stressing the urgency for documenting and describing the wild bee fauna of the GCFR before species might disappear.

In this publication, we provide diagnoses and descriptions of 14 new species of the *C. fasciatus* species group collected in the GCFR in western South Africa, accompanied by illustrations and updated identification keys to all 37 species. In addition, the female of *Colletes inornatus* Cockerell, 1946 is described for the first time and two species are synonymized based on newly recognized sex associations. New distributional records are given for most of the already described species.

Material and methods

Species differentiation was based on external morphological characters and, additionally in males, the hidden internal metasomal sterna and genitalia were dissected. A stereo microscope Zeiss Stemi 508 (Carl Zeiss AG, Oberkochen, Germany) was used for the study. Morphological terminology follows that of Michener (2007) and Kuhlmann (2007). Puncture diameter (pd) in relation to the intervals between them describes the density of punctation (0.5 pd means that the distance between punctures is ½ of their diameter). Body length was measured in dorsal view with an eyepiece micrometer from vertex to the tip of metasoma.

Label information of specimens are documented as given at the specimens. It was just adapted according to the standard of EJT (order and format of data) but otherwise remains unchanged.

Images were taken with a digital microscope (Keyence VHX-5000) using the VH-Z20R/Z20T (20× to 200×) zoom lens and the OP-42305 super diffused illumination adapter. Images were stacked for extended depth-of-field and processed using Adobe Photoshop Elements 2021 (Adobe Systems Software Ireland Limited, Republic of Ireland) and then assembled into the figure plates.

Distribution maps were created with QGIS (3.22.7-Białowieża [http://qgis.org/]) and with Datasets of NASA's Earth Observing System Data and Information System (EOSDIS) in NASA's Earthdata (NASA, Washington, D.C. [https://search.earthdata.nasa.gov/search]). Shape files of South Africa (https://data.humdata.org/dataset/cod-ab-zaf) and Namibia (https://data.humdata.org/dataset/cod-ab-nam) originate from the Humanitarian Data Exchange (HDX ver. 1.60.6) provided by the United Nations Office of Humanitarian Affairs (OCHA, Geneva & New York City). Distribution maps include all known records of a species, including material studied by Kuhlmann (2007).

Permits for fieldwork and wild bee collecting in South Africa were granted by the Cape Nature for Western Cape Province (permit numbers 202/1999, 250/2000, 368/2001, AAA004-00212-0035, AAA004-00446-0035, AAA004-01055-0035, 0056-AAA008-00076, CN44-87-21440) and by the Northern Cape Department of Environment and Nature Conservation for Northern Cape Province

(025/2002, 056/2003, 0055/04, 0332/05, 0648/06, 0317/07, FAUNA 074/2008, FAUNA 1299/2008, FAUNA 082/2010, FAUNA 557/2011, FAUNA 638/2012, FAUNA 155/2013, FAUNA 1213/2014, FAUNA 0529/2016, FAUNA 0345/2017, FAUNA 0461/2022).

Abbreviations for morphological structures

T = metasomal tergum
S = metasomal sternum

Institutional abbreviations

AMGS	=	Albany Museum, Grahamstown, South Africa
AMNH	=	American Museum of Natural History, New York, United States of America
BLCU	=	Bee Biology and Systematics Laboratory, Logan, Utah, United States of America
CMK	=	Collection of Michael Kuhlmann, Zoological Museum of Kiel University, Germany
DNMNH	=	Ditsong National Museum of Natural History, Pretoria, South Africa
NHMUK	=	Natural History Museum, London, UK
NHMW	=	Naturhistorisches Museum, Wien, Austria
OLML	=	Oberösterreichisches Landesmuseum, Linz, Austria
PCYU	=	The Packer Collection at York University, Toronto, Canada
SAMC	=	Iziko Museums of Cape Town, South Africa
SANC	=	South African National Collection of Insects, Pretoria, South Africa
SEMC	=	Snow Entomological Museum, University of Kansas, Lawrence, USA
ZMHB	=	Museum für Naturkunde (former Zoologisches Museum der Humboldt Universität), Berlin, Germany

Results

Taxonomy

Class Insecta Linnaeus, 1758
Order Hymenoptera Linnaeus, 1758
Superfamily Apoidea Latreille, 1802
Family Colletidae Lepeletier, 1841
Subfamily Colletinae Lepeletier, 1841

Colletes Latreille, 1802

The *Colletes fasciatus* species group

The *C. fasciatus* species group was first defined by Kuhlmann (2007) and is unique within the genus because some females of this species group exhibit a scopa reduction (Kuhlmann 2006). A total of 37 species are now recorded, all endemic to the GCFR of South Africa and southwestern Namibia, of which 25 species (including two here newly synonymized taxa) were already revised by Kuhlmann (2007). The *C. fasciatus* species group can be delineated based on the following set of morphological characters (Kuhlmann 2007): both sexes have an oval-shaped metasoma, with T1 slightly shortened, almost regularly rounded anteriorly, and the widest part approximately in the middle of T2. The surface of the metasoma often has a bluish shine and the discs of male terga are densely covered with long, erect hairs. In almost all males the tip of T7 is narrowly rounded and often slightly protruding (except *C. fuscitergus* sp. nov, *C. inornatus* Cockerell, 1946, *C. testaceipes* Friese, 1909), the hind basitarsus is modified (broadened, curved or crested) (except *C. abnormis* Kuhlmann, 2007, *C. fuscitergus*, *C. genalis* Friese, 1909, *C. karooensis* Kuhlmann, 2007, *C. longitarsus* sp. nov., *C. testaceipes* Friese, 1909). Furthermore, almost all males show modifications of the gonostylus and the wings of the penis

valves (e.g. elongate, reduced, broadened) (except *C. fuscitergus*, *C. genalis*), extremely so in some species. Many males also have elongate antennae and swollen femorae and mid tibiae. In females the protuberance of clypeus in profile is at least ¾ of the eye width (except *C. gessi* Kuhlmann, 2007 and less pronounced in *C. carolinae* sp. nov., *C. fabiani* sp. nov., *C. kogelbergensis* sp. nov.). The clypeus is strongly and regularly convex, except in *C. gessi*, and in *C. cyanonitidus* Kuhlmann, 2007 it has a slight longitudinal, median depression.

Species of the *Colletes fasciatus* species group

Since the relationships of the species are not known, they are listed in alphabetical order.

Colletes abnormis Kuhlmann, 2007
Figs 4–5, 14

Colletes abnormis Kuhlmann, 2007: 127–130, figs 6–7, 40. Holotype male, SEMC; type locality: South Africa: Citrusdal. Examined.

New records

SOUTH AFRICA – **Northern Cape Province** • 1 ♀; Hondeklipbaai, Farm Diknek, 3017 AC; 30°19′ S, 17°17′ E; 20 Aug. 1991; V.B. Whitehead leg.; CMK • 1 ♀; 8 km WNW Leliefontein, Fynbos, road side; 30°15′ 58″ S, 18°03′ 17″ E; alt. 1190 m; 10 Sep. 2017; M. Kuhlmann leg.; CMK. – **Western Cape Province** • 1 ♀; Langebaan; 33°05′ S, 18°01′ E; 20 Aug. 1986; V.B. Whitehead leg.; CMK • 1 ♀; Clanwilliam Dist., Biedouw Valley; 32°08′ S, 19°14′ E; 5–7 Sep. 1987; C.D. Eardley leg.; CMK • 1 ♀; Farm Skarpdam, 3218 AB; 32°10′ S, 18°20′ E; 9 Sep. 1987; K. Steiner leg.; on *Heliophila* sp.; CMK • 1 ♀; Kunje Farm, 28 km SE Citrusdal; 32°40′ S, 19°12′ E; alt. 760 m; 23–25 Sep. 2001; B. Danforth leg.; CMK • 1 ♀; 86 km E Ceres, Peerboomskloof Pass; 32°52′ S, 19°43′ E; alt. 785 m; 24 Sep. 2001; B. Danforth leg.; CMK • 1 ♀; near Lambert′s Bay; 32°10′52″ S, 18°26′08″ E; alt. 140 m; 17 Sep. 2005; C.D. Eardley leg.; SANC • 1 ♂; near Skurfkop; 32°04′ S, 18°43′ E; 21 Sep. 2007; C.D. Eardley leg.; SANC • 1 ♀; 12 km W of Clanwilliam; 32°09′ S, 18°47′ E; 19 Oct. 2008; C.D. Eardley leg.; SANC • 1 ♀; Pakhuis Pass; 32°08′ S, 18°59′ E; 20 Oct. 2008; T. L. Griswold leg.; BLCU • 1 ♀; same collection data as preceding; CMK • 1 ♂; Cederberg Mts, road to Algeria, Olifants River road; 32°21′55″ S, 18°57′06″ E; alt. 150 m; 8 Sep. 2017; M. Kuhlmann leg.; CMK.

Distribution

Known distribution as shown in Fig. 14.

Colletes albohirtus Cockerell, 1946
Figs 6–7, 14

Colletes albohirtus Cockerell, 1945(1946): 838. Holotype male, NHMUK; type locality: South Africa: Matjesfontein. Examined.

Colletes montacuti Cockerell, 1946(1947): 200–201. Holotype female, NHMUK; type locality: South Africa: Montagu. Synonymized by Kuhlmann (2007: 130). Examined.

New records

SOUTH AFRICA – **Western Cape Province** • 1 ♀; Mossel Bay; 34°10′ S, 22°07′ E; 20 Oct. 1938; R.E. Turner leg.; NHMUK • 1 ♂; between Struisbaai and Elim; 34°45′ S, 20°00′ E; 27 Sep. 2001; C.D. Eardley leg.; SANC • 1 ♀; 27 km SE Vanrhynsdorp, Ouberg Pass, Fynbos; 31°48′07″ S, 18° 55′00″ E; alt. 380 m; 8 Aug. 2012; M. Kuhlmann leg.; CMK.

Distribution

Known distribution as shown in Fig. 14.

Fig. 4. *Colletes abnormis* Kuhlmann, 2007, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

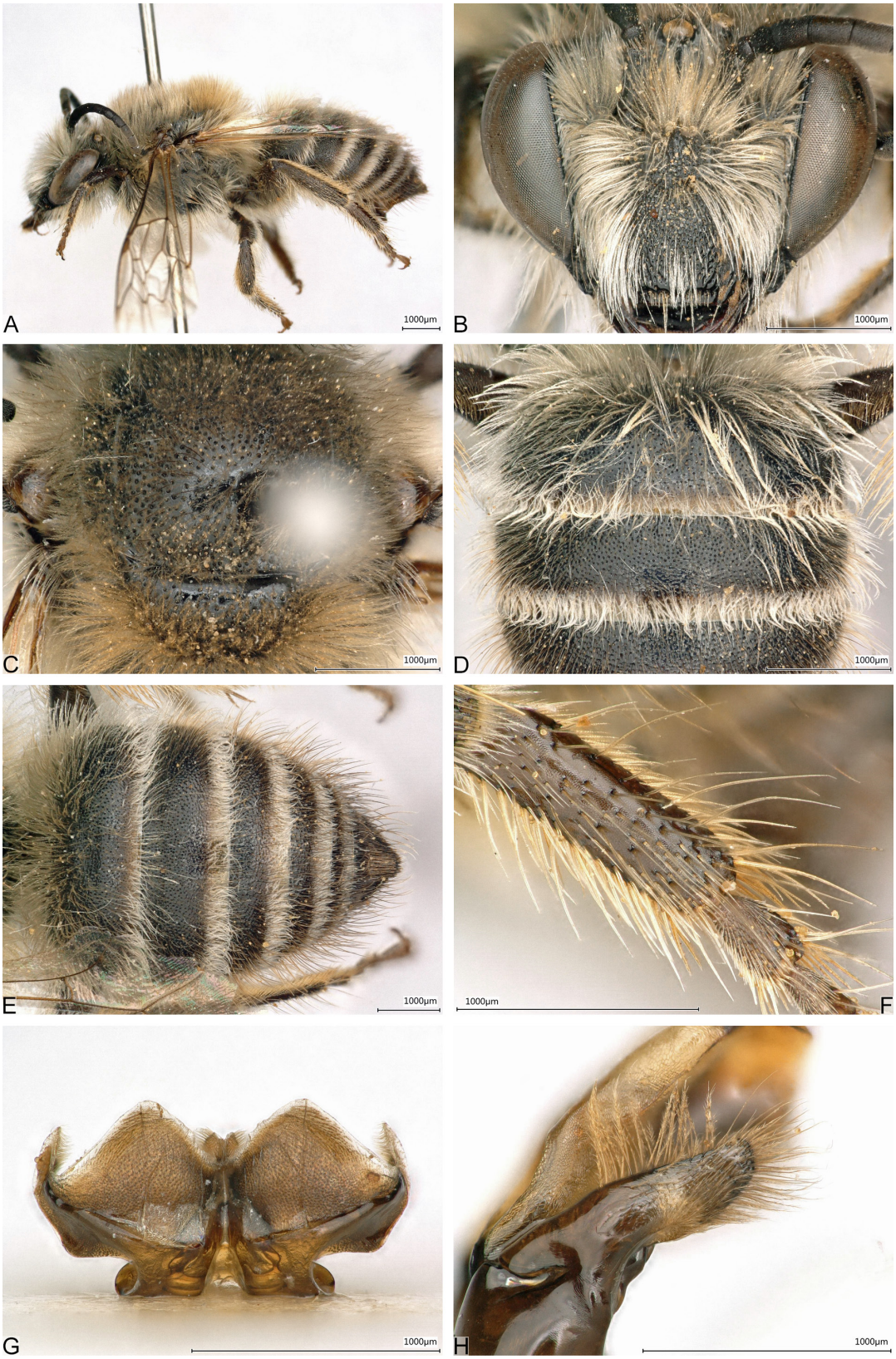

Fig. 5. *Colletes abnormis* Kuhlmann, 2007, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Fig. 6. *Colletes albohirtus* Cockerell, 1946, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

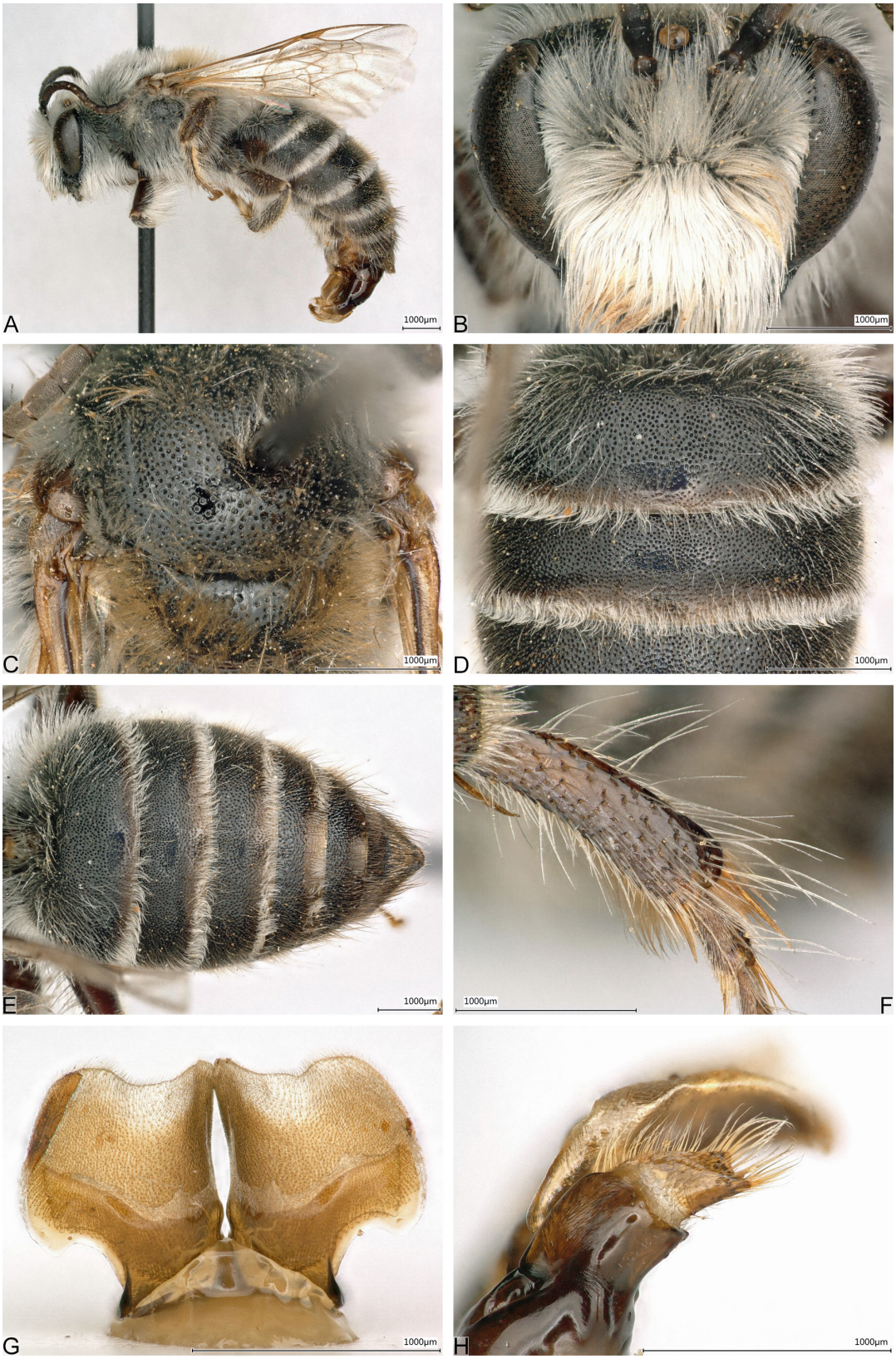

Fig. 7. *Colletes albohirtus* Cockerell, 1946, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Colletes ascopalis sp. nov.
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Figs 8, 14

Diagnosis

Among the species with reduced scopa the female of *Colletes ascopalis* is characterized by a combination of legs completely red (Fig. 8A), facial fovea relatively broad (width about 1.5 × antennal diameter),

Fig. 8. *Colletes ascopalis* sp. nov., ♀, paratype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

apical hair bands of terga 1–2 broad (Fig. 8D–E), medially nearly completely covering tergal depression (Fig. 8D–E) and upper sloping part of propodeal triangle with short longitudinal carinae.

Etymology

This species is named for its reduced scopa.

Material examined

Holotype

SOUTH AFRICA – **Western Cape Province** • ♀; Ysterfontein; 33°21′ S, 18°09′ E; Sep. 1960; South African Museum leg.; SAMC.

Paratypes

SOUTH AFRICA – **Northern Cape Province** • 1 ♀; Leliefontein, slope; 30°13′58″ S, 18°09′ 52″ E; 31 Aug. 2003; C. Mayer leg.; white trap; CMK • 1 ♀; same collection data as for preceding; 11 Sep. 2003; CMK • 1 ♀; same collection data as for preceding; 15 Sep. 2003; CMK • 1 ♀; same collection data as for preceding; slope 402/1; 5 Sep. 2003; pink trap; CMK • 1 ♀; Remhoogte, plain; 30°14′07″ S, 18°09′56″ E; 31 Aug. 2003; C. Mayer leg.; pink trap; CMK • 1 ♀; Leliefontein, plain; 30°13′54″ S, 18°09′45″ E; 11 Sep. 2003; C. Mayer leg.; white trap; CMK. – **Western Cape Province** • 2 ♀♀; Ysterfontein; 33°21′ S, 18°09′ E; Sep. 1960; South African Museum leg.; CMK.

Description

Female

Body length. 11–12 mm.

Head. Integument black, antenna brown ventrally. Face with short grayish white hairs (Fig. 8B), brown on vertex. Clypeus with fine, dense (< 0.2 pd) medium-sized, slightly elongate punctures. Malar area very narrow, about ⅓ width of mandibular base. Facial fovea relatively broad, maximum width about 1.5 × antennal diameter.

Mesosoma. Integument black, coxa and trochanter brown, femur, tibia and tarsi red (Fig. 8A). Scutum with short yellowish brown hairs with numerous slightly longer dark brown hairs intermixed. Mesosomal sides grayish white, few light brown hairs on mesepisternum, legs with yellowish white hairs. Disc of scutum with relative dense (0.5–1 pd) punctation, surrounded by dense (< 0.5 pd) punctation, interspaces glabrous (Fig. 8C). Scutellum and metanotum with short yellowish brown hairs, intermixed with longer dark brown hairs on scutellum, plumose on scutellum and medially on metanotum. Upper sloping part of propodeal triangle with short, longitudinal carinae. Vertical part superficially shagreened and shiny, anterior with a few more or less transverse well-developed carinae. Scopa partly reduced, dorsal dark brown and ventral yellowish white (Fig. 8F).

Metasoma. Integument black, terga broadly yellowish to reddish translucent posteriorly. T1–T2 with slight bluish shine. Disc of T1 covered with moderately long, erect white hairs, medio-anteriorly with short hairs interspersed (Fig. 8D). Disc of T2 with very short, erect yellowish hairs. T2 with well-developed, relatively broad white basal tomentum (Fig. 8D). Discs of T3–T5 with successively longer, short erect blackish hairs. T1–T5 with white relatively broad posterior tergal hair bands, medially narrower on T1 (Fig. 8E). Disc of T1 with fine and dense punctation (0.5–1 pd), punctures becoming slightly finer and denser on posterior tergal depression, interspaces glabrous (Fig. 8D). Disc of T2 with very fine, dense punctation (< 0.5 pd). S2–S5 short white hair fringes, medially very small. Disc of sterna sparsely covered with anterior directed hairs, longer laterally.

Male

Unknown.

Distribution

Found from the Kamiesberg Mountains in the north down to Ysterfontein in the south (Fig. 14).

Phenology

Recorded in August and September.

Colletes aureocinctus Cockerell, 1946
Figs 9–10, 14

Colletes aureocinctus Cockerell, 1945(1946): 840. Lectotype female [designated by Kuhlmann 1998: 564], NHMUK; type locality: South Africa: Matjesfontein. Examined.

New records

SOUTH AFRICA – **Northern Cape Province** • 1 ♀; Nieuwoudtville, Pad Glenlyon to R27; 31°23′24″ S, 19°09′06″ E; alt. 740 m; 3 Sep. 2007; K. Timmermann leg.; on *Ruschia unca* L.Bolus; CMK • 1 ♀; same collection data as for preceding; 7 Sep. 2007; CMK • 1 ♀, 1 ♂; 32 km N Calvinia, S Klipwerffarm, Hantam Mountains, river bank; 31°12′09″ S; 19°50′04″ E; alt. 870 m; 16 Sep. 2007; K. Timmermann leg.; CMK • 1 ♀; 12 km NW Nieuwoudtville, Farm Avontuur, Fynbos; 31°16′18″ S, 19°02′55″ E; alt. 770 m; 3 Sep. 2009; M. Kuhlmann leg.; CMK. – **Western Cape Province** • 1 ♂; Remhoogte, plain; 30°14′ S, 18°10′ E; 16 Aug. 2003; C. Mayer leg.; CMK.

Distribution

Known distribution as shown in Fig. 14.

Colletes cardiurus Cockerell, 1946
Figs 11, 14

Colletes cardiurus Cockerell, 1945(1946): 839. Holotype female, NHMUK; type locality: South Africa: Matjesfontein. Examined.

New records

None.

Distribution

Known distribution as shown in Fig. 14.

Colletes carolinae sp. nov.
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Figs 12–14

Diagnosis

The female can be separated from that of all other species with a normal scopa by the combination of the following characters: apical hair band of T2 about ¼ width of disc (Fig. 12D–E), malar area narrow (⅓ width of mandibular base), facial fovea slightly broadened (about 1–1.2 × width of antennal flagellum), T6 narrowly rounded and disc of T1 medio-anteriorly without numerous conspicuously short

hairs interspersed (Fig. 12D–E). The male can be most easily identified by the unique shape of S7 (Fig. 13G).

Etymology

The species is dedicated to Dr Carolin Mayer, University of Namur, Belgium. She extensively collected bees in Namaqualand for pollination research and greatly facilitated the exploration of the bee fauna in this area.

Fig. 9. *Colletes aureocinctus* Cockerell, 1946, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

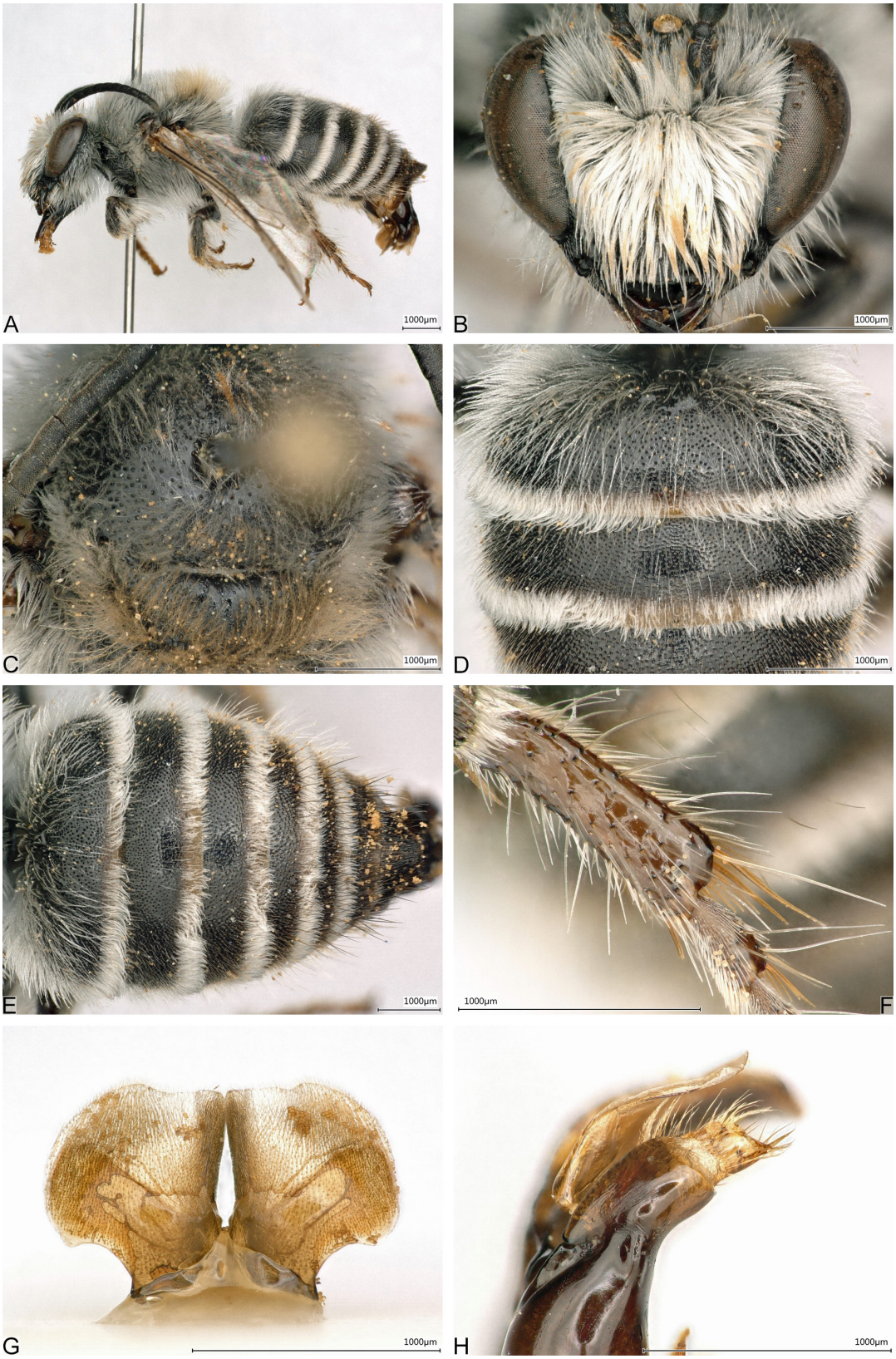

Fig. 10. *Colletes aureocinctus* Cockerell, 1946, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Material examined

Holotype

SOUTH AFRICA – **Northern Cape Province** • ♂; Keiski Mts, 5 km S Farm Nooiensrivier, burned area; 31°45′47″ S, 19°50′17″ E; alt. 1275 m; 18 May 2013; M. Kuhlmann leg.; SAMC.

Fig. 11. *Colletes cardiurus* Cockerell, 1946, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

Paratypes

SOUTH AFRICA – **Northern Cape Province** • 1 ♀; Remhoogte, plain, 49/26; 30°14′07″ S, 18°09′56″ E; 16 Aug. 2003; C. Mayer leg.; yellow trap; CMK • 1 ♀; Remhoogte, plain, 390/11; 30°14′04″ S, 18°09′53″ E; 31 Aug. 2003; C. Mayer leg.; yellow trap; CMK • 1 ♂; Leliefontein, slope; 30°13′58″ S, 18°09′52″ E; 7 Sep. 2003; C. Mayer leg.; yellow trap; CMK • 1 ♀; Keiski Mts, 5 km S Farm Nooiensrivier, dolerite hill; 31°45′54″ S, 19°50′17″ E; alt. 1270 m; 29 Aug. 2010; M. Kuhlmann;

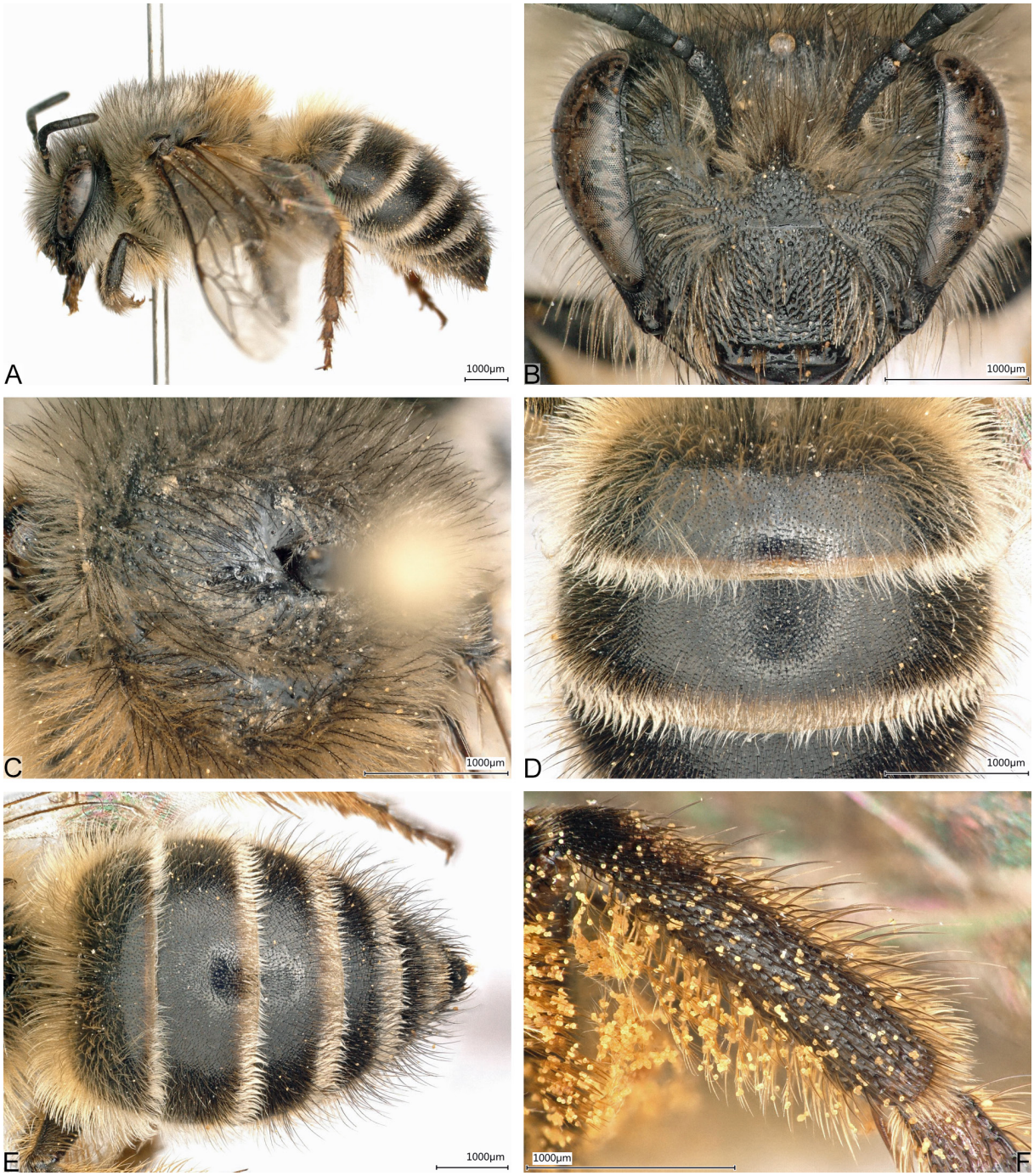

Fig. 12. *Colletes carolinae* sp. nov., ♀, paratype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

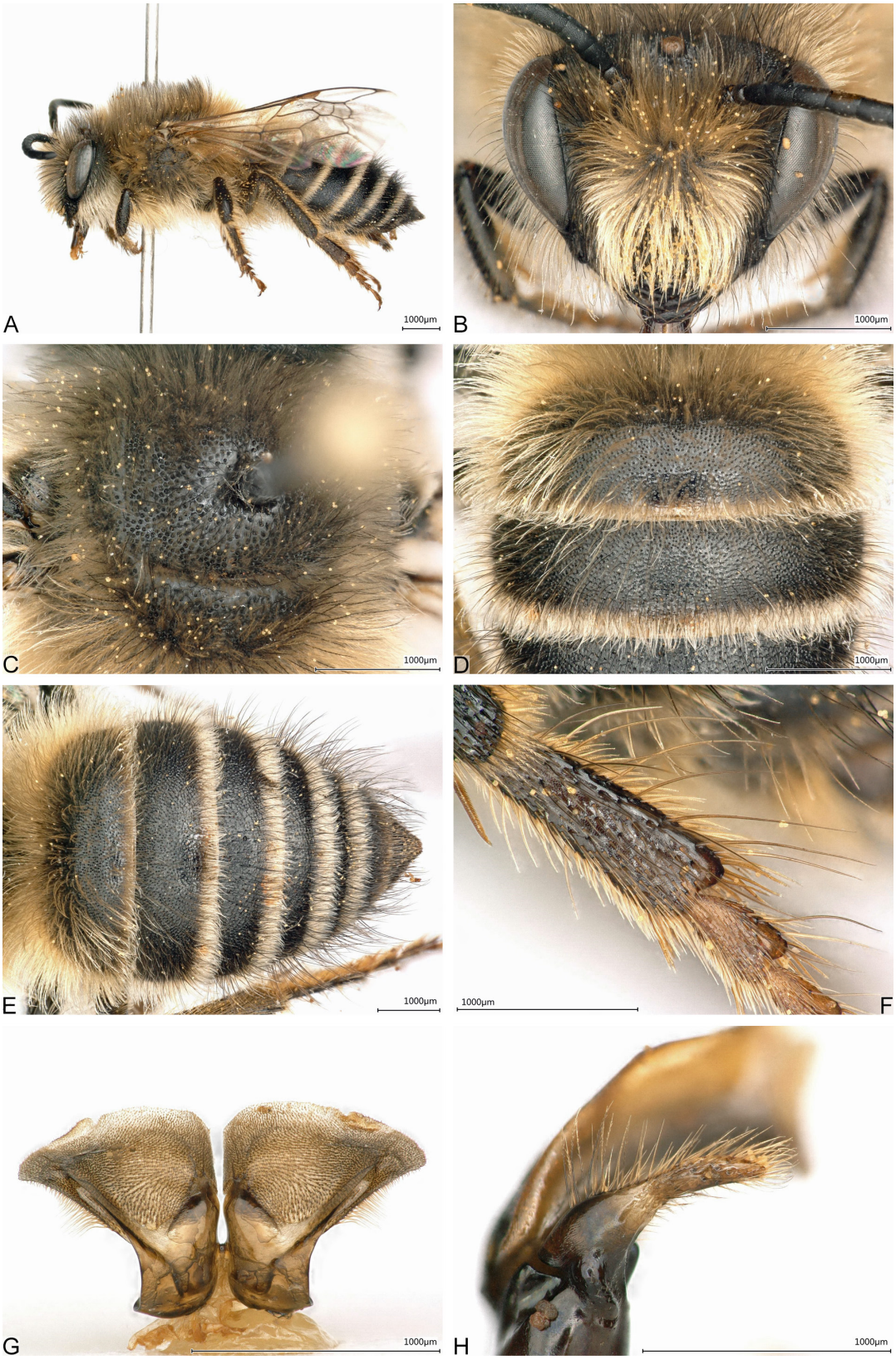

Fig. 13. *Colletes carolinae* sp. nov., ♂, paratype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

CMK • 1 ♀; 9 km N Calvinia, Plateau Hantam Mts, near antenna; 31°22′29″ S, 19°47′03″ E; alt. 1570 m; 7 Sep. 2010; M. Kuhlmann leg.; CMK • 1 ♀, 1 ♂; same collection data as for preceding; 30 Aug. 2011; M. Kuhlmann leg.; CMK • 3 ♀♀, 9 ♂♂; same collection data as for preceding; 7 Jun. 2013; CMK • 4 ♀♀; 20 km W Sutherland, Farm Kanolfontein, road side; 32°24′43″ S, 20°27′28″ E; alt. 1385 m; 7 Sep. 2012; M. Kuhlmann leg.; CMK • 1 ♀, 1 ♂; Keiski Mts, 5 km S Farm Nooiensrivier, burned area; 31°45′47″ S, 19°50′17″ E; alt. 1275 m; 18 May 2013; M. Kuhlmann leg.; CMK • 1 ♀; Nieuwoudtville, Flower Reserve East; 31°21′56″ S, 19°08′52″ E; alt. 735 m; 6 Jun. 2013; M. Kuhlmann leg.; CMK • 1 ♀; Keiski Mts, 3 km E Farm M'Vera, shale; 31°45′29″ S, 19°54′13″ E; alt. 1190 m; 15 Sep. 2016; M. Kuhlmann leg.; CMK • 1 ♀; same collection data as for preceding; 19 Aug. 2017; CMK.

Description

Female

Body length. 11–12 mm.

Head. Integument black, antenna brown ventrally. Face yellowish gray, with longer dark brown hairs intermixed, along inner eye margins and on vertex with blackish hairs interspersed (Fig. 12B). Clypeus

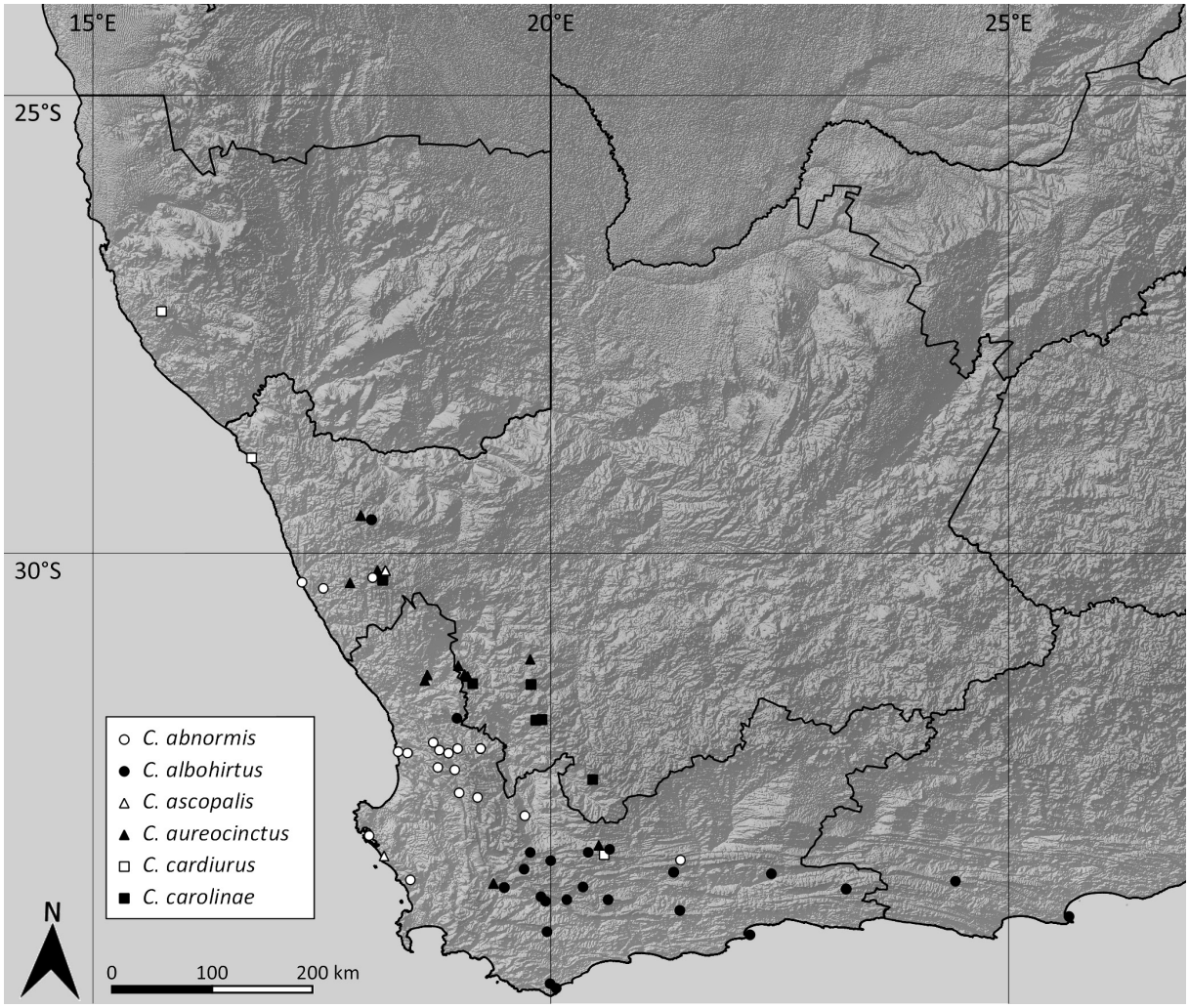

Fig. 14. Distribution of *C. abnormis* Kuhlmann, 2007, *C. albohirtus* Cockerell, 1946, *C. ascopalis* sp. nov., *C. aureocintus* Cockerell, 1946, *C. cardiurus* Cockerell, 1946 and *C. carolinae* sp. nov.

with fine, dense punctures (0.2 pd), punctures slightly elongate; interspaces glabrous (Fig. 12B). Malar area narrow, length about ⅓ width of mandibular base. Facial fovea relatively broad, maximum width about 1–1.2 × antennal diameter.

Mesosoma. Integument black, tarsi often brownish (Fig. 12A). Scutum with long grayish to yellowish white hairs, intermixed with longer dark brown hairs (Fig. 12C). Mesosomal sides and legs grayish to yellowish hairs, mesosomal sides intermixed with dark brown hairs on mesepisternum, tibiae and tarsi with some brown hairs interspersed. Disc of scutum without or with scattered (1–2 pd) fine punctures, integument smooth and shiny, surrounded by dense (< 0.5 pd) punctation. Scutellum and metanotum with long yellowish brown hairs, scutellum intermixed with slightly longer dark brown hairs. Upper sloping part of propodeal triangle scabriculous. Vertical part superficially shagreened and shiny, anteriorly with few indistinct more or less transverse carinae. Scopa dark brown dorsally, dark yellowish ventrally (Fig. 12F). Mid femora basally with edge and stout ridge ventrally with brush of hairs.

Metasoma. Integument black, terga narrowly translucent posteriorly. T1–T3 with slight bluish shine. T1 densely covered with long, erect yellowish white hairs (Fig. 12D). Disc of T2 with shorter, erect yellowish white hairs. Discs of T3–T5 with successively longer, erect blackish hairs. T2–T5 with broad white posterior tergal hair bands, narrower on T1 (Fig. 12E). Disc of T1 with shallow, fine and relatively dense punctures (1–2 pd), punctures becoming slightly finer and less distinct towards posterior tergal depression. Disc of T2 with very fine and dense punctation (0.5–1 pd); glabrous between punctures. S2–S5 with long, yellowish hair fringes. Discs of sterna sparsely covered with shorter yellowish hairs.

Male

Body length. 11–12 mm

Head. Integument black, antenna dark brown ventrally. Face yellowish white to white hairs, intermixed with black hairs on vertex, on supraclypeal area and along inner eye margins and with brown hairs between antennae (Fig. 13B). Clypeus with very dense, small punctures (< 0.2 pd). Malar area narrow, length about ½ width of mandibular base. Facial fovea narrow, maximum width about antennal diameter.

Mesosoma. Integument black, except tarsi often reddish brown (Fig. 13A). Scutum with long yellowish white hairs, intermixed with numerous black hairs (Fig. 13C). Mesosomal sides and legs yellowish white. Mesosomal sides intermixed with some brown hairs. Disc of scutum with medium-sized, scattered punctures (0.5–1 pd), integument glabrous, surrounded by dense punctation (< 0.2 pd) (Fig. 13C). Scutellum and metanotum with long, yellowish brown hairs, scutellum intermixed with black hairs. Upper sloping part of propodeal triangle with short, longitudinal carinae anteriorly, scabriculous posteriorly. Vertical part shagreened and shiny without or with some short, more or less transverse carinae anteriorly. Hind basitarsus broadened apically, with prominent long reddish bristles on dorso-apical edge (Fig. 13F). Mid femora with right-angled edge on basal end.

Metasoma. Integument black, terga narrowly translucent. T1–T3 with slight bluish shine. T1 densely covered with long, erect yellowish brown hairs (Fig. 13D). Disc of T2 with shorter, erect yellowish brown hairs intermixed with some dark brown hairs posteriorly. Discs of T3–T6 with long erect, blackish hairs. T1–T5 with moderately broad white tergal hair bands posteriorly, T1 slightly narrower medially (Fig. 13E). Discs of T1 and T2 with dense punctures (0.5–1 pd), punctation becoming finer on posterior tergal depression, integument between punctation glabrous (Fig. 13D). S1–S5 with yellowish white hair fringes posteriorly, laterally longer. Discs of sterna covered with yellowish white hairs. S6 with 2 brushes of bristles laterally.

Distribution

Found in mountainous regions of the Kamiesberg, Hantam, Keiskie and Roggeveld Mountains as well as the Bokkeveld (Fig. 14).

Phenology

Recorded from May to September.

Colletes cedarbergensis sp. nov.

urn:lsid:zoobank.org:act:04F52DEC-D29D-4518-B6B9-B7E470E2EF0B

Figs 15, 24

Diagnosis

The female can be separated from that of all other species with a normal scopa by the combination of the following characters: apical hair band of T2 about ½ width of disc (Fig. 15D–E), malar area very narrow (¼ width of mandibular base), facial fovea narrow (about ⅔ width of antennal flagellum), scutellum with black hairs (Fig. 15C), T6 broadly rounded and disc of T1 medio-anteriorly with numerous short hairs interspersed (Fig. 15D–E).

Etymology

Named after the Cedarberg Mountains where this species was discovered.

Material examined

Holotype

SOUTH AFRICA – **Western Cape Province** • ♀; Cederberg Mts, road to Algeria, Olifants River bridge; 32°21′55″ S, 18°57′06″ E; alt. 150 m; 8 Sep. 2017; M. Kuhlmann leg.; SAMC.

Description

Female

Body length. 12 mm.

Head. Integument black, antenna dark brown ventrally. Face grayish to yellowish brown with numerous dark hairs intermixed, especially along inner eye margins and on vertex (Fig. 15B). Clypeus with fine, dense punctation (0.2 pd), punctures slightly elongate; interspaces glabrous (Fig. 15B). Malar area very narrow, length about ¼ width of mandibular base. Facial fovea narrow, maximum width about ⅔ antennal diameter.

Mesosoma. Integument black, tarsi often brownish (Fig. 15A). Scutum with relatively long grayish to yellowish white hairs, intermixed with numerous longer, dark brown hairs (Fig. 15C). Mesosomal sides and legs with yellowish white hairs, on legs with blackish hairs intermixed. Disc of scutum with scattered (1–2 pd) medium-sized punctures, integument smooth and shiny, surrounded by dense (< 0.5 pd) punctation (Fig. 15C). Scutellum and metanotum with long, yellowish brown hairs intermixed with longer dark brown hairs on scutellum. Upper sloping part of propodeal triangle with short longitudinal carinae anteriorly, scabriculous posteriorly. Vertical part shagreened and shiny, anteriorly with some well-developed more or less transverse carinae. Scopa dark brown dorsally, yellowish brown ventrally (Fig. 15F). Mid femora with distinct edge and stout ridge ventrally with brush of hairs.

Metasoma. Integument black, terga narrowly translucent posteriorly. T1–T4 with slight bluish shine. Disc of T1 densely covered with long, erect, yellowish white hairs, medio-anteriorly interspersed with

numerous short concolorous hairs (Fig. 15D). Disc of T2 with very short erect yellowish white hairs. T2 with narrow basal tomentum. Discs of T2–T5 with successively longer, short erect blackish hairs. T1–T5 with relatively broad, yellowish white posterior tergal hair bands, on T1 slightly narrower (Fig. 15E). Disc of T1 with fine and dense punctures (0.5–1 pd), punctures much finer and denser on posterior tergal depression. Disc of T2 with fine and dense punctation (0.5–1 pd); glabrous between punctures. S2–S5 with yellowish brown hair fringes. Discs of sterna densely covered with yellowish brown apically directed hairs.

Fig. 15. *Colletes cedarbergensis* sp. nov., ♀, holotype (SAMC). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

Male

Unknown.

Distribution

Only known from the Cedarberg Mountains (Fig. 24).

Phenology

Only found in September.

Colletes cyanonitidus Kuhlmann, 2007
Figs 16–17, 24

Colletes cyanonitidus Kuhlmann, 2007: 136–139, figs 5, 30–31, 40. Holotype male, AMGS; type locality: South Africa: Grahamstown. Examined.

New records

SOUTH AFRICA – **Eastern Cape Province** • 1 ♀, 1 ♂; Algoabay, Capland; 33°42′ S, 26°00′ E; 30 Aug. 1896; Dr Brauns leg.; NHMW. – **Western Cape Province** • 1 ♂; Cape Point Nature Res.; 34°14′ S, 18°26′ E; 29 Sep. 2001; C.D. Eardley leg.; SANC • 1 ♀; Gans Bay, offene Sandflächen [open sand areas]; 34°34′52″ S, 19°20′46″ E; W.H. Liebig leg.; Coll. Liebig • 1 ♂; S Elands Bay; 32°25′02″ S, 18°20′04″ E; alt. 4 m; 18 Sep. 2005; C.D. Eardley leg.; SANC.

Distribution

Known distribution as shown in Fig. 24.

Colletes denudatus Cockerell, 1946
Figs 18, 24

Colletes denudatus Cockerell, 1945(1946): 839. Holotype male, NHMUK; type locality: South Africa: Matjesfontein. Examined.

New records

None.

Distribution

Known distribution as shown in Fig. 24.

Colletes eardleyi Kuhlmann, 2007
Figs 19, 24

Colletes eardleyi Kuhlmann, 2007: 140–141, fig. 41. Holotype female, SANC; type locality: South Africa: Lamberts Bay. Examined.

New records

SOUTH AFRICA – **Western Cape Province** • 1 ♀; Namaqualand, Knersvlakte; 31°33′ S, 18°40′ E; 1 Sep. 1941; museum staff leg.; CMK • 1 ♀; Strandfontein; 31°45′11″ S, 18°13′37″ E; alt. 42 m; 16 Sep. 2005; C.D. Eardley leg.; labelled as "*Colletes fasciatus* group 14"; SANC.

Distribution

Known distribution as shown in Fig. 24.

Colletes fabiani sp. nov.
urn:lsid:zoobank.org:act:CC2563C3-EC07-467C-B891-D75B801A06A3
Figs 20–21, 24

Diagnosis

The female can be separated from that of all other species with a normal scopa by the combination of the following characters: apical hair band of T2 about ½ width of disc (Fig. 20D–E), malar area narrow (⅓ width of mandibular base), facial fovea narrow (about width of antennal flagellum), T6 narrowly rounded and disc of T1 medio-anteriorly without numerous conspicuously short hairs interspersed

Fig. 16. *Colletes cyanonitidus* Kuhlmann, 2007, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

Fig. 17. *Colletes cyanonitidus* Kuhlmann, 2007, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Fig. 18. *Colletes denudatus* Cockerell, 1946, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

(Fig. 20D–E), sternal discs covered with short hairs and apical tergal hair bands whitish (Fig. 20D–E). The male is best identified by the shape of S7 (Fig. 21G) and gonostylus (Fig. 21H).

Etymology

The species is dedicated to my (TZ) beloved husband Fabian Zabel, who always supported me in every way and thus gave me the opportunity to successfully complete my studies.

Fig. 19. *Colletes eardleyi* Kuhlmann, 2007, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

Material examined

Holotype

SOUTH AFRICA – **Northern Cape Province** • ♂; 20 km W Sutherland, Farm Kanolfontein, road side; 32°24′43″ S, 20°27′28″ E; alt. 1385 m; 17 Sep. 2017; M. Kuhlmann leg.; SAMC.

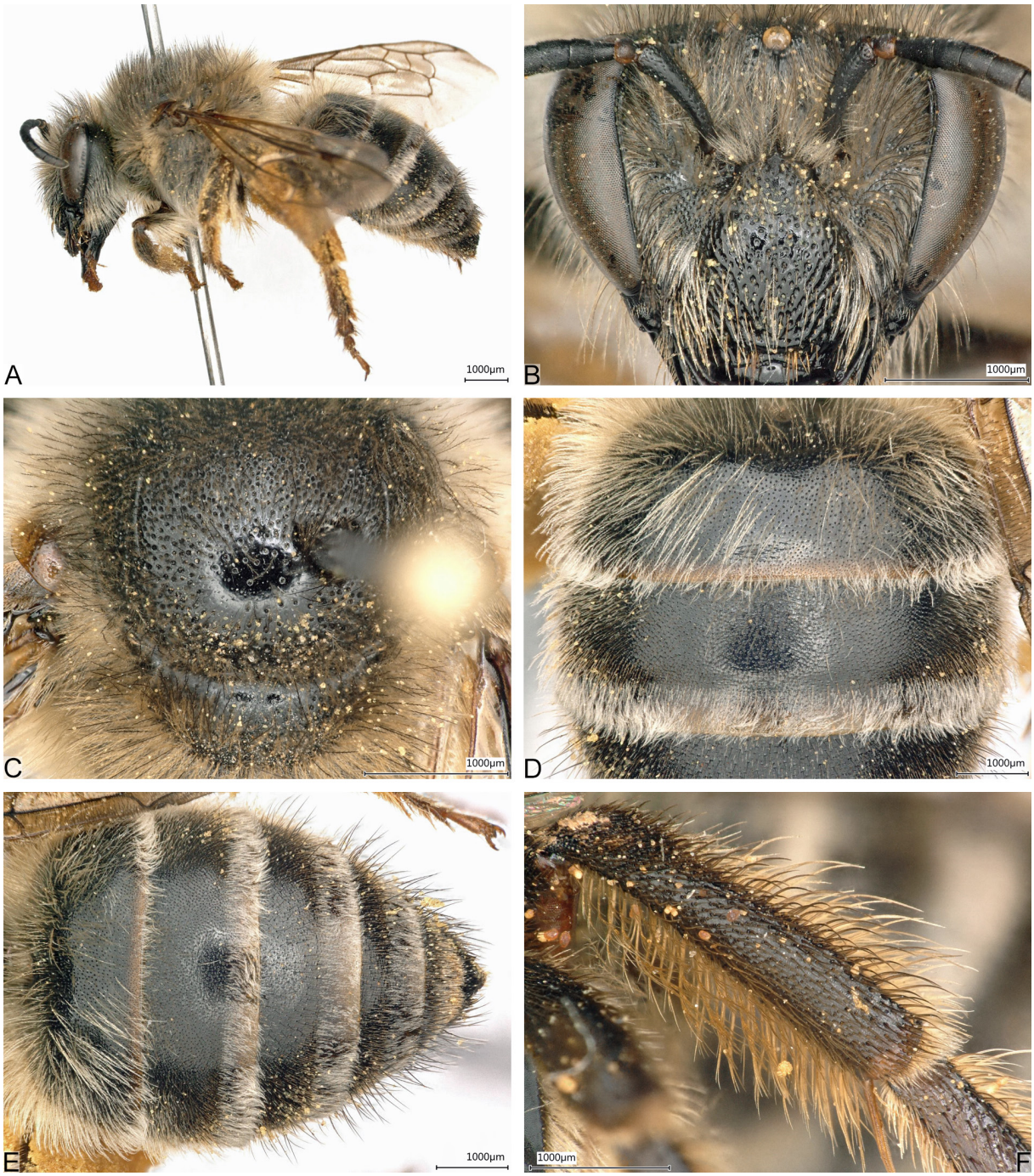

Fig. 20. *Colletes fabiani* sp. nov., ♀, paratype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

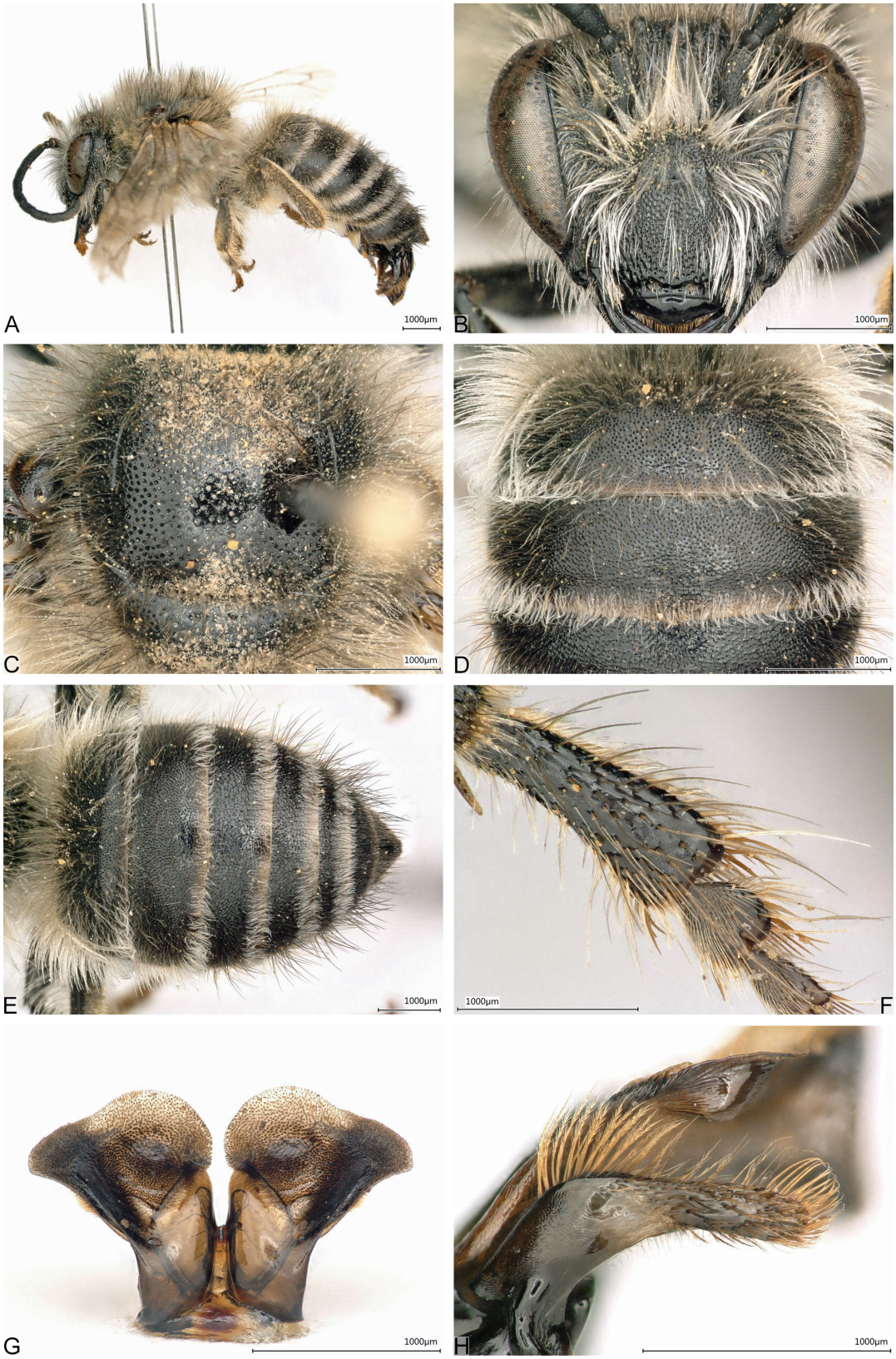

Fig. 21. *Colletes fabiani* sp. nov., ♂, paratype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Paratypes

SOUTH AFRICA – **Northern Cape Province** • 1 ♀; 8 km WNW Leliefontein, Fynbos, road side; 30°15′58″ S, 18°03′17″ E; alt. 1190 m; 14 Sep. 2017; M. Kuhlmann leg.; CMK • 1 ♀; 30 km W Sutherland, 6 km NNW Farm Kanariesfontein, road side; 32°22′17″ S, 20°22′50″ E; alt. 1310 m; 17 Sep. 2017; M. Kuhlmann leg.; CMK • 3 ♂♂; same collection data as for preceding; 15 Sep. 2018; CMK. – **Western Cape Province** • 1 ♀; Wuppertal; 32°17′ S, 19°13′ E; 8 Sep. 1987; C.D. Eardley leg.; CMK.

Description

Female

Body length. 12 mm.

Head. Integument black, antenna dark brown ventrally. Face grayish to yellowish white, with brown hairs intermixed and with blackish hairs along inner eye margins and on vertex (Fig. 20B). Clypeus with dense, medium-sized punctures (0.2 pd) that are slightly elongate (Fig. 20B). Malar area narrow, length about ⅓ width of mandibular base. Facial fovea narrow, maximum width about antennal diameter.

Mesosoma. Integument black, tarsi often brownish (Fig. 20A). Scutum with long grayish white to yellowish brown hairs intermixed with longer, dark brown hairs (Fig. 20C). Mesosomal sides with yellowish to grayish white hairs, intermixed with few brown hairs on mesepisternum. Legs yellowish white with brown hairs intermixed. Disc of scutum relative densely (1–3 pd) punctured, surrounded by dense (< 0.5 pd) punctation, interspaces glabrous (Fig. 20C). Scutellum and metanotum with long, yellowish white hairs, on scutellum intermixed with brown hairs. Upper sloping part of propodeal triangle with short longitudinal carinae anteriorly, scabriculous posteriorly. Vertical part glabrous, anteriorly scabriculous. Scopa dark brown dorsally, yellow ventrally (Fig. 20F). Mid femora with distinct edge, stout ridge ventrally and brush of hairs basally.

Metasoma. Integument black, terga narrowly translucent posteriorly. T1–T3 with slight bluish shine. Disc of T1 densely covered with long, erect, yellowish white hairs, interspersed inconspicuously with a few short, yellowish white hair medio-anteriorly (Fig. 20D). Disc of T2 with short, erect, yellowish white hairs. T2 with very weak, narrow basal tomentum. Discs of T3–T5 with successively longer, erect, blackish hairs. T1–T5 with broad white posterior tergal hair bands, narrower on T1 medially (Fig. 20E). Disc of T1 with fine and dense punctures (0.5–1 pd), punctures much finer and denser on posterior tergal depression. Disc of T2 with very fine and dense punctation (< 0.5 pd); glabrous between punctures. S2–S5 with long, yellowish white hair fringes, shorter medially. Discs of sterna densely covered with shorter, apically directed hairs.

Male

Body length. 12–13 mm.

Head. Integument black, antenna dark brown ventrally. Face grayish white to white, intermixed with black hairs on vertex, along inner eye margins, some on supraclypeal area and light brown hairs between antennae (Fig. 21B). Clypeus very dense, small punctures (< 0.2 pd) (Fig. 21B). Malar area narrow, length about ⅓ width of mandibular base. Facial fovea narrow, maximum width about antennal diameter.

Mesosoma. Integument black, tarsi brownish (Fig. 21A). Scutum with long, grayish white to yellowish white hairs, with longer, dark brown hairs intermixed (Fig. 21C). Mesosomal sides grayish white, with brown hairs intermixed on mesepisternum. Legs with yellowish white hairs. Disc of scutum with medium-sized, scattered punctures (0.5–1 pd), integument glabrous, surrounded by dense punctation (< 0.2 pd) (Fig. 21C). Scutellum and metanotum with long, yellowish white hairs, intermixed with dark brown hairs on scutellum. Upper sloping part of propodeal triangle with short longitudinal carinae

anteriorly, scabriculous posteriorly. Vertical part slightly shagreened and shiny, with some more or less transverse carinae anteriorly. Hind basitarsus curved and broadened apically, with long yellowish bristles on dorso-apical edge (Fig. 21F). Dorsal half of inner side of hind basitarsus covered with hairs, ventral side glabrous. Second tarsus heart shaped, dorsal side is strongly broadened and rounded (Fig. 21F). Mid femora with right-angled edge on basal end, ventrally with long spine.

Metasoma. Integument black, terga very narrowly translucent posteriorly. T1–T3 with slight bluish shine. T1 densely covered with long, erect, yellowish white hairs (Fig. 21D). Disc of T2 with shorter, concolorous hairs, intermixed with brown hairs. Discs of T3–T6 with long, erect blackish hairs. T1–T5 moderately broad, white posterior tergal hair bands, that on T1 medially narrower (Fig. 21E). Discs of T1 and T2 fine punctured (0.5–1 pd), punctures becoming slightly finer towards posterior tergal depression, interspaces glabrous (Fig. 21D). S2–S5 with white hair fringes, significantly longer laterally than medially. Discs of sterna sparsely covered with very short yellowish white hairs. On S5 two elevations medio-laterally, also on S4 and S6 but less distinct. S6 with small brush of bristles laterally. S7 (Fig. 21G) and gonostylus (Fig. 21H) as illustrated.

Distribution

Found in mountainous regions of the Kamiesberg, Roggeveld and Cedarberg (Fig. 24).

Phenology

Only found in September.

Colletes fasciatus Smith, 1853
Figs 22–24

Colletes fasciata [sic!] Smith, 1853: 4. Lectotype female [designated by Kuhlmann 1998: 566], NHMUK; type locality: South Africa: Cape. Examined.

Colletes hirsutissimus Cockerell, 1945(1946): 837–838. Holotype male, NHMUK; type locality: South Africa: Lion's Head, Cape Town. Synonymized by Kuhlmann (1998: 566). Examined.

New records

SOUTH AFRICA – **Northern Cape Province** • 1 ♂; Nieuwoudtville, Pad Glenlyon to R27, slope and side of road; 31°23′25″ S, 19°08′28″ E; alt. 740 m; 18 Aug. 2007; K. Timmermann leg.; CMK • 1 ♀, 4 ♂♂; Nieuwoudtville, Pad Glenlyon to R27; 31°23′24″ S, 19°09′06″ E; alt. 740 m; 20 Aug. 2007; M. Kuhlmann leg.; on *Ruschia unca* L.Bolus; CMK • 1 ♂; same collection data as for preceding; 3 Sep. 2007; K. Timmermann leg.; CMK • 1 ♂; same collection data as for preceding; 7 Sep. 2007; CMK • 1 ♀; 20 km S of Nieuwoudtville, Farm Papkuilsfontein, 150 m S of parking waterfall; 31°33′06″ S, 19°07′31″ E; alt. 675 m; 1 Oct. 2022; M. Kuhlmann leg.; CMK • 1 ♀; Hoek se Berg; 32°04′ S, 19°06′ E; 20 Sep. 2007; T. L. Griswold leg.; CMK • 4 ♀ ♀; same collection data as for preceding; BLCU • 5 ♀♀; Biedouw Valley; 32°08′ S, 19°16′ E; 20 Sep. 2007; C.D. Eardley leg.; SANC. – **Western Cape Province** • 1 ♀; Giftsberg, Rhynsdorp; 31°45′ S, 18°47′ E; 1 Sep. 1911; C.C. leg.; AMNH.

Distribution

Known distribution as shown in Fig. 24.

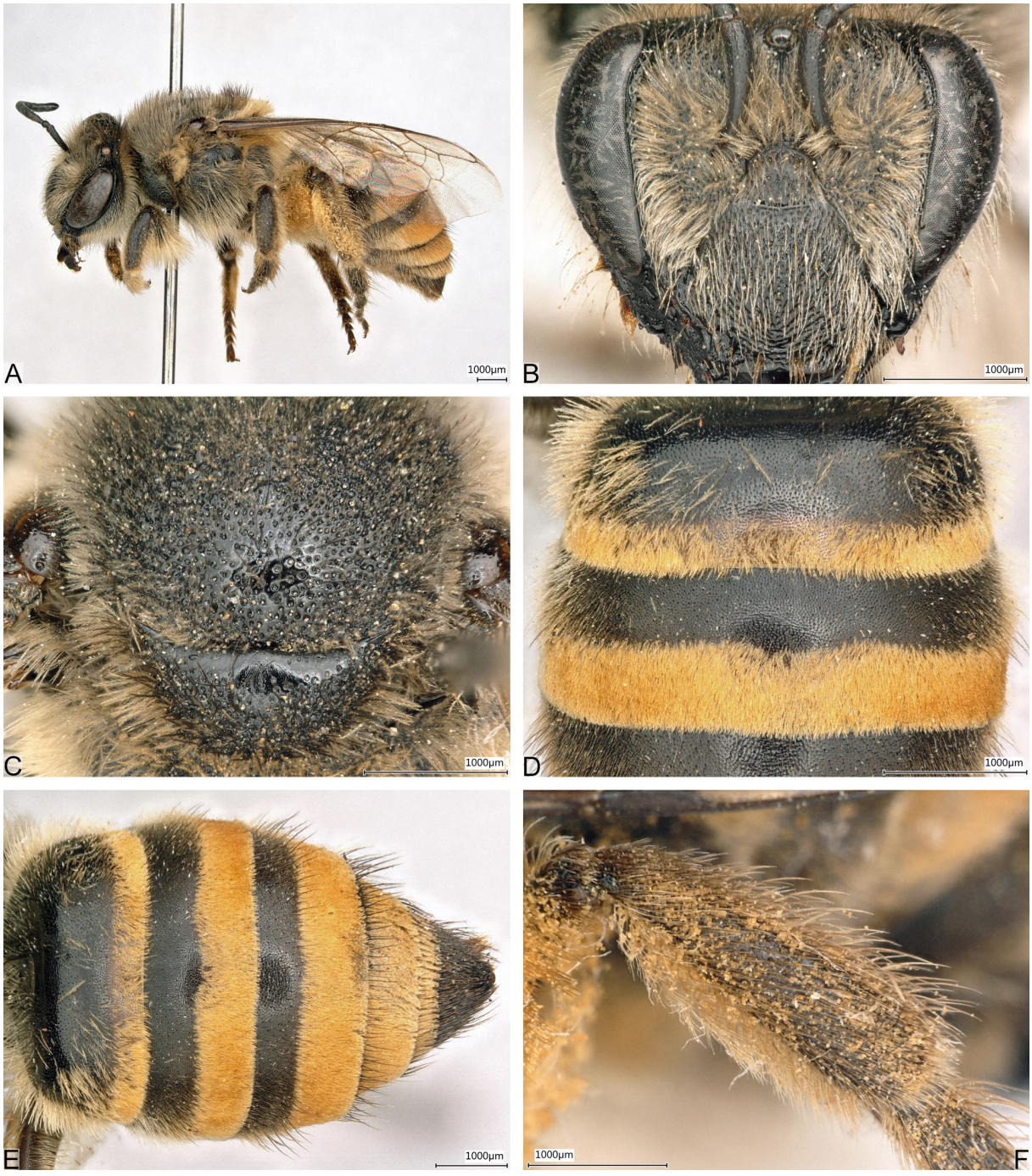

Fig. 22. *Colletes fasciatus* Smith, 1853, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

Fig. 23. *Colletes fasciatus* Smith, 1853, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Colletes fuscitergus sp. nov.
urn:lsid:zoobank.org:act:EB8ABC0E-B0BB-4BDF-84A3-C6952FDD26D8
Figs 25, 36

Diagnosis

The male can best be identified by the unique shape of S7 (Fig. 25G) and gonostylus (Fig. 25H).

Etymology

Named for the brownish metasomal terga.

Material examined

Holotype

SOUTH AFRICA – **Northern Cape Province** • ♂; Namaqualand, Garies; 30°30′ S, 18°00′ E; Jun. 1930; museum staff leg.; SAMC.

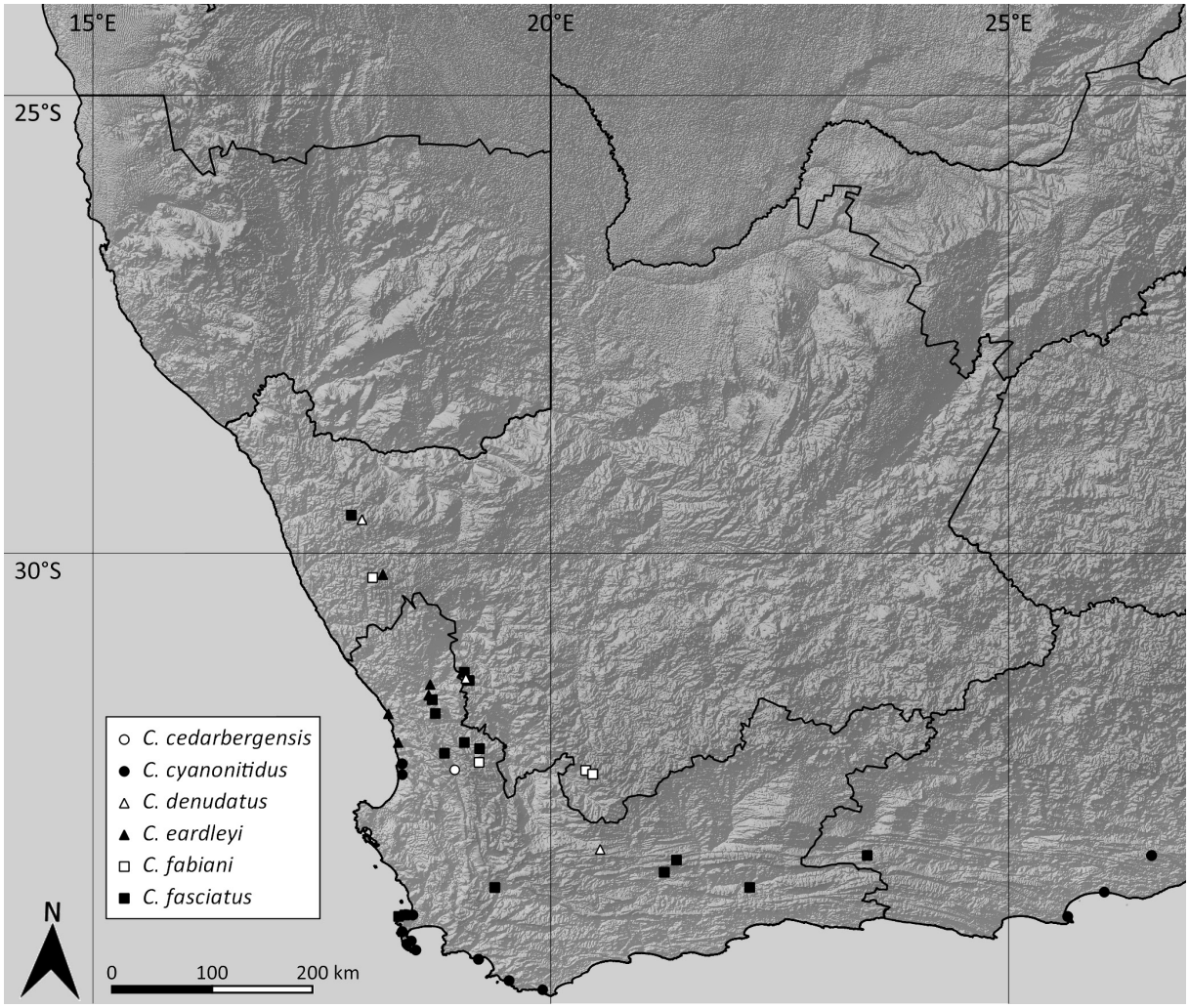

Fig. 24. Distribution of *C. cedarbergensis* sp. nov., *C. cyanonitidus* Kuhlmann, 2007, *C. denudatus* Cockerell, 1946, *C. eardleyi* Kuhlmann, 2007, *C. fabiani* sp. nov. and *C. fasciatus* Smith, 1853.

Fig. 25. *Colletes fuscitergus* sp. nov., ♂, holotype (SAMC). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Description

Female

Unknown.

Male

Body length. 9 mm.

Head. Integument black, antenna brown ventrally. Face with grayish white to white hairs (Fig. 25B). Clypeus with very dense, small punctures (< 0.2 pd). Malar area long, length about 1.2–1.5 × width of mandibular base. Facial fovea narrow, maximum width about ½ antennal diameter.

Mesosoma. Integument black, tarsi brownish (Fig. 25A). Scutum with long grayish white to white hairs (Fig. 25C). Mesosomal sides and legs with white hairs. Disc of scutum with medium-sized, scattered punctures (0.5–1 pd), integument glabrous, surrounded by dense punctation (< 0.2 pd). Scutellum and metanotum with long yellowish to yellowish brown hairs, intermixed with few light brown hairs on scutellum. Upper sloping part of propodeal triangle with short, longitudinal carinae. Vertical part superficially shagreened and shiny with lateral 1–2 more or less developed transverse carinae anteriorly. Hind basitarsus not modified (Fig. 25F).

Metasoma. Integument brown and terga narrowly translucent posteriorly. T1 densely covered with long, erect yellowish white hairs (Fig. 25D). Disc of T2 with concolorous shorter hairs as on T1. Disc of T3–T6 with relatively long, erect dark brown hairs. T1–T5 with narrow white posterior hair bands (Fig. 25E). Discs of T1 and T2 with fine and dense (< 0.5 pd) punctation, punctures becoming a bit more scattered on posterior tergal depression, interspaces glabrous. S2–S5 with long whitish fringes posteriorly. Discs of sterna covered with relatively long white hairs. S7 (Fig. 25G) and gonostylus (Fig. 25H) as illustrated.

Distribution

The only record is from Garies (Fig. 36).

Phenology

Only recorded in June.

Colletes genalis Friese, 1909
Figs 26–27, 36

Colletes genalis Friese, 1909: 122. Lectotype female [designated by Kuhlmann 1998: 567], ZMHB; type locality: Namibia: Grotfontein [sic!]. Examined.

Colletes genalis australis Cockerell, 1945(1946): 841. Holotype female, NHMUK; type locality: South Africa: Rapenburg, Cape Flats. Synonymized by Kuhlmann (1998: 567). Examined.

New records

SOUTH AFRICA – **Northern Cape Province** • 1 ♀; 7,8 km NE Springbok; 29°37′ S, 17°56′ E; 19 Sep. 2007; C.D. Eardley leg.; SANC • 1 ♀; W of Steinkopf; 29°14′ S, 17°41′ E; alt. 949 m; 15 Sep. 2011; L. Packer leg.; PCYU • 1 ♀; 4.5 km NE Grootdrif, Gemsbokrivier-Pad, road side; 31°25′54″ S, 18°55′16″ E; alt. 170 m; 17 Aug. 2012; M. Kuhlmann leg.; CMK • 1 ♀; same collection data as for preceding; 22 Aug. 2012; CMK. – **Western Cape Province** • 1 ♂; Farm Quaggaskop; 31°19′ S, 18°39′ E; 29 Jul. 1992; M. Struck leg.; SANC • 1 ♀; Strandfontein; 31°45′11″ S, 18°13′37″ E; alt. 42 m; 16 Sep. 2005; C.D. Eardley leg.; SANC.

Distribution

Known distribution as shown in Fig. 36.

Colletes gessi Kuhlmann, 2007
Figs 28–29, 36

Colletes gessi Kuhlmann, 2007: 145–147, figs 14–15, 41. Holotype male, SAMC; type locality: South Africa: Nieuwoudtville, Wild Flower Reserve. Examined.

New records

None.

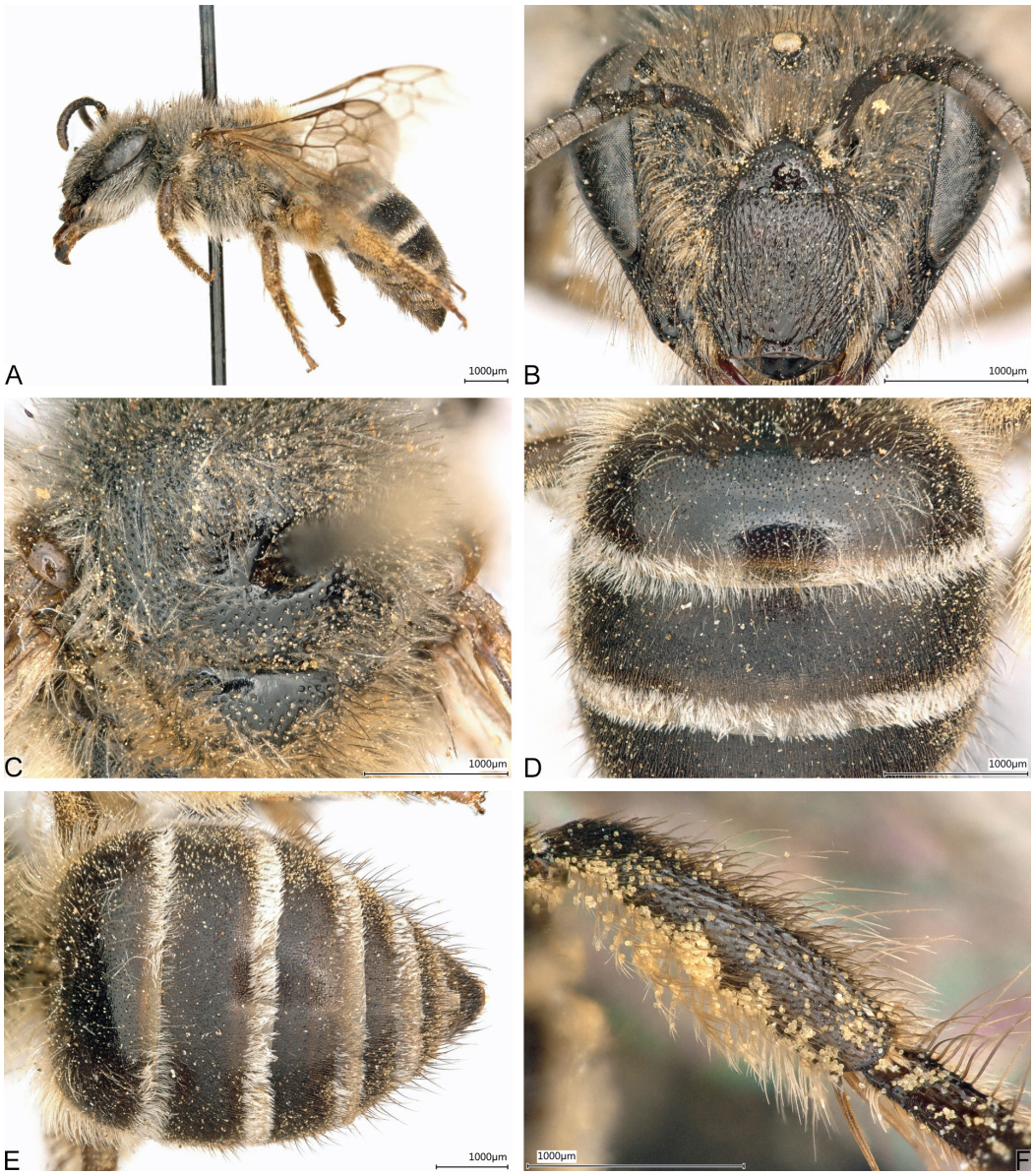

Fig. 26. *Colletes genalis* Friese, 1909, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

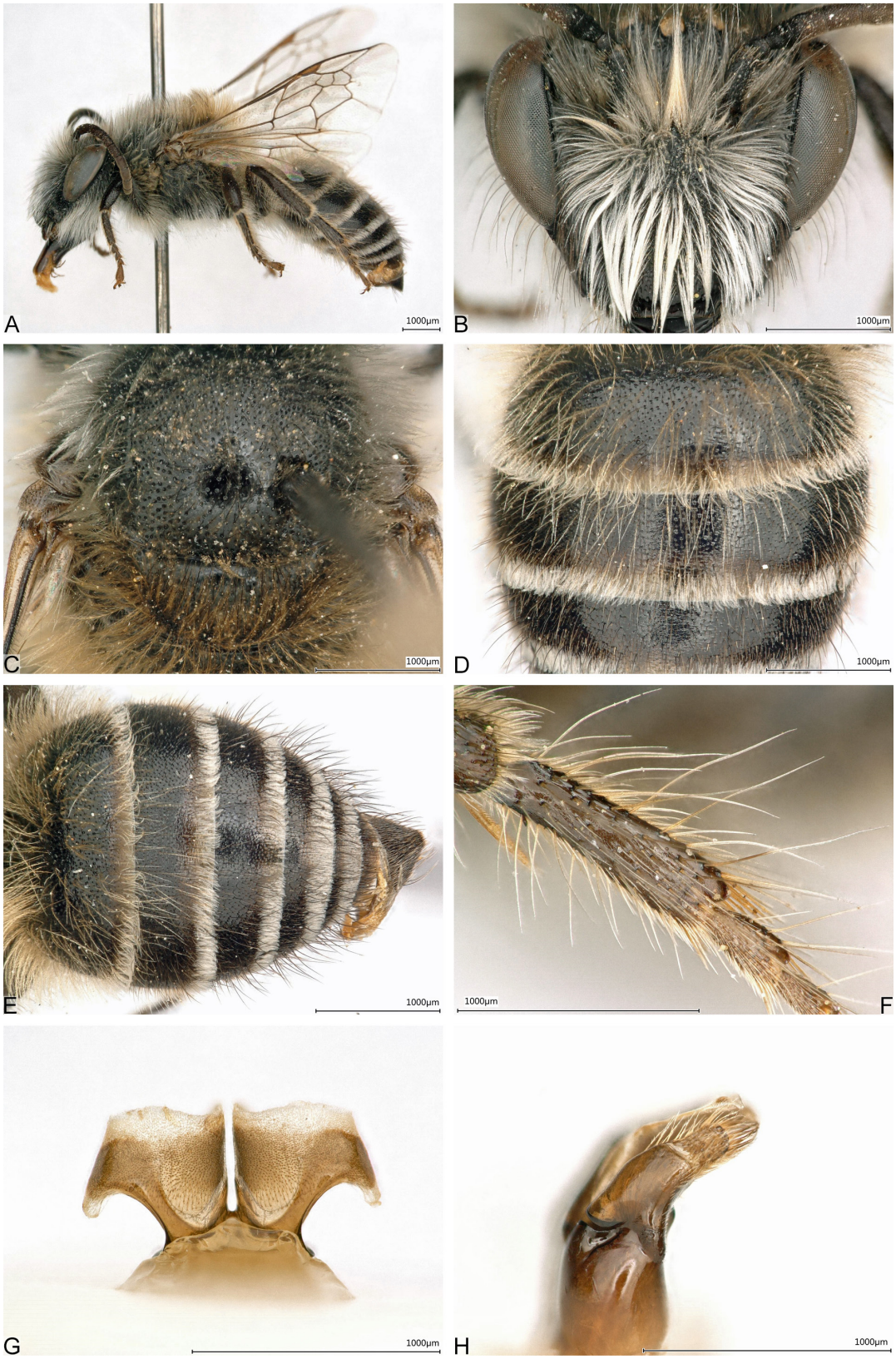

Fig. 27. *Colletes genalis* Friese, 1909, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Distribution

Known distribution as shown in Fig. 36.

Fig. 28. *Colletes gessi* Kuhlmann, 2007, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

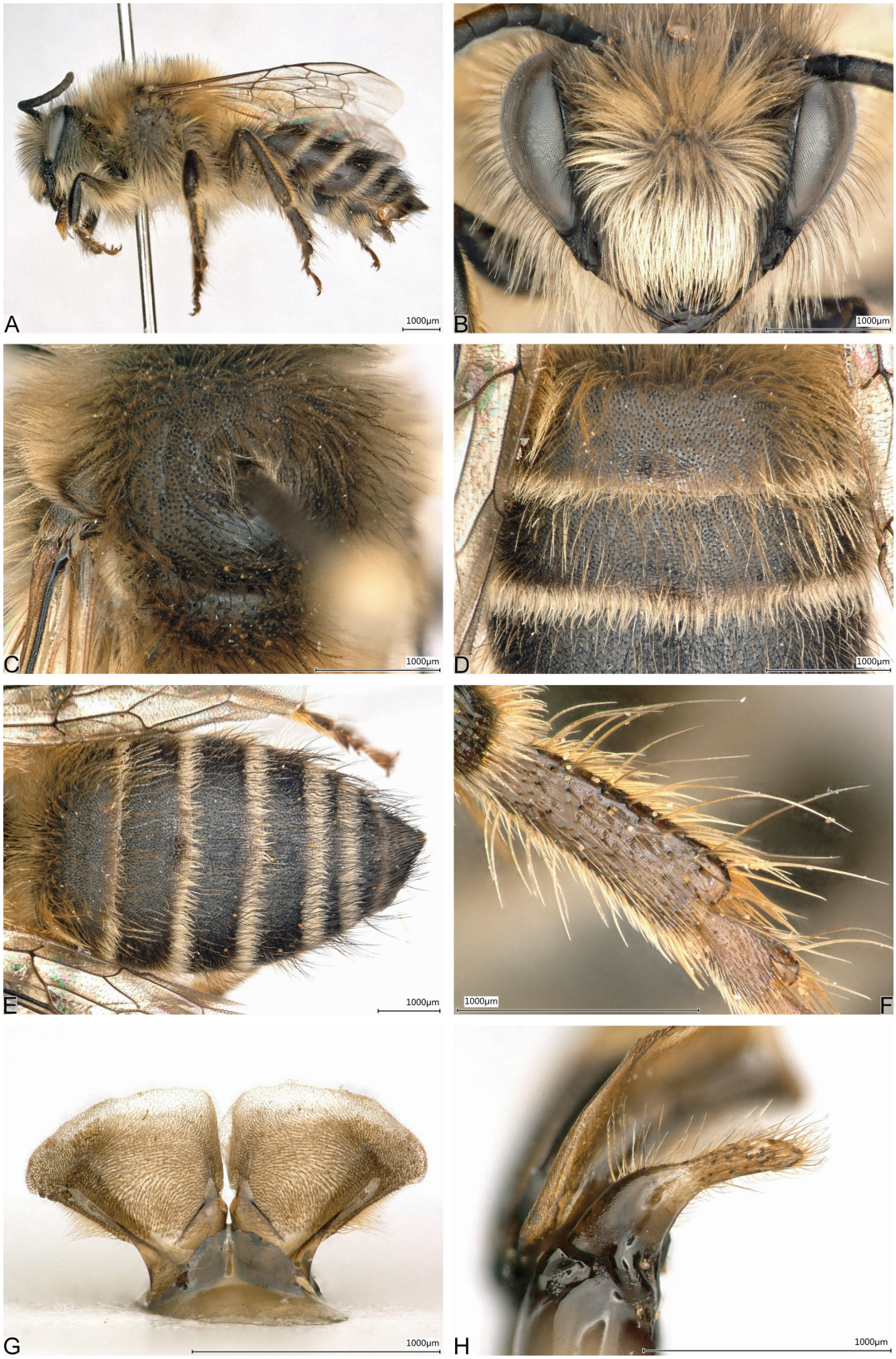

Fig. 29. *Colletes gessi* Kuhlmann, 2007, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Colletes infracognitus Cockerell, 1937
Figs 30–31, 36

Colletes infracognitus Cockerell, 1937: 137–138. Holotype female, NHMUK; type locality: South Africa: Worcester. Examined.

Fig. 30. *Colletes infracognitus* Cockerell, 1937, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

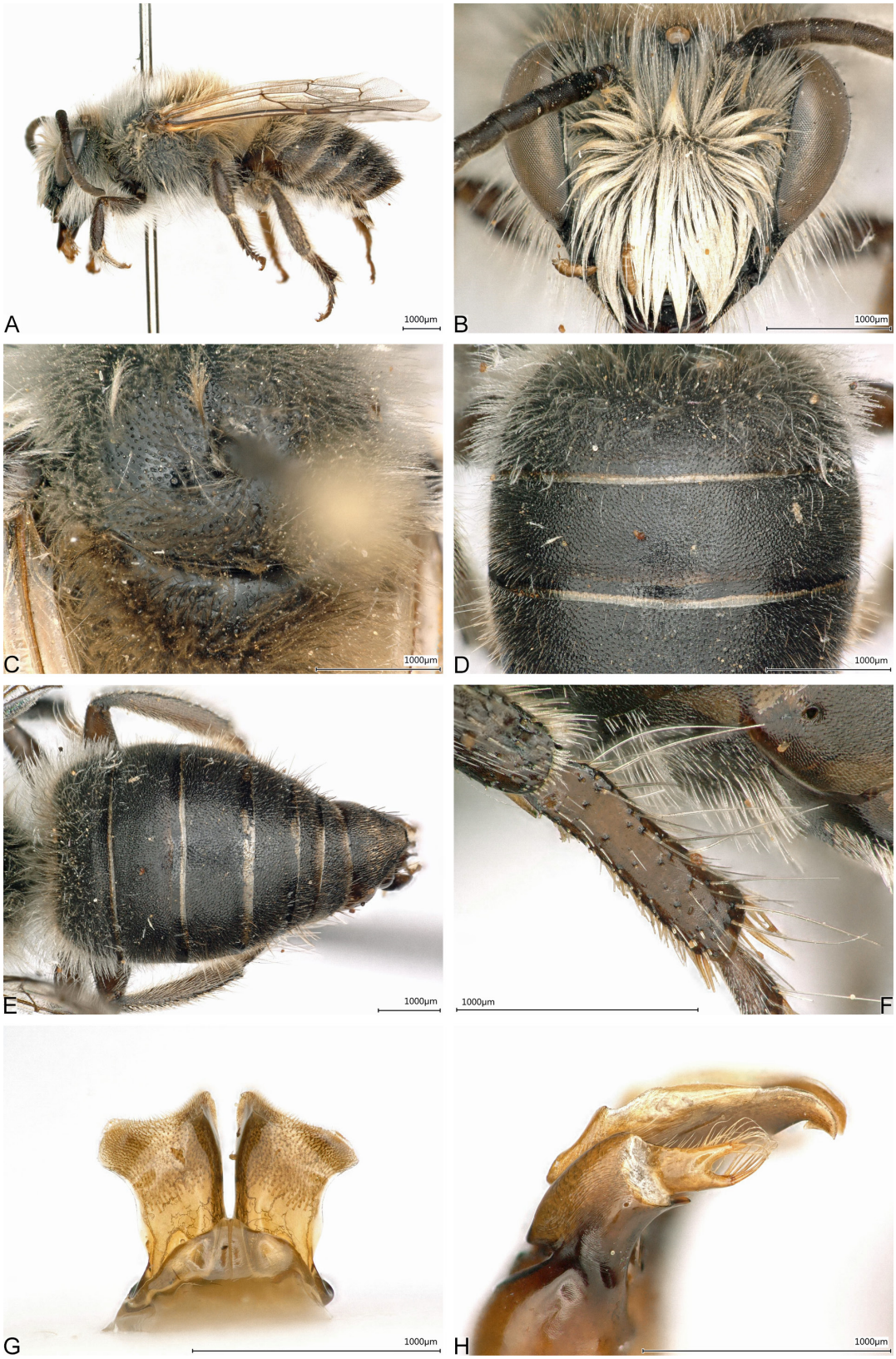

Fig. 31. *Colletes infracognitus* Cockerell, 1937, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Colletes katharinae Kuhlmann, 2007: 150–152, figs 34, 35, 42. Holotype male, SANC; type locality: South Africa: Springbok, Hester Malan Nature Reserve. **Syn. nov.** Examined.

New records

SOUTH AFRICA – **Northern Cape Province** • 1 ♀; near Die Berg; 32°12′35″ S, 18°44′51″ E; alt. 590 m; 20 Sep. 2005; C.D. Eardley leg.; SANC • 1 ♀; Nieuwoudtville, Pad Glenlyon to R 27; 31°23′24″ S, 19°09′06″ E; alt. 740 m; 7 Sep. 2007; K. Timmermann leg.; on *Ruschia unca* L.Bolus; CMK • 1 ♀; same collection data as for preceding; 17 Sep. 2007; CMK • 2 ♀♀; Hoek se Berg; 32°04′ S, 19°06′ E; 20 Sep. 2007; T.L. Griswold leg.; BLCU • 3 ♀♀; 12 km NW of Nieuwoudtville, Farm Avontuur, Fynbos; 31°16′18″ S, 19°02′55″ E; alt. 770 m; 3 Sep. 2009; M. Kuhlmann leg.; CMK • 6 ♀♀, 1 ♂; 20 km S Nieuwoudtville, Farm Papkuilsfontein, Fynbos; 31°33′16″ S, 19°08′31″ E; alt. 680 m; 15 Aug. 2010; M. Kuhlmann leg.; CMK • 1 ♀; Roggeveld Mts, 2 km S Farm Perdekloof, rivier, dolerite; 31°47′35″ S, 19°58′16″ E; alt. 1220 m; 20 Sep. 2022; M. Kuhlmann leg.; CMK. – **Western Cape Province** • 2 ♀♀; Clanwilliam; 32°07′59″ S, 18°52′43″ E; 12 Sep. 2005; C.D. Eardley leg.; SANC.

Distribution

Known distribution as shown in Fig. 36.

Remarks

Synonymisation of *C. katharinae* with *C. infracognitus* is based on sex association (both species were only known from a single sex) when females and males were captured on the farm Papkuilsfontein in 2010.

Colletes inornatus Cockerell, 1946
Figs 32–33, 36

Colletes inornatus Cockerell, 1945(1946): 836. Holotype male, NHMUK; type locality: South Africa: Rapenburg, Cape Flats. Examined. [the female is here described for the first time].

Diagnosis

The female can be separated from that of all other species with a normal scopa by the combination of the following characters: apical hair band of T2 about ½ width of disc (Fig. 32D–E), malar area narrow (⅓ width of mandibular base), facial fovea narrow (about width of antennal flagellum), T6 broadly rounded and disc of T1 medio-anteriorly with numerous conspicuously short hairs interspersed (Fig. 32D–E).

New records

SOUTH AFRICA – **Northern Cape Province** • 4 ♀♀, 1 ♂; Keiski Mts, 5 km S of Farm Nooiensrivier, dolerite hill; 31°45′54″ S, 19°50′17″ E; alt. 1270 m; 4 Sep. 2010; M. Kuhlmann leg.; CMK • 1 ♀; 20 km W Sutherland, Farm Kanolfontein, road side; alt. 1385 m; 7 Sep. 2012; M. Kuhlmann; CMK • 1 ♂; same collection data as for preceding; 17 Sep. 2017; CMK • 1 ♀, 1 ♂; 8 km WNW of Leliefontein, Fynbos, road side; 30°15′58″ S, 18°03′17″ E; alt. 1190 m; 10 Sep. 2017; M. Kuhlmann leg.; CMK • 1 ♀, 1 ♂; same collection data as for preceding; 14 Sep. 2017; CMK. – **Western Cape Province** • 1 ♂; 16 km E of Clanwilliam; 32°08′ S, 18°59′ E; alt. 713 m; 8 Nov. 2001; C.D. Eardley leg.; SANC • 2 ♀♀; Strandfontein, W of Muizenberg; 34°04′ S, 18°32′ E; alt. 25 m; 7 Oct. 2002; M. E. Irwin, F. D. Parker; BLCU • 2 ♀♀; 3 km W of Atlantis; 33°34′ S, 18°27′ E; alt. 150 m; 8–12 Oct. 2002; M.E. Irwin, F.D. Parker leg.; Malaise trap; CMK • 3 ♀♀; same collection data as for preceding; BLCU.

Description

Female

Body length. 12–13 mm.

Head. Integument black, antenna brown ventrally. Pilosity of face grayish to yellowish white (Fig. 32B), intermixed with brown hairs. Clypeus with dense small punctures (0.2 pd), slightly elongate, interspaces glabrous (Fig. 32B). Malar area narrow, length about ⅓ width of mandibular base. Facial fovea narrow, maximum width about antennal diameter.

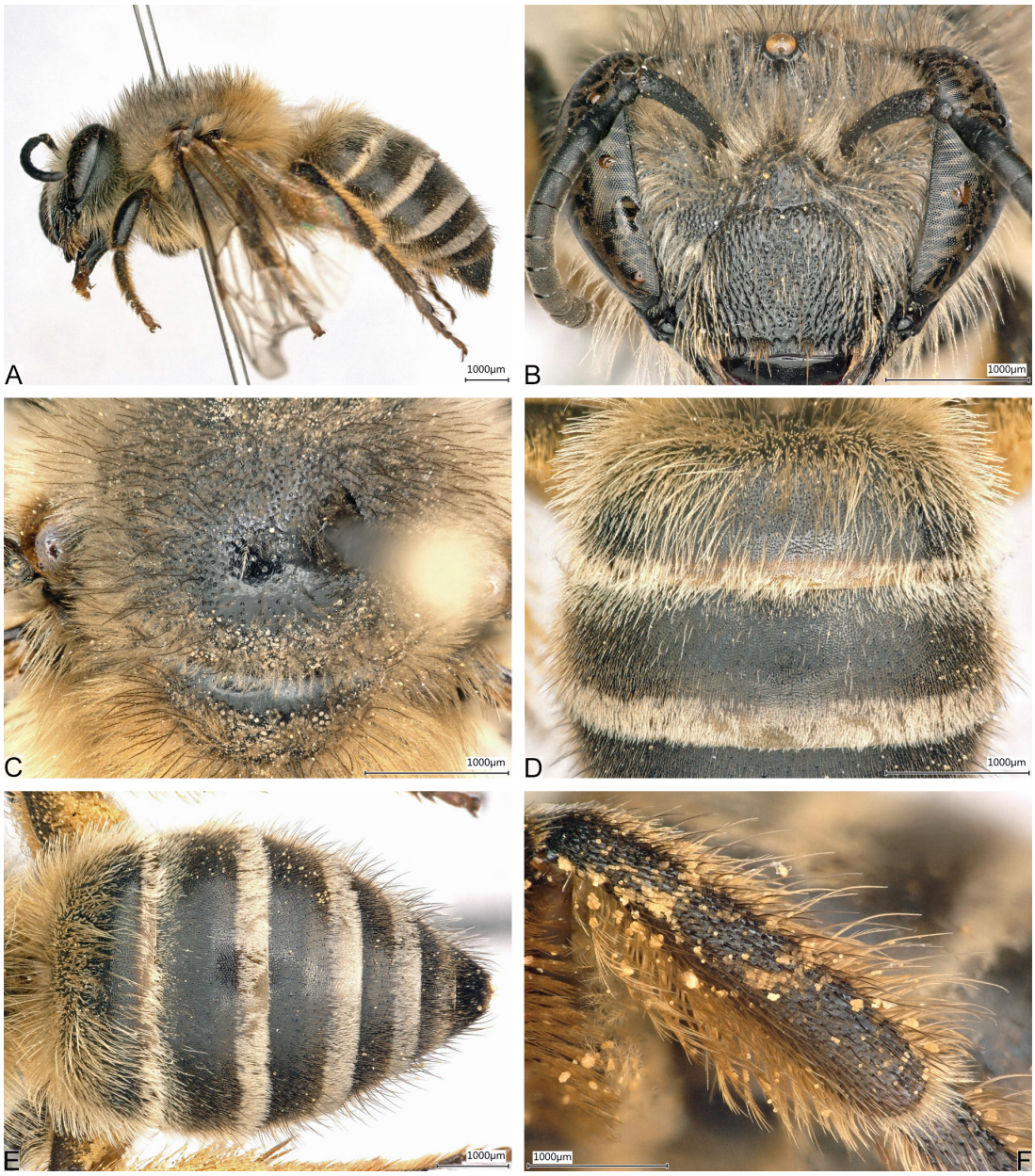

Fig. 32. *Colletes inornatus* Cockerell, 1946, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

Fig. 33. *Colletes inornatus* Cockerell, 1946, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Mesosoma. Integument black, tarsi often brownish (Fig. 32A). Scutum with long grayish hairs, intermixed with longer dark brown hairs (Fig. 32C). Mesosomal sides and legs with yellowish to grayish white hairs, intermixed with few brown hairs on mesepisternum. Disc of scutum with scattered (1–2 pd), medium-sized punctures, surrounded by slightly denser punctation (< 0.5 pd), interspaces glabrous (Fig. 32C). Scutellum and metanotum with long yellowish white hairs, on scutellum intermixed with dark brown hairs. Upper sloping part of propodeal triangle scabriculous. Vertical part superficially shagreened and shiny, anteriorly with a few transverse carinae. Scopa dark brown dorsally, dark yellowish ventrally (Fig. 32F). Mid femora with basal edge and stout ridge ventrally with brush of hairs.

Metasoma. Integument black, terga narrowly translucent posteriorly. T1–T3 with slight bluish shine. T1 densely covered with long, erect yellowish white hairs, anteriorly interspersed with short yellowish white hairs (Fig. 32D). Disc of T2 with very short, erect yellowish brown hairs. T2 with narrow basal tomentum. Discs of T2–T5 with successively longer, erect short blackish hairs. T2–T5 with broad white posterior tergal hair bands, narrower on T1 (Fig. 32E). Disc of T1 with very fine and dense punctures (0.5–1 pd), punctures becoming finer and denser on posterior tergal depression. Disc of T2 with very fine and dense punctation (< 0.5 pd). S2–S5 with yellowish brown hair fringes. Discs of sterna densely covered with yellowish long, apically directed hairs.

Distribution

Known distribution as shown in Fig. 36.

Colletes karooensis Kuhlmann, 2007
Figs 34–36

Colletes karooensis Kuhlmann, 2007: 149–150, figs 4, 38–39, 42. Holotype male, SAMC; type locality: South Africa: Sandberg Station, Droogerivier. Examined.

New records

SOUTH AFRICA – **Western Cape Province** • 1 ♀; 711 km N of Clanwilliam; 32°05′ S, 18°49′ E; alt. 92 m; 21 Sep. 2011; L. Packer leg.; PCYU.

Distribution

Known distribution as shown in Fig. 36.

Colletes khoisanorum sp. nov.
urn:lsid:zoobank.org:act:DCB1CA2B-B2F5-4C59-8317-CAE4A4D61A85
Figs 37, 45

Diagnosis

The female can be separated from that of all other species with a normal scopa by the combination of the following characters: apical hair band of T2 about ¼ width of disc (Fig. 37D–E), malar area elongate (about width of mandibular base), facial fovea narrow (about ⅔ width of antennal flagellum), on metanotum no dark brown hairs intermixed.

Etymology

Dedicated to the Khoisan ethnic group who lived, among others, in the region where this species was found.

Material examined

Holotype

SOUTH AFRICA – **Western Cape Province** • ♀; Pakhuis Pass; 32°08′ S, 19°02′ E; 7 Sep. 1987; C.D. Eardley leg.; SAMC.

Fig. 34. *Colletes karooensis* Kuhlmann, 2007, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

Fig. 35. *Colletes karooensis* Kuhlmann, 2007, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Paratypes

SOUTH AFRICA– **Western Cape Province** • 1 ♀; Clanwilliam Dist., Biedouw Valley; 32°08′ S, 19°14′ E; 5–7 Sep. 1987; C.D. Eardley leg.; CMK • 1 ♀; S of Lamberts Bay; 32°06′ S, 18°18′ E; 7–9 Oct. 1999; M. Halada leg.; CMK.

Additional material

SOUTH AFRICA – **Northern Cape Province** • 1 ♀; Concordia, 4 km N; 29°30′ S, 17°56′ E; 14 Sep. 2007; T. L. Griswold leg.; labelled as "*Colletes fasciatus* group 8"; BLCU.

Description

Female

Body length. 9 mm.

Head. Integument black. Face with short, grayish to yellowish white hairs (Fig. 37B), with long dark brown hairs on vertex and along inner eye margins. Clypeus with dense, small punctation (0.2–0.5 pd), slightly elongate, shiny between punctures (Fig. 37B). Malar area elongate, about width of mandibular base. Facial fovea narrow, maximum width about ⅔ × antennal diameter.

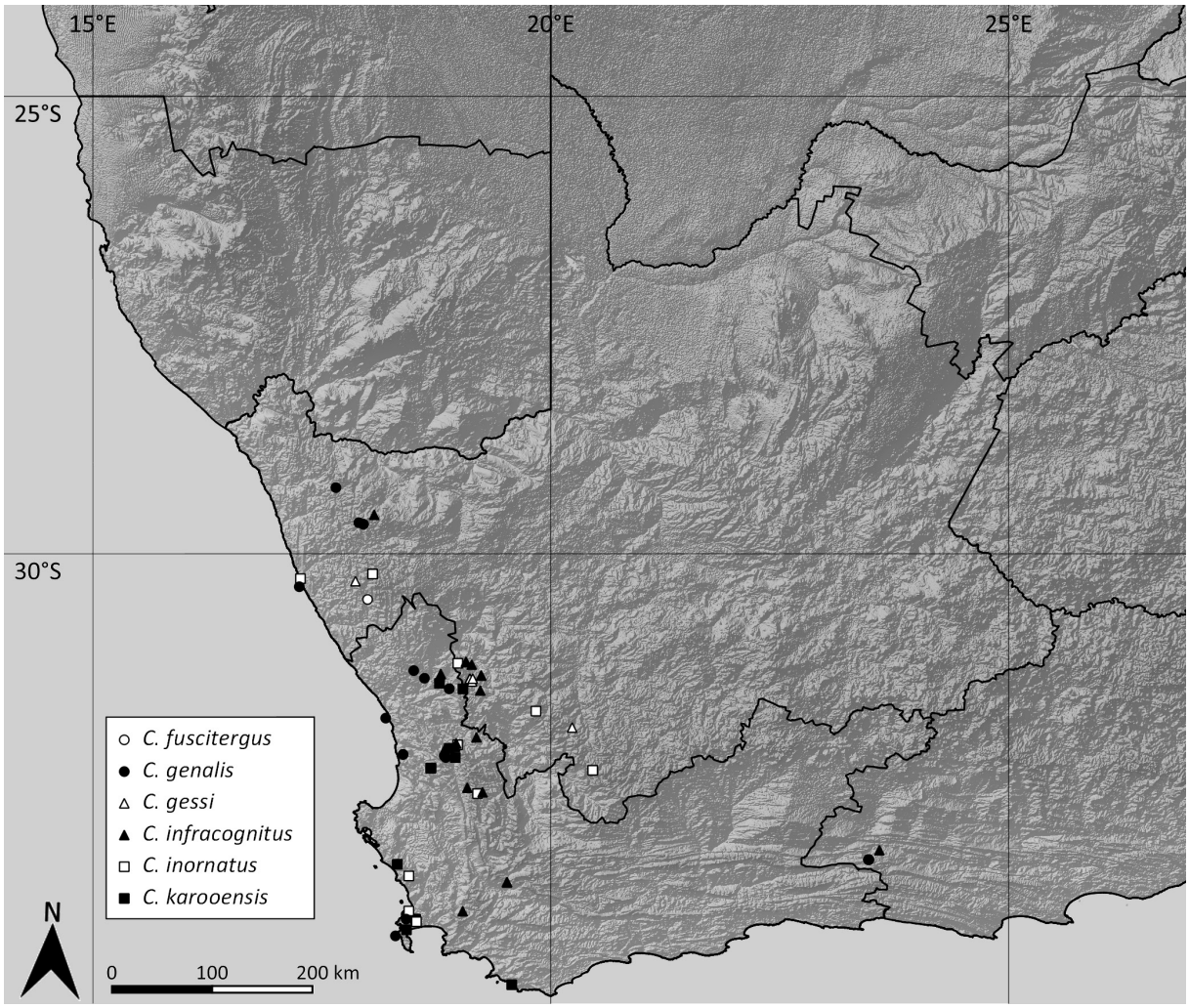

Fig. 36. Distribution of *C. fuscitergus* sp. nov., *C. genalis* Friese, 1909, *C. gessi* Kuhlmann, 2007, *C. infracognitus* Cockerell, 1937, *C. inornatus* Cockerell, 1946 and *C. karooensis* Kuhlmann, 2007.

Mesosmoa. Integument black, legs brownish (Fig. 37A). Scutum with relatively long, yellowish to grayish white hairs, intermixed with numerous longer dark brown hairs (Fig. 37C). Mesosomal sides and legs with yellowish to grayish white hairs with some brownish hairs intermixed on mesepisternum and on legs. Disc of scutum with medium-sized, very scattered punctures (2–4 pd), integument glabrous, surrounded by dense, small (< 0.5 pd) punctation (Fig. 37C). Scutellum and metanotum with relatively long, yellowish brown hairs, with longer dark brown hairs intermixed on scutellum. Upper sloping part of propodeal triangle with short, longitudinal carinae. Vertical part glabrous. Scopa dorsal brown, ventrally yellowish white (Fig. 37F). Mid femora with little brush of hairs basally.

Metasoma. Integument black, terga narrowly yellowish translucent posteriorly. T1–T3 with very slight bluish shine. T1 sparsely covered with relatively long, erect yellowish white hairs (Fig. 37D). Disc of T2

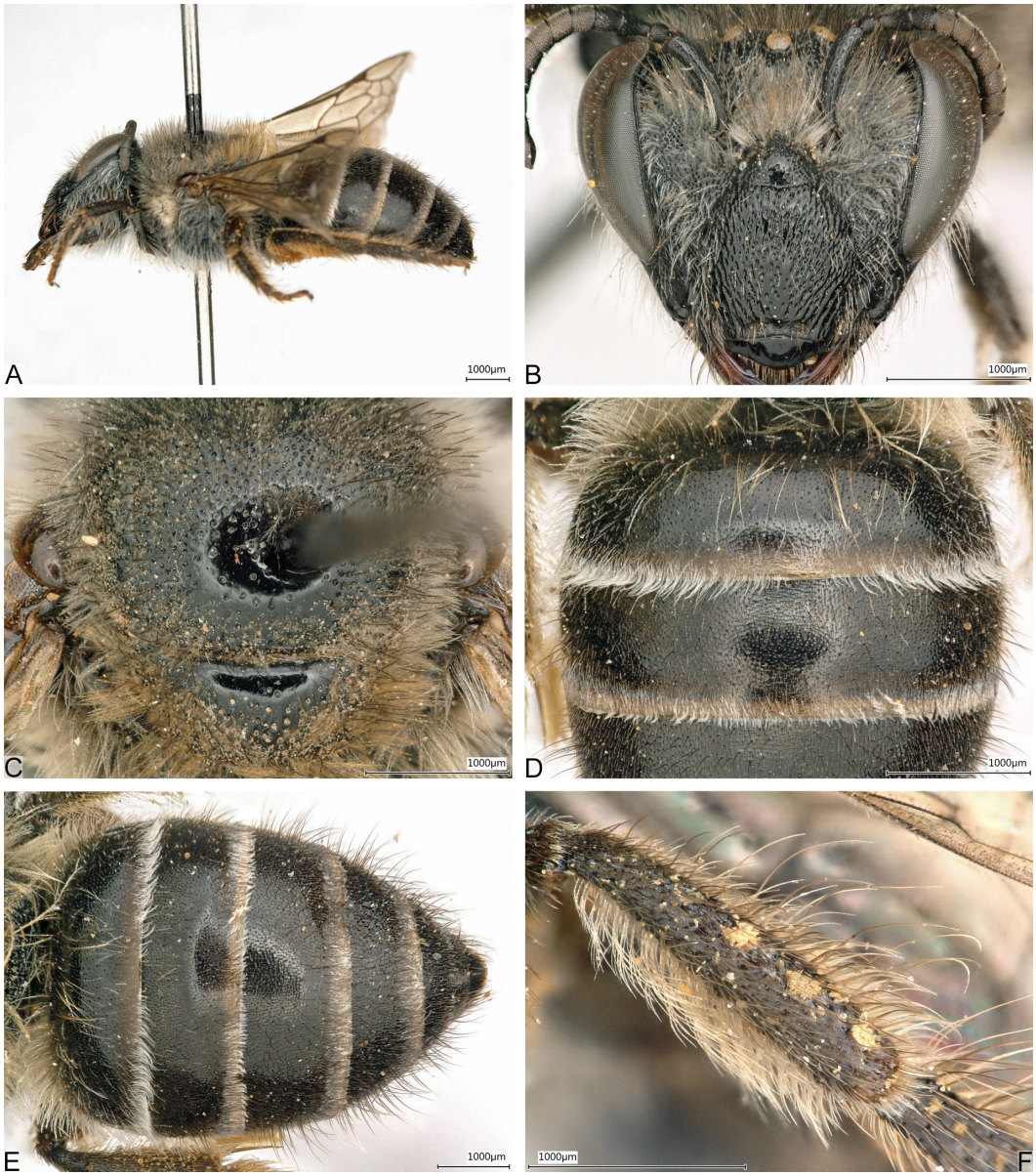

Fig. 37. *Colletes khoisanorum* sp. nov., ♀, paratype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

with shorter erect hairs with same color as on T1. Discs of T2–T5 with successively longer, short, erect blackish hairs. T1–T4 with very narrow, white posterior tergal hair bands (Fig. 37E). Discs of T1 with fine, dense punctation (0.5–1 pd), punctures becoming slightly finer, denser and shallower on posterior tergal depression (Fig. 37D). Disc of T2 with fine, dense (< 0.5 pd) punctation; interspaces glabrous. S2–S5 without apical hair fringes. Discs of sterna loosely covered with relatively long, yellowish white, apically directed hairs.

Male

Unknown.

Distribution

From the Springbok area in the north down south to the vicinity of Clanwilliam (Fig. 45).

Phenology

Found from September to October.

Colletes knersvlaktei Kuhlmann, 2007
Figs 38, 45

Colletes knersvlaktei Kuhlmann, 2007: 152–153, figs 28, 29, 42. Holotype male, DNMNH; type locality: South Africa: Steinkopf. Examined.

New records

SOUTH AFRICA – **Western Cape Province** • 2 ♂♂; Vanrhynsdorp; 31°36′ S, 18°44′ E; Jul.–Aug. 1927; G. v. Son leg.; CMK • 6 ♂♂; same collection data as for preceding; DNMNH.

Distribution

Known distribution as shown in Fig. 45.

Colletes kogelbergensis sp. nov.
urn:lsid:zoobank.org:act:1A7B70B2-0A58-4557-94E2-3DE7072B0E48
Figs 39–40, 45

Diagnosis

Among all species of this group the female and male *Colletes kogelbergensis* are unique in having hairs on face and scutum (in female also scutellum) with partial brown tips. Additionally, the discs of T1–2 in the female have reddish margins posteriorly (Fig. 39D–E). The male can be most easily identified by the unique shape of S7 (Fig. 40G) and gonostylus (Fig. 40H).

Etymology

Named after the Kogelberg Mountains where this species was discovered.

Material examined

Holotype

SOUTH AFRICA – **Western Cape Province** • ♂; Kogelberg, Palmeit Trail; 34°18′37″ S, 18°56′53″ E; alt. 50 m; 16 Nov. 2018; A.D. Vaudo leg.; SAMC.

Fig. 38. *Colletes knersvlaktei* Kuhlmann, 2007, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Paratypes

SOUTH AFRICA – **Western Cape Province** • 1 ♂; Kogelberg, Palmeit Trail; 34°18′37″ S, 18°56′53″ E; alt. 50 m; 16 Nov. 2018; A.D. Vaudo leg.; CMK • 1 ♀; Kogelberg, Brodie-Link; same collection data as for preceding; 17 Nov. 2018; CMK.

Description

Female

Body length. 11 mm.

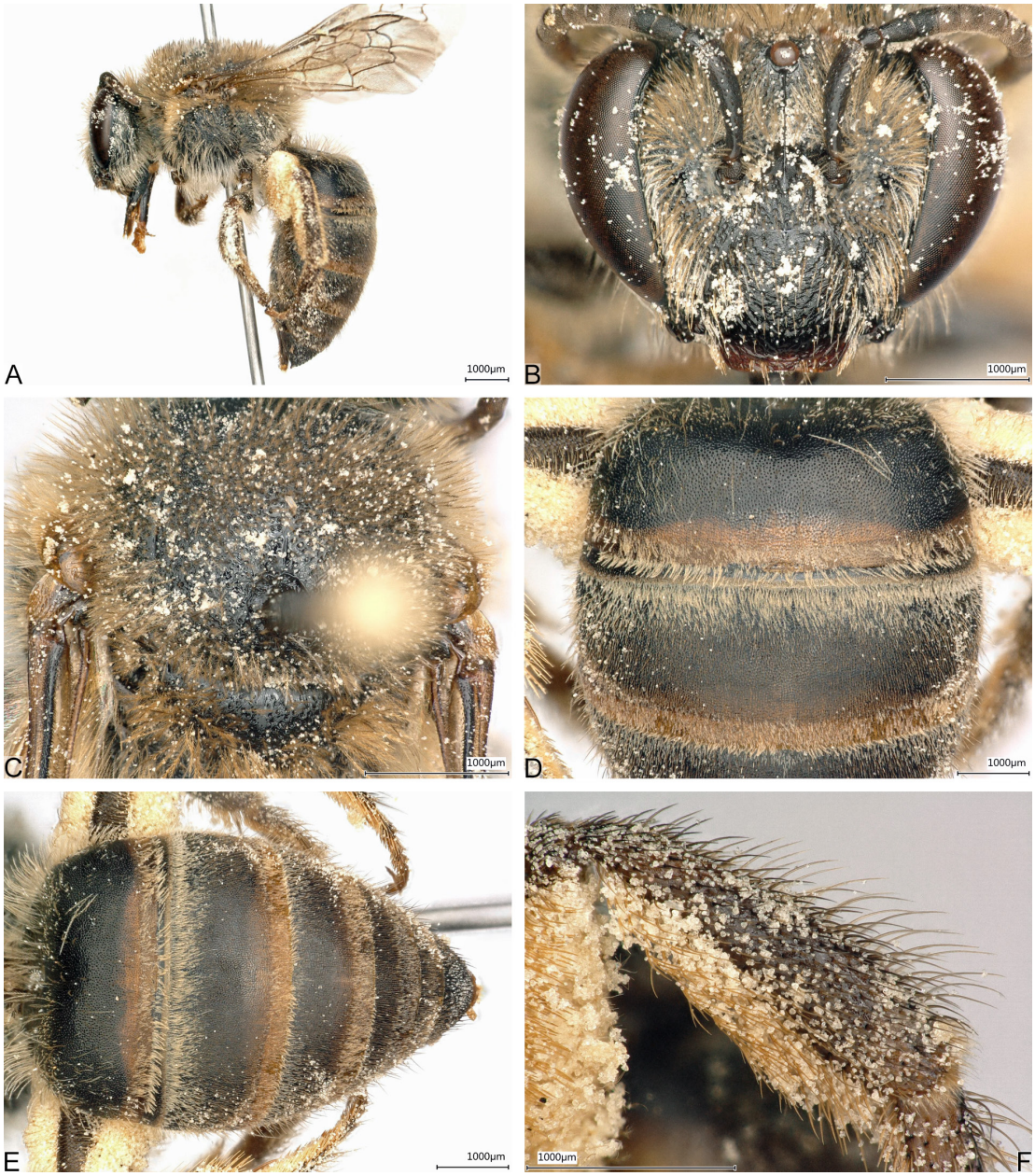

Fig. 39. *Colletes kogelbergensis* sp. nov., ♀, paratype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

Head. Integument black, antenna brown ventrally. Face yellowish white (Fig. 39B), hairs partly with dark brown tips. Clypeus with fine, dense indistinct punctation (0.2 pd), punctures elongate, interspaces glabrous. Malar area narrow, length about ⅓ width of mandibular base. Facial fovea narrow, maximum width about 1–1.2 × antennal diameter.

Mesosoma. Integument black except tarsi often brownish (Fig. 39A). Scutum with relatively long, yellowish white to yellowish brown hairs (Fig. 39C), with numerous hairs with dark brown tips. Mesosomal sides and legs grayish to yellowish white hairs, intermixed with some hairs with brown tips on mesepisternum. Disc of scutum with dense (0.5–1 pd) punctures, surrounded by dense punctation (0.5–1 pd). Integument shagreened and the punctures have a crater-like structure. Scutellum and metanotum with relatively long, yellowish brown hairs, on scutellum most hairs with dark brown tips. Upper sloping part of propodeal triangle scabricoulus, vertical part shagreened and shiny. Scopa dark brown dorsally, yellowish ventrally (Fig. 39F). Mid femora with a stout ridge ventrally and a brush of hairs.

Metasoma. Integument black. Terga translucent posteriorly, disc of terga 1 and 2 with reddish margins posterior (Fig. 39D). T1–T3 with slight bluish shine. T1 covered with long yellowish white erect hairs, medio-anteriorly with short concolorous hairs interspersed. Disc of T2 with some short erect yellowish white hairs. T2 with narrow basal tomentum. Discs of T3–T5 with successively longer, short erect blackish hairs. T1–T3 with relatively broad, yellowish white posterior tergal hair bands (Fig. 39E). Disc of T1 with fine and dense punctures (0.5–1 pd), punctures slightly smaller, finer and denser towards posterior tergal depression (Fig. 39D). Disc of T2 with very fine, indistinct and dense punctation (< 0.5 pd); glabrous between punctures. S2–S5 with short yellowish hair fringes. Discs of sterna covered with short yellowish hairs, directed apically, longer on S2 medially.

Male

Body length. 10–11 mm.

Head. Integument black, antenna ventrally dark brown. Face grayish to yellowish brown hairs (Fig. 40B), partly with darker brown tips. Clypeus with very dense, small punctures (< 0.2 pd). Malar area narrow, length about ½ width of mandibular base. Facial fovea narrow, maximum width about antennal diameter.

Mesosoma. Integument black, legs reddish brown, apical and basal end of tibiae and tarsi completely yellowish brown (Fig. 40A). Scutum with long, yellowish brown hairs, partly with brown tips. Mesosomal sides and legs yellowish to grayish white hairs, intermixed with some hairs with brown tips on mesepisternum. Disc of scutum with medium-sized dense punctures (0.5–1 pd), surrounded by dense punctation (< 0.5 pd), integument shagreened and dull and the punctures have a crater-like structure (Fig. 40C). Scutellum and metanotum with long, yellowish white hairs, on scutellum with some darker hairs intermixed. Upper sloping part of propodeal triangle with short, longitudinal carinae anteriorly, scabriculous posteriorly. Vertical part superficially shagreened and shiny with 2 or 3, short, more or less transverse carinae. Hind basitarsus broadened apically (Fig. 40F). Dorso-apical edge is slightly beveled.

Metasoma. Integument black, terga narrowly translucent posteriorly. T1–T3 with slight bluish shine. T1 densely covered with long, erect yellowish white hairs (Fig. 40D). Disc of T2 with shorter, erect hairs. Discs of T3–T5 with relatively short, erect dark brown to black hairs. T1–T5 with narrow white tergal hair bands (Fig. 40E). Discs of T1 and T2 with fairly coarse distinct, dense punctation (< 0.2 pd), punctures becoming slightly finer and shallower towards posterior tergal depression, interspaces glabrous (Fig. 40D). S1–S5 with short, yellowish white hair fringes, very short medially, longer laterally. Discs of sterna with short posterior directed hairs, laterally long yellow white hairs. S7 (Fig. 40G) and gonostylus (Fig. 40H) as illustrated.

Fig. 40. *Colletes kogelbergensis* sp. nov., ♂, paratype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Distribution

Only known from the Kogelberg Mountains (Fig. 45).

Phenology

Only found in November.

Colletes latefasciatus Friese, 1925
Figs 41, 45

Colletes latefasciatus Friese, 1925: 524. Lectotype female [designated by Kuhlmann 1998: 567], ZMHB; type locality: South Africa: Capland. Examined.

New records

None.

Distribution

Known distribution as shown in Fig. 45.

Colletes laticaudus Cockerell, 1946
Figs 42–43, 45

Colletes laticaudus Cockerell, 1945(1946): 850–851. Holotype female, NHMUK; type locality: South Africa: Matjesfontein. Examined.

New records

SOUTH AFRICA – **Northern Cape Province** • 1 ♂; Nieuwoudtville, Pad Glenlyon to R27, slope and side of road; 31°23′25″ S, 19°08′28″ E; alt. 740 m; 18 Aug. 2007; K. Timmermann leg.; CMK • 3 ♂♂; Nieuwoudtville, Pad Glenlyon to R27; 31°23′24″ S, 19°09′06″ E; alt. 740 m; 20 Aug. 2007; M. Kuhlmann leg.; on *Ruschia unca* L.Bolus; CMK • 1 ♀; 4.5 km NE Grootdrif, Gemsbokrivier-Pad, road side; 31°25′54″ S, 18°55′16″ E; alt. 170 m; 22 Aug. 2012; M. Kuhlmann leg.; CMK • 1 ♀; 30 km W Sutherland, 6 km NNW Farm Kanariesfontein, road side; 32°22′17″ S, 20°22′50″ E; alt. 1310 m; 16 Sep. 2017; M. Kuhlmann leg.; CMK • 1 ♀; same collection data as for preceding; 17 Sep. 2017; CMK. – **Eastern Cape Province** • 1 ♀; Willowmore, 18 km on Baviaanskloof Rd; 33°25′ S, 23°33′ E; 6 Oct. 1971; C. Jacot-Guillarmod leg.; CMK. – **Western Cape Province** • 1 ♀; NNE of Clanwilliam, Doringbos; 32°08′ S, 18°54′ E; 11 Oct. 1999; M. Halada leg.; OLML • 1 ♀; 9 km NE Van Rhynsdorp, Droerivier; 31°42′ S, 18°12′ E; alt. 160 m; 10 Oct. 2002; M.E. Irwin and F.D. Parker leg.; pan trap; BLCU • 1 ♀; Pakhuis Pass; 32°08′ S, 18°55′ E; alt. 296 m; 21 Sep. 2011; L. Packer leg.; PCYU.

Distribution

Known distribution as shown in Fig. 45.

Colletes littoralis sp. nov.
urn:lsid:zoobank.org:act:D8210C78-AEF3-4166-BDCB-A49E378BBFF0
Figs 44–45

Diagnosis

Among the species with a normal scopa the following combination of characters is unique for the female: apical hair band of T2 about ⅔ width of disc (Fig. 44D–E), malar area elongate, length about width of mandibular base and maximum width of facial fovea about 1–1.2 × antennal diameter.

Fig. 41. *Colletes latefasciatus* Friese, 1925, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

Etymology

This species was named for the fact that some specimens were collected near the coast.

Material examined

Holotype

NAMIBIA – **Karas** • ♀; Aurusberg, Diamond Area No. 1; 27°40′ S, 16°23′ E; 23 Oct. 1974; R.H. Watmough leg.; on orange *Mesembryanthemum* sp.; SAMC.

Fig. 42. *Colletes laticaudus* Cockerell, 1946, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

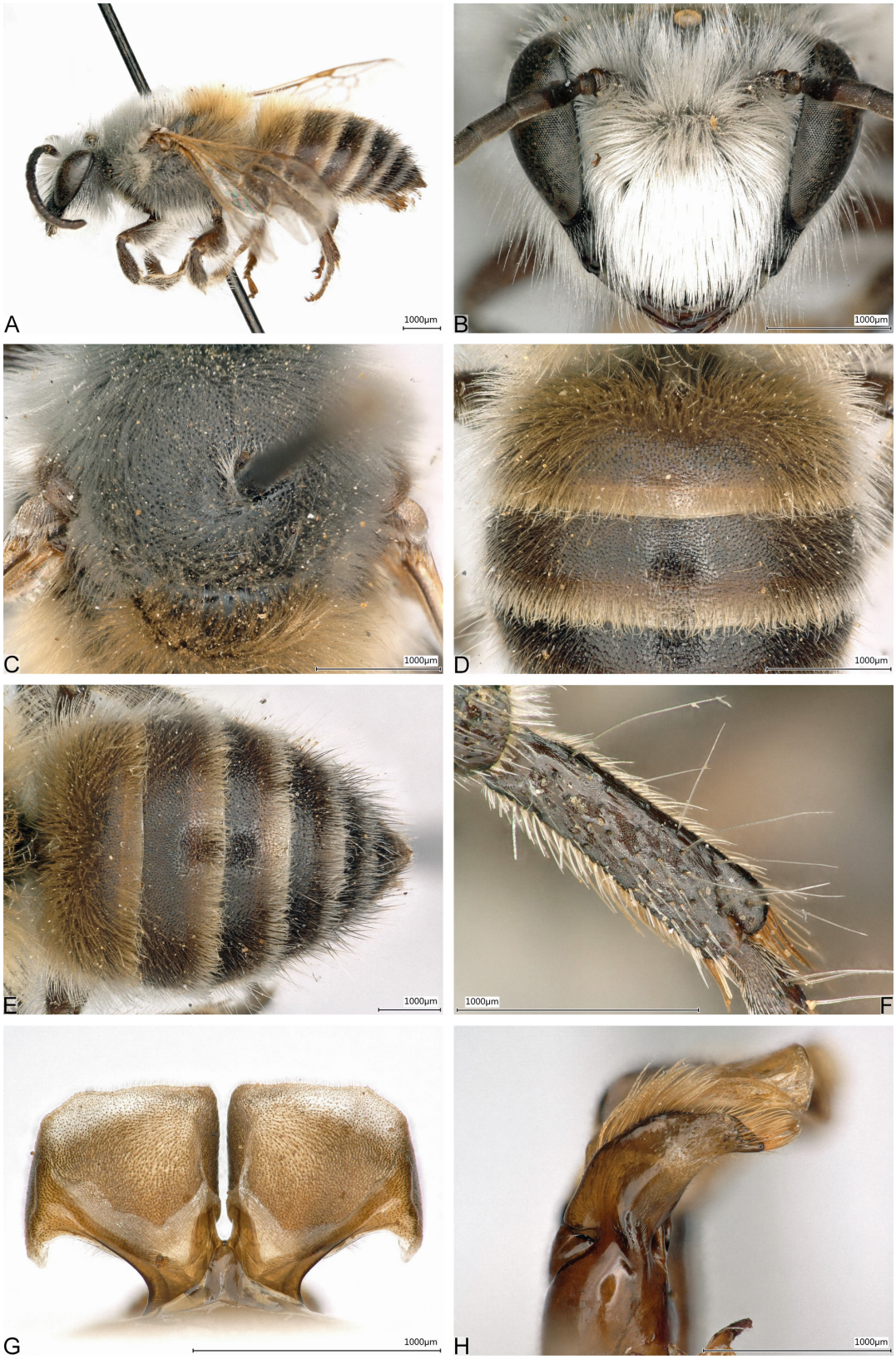

Fig. 43. *Colletes laticaudus* Cockerell, 1946, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Paratypes

SOUTH AFRICA – **Northern Cape Province** • 2 ♀♀; Groenriviersmond coast; 30°51′ S, 17°34′ E; 15 Oct. 1999; M. Halada leg.; CMK • 1 ♀; 17 km NE Springbok; 29°34′ S, 17°01′ E; 19 Sep. 2007; C.D. Eardley leg.; CMK.

Description

Female

Body length. 9–10 mm.

Fig. 44. *Colletes littoralis* sp. nov., ♀, paratype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

Head. Integument black, antenna brown ventrally. Face with relatively long, grayish white hairs, with light brown hairs on vertex (Fig. 44B). Clypeus with dense, small punctation (0.2 pd), slightly elongate, interspaces glabrous (Fig. 44B). Malar area elongate, length about width of mandibular base. Facial fovea slightly broadened, maximum width about 1–1.2 × antennal diameter.

Mesosoma. Integument black, tarsi often reddish brown (Fig. 44A). Scutum with relatively long, yellowish white hairs, intermixed with longer brown hairs (Fig. 44C). Mesosomal sides and legs yellowish to grayish white hairs, intermixed with some brown hairs on mid tibiae. Disc of scutum with medium-sized, scattered punctures (1–3 pd), integument glabrous, surrounded by dense, small (< 0.5 pd) punctation (Fig. 44C). Scutellum and metanotum with long, yellowish brown hairs, on scutellum intermixed with brown hairs. Upper sloping part of propodeal triangle with short, longitudinal carinae. Vertical part superficially shagreened and slightly dull, with some indistinct, short transverse carinae anteriorly. Scopa dorsal light brown, ventrally yellowish (Fig. 44F).

Metasoma. Integument black, terga narrowly translucent posteriorly. Disc of T1 covered with moderately long, erect yellowish white hairs, shorter posterior, medio-anteriorly with short yellowish white hairs interspersed (Fig. 44D). Disc of T2 covered with short erect, yellowish white hairs. T2 with weakly

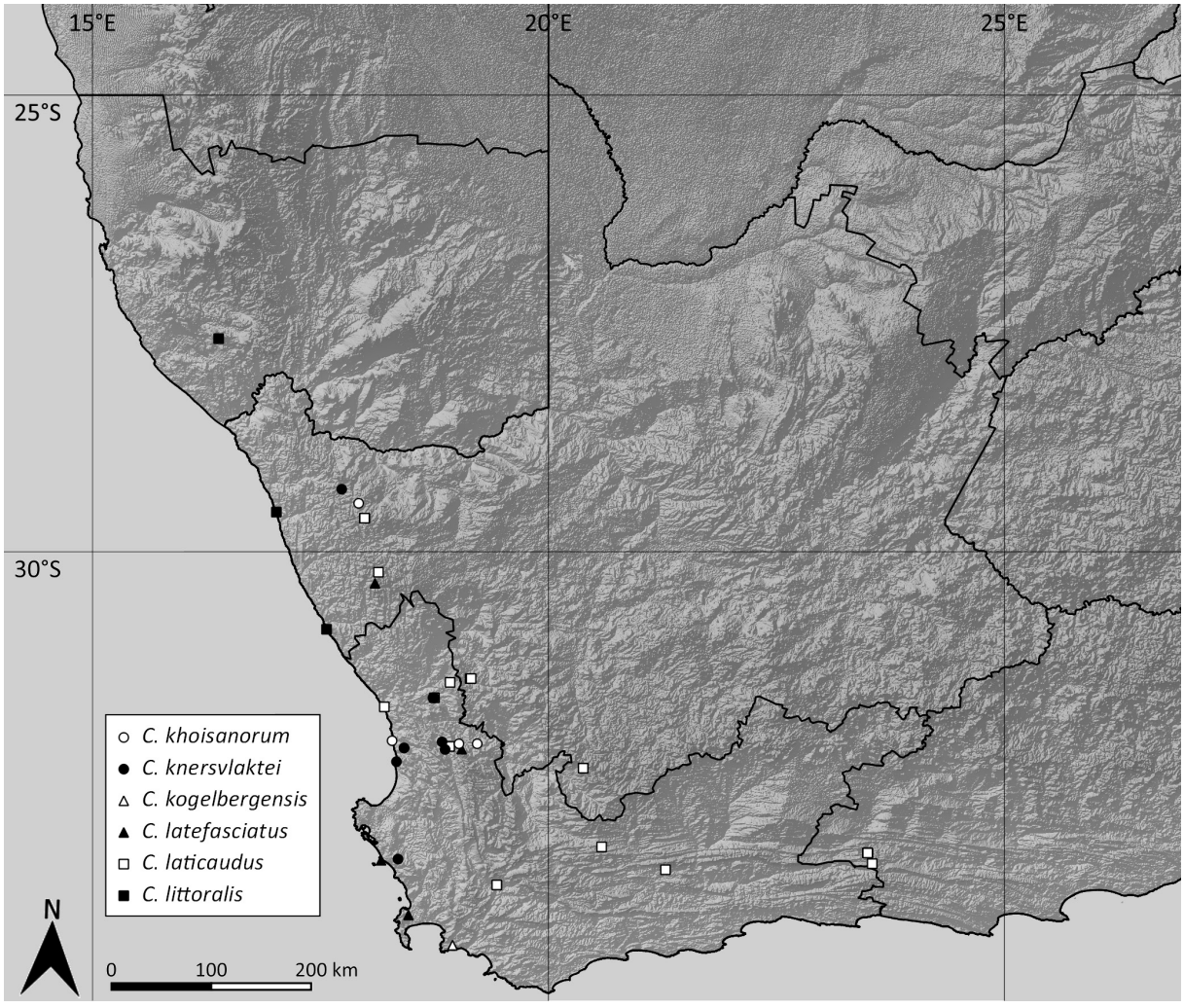

Fig. 45. Distribution of *C. khoisanorum* sp. nov., *C. knersvlaktei* Kuhlmann, 2007, *C. kogelbergensis* sp. nov., *C. latefasciatus* Cockerell, 1946, *C. laticaudus* Cockerell, 1946 and *C. littoralis* sp. nov.

developed, narrow basal tomentum. Discs of T3–T5 with successively longer, erect dark brown hairs. T1–T5 with relatively broad white posterior tergal hair bands (Fig. 44E). Disc of T1 with very fine, dense and shallow punctation (0.5–1 pd), punctures becoming slightly finer and shallower on posterior tergal depression. Disc of T2 with fine, dense (< 0.5 pd) punctation; interspaces glabrous. S2–S5 with white hair fringes, a bit longer laterally. Discs of sterna loosely covered with apically directed, short white hairs.

Male

Unknown.

Distribution

Namaqualand to SW Namibia (Fig. 45).

Phenology

Found from September to October.

Floral hosts

On *Mesembryanthemum* sp. (Aizoaceae).

Colletes longitarsus sp. nov.

urn:lsid:zoobank.org:act:13DBB574-35EF-4A44-BF91-03D0F5E6617D

Figs 46, 53

Diagnosis

The male is best identified by the unique shape of S7 (Fig. 46G) and the 2nd hind tarsomere, which is narrow and very elongate (Fig. 46F), as otherwise only in *C. cyanonitidus* (Fig. 17F).

Etymology

The species is named for its exceptionally elongate second hind tarsomere.

Material examined

Holotype

SOUTH AFRICA – **Western Cape Province** • ♂; Clanwilliam, Ramskop; 32°10′ S, 18°52′ E; 9 Jul. 1984; V.B. Whitehead leg.; SAMC.

Description

Female

Unknown.

Male

Body lengh. 9 mm.

Head. Integument black, antenna brownish ventrally. Face with grayish white to white hairs (Fig. 46B). Clypeus with very dense, small punctures (< 0.2 pd). Malar area long, about as long as width of mandibular base. Facial fovea narrow, maximum width about ½ antennal diameter.

Mesosoma. Integument black, legs reddish brown and tarsi yellowish brown (Fig. 46A). Scutum with long, grayish white to yellowish white hairs (Fig. 46C). Mesosomal sides and legs grayish white to white. Disc of scutum medium sized, scattered punctures (0.5–1 pd), integument glabrous, surrounded

Fig. 46. *Colletes longitarsus* sp. nov., ♂, holotype (SAMC). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

by dense (< 0.2 pd) punctation. Scutellum and metanotum with long, yellowish white hairs, on scutellum intermixed with brown hairs. Upper sloping part of propodeal triangle with short, longitudinal carinae anteriorly, scabriculous posteriorly, vertical part distinctly shagreened and shiny. Hind basitarsus not modified. 2nd hind tarsomere very elongated (Fig. 46F).

Metasoma. Integument black, terga narrowly translucent posteriorly. T1–T4 with slightly bluish shine. T1 covered with long, erect grayish white hairs (Fig. 46D). Disc of T2 with shorter, erect grayish white hairs. Discs of T3–T6 with erect black hairs. T1–T5 with white, narrow posterior tergal hair bands (Fig. 46E). Discs of T1 and T2 with relatively dense (0.5 pd) granulation that is becoming slightly finer and indistinct on posterior tergal depression, interspaces glabrous. S1–S5 with white hair fringes posteriorly, laterally minimal longer than medially. Disc of S2 with long, erect white hairs, S3–S5 with scattered, short white hairs, laterally longer. S7 (Fig. 46G) and gonostylus (Fig. 46H) as illustrated.

Distribution

Only record is from the type locality in the Cedarberg Mountains (Fig. 53).

Phenology

Only recorded in July.

Colletes nieuwoudtvillei Kuhlmann, 2007
Figs 47, 53

Colletes nieuwoudtvillei Kuhlmann, 2007: 155–156, figs 32–33, 43. Holotype male, SAMC; type locality: South Africa: Nieuwoudtville, Wild Flower Reserve. Examined.

New records

None.

Distribution

Known distribution as shown in Fig.53.

Colletes obscurus Friese, 1925
Figs 48, 53

Colletes obscurus Friese, 1925: 528. Lectotype female [designated by Kuhlmann 1998: 570], ZMHB; type locality: South Africa: Zeerust. Examined.

New records

None.

Distribution

Known distribution as shown in Fig. 53.

Fig. 47. *Colletes nieuwoudtvillei* Kuhlmann, 2007, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Colletes peerbomi sp. nov.
urn:lsid:zoobank.org:act:ED34B6BF-6C65-416B-9B08-314714BC4F9C
Figs 49, 53

Diagnosis

Among the species with a normal scopa the following combination of characters is unique for the female: apical hair band of T2 about ¼ width of disc (Fig. 49D–E), malar area narrow (⅓ width of mandibular base), facial fovea narrow (about ⅔ width of antennal flagellum), scutellum with black

Fig. 48. *Colletes obscurus* Friese, 1925, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

hairs (Fig. 49C), T6 narrowly rounded and disc of T1 medio-anteriorly without numerous short hairs interspersed (Fig. 49D–E).

Etymology

Named after the Peerboomskloof Pass, where this species was discovered.

Fig. 49. *Colletes peerboomi* sp. nov., ♀, holotype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

Material examined

Holotype

SOUTH AFRICA – **Western Cape Province** • ♀; 86 km E Ceres, Peerboomskloof Pass; 32°52′ S, 19°42′ E; 24 Sep. 2001; C.D. Eardley; CMK.

Description

Female

Body length. 12 mm.

Head. Integument black, antenna dark brown ventrally. Face grayish white intermixed with dark brown hairs on vertex and along inner eye margin (Fig. 49B). Clypeus with dense, medium-sized punctures (0.2 pd), punctures slightly elongate (Fig. 49B). Malar area narrow, length about ⅓ width of mandibular base. Facial fovea narrow, maximum width about ⅔ antennal diameter.

Mesosoma. Integument black, tarsi often brownish (Fig. 49A). Scutum with grayish white hairs, intermixed with dark brown hairs (Fig. 49C). Mesosomal sides grayish white to yellowish white, intermixed with dark brown hairs on mesepisternum and legs with yellowish white hairs, intermixed with brown hairs. Disc of scutum relatively dense (0.5–1 pd) punctured, integument glabrous, surrounded by dense (< 0.5 pd) punctation. Scutellum and metanotum with long, yellowish white hairs, on scutellum intermixed with dark brown hairs. Upper sloping part of propodeal triangle scabriculous. Vertical part superficially shagreened and shiny. Scopa dark brown dorsally, yellowish ventrally (Fig. 49F). Mid femora with distinct edge and stout ridge ventrally with brush of hairs.

Metasoma. Integument black, terga narrowly translucent posteriorly. T1–T3 with slight bluish shine. Disc of T1 relatively dense covered with long, erect yellowish white to white hairs (Fig. 49D). Disc of T2 densely covered with shorter, concolorous hairs. T2 without or very weakly developed basal tomentum. Discs of T3–T5 with successively longer, short erect blackish hairs. T1–T5 with relatively broad white posterior tergal hair bands, narrower on T1 (Fig. 49E). Disc of T1 with fine and dense, scattered punctures (1–2 pd), punctures much finer and denser on posterior tergal depression. Disc of T2 with fine and dense punctation (0.5–1 pd); glabrous between punctures. S2–S5 with yellowish white hair fringes, larger laterally. Discs of sterna covered with white to yellowish white, erect, apically directed hairs, medially few hairs, S5 sparsely covered with hairs.

Male

Unknown.

Distribution

Only found in the vicinity of Ceres (Fig. 53).

Phenology

The only record is from September.

Colletes richtersveldensis sp. nov.
urn:lsid:zoobank.org:act:B9BD11A4-51AD-422C-B61A-31D81BF44A10
Figs 50, 53

Diagnosis

The female can be separated from that of all other species with a normal scopa by the combination of the following characters: apical hair band of T2 about ½ width of disc (Fig. 50D–E), malar area long

Fig. 50. *Colletes richtersveldensis* sp. nov., ♀, paratype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

(¾ width of mandibular base), facial fovea elongate (about 1.5 x width of antennal flagellum), T2 with basal tomentum (Fig. 50D–E).

Etymology

Named after the Richtersveld National Park where this species was discovered.

Material examined

Holotype

SOUTH AFRICA – **Northern Cape Province** • ♀; Richtersveld National Park, near Oena Mine; 28°03′ S, 17°03′ E; 23–24 Aug. 2006; C.D. Eardley leg.; SAMC.

Paratypes

SOUTH AFRICA **– Northern Cape Province** • 2 ♀♀; same collection data as for holotype; CMK.

Description

Female

Body length. 10–11 mm.

Head. Integument black, antenna reddish brown ventrally. Face grayish to yellowish white, intermixed with brown hairs especially on vertex and along inner eye margins (Fig. 50B). Clypeus with fine and dense punctation (0.2 pd), punctures slightly elongate, interspaces glabrous. Malar area narrow, length about ¾ width of mandibular base. Facial fovea elongate, maximum width about 1.5 × antennal diameter.

Mesosoma. Integument black, tarsi partly brownish (Fig. 50A). Scutum with relatively long, grayish to yellowish white hairs, intermixed with brown hairs (Fig. 50C). Mesosomal sides yellowish white, intermixed with brown hairs on mesepisternum, hairs on legs yellowish with brown hairs on tibiae and tarsi interspersed. Disc of scutum dense, fine (1–2 pd) punctured, integument glabrous, surrounded by dense (< 0.5 pd) punctation, integument glabrous. Scutellum and metanotum with long, yellowish white hairs, intermixed with brown hairs. Upper sloping part of propodeal triangle scabriculous, vertical part with some transverse carinae anteriorly. Scopa dark brown dorsally, yellowish white ventrally (Fig. 50F). Mid femora with distinct edge, stout ridge ventrally and brush of hairs basally.

Metasoma. Integument black, terga broadly translucent posteriorly. T1 densely covered with long, erect yellowish white hairs, medio-anteriorly with short hairs interspersed (Fig. 50D). Disc of T2 densely covered with shorter, concolorous hairs. T2 with well developed, relatively broad basal tomentum. Discs of T3–T5 with successively longer, short erect blackish hairs. T1–T4 with relatively broad yellowish white posterior tergal hair bands (Fig. 50E). Disc of T1 with fine and dense punctation (0.5–1 pd), punctures much finer and denser on posterior tergal depression. Disc of T2 with fine and dense punctation (0.5 pd); glabrous between punctures. S2–S4 with yellowish white hair fringes, longer laterally, intermixed with brown hairs, S5 long brown hairs. Discs of sterna sparsely covered with short hairs, S2 long yellowish white hairs, S3–S5 shorter.

Male

Unknown.

Distribution

Only known from the Richtersveld National Park (Fig. 53).

Phenology

Only recorded in August.

Colletes ruschia sp. nov.
urn:lsid:zoobank.org:act:CF6706B2-DA70-4005-A4B2-CF5E300B6040
Figs 51–53

Diagnosis

Among the species with a normal scopa the following combination of characters is unique for the female: apical hair band of T2 about ⅔ width of disc (Fig. 51D–E), malar area elongate, length about

Fig. 51. *Colletes ruschia* sp. nov., ♀, paratype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

width of mandibular base, maximum width of facial fovea about ⅔ antennal diameter and discs of terga completely black (Fig. 51D–E). Male best identified by the unique shape of S7 (Fig. 52G).

Etymology

Named for the apparently preferred host plant genus '*Ruschia*' Schwantes (Aizoaceae L.) on which the species was collected several times. Noun in apposition.

Material examined

Holotype

SOUTH AFRICA – **Northern Cape Province** • ♂; 12 km NW Nieuwoudtville, Farm Avontuur, Renosterveld along Pad; 31°15′27″ S, 19°03′38″ E; alt. 770 m; 21 May 2013; M. Kuhlmann leg.; SAMC.

Paratypes

SOUTH AFRICA – **Northern Cape Province** • 1 ♂; Namaqualand 2917 DB, Hester Malan Nat. Res.; 29°38′ S, 17°59′ E; 2 Jul. 1985; M. Struck leg.; CMK • 1 ♀; same collection data as for preceding; 2 Aug. 1986; M. Struck leg.; CMK • 2 ♀♀; 15 km NW Nieuwoudtville, Farm Engelsepunt, Fynbos, Pf E1; 31°14′ 31″S, 18°59′08″ E; alt. 830 m; 26 Jul. 2003; K. Timmermann leg.; CMK • 1 ♀; Nieuwoudtville, Pad Glenlyon to R27, slope and side of the road; 31°23′25″ S, 19°08′28″ E; alt. 740 m; 18 Aug. 2007; K. Timmermann leg.; CMK • 1 ♀; Nieuwoudtville, Pad Glenlyon to R27; 31°23′24″ S, 19°09′06″ E; alt. 740 m; 19 Aug. 2007; K. Timmermann leg.; on *Ruschia unca* L.Bolus; CMK • 4 ♀♀; same collection data as for preceding; 3 Sep. 2007; CMK • 4 ♀♀; same collection data as for preceding; 20 Aug. 2007; M. Kuhlmann leg.; CMK • 4 ♀♀; same collection data as for preceding; 7 Sep. 2007; K. Timmermann leg.; CMK • 4 ♀♀; same collection data as for preceding; 17 Sep. 2007; M. Kuhlmann leg.; on *Ruschia* sp.; CMK • 1 ♀; 12 km NW Nieuwoudtville, Farm Avontuur, Fynbos; 31°16′18″ S, 19°02′55″ E; alt. 770 m; 13 Aug. 2010; M. Kuhlmann leg.; CMK • 6 ♂♂; 12 km NW Nieuwoudtville, Farm Avontuur, Renosterveld along Pad; 31°15′27″ S, 19°03′38″ E; alt. 770 m; 17 May 2013; M. Kuhlmann leg.; CMK • 1 ♀, 12 ♂♂; same collection data as for preceding; 31 May 2013; CMK • 1 ♂; same collection data as for preceding; 11 Jun. 2013; CMK. – **Western Cape Province** • 1 ♀; Worcester; 33°39′ S, 19°26′ E; 30 Sep. 1966; C.D. Michener leg.; CMK.

Additional material

SOUTH AFRICA – **Western Cape Province** • 1 ♀; Hoek se Berg; 32°07′ S, 19°10′ E; 20 Sep. 2007; T. L. Griswold leg.; labelled as "*Colletes fasciatus*-group 11"; BLCU.

Description

Female

Body length. 11–12 mm.

Head. Integument black, antenna dark brown ventrally. Face grayish to yellowish brown intermixed with longer dark brown hairs and with blackish hairs along inner eye and on vertex (Fig. 51B). Clypeus with dense (0.2 pd) medium-sized, slightly elongate punctures; interspaces smooth and shiny (Fig. 51B). Malar area elongate, length about width of mandibular base. Facial fovea narrow, maximum width about ⅔ antennal diameter.

Mesosoma. Integument black, tarsi often brownish (Fig. 51A). Scutum with relatively long, grayish white to yellowish brown hairs intermixed with numerous long blackish hairs (Fig. 51C). Mesosomal sides and legs grayish to yellowish white hairs intermixed with brown hairs on mesepisternum and few on fore femur, on legs intermixed with blackish hairs. Disc of scutum with relative dense (0.5–1 pd), coarse punctation, interspaces smooth and shiny, surrounded by dense (< 0.5 pd) punctation (Fig. 51C). Scutellum with long, orange brown and long blackish hairs. Metanotum with long brownish orange

hairs, medially plumose, sometimes with some black hairs intermixed. Upper sloping part of propodeal triangle with short, longitudinal carinae. Vertical part shagreened and slightly dull, anteriorly with well-developed more or less transverse carinae. Scopa dark brown dorsally and yellowish white ventrally (Fig. 51F). Mid femora with basal edge and yellow brush of hairs ventrally.

Metasoma. Integument black, terga narrowly translucent posteriorly. T1–T3 with slight bluish shine. T1 densely covered with long, erect yellowish white hairs (Fig. 51D). Disc of T2 with very short yellowish brown and short black hairs. T2 with weakly developed, narrow basal tomentum. Discs of T3–T5 with successively longer, short, erect blackish hairs. T1–T5 with broad whitish posterior tergal hair bands, slightly narrower on T1 (Fig. 51E). Disc of T1 distinct, fine, dense (0.5–1 pd) punctation, punctures becoming finer and denser towards posterior tergal depression. Disc of T2 very fine, dense (< 0.5 pd) punctation (Fig. 51D). Interspaces glabrous. S2–S5 short yellowish white hair fringes, shorter medially, with long blackish hairs. S3–S5 with black hairs. Discs of sterna covered with yellowish white, erect hairs, medially short.

Male

Body length. 10–11 mm.

Head. Integument black, antenna dark brown ventrally. Face grayish white, along inner eye margins intermixed with blackish hairs; between antennae intermixed with brownish hairs (Fig. 52B). Hairs on vertex yellowish white with dark brown hairs intermixed. Clypeus with very dense, small punctures (< 0.2 pd). Malar area long, about as long as width of mandibular base. Facial fovea narrow, maximum width about ½ antennal diameter.

Mesosoma. Integument black, tarsi reddish brown (Fig. 52A). Scutum with long, grayish white hairs, intermixed with dark brown hairs (Fig. 52C). Mesosomal sides and legs grayish white. Disc of scutum with medium-sized punctures (0.5–1 pd), integument glabrous, surrounded by dense punctation (< 0.2 pd) (Fig. 52C). Scutellum and metanotum with long, yellowish brown hairs, on scutellum intermixed with dark brown hairs. Upper sloping part of propodeal triangle with short longitudinal carinae, vertical part shagreened and dull, anteriorly with some more or less transverse carinae. Hind basitarsus slightly curved (Fig. 52F).

Metasoma. Integument black, terga narrowly translucent posteriorly. T1–T3 with slight bluish shine. Disc of T1 densely covered with long, erect yellowish white hairs (Fig. 52D). Disc of T2 similar to T1, but with shorter hairs. Discs of T3–T6 with long, erect blackish hairs. T1–T5 with moderately broad, white hair bands (Fig. 52E). Discs of T1 and T2 with fine and dense granulation (0.5 pd), granulation becoming more scattered and indistinct on posterior tergal depression, integument between granulation glabrous. S1–S5 with dense posterior fringes longer laterally than medially. Discs of S1 and S2 with long erect grayish white hairs, S3–S5 covered with shorter hairs. S6 with very small brush of bristles lateral. S7 (Fig. 52G) and gonostylus (Fig. 52H) as illustrated.

Distribution

From the Springbok area in the north down to Worcester (Fig. 53).

Phenology

Recorded from May to September.

Floral hosts

Ruschia sp., *R. unca* L.Bolus (Aizoaceae).

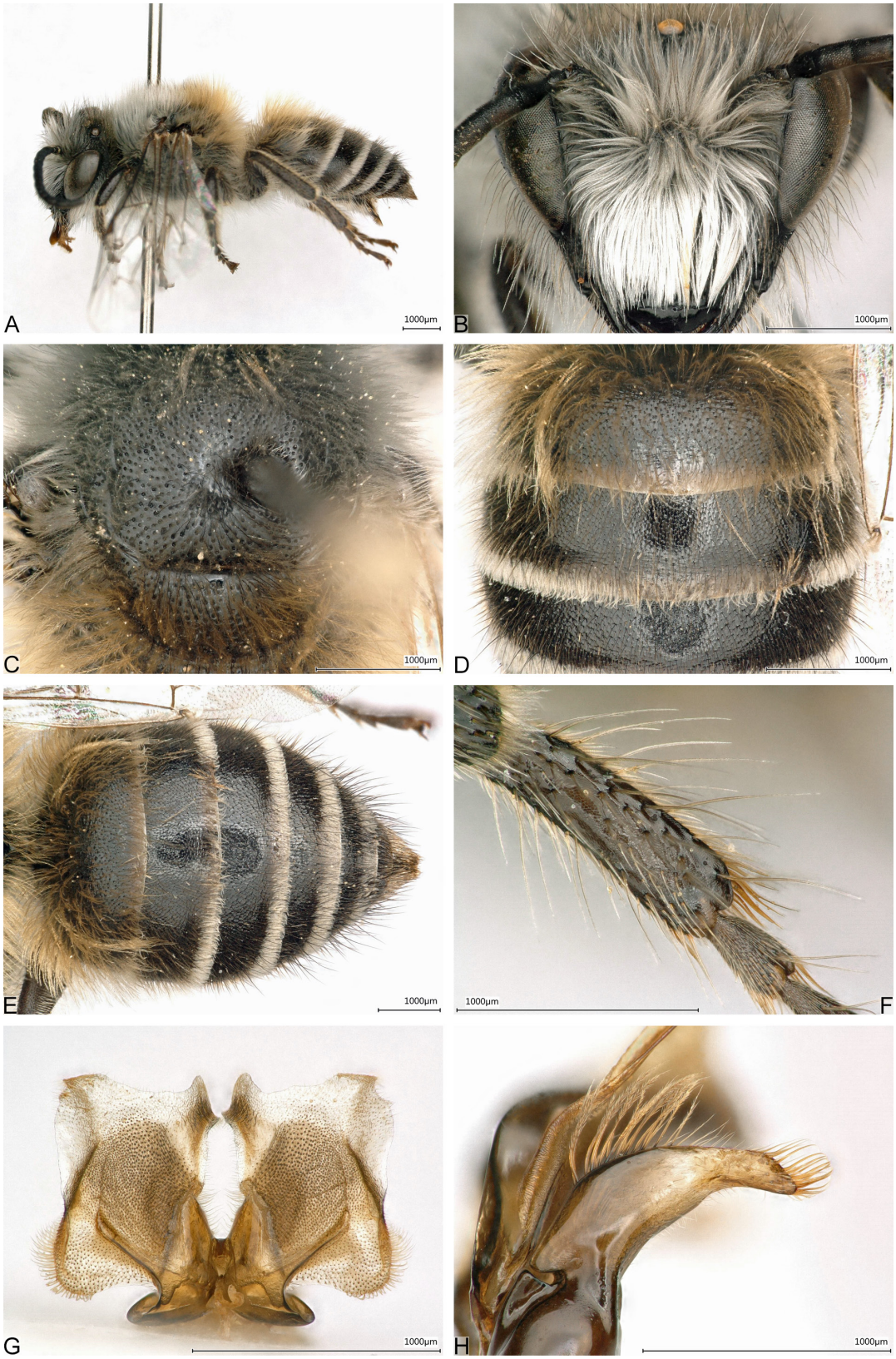

Fig. 52. *Colletes ruschia* sp. nov., ♂, paratype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Colletes schultzei Friese, 1909
Figs 54, 63

Colletes schultzei Friese, 1909: 122. Lectotype male [designated by Kuhlmann 1998: 573], ZMHB; type locality: South Africa: Steinkopf. Examined.

New records

SOUTH AFRICA – **Northern Cape Province** • 1 ♂; 32 km N Calvinia, Hantam Mountains, S Klipwerffarm, river bank; 31°12′09″ S, 19°50′04″ E; alt. 870 m; 16 Sep. 2007; K. Timmermann leg.; CMK.

Distribution

Known distribution as shown in Fig. 63.

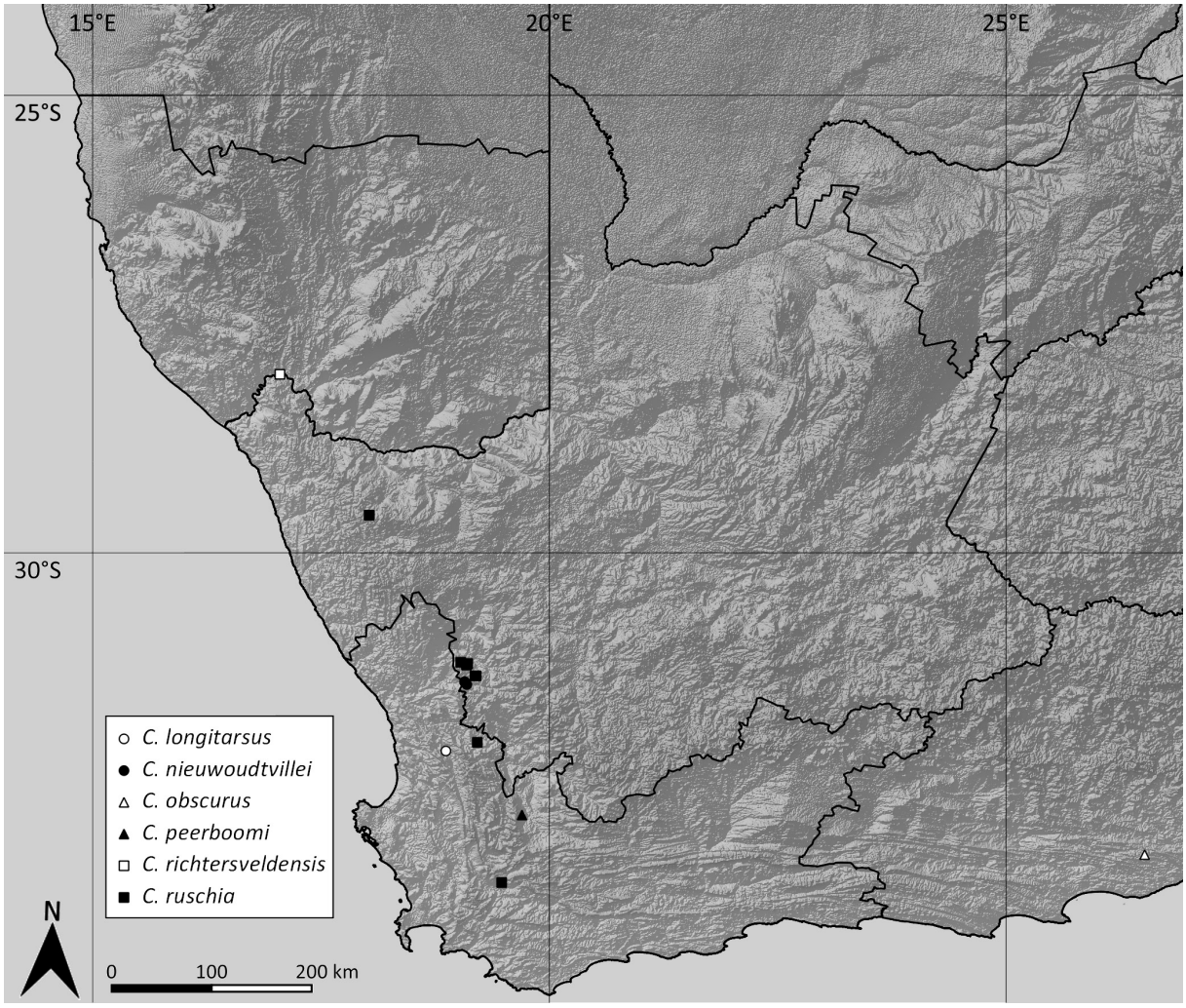

Fig. 53. Distribution of *C. longitarsus* sp. nov., *C. nieuwoudtvillei* Kuhlmann, 2007, *C. obscurus* Friese, 1925, *C. peerboomi* sp. nov., *C. richtersveldensis* sp. nov. and *C. ruschia* sp. nov.

Fig. 54. *Colletes schultzei* Friese, 1909, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Colletes spinipes sp. nov.
urn:lsid:zoobank.org:act:95A63620-838F-45D0-9AEE-B89FE629FE65
Figs 55, 63

Diagnosis

Male best identified by the unique shape of S7 (Fig. 55G) and gonostylus (Fig. 55H).

Etymology

Named for the conspicuous spine on the mid femur of the male.

Material examined

Holotype

SOUTH AFRICA – **Northern Cape Province** • ♂; Nieuwoudtville, Reserve, 3119 AC; 31°22′ S, 19°07′ E; 28 Aug. 1985; V.B. Whitehead and M. Macpherson leg.; patrolling *Cysticapnos* sp.; SAMC.

Description

Female

Unknown.

Male

Body length. 11 mm.

Head. Integument black, antenna dark brown ventrally. Face with grayish white to white hairs (Fig. 55B), with black hairs intermixed along inner eye margins and on vertex. Clypeus with very dense, small punctation (< 0.2 pd). Malar area narrow, length about ½ width of mandibular base. Facial fovea narrow, maximum width about ½ antennal diameter.

Mesosoma. Integument black, legs brown, tarsi reddish to yellowish brown (Fig 55A). Scutum with long grayish to yellowish white hairs, intermixed with dark brown hairs. Mesosomal sides and legs grayish white, with some brown hairs intermixed on mesepisternum. Disc of scutum with medium-sized, scattered punctures (0.5–1 pd), integument glabrous, surrounded by dense, small (< 0.2 pd) punctation (Fig. 55C). Scutellum and metanotum long, yellowish white, with dark brown hairs intermixed on scutellum. Upper sloping part of propodeal triangle with short, longitudinal carinae anteriorly, scabriculous posteriorly. Vertical part superficially shagreened and shiny, with some weakly developed more or less transverse carinae. Hind basitarsus modified, broadened apically, curved (Fig. 55F), slightly convex and with prominent long reddish bristles on apical dorsal edge. Inner side of hind basitarsus only hairy on ⅔ dorsally, ventrally some scattered bristles. Tarsal segment 2 heart shaped, dorsal side is strongly broadened and rounded (Fig. 55F). Mid femora with right-angled edge on basal end, ventrally with long spine and femur slightly swollen.

Metasoma. Integument black, terga narrowly translucent posteriorly and T1–T3 with slight bluish shine. T1 covered with long, erect, grayish white hairs (Fig. 55D). Disc of T2 with shorter erect hairs with same color as on T1. Discs of T3–T6 with erect blackish hairs. T1–T6 with relatively broad posterior tergal hair bands (Fig. 55E), on T1 and T6 narrower. Discs of T1 and T2 with fine, dense punctation (0.5–1 pd), punctures becoming slightly finer on posterior tergal depression, interspaces glabrous (Fig. 55D). S2–S5 with dense, relatively short fringes, laterally longer than medially. Disc of S2 covered with erect white hairs. On S5 with two elevations laterally and on S6 more medially and anterio-laterally with elongate brush of dense, short, red bristles. S7 (Fig. 55G) and gonostylus (Fig. 55H) as illustrated.

Fig. 55. *Colletes spinipes* sp. nov., ♂, holotype (SAMC). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Distribution

The only record is from Nieuwoudtville (Fig. 63).

Phenology

Only recorded in August.

Colletes stellatus Cockerell, 1946
Figs 56, 63

Colletes stellatus Cockerell, 1945(1946): 842. Holotype female, NHMUK; type locality: South Africa: Stellenbosch. Examined.

Fig. 56. *Colletes stellatus* Cockerell, 1946, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

New records

SOUTH AFRICA – **Western Cape Province** • 2 ♀♀; 60 km N Cape Town, coast; 33°47′ S, 18°27′ E; 6 Oct. 1999; M. Halada leg.; OLML.

Distribution

Known distribution as shown in Fig. 63.

Colletes testaceipes Friese, 1909
Figs 57–58, 63

Colletes testaceipes Friese, 1909: 120–121. Lectotype male [designated by Kuhlmann 1998: 573], ZMHB; type locality: Namibia: Prince of Wales Bay). Examined.

New records

SOUTH AFRICA – **Northern Cape Province** • 1 ♀; Port Nolloth, 40 km N; 28°54′ S, 16°44′ E; 11 Sep. 2001; C.D. Eardley leg.; SANC • 1 ♀; 12 km NW Nieuwoudtville, Farm Avontuur, Fynbos; 31°16′18″ S, 19°02′55″ E; alt. 770 m; 16 Aug. 2011; M. Kuhlmann leg.; CMK • 1 ♀; same collection data as for preceding; 10 Aug. 2012; CMK • 1 ♀; same collection data as for preceding; 3 Sep. 2012; CMK • 1 ♀; Roggeveld Mts, 2 km S Farm Perdekloof, river, dolerite; 31°47′35″ S, 19°58′16″ E; alt. 1220 m; 20 Sep. 2022; M. Kuhlmann leg.; CMK • 1 ♀; E of Port Nolloth; 29°16′ S, 16°54′ E; alt. 28 m; 15 Sep. 2011; L. Packer leg.; PCYU • 2 ♀♀; W of Nourivier; 30°15′ S, 18°03′ E; alt. 1082 m; 25 Sep. 2011; L. Packer leg.; PCYU • 1 ♀; same collection data as for preceding; 26 Sep. 2011; PCYU. – **Western Cape Province** • 5 ♀♀; Lambert's Bay; 32°04′21″ S, 18°22′12″ E; alt. 160 m; 13 Sep. 2005; C.D. Eardley leg.; SANC • 1 ♀; Donkin's Bay; 31°54′28″ S, 18°16′54″ E; alt. 12 m; 16 Sep. 2005; C.D. Eardley leg.; SANC • 17 ♀♀; near Lambert's Bay; 32°10′52″ S, 18°26′08″ E; alt. 140 m; 17 Sep. 2005; C.D. Eardley leg.; SANC • 2 ♀♀; near Die Berg; 32°12′35″ S, 18°44′51″ E; alt. 590 m; 20 Sep. 2005; C.D. Eardley leg.; SANC • 1 ♀; 11 km N Clanwilliam; 32°05′ S, 18°49′ E; alt. 92 m; 22 Sep. 2011; L. Packer leg.; PCYU • 1 ♀; 27 km SE Vanrhynsdorp, Ouberg Pass, Fynbos; 31°48′07″ S, 18°55′00″ E; alt. 380 m; 30 Aug. 2012; M. Kuhlmann; CMK.

Distribution

Known distribution as shown in Fig. 63.

Colletes troetroeensis sp. nov.
urn:lsid:zoobank.org:act:6374F752-D657-4DE5-8116-709B0871137E
Figs 59, 63

Diagnosis

The female can be separated from that of all other species with a normal scopa by the combination of the following characters: apical hair band of T2 about ½ width of disc (Fig. 59D–E), malar area elongate (about width of mandibular base), facial fovea very narrow (about ½ width of antennal flagellum), on metanotum dark brown hairs intermixed.

Etymology

Troe-Troe was the name of an old mission settlement that was later changed to Vanrhynsdorp. The only known specimen of this species was found in the vicinity of this town.

Material examined

Holotype

SOUTH AFRICA – **Western Cape Province** • ♀; 20 km N Vanrhynsdorp, Knersvlakte; 31°26′ S, 18°41′ E; alt. 211 m; 21 Sep. 2001; B. Danforth leg.; CMK.

Fig. 57. *Colletes testaceipes* Friese, 1909, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

Fig. 58. *Colletes testaceipes* Friese, 1909, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

Description

Female

Body length. 10 mm.

Head. Integument black, antenna brown ventrally. Face short grayish white hairs intermixed with light brown hairs on vertex and along inner eye margins blackish hairs. Clypeus with fine, dense (0.2 pd) slightly elongate punctures (Fig. 59B). Malar area elongate, as long as width of mandibular base. Facial fovea very narrow, maximum width about ½ antennal diameter.

Fig. 59. *Colletes troetroeensis* sp. nov., ♀, holotype (CMK). **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

Mesosoma. Integument black, tarsi mostly brownish (Fig. 59A). Scutum with relatively long, yellowish white to grayish hairs intermixed with slightly longer brownish hairs (Fig. 59C). Mesosomal sides yellowish to grayish white with brown hairs on mesepisternum, legs with yellowish white and some brown hairs intermixed. Disc of scutum relative densely (1–2 pd) punctured, surrounded by dense (0.5 pd) punctation, interspaces glabrous (Fig. 59C). Scutellum and metanotum with relatively long, yellowish brown hairs, intermixed with dark brown hairs. Upper sloping part of propodeal triangle scabriculous, vertical part glabrous. Scopa dorsally brown, ventrally yellowish white (Fig. 59F). Mid femora basally with slight edge and yellow short brush of hairs ventrally.

Metasoma. Integument black, terga posteriorly broadly translucent. Disc of T1 with yellowish white erect long hairs, with short hairs interspersed (Fig. 59D). Disc of T2 with short erect hairs, yellowish white. T2 with white relatively broad basal tomentum (Fig. 59D). Discs of T3–T5 with short, erect blackish hairs, on T3 very short. T1–T5 with white tergal hair bands, narrower on T1 and T5 (Fig. 59E). Disc of T1 with fine, relatively dense, slightly indistinct (1–2 pd) punctation, punctures becoming slightly finer, more shallow and denser towards posterior tergal depression. Disc of T2 with fine, indistinct, dense (< 0.5 pd) punctation; interspaces glabrous. S2–S5 with white hair fringes posteriorly. Discs of sterna loosely covered with yellowish white apical directed hairs, medially longer on S2. S3–S5 with few black hairs laterally.

Male

Unknown.

Distribution

Only known from the Knersvlakte (Fig. 63).

Phenology

The only record is from September.

Colletes watmoughi Kuhlmann, 2007

Figs 60, 63

Colletes watmoughi Kuhlmann, 2007: 162–163, fig. 43. Holotype female, SANC; type locality: South Africa: Lamberts Bay. Examined.

New records

SOUTH AFRICA – **Northern Cape Province** • 1 ♀; 10 km N Concordia; 29°31′ S, 17°57′ E; 23–24 Aug. 2006; C.D. Eardley leg.; SANC • 1 ♀; 20 km S Nieuwoudtville, Farm Papkuilsfontein, Fynbos; 31°33′16″ S, 19°08′31″ E; alt. 680 m; 27 Aug. 2012; M. Kuhlmann leg.; CMK. – **Western Cape Province** • 4 ♀♀; 86 km E Ceres, Peerboomskloof Pass; 32°52′ S, 19°42′ E; 24 Sep. 2001; C.D. Eardley leg.; SANC • 2 ♀; Donkin's Bay; 31°54′28″ S, 18°16′54″ E; alt. 12 m; 16 Sep. 2005; C.D. Eardley; SANC.

Distribution

Known distribution as shown in Fig. 63.

Colletes zygophyllum Kuhlmann, 2007
Figs 61–63

Colletes zygophyllum Kuhlmann, 2007: 163–164, fig. 43. Holotype female, SAMC; type locality: South Africa: Nieuwoudtville, Wild Flower Reserve. Examined.

Colletes bokkeveldi Kuhlmann, 2007: 134–135, figs 12–13, 40. Holotype male, SANC; type locality: South Africa: Nieuwoudtville, Wild Flower Reserve. **Syn. nov.** Examined.

Fig. 60. *Colletes watmoughi* Kuhlmann, 2007, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

New records

SOUTH AFRICA – **Northern Cape Province** • 1 ♀; Nieuwoudtville, Botanic Gardens; 31°22′ S, 19°07′ E; 9 Sep. 1987; C.D. Eardley leg.; SANC • 1 ♀; Nieuwoudtville, Wild Flower Reserve, Pf.; 31°22′10″ S, 19°08′50″ E; alt. 770 m; 10 Sep. 2006; K. Timmermann leg.; CMK • 1 ♀; same collection data as for preceding; 11 Sep. 2006; CMK • 2 ♀♀; same collection data as for preceding; 18 Sep. 2006; CMK • 5 ♀♀; same collection data as for preceding; 27 Sep. 2006; CMK • 1 ♂; Nieuwoudtville, Wild Flower Reserve, dolerite hills; 31°22′10″ S, 19°08′50″ E; alt. 770 m; 17 Aug. 2007; K. Timmermann leg.; CMK • 2 ♀♀; same collection data as for preceding; 22 Aug. 2007; CMK • 2 ♀♀; same collection

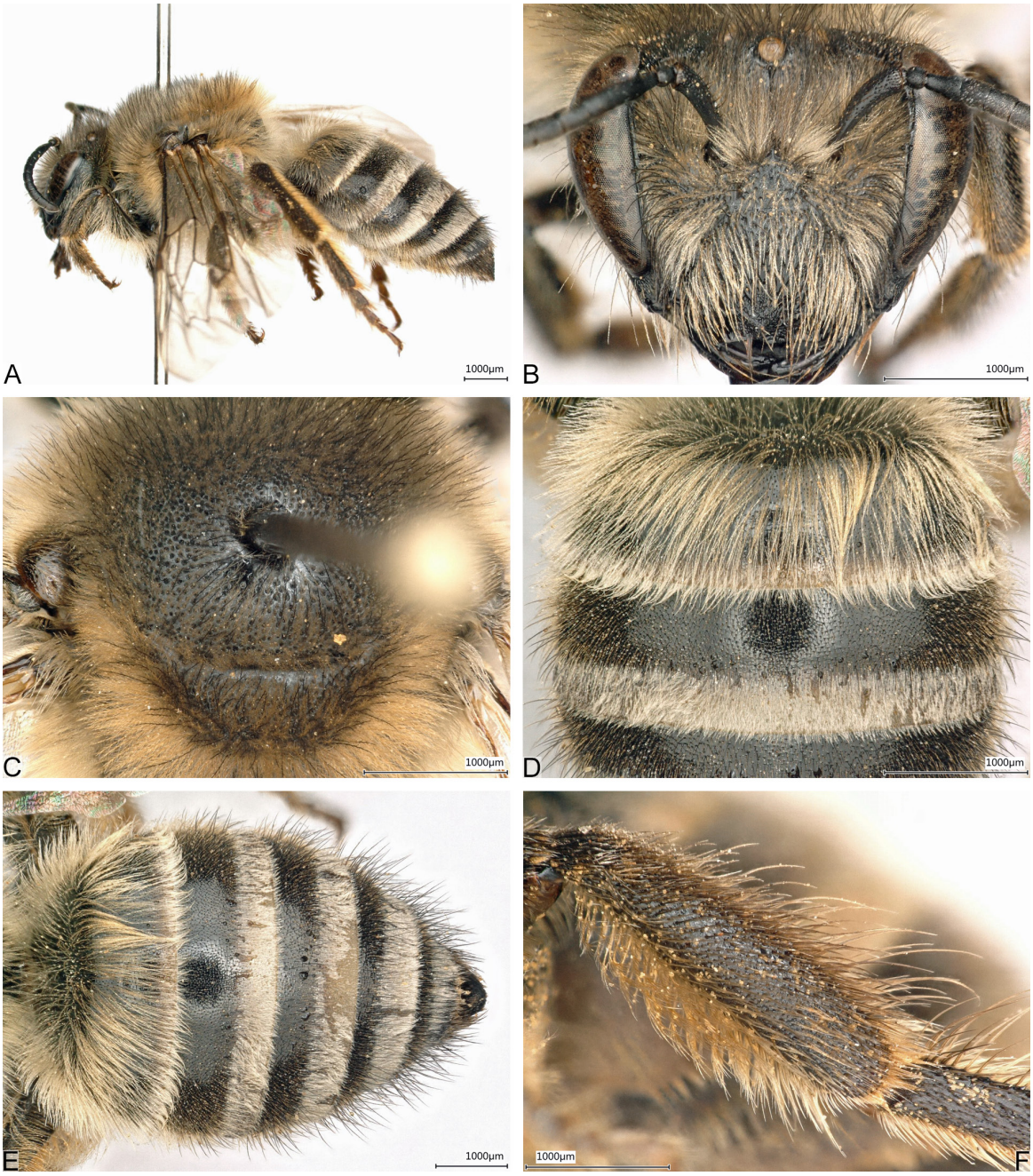

Fig. 61. *Colletes zygophyllum* Kuhlmann, 2007, ♀. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind tibia, lateral view.

data as for preceding; 29 Aug. 2007; CMK • 1 ♀; same collection data as for preceding; 8 Sep. 2007; CMK • 2 ♀♀; same data as for preceding; 11 Sep. 2007; CMK • 1 ♀; same collection data as for preceding; 19 Sep. 2007; CMK • 2 ♀♀; Nieuwoudtville, Wild Flower Reserve; 31°22′ S, 19°05′ E; 18 Sep. 2007; C.D. Eardley leg.; SANC • 3 ♀♀; Nieuwoudtville, 4 km E, Wildflower Reserve; 31°22′ S, 19°09′ E; 19 Sep. 2007; T. L. Griswold; BLCU • 2 ♀♀; 14 km SE Nieuwoudtville, Farm De Lande, dolerite; 31°28′49″ S, 19°13′09″ E; alt. 730 m; 7 Sep. 2008; M. Kuhlmann leg.; CMK • 1 ♀; 15 km SE Nieuwoudtville, Farm Grootfontein, dolerite; 31°28′57″ S, 19°13′58″ E; alt. 760 m; 7 Sep. 2008; M. Kuhlmann leg.; CMK • 1 ♀; 20 km S Nieuwoudtville, Farm Papkuilsfontein, waterfall; 31°33′01″ S, 19°07′24″ E; alt. 680 m; 12 Sep. 2008; H. Erhardt leg.; CMK • 7 ♀♀, 1 ♂; 15 km SE Nieuwoudtville, Farm Grootfontein, dolerite hill; 31°30′06″ S, 19°13′27″ E; alt. 790 m; 11 Sep. 2009; M. Kuhlmann leg.; CMK • 1 ♂; Nieuwoudtville, Wild Flower Reserve, Car Park East; 31°22′18″ S, 19°08′58″ E; alt. 730 m; 14 Aug. 2010; M. Kuhlmann leg.; CMK • 1 ♀; same collection data as for preceding; 20 Aug. 2010; CMK. – **Eastern Cape Province** • 1 ♀; Hilton, Grahamstown; 33°18′ S, 26°31′ E; 9 Oct. 1972; F. W. Gess leg.; CMK • 1 ♀; same collection data as for preceding; 18 Oct. 1977; F.W. Gess and S.K. Gess leg.; CMK.

Distribution

Known distribution as shown in Fig. 63.

Remarks

Synonymisation of *C. bokkeveldi* with *C. zygophyllum* is based on sex association (both species were only known from a single sex) when females and males were captured together. Both species were described in the same publication but the name *C. zygophyllum* is given precedence because it has been used in flower visitation records and analyses of female scopal pollen loads.

Key for the identification of species of the Colletes fasciatus species group

The males of *C. ascopalis* sp. nov., *C. cardiurus*, *C. cedarbergensis* sp. nov., *C. eardleyi*, *C. khoisanorum* sp. nov., *C. latefasciatus*, *C. littoralis* sp. nov., *C. obscurus*, *C. peerboomi* sp. nov., *C. richtersveldensis* sp. nov., *C. stellatus*, *C. troetroeensis* sp. nov. and *C. watmoughi* are unknown.

The females of *C. denudatus*, *C. fuscitergus* sp. nov., *C. knersvlaktei*, *C. longitarsus* sp. nov., *C. nieuwoudtvillei*, *C. schultzei* and *C. spinipes* sp. nov. are unknown.

1. Females: antennal flagellum 10-segmented; metasoma with six visible terga 2
– Males: antennal flagellum 11-segmented; metasoma with seven visible terga 31

2. Hind femur and tibia with reduced scopa (Figs 6F, 8F, 16F, 19F, 30F, 34F, 42F, 48F, 56F, 57F) 3
– Hind femur and tibia with well-developed scopa (Figs 4F, 9F, 11F, 12F, 15F, 20F, 22F, 26F, 28F, 32F, 37F, 39F, 41F, 44F, 49, 50F, 51F, 59F, 60F, 61F) 12

3. Hind femur largely or entirely orange-brown to red (Figs 6A, 8A, 19A, 30A, 56A) 4
– Hind femur black to dark brown (Figs 4A, 28A, 48A, 50A) 9

4. Fore and mid tibiae largely or completely blackish or brownish, sometimes to about half reddish (Figs 30A, 56A) 5
– Fore and mid tibiae completely orange brown to red, sometimes blackish or brownish basally and/or apically (Figs 6A, 8A, 19A, 57A) 6

Fig. 62. *Colletes zygophyllum* Kuhlmann, 2007, ♂. **A**. Habitus, lateral view. **B**. Head. **C**. Scutum, dorsal view. **D**. Metasomal terga 1 and 2, dorsal view. **E**. Metasoma, dorsal view. **F**. Hind basitarsus, lateral view. **G**. Metasomal sternum 7, dorsal view. **H**. Gonostylus, lateral view.

5. T1 with interspaces smooth and shiny (Fig. 56D); apical tergal depressions narrowly translucent and discs completely black (Fig. 56D–E); T6 broadly rounded apically ..... ***C. stellatus*** Cockerell, 1945
– T1 with interspaces finely shagreened and dull (Fig. 30D); apical tergal depressions broadly translucent and discs of T1–T3 posteriorly with narrow red margin (Fig. 30D–E); T6 narrowly rounded apically .....***C. infracognitus*** Cockerell, 1937

6. Maximum width of facial fovea about diameter of antennal flagellum; malar area long, ¾ width of base of mandible .....***C. eardleyi*** Kuhlmann, 2007
– Maximum width of facial fovea about 1.5–3 × as long as diameter of antennal flagellum; malar area narrow, about ⅓ width of base of mandible 7

7. Hairs on disc of scutum long (Fig. 57A), about 2 × as long as diameter of antennal flagellum; hairs of scutellum not plumose (Fig. 57C) ..... ***C. testaceipes*** Friese, 1909
– Hairs on disc of scutum short (Figs 6A, 8A), about as long as diameter of flagellum; hairs on scutellum medially plumose (Figs 6C, 8C) 8

8. Apical hair bands of T2–T5 narrow, medially covering only about posterior half of depression (Fig. 6D–E); upper sloping part of propodeal triangle scabriculous .. ***C. albohirtus*** Cockerell, 1946
– Apical hair bands of T2–T5 broad, medially nearly completely covering depression (Fig. 8D–E); upper sloping part of propodeal triangle with short longitudinal carinae ..... ***C. ascopalis*** sp. nov.

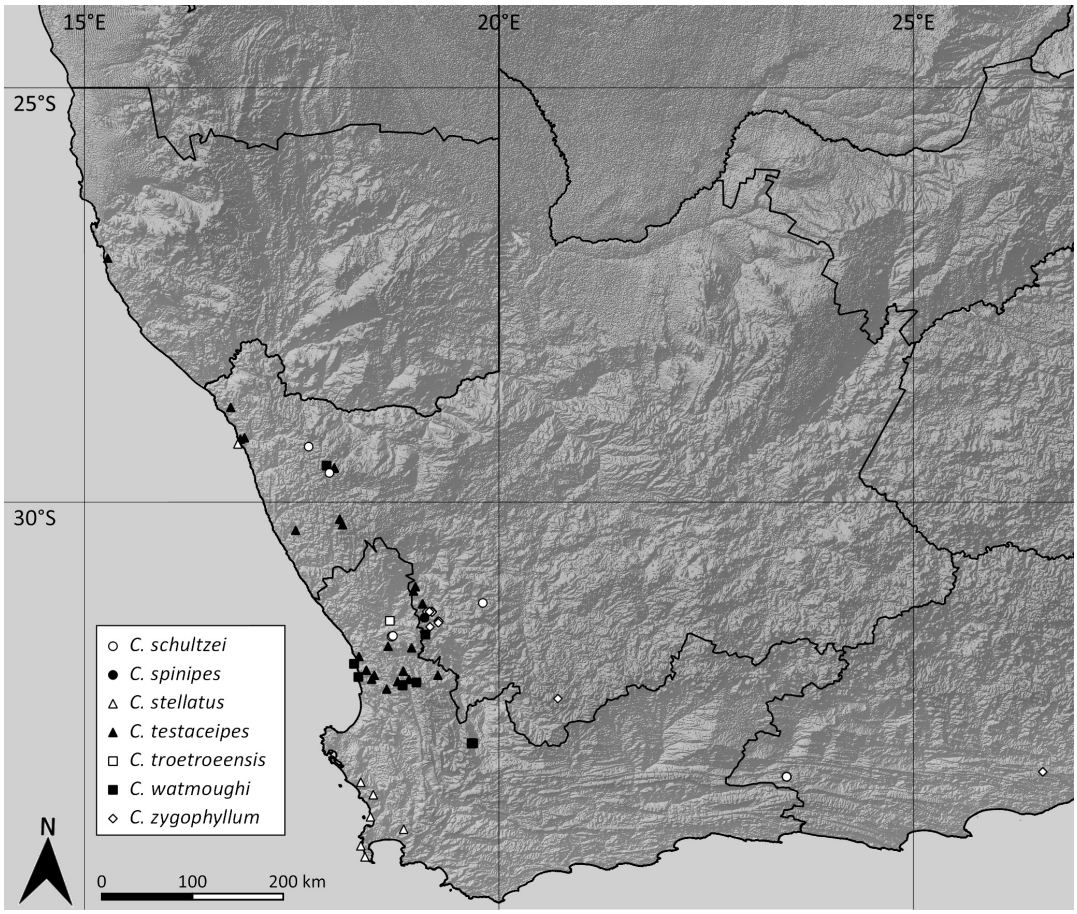

Fig. 63. Distribution of *C. schultzei* Friese, 1909, *C. spinipes* sp.nov., *C. stellatus* Cockerell, 1946, *C. testaceipes* Friese, 1909, *C. troetroeensis* sp.nov., *C. watmoughi* Kuhlmann, 2007 and *C. zygophyllum* Kuhlmann, 2007.

9. Hind tibia with dense short hairs dorsally (Fig. 42F); apical tergal depression broadly translucent yellowish to reddish (Fig. 42D–E) ..... ***C. laticaudus*** Cockerell, 1945
– Hind tibia without dense short hairs dorsally (Figs 16F, 34F, 48F); apical tergal depression narrowly translucent reddish to brownish (Figs 16D–E, 34D–E, 48D–E) 10

10. Metanotum medially with relative thin, longer hairs; malar area long, about width of mandibular base ..... ***C. karooensis*** Kuhlmann, 2007
– Metanotum medially with thick and short, erect hairs (Kuhlmann 2007: fig. 5); malar area narrow, ½ width of mandibular base 11

11. Propodeal triangle entirely covered with coarse transverse carinae; disc of scutum without or with very scattered (2–4 pd), medium-sized punctation (Fig. 48C); T2 without basal tomentum (Fig. 48D–E) ..... ***C. obscurus*** Friese, 1925
– Propodeal triangle dorsally with few, very weak transverse carinae; disc of scutum with relative dense (0.5 1 pd), fine punctation (Fig. 16C); T2 with weak and very narrow basal tomentum medially (Fig. 16D–E) ..... ***C. cyanonitidus*** Kuhlmann, 2007

12. Apical hair band of T2 broad, about ⅔ or as broad as disc (Figs 9D–E, 22D–E, 41D–E, 44D–E, 51D–E, 61D–E) 13
– Apical hair band of T2 narrower, about ¼ to ½ width of disc (Figs 4D–E, 26D–E, 28D–E, 37D–E, 59D–E, 60D–E) 18

13. Malar area short, ½ as long as width of base of mandible 14
– Malar area long, ¾ or about as width of base of mandible 16

14. Apical hair bands of terga whitish, width of apical hair band of T2 about ⅔ width of disc (Fig. 61D–E) ..... ***C. zygophyllum*** Kuhlmann, 2007
– Apical hair bands of terga yellowish brown or brownish orange, width of apical hair band of T2 as broad as disc (Figs 22D–E, 41D–E) 15

15. Apical hair bands of terga brownish orange (Fig. 22D–E), that on T3 broader, maximum width about 1.75 × as wide as the disc (Fig. 22E) ..... ***C. fasciatus*** Smith, 1853
– Apical hair bands of terga yellowish brown (Fig. 41D–E), that on T3 narrower, maximum width about 1.2 × as wide as the disc (Fig. 41E) ..... ***C. latefasciatus*** Friese, 1925

16. Facial fovea broad, about 1–1.2 × as broad as diameter of antennal flagellum ...***C. littoralis*** sp. nov.
– Facial fovea narrow, about ⅔ as broad as diameter of antennal flagellum 17

17. Apical tergal depressions distinctly translucent and discs posteriorly with narrow red margin (Fig. 9D E); apical hair bands orange (Fig. 9D–E) ..... ***C. aureocinctus*** Cockerell, 1945
– Apical tergal depressions weakly translucent, discs completely black (Fig. 51D–E); apical hair bands whitish (Fig. 51D–E) ..... ***C. ruschia*** sp. nov.

18. Malar area narrow, maximum ⅓ width of base of mandible 19
– Malar area longer, ¾, about or longer as width of base of mandible 26

19. Facial fovea narrow, about ⅔ width as diameter of antennal flagellum 20
– Facial fovea about as broad or broader than diameter of antennal flagellum 22

20. Scutellum without black hairs intermixed (Fig. 4C) ..... ***C. abnormis*** Kuhlmann, 2007
– Scutellum with black hairs intermixed (Figs 15C, 49C) 21

21. T6 broadly rounded apically (Fig. 15E); disc of T1 medio-anteriorly with numerous short hairs interspersed (Fig. 15D–E); apical hair band of T2 about ½ width of disc (Fig. 15D–E) ..... ***C. cedarbergensis*** sp. nov.
– T6 narrowly rounded apically (Fig. 49E); disc of T1 medio-anteriorly without numerous short hairs (Fig. 49D–E); apical hair band of T2 about ¼ width of disc (Fig. 49D–E) ..... ***C. peerboomi*** sp. nov.

22. Some hairs on face, scutum and scutellum with brown tips; discs of T1–2 with posterior reddish margins (Fig. 39D–E) ..... ***C. kogelbergensis*** sp. nov.
– Hairs on face, scutum and scutellum without brown tips; discs of T1–2 without posterior reddish margins (Figs 12D–E, 20D–E, 28D–E, 32D–E) 23

23. T6 broadly rounded apically (Fig. 32E); disc of T1 medio-anteriorly with numerous conspicuously short hairs interspersed (Fig. 32D–E); T2 with basal tomentum (Fig. 32D–E) ..... ***C. inornatus*** Cockerell, 1945
– T6 narrowly rounded apically (Figs 12E, 20E); disc of T1 medio-anteriorly without numerous conspicuously short hairs interspersed (Figs 12D–E, 20D–E, 28D–E); T2 without or with very weak, narrow basal tomentum (Figs 12D–E, 20D–E, 28D–E 24

24. Apical hair band of T2 about ¼ width of disc (Fig. 12D–E) ..... ***C. carolinae*** sp. nov.
– Apical hair band of T2 about ½ width of disc (Figs 20D–E, 28D–E) 25

25. Sternal discs 3–4 sparsely covered with long hairs; apical tergal hair bands yellowish white (Fig. 28D–E) ..... ***C. gessi*** Kuhlmann, 2007
– Sternal discs 3–4 covered with short hairs; apical tergal hair bands whitish (Fig. 20D–E) ..... ***C. fabiani*** sp. nov.

26. Facial fovea up to ¾ width of diameter of antennal flagellum 27
– Facial fovea as wide or wider than diameter of antennal flagellum 29

27. Pilosity on metanotum intermixed with dark brown hairs; apical hair band of T2 about ½ width of disc (Fig. 59D–E) ..... ***C. troetroeensis*** sp. nov.
– Pilosity on metanotum without dark brown hairs intermixed; apical hair band of T2 about ¼ width of disc (Figs 26D–E, 37D–E) 28

28. Upper sloping part of propodeal triangle scabriculous, vertical part shagreened and slightly dull; malar area elongate, length about 1.5 × width of mandibular base; disc of scutum with relatively dense punctation (0.5–1 pd) (Fig. 26C) … ..... ***C. genalis*** Friese, 1909
– Upper sloping part of propodeal triangle with short longitudinal carinae, vertical part glabrous; malar area relatively, length about width of mandibular base; disc of scutum with scattered punctation (2–4 pd) (Fig. 37C) ..... ***C. khoisanorum*** sp. nov.

29. Apical hair band of T2 about ½ width of disc (Fig. 50D–E); T2 with basal tomentum (Fig. 50D–E); malar area about ¾ width of base of mandible ..... ***C. richtersveldensis*** sp. nov.
– Apical hair band of T2 about ¼ width of disc (Figs 11D–E, 60D–E); T2 without basal tomentum (Figs 11D–E, 60D–E); malar area about as long or longer than base of mandible 30

30. Apical hair bands of terga narrow (Fig. 11D–E), on T2 medially about as half as wide as width of hind basitarsus; scutellum and metanotum with short pubescence, hair as long as the antennal flagellum wide; scutellum intermixed with blackish hairs, metanotum without blackish hairs intermixed ..... ***C. cardiurus*** Cockerell, 1945
– Apical hair bands of terga broad (Fig. 60D–E), on T2 medially about as broad as width of hind basitarsus; scutellum and metanotum with long pubescence, hair twice as long as antennal flagellum wide; scutellum and metanotum intermixed with blackish hairs ..... ***C. watmoughi*** Kuhlmann, 2007

31. Hind basitarsus not modified, parallel-sided (Figs 5F, 25F, 27F, 35F, 46F, 58F) 32
– Hind basitarsus modified (curved, broadened, crested) (Figs 13F, 17F, 29F, 33F, 38F, 55F) … 37

32. Second hind tarsomere very elongate and slender, 3 × as long as broad (Fig. 46F); S7 and gonostylus see in Fig. 46G–H ..... ***C. longitarsus*** sp. nov.
– Second hind tarsomere shorter and wide, at most 1.5 × as long as broad or broader (Figs 5F, 27F, 58F) 33

33. T1–T3 with very narrow red posterior margin (Fig. 58D–E); width of facial fovea about antennal diameter; S7 and gonostylus see in Fig. 58G–H ..... ***C. testaceipes*** Friese, 1909
– T1–T3 without red margin (Figs 5D–E, 25D–E, 27D–E, 35D–E); width of facial fovea narrower than antennal diameter 34

34. Malar area narrow, length about ½ width of mandibular base; width of facial fovea about ¾ antennal diameter; S7 and gonostylus see in Fig. 5G–H ..... ***C. abnormis*** Kuhlmann, 2007
– Malar area long, length about ¾ to 1.5 × width of mandibular base; facial fovea very narrow, width about ½ antennal diameter 35

35. Inner eye margins with black hairs intermixed (Fig. 27A–B); S7 and gonostylus see in Fig. 27–H ..... ***C. genalis*** Friese, 1909
– Inner eye margins without black hairs (Figs 25A–B; 35A–B) 36

36. Few brown hairs on vertex; length of malar area about ¾ of width of base of mandible; S7 and gonostylus see in Fig. 35G–H ..... ***C. karooensis*** Kuhlmann, 2007
– Without brown hairs on vertex; length of malar area about 1.2–1.5 × of width of base of mandible; S7 and gonostylus see in Fig. 25G–H ..... ***C. fuscitergus*** sp. nov.

37. Mid femora broadest near base, forming a near right-angled edge ventrally 38
– Mid femora broadest ± medially, ventrally rounded at base 43

38. Mid femora with a long spine ventrally on basal end; second hind tarsus heart-shaped, as broad as long (Figs 21F, 55F) 39
– Mid femora without a spine on basal end; second hind tarsus not heart-shaped, longer than broad (Figs 13F, 29F, 47F) 40

39. Tarsi reddish-brown (Fig. 55A, F); S7 and gonostylus see in Figs 55G, 55H ..... ***C. spinipes*** sp. nov.
– Tarsi brown (Fig. 21A, F); S7 and gonostylus see in Figs 21G, 21H ..... ***C. fabiani*** sp. nov.

40. S7 longer than broad (Fig. 47G), gonosylus see in Fig. 47H ... ***C. nieuwoudtvillei*** Kuhlmann, 2007
– S7 broader than long (Figs 13G, 29G, 62G) 41

41. Length of malar area about ⅓ width of mandibular base; width of facial fovea about ½ antennal diameter; lobes of S7 laterally broadly rounded, somewhat blunter and apically broader (Fig. 29G) than in *C. carolinae* sp. nov. and *C. zygophyllum*; gonostylus see in Fig. 29H ..... ***C. gessi*** Kuhlmann, 2007
– Length of malar area about ½ width of mandibular base; width of facial fovea about antennal diameter; lobes of S7 laterally narrowly rounded, slightly more pointed and apically narrower (Figs 13G, 62G) 42

42. Gonostylus as in Fig. 13H, broader than that of *C. zygophyllum*; S7 see in Fig. 13G; hind basitarsus not curved (Fig. 13F) ..... ***C. carolinae*** sp. nov.
– Gonostylus as in Fig. 62H, thinner than that of *C. carolinae* sp. nov.; S7 see in Fig. 62G; hind basitarsus slightly curved (Fig. 62F) ..... ***C. zygophyllum*** Kuhlmann, 2007

43. Hind tarsal segment 2 elongate and slender, more than 3 × as long as broad (Fig. 17F); S7 and gonostylus see in Fig. 17G–H ..... ***C. cyanonitidus*** Kuhlmann, 2007
– Hind tarsal segment 2 shorter and wide, at most 1.5 × as long as broad (Figs 18F, 23F, 40F) 44

44. Gonostylus bifurcate (Figs 18H, 31H, 38H) 45
– Gonostylus simple (Figs 7H, 10H, 23H, 33H, 40H, 43H, 52H, 54H) 47

45. Gonostylus with 4 spikes as in Fig. 38H ..... ***C. knersvlaktei*** Kuhlmann, 2007
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46. Gonostylus longer (Fig. 18H) and S7 long (Fig. 18G) ..... ***C. denudatus*** Cockerell, 1945
– Gonostylus shorter (Fig. 31H) and S7 short (Fig. 31G) ..... ***C. infracognitus*** Cockerell, 1937

47. S6 with large lateral teeth directed backwards 48
– S6 without teeth 49

48. Hind basitarsus with a rounded edge dorso-apically (Fig. 23F); S7 and gonostylus see in Fig. 23G–H ..... ***C. fasciatus*** Smith, 1853
– Hind basitarsus with an angular edge dorso-apically (Fig. 54F); S7 and gonostylus see in Fig. 54G–54H ..... ***C. schultzei*** Friese, 1909

49. Tarsi completely and tibiae basally and apically yellowish brown (Fig. 40A); some hairs of face and scutum with brown tips; S7 and gonostylus see in Fig. 40G–H ..... ***C. kogelbergensis*** sp. nov.
– Tarsi brownish or reddish brown, tibiae black (Figs 7A, 10A, 33A, 43A, 52A); hair of face and scutum without brown tips 50

50. Gonostylus very broad and rounded (Fig. 33H); lobes of S7 laterally strongly emarginate, apically with two emarginations (Fig. 33G) ..... ***C. inornatus*** Cockerell, 1946
– Gonostylus narrow (Figs 7H, 10H, 43H, 52H); lobes of S7 only with a single slight emargination apically or not emarginate (Figs 7G, 10G, 43G, 52G) 51

51. Tip of gonostylus truncate (Figs 43H, 52H) 52
– Tip of gonostylus slightly concave (Figs 7H, 10H) 53

52. S7 broader than long, apically without emargination (Fig. 43G); gonostylus as in Fig. 43H; facial fovea broad, width about 1.5 × antennal diameter; hind basitarsus not curved (Fig. 43F) .... ***C. laticaudus*** Cockerell, 1946
– S7 longer than broad, apically with slight emargination (Fig. 52G); gonostylus as in Fig. 52H; facial fovea narrow, width about ½ antennal diameter; hind basitarsus slightly curved (Fig. 52F) .... ***C. ruschia*** sp. nov.

53. Malar area narrow, length about ½ width of mandibular base; facial fovea narrow, width about antennal diameter; S7 and gonostylus see in Fig. 7G–H ..... ***C. albohirtus*** Cockerell, 1946
– Malar area long, about as long as width of mandibular base; facial fovea very narrow, width about ½ antennal diameter; S7 and gonostylus see in Fig. 10G–H ..... ***C. aureocinctus*** Cockerell, 1945

Discussion

In the present study, 14 new species of the bee genus *Colletes*, more specifically of the *C. fasciatus*-group, are described and two are synonymized, bringing the total number in this species group to 37. In addition, new records are presented for 17 species that were predominantly collected in the last two decades, partly resulting in a significant extension of the known ranges for some of them.

Six new species were described based on single specimens (*C. cedarbergensis* sp. nov., *C. fuscitergus* sp. nov., *C. longitarsus* sp. nov., *C. peerboomi* sp. nov., *C. spinipes* sp. nov., *C. troetroeensis* sp. nov.) because they showed unique characters not present in related species and no overlap in variation with them. Their description is also meant as a statement to point out the need for a more rapid and comprehensive documentation of the unique and rich endemic bee fauna of the GCFR, that is particularly vulnerable to and affected by ongoing climate change (Kuhlmann *et al.* 2012).

Furthermore, of the 37 species in this group 20 are only known from a single sex (females only in 13 species, males only in 7 species). Since the genus *Colletes* has a high degree of sexual dimorphism, it can be difficult to associate sexes. Thus, it is possible that further species of the *C. fasciatus*-group have to be synonymised in the future when more specimens or new data becmes available. Only if females and males are caught together or when genetic methods are applied (e.g., DNA barcoding), it can be concluded with high certainty that they represent the same species. However, sampling unique (old) specimens for DNA extraction poses a risk of damage to type material, highlighting the importance of conducting further field research. More extensive collecting, even in relatively well-sampled regions, is also required for a better documentation of the rich but underexplored bee fauna of the GCFR. Many regions of the GCFR are poorly sampled, making it difficult to survey and study bee diversity and endemicity (Eardley *et al.* 2009), which is essential for assessing extinction risks.

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