



The Calliphoridae (Diptera) of Armenia

KNUT ROGNES

University of Stavanger, Faculty of Arts and Education, Department of Early Childhood Education, NO-4036 Stavanger, Norway.
E-mails: knut@rogn.no; knut.rogn@uis.no

Abstract

A report is given on the Calliphoridae (Diptera) collected by Adrian C. Pont during recent fieldwork in Armenia. Twenty-six (26) named species have been identified, and of these 21 are newly recorded from Armenia. Various taxonomic characters of *Pollenia paragrugini* Rognes, 1988, including the large variation in the width of the male frons, are discussed. One new species is described: *Pollenia agnetee* sp. nov., and is assigned to the *Pollenia semicinerea* species-group.

Key words: Armenia, blowflies, new species, new records, *Pollenia*

Introduction

This paper is a follow-up on the recent work of Pont (2018) on Armenian Muscidae, and is the first comprehensive treatment of Armenian blowflies. Scattered records from Armenia have been included in other more general works on the fauna of the former Soviet Union, such as those of Grunin (1970a, 1970b). The present paper may therefore be considered as the first step in the systematic build-up of knowledge on the Armenian blowfly fauna. The *Catalogue of the Diptera of the Palaearctic Region* (Schumann 1986) listed three species of Calliphoridae from Armenia (“*Abago rohdendorfi* Grunin, 1966”, “*Bellardia agilis* (Meigen, 1826)”, “*Bellardia osetica* Khitsova, 1979”), whereas three other species were listed as occurring in “all parts of the USSR” and 5 others were listed as occurring in “all parts of Palaearctic region”. Rognes (1991a) listed two species (*B. bayeri* [Jacentkovský, 1937], *Pollenia amentaria* [Scopoli, 1763]) as occurring in Armenia; however, I have since not been able to locate the source of my own *B. bayeri* record. It is possibly Schumann (1986), who erroneously listed *B. osetica* (a junior synonym of *B. bayeri*) from Armenia. Rognes (1988) listed two other species from Armenia for the first time (*Pollenia bulgarica* Jacentkovský, 1939 and *Pollenia paragrugini* Rognes, 1988). Below, 26 species are reported upon, of which 21 are newly recorded from Armenia and one is described as new.

Material and methods

Material. All specimens were collected by Adrian C. Pont between 2010 and 2018, as a by-product of his Muscidae collecting efforts. The material was mainly collected with a hand net. In the material were 187 calliphorids, 159 of which have been identified to species. No systematic effort to capture common calliphorids was made, but *Pollenia* Robineau-Desvoidy species were especially sought, especially on Mt Aragats. The studied material is deposited in the Natural History Museum, London, with some duplicates in my own collection.

Abbreviations for specimen depositories. KR—Private collection of Knut Rognes, Oslo, Norway (ultimately to be transferred to OUMNH); NHMUK—Natural History Museum, London, United Kingdom (formerly BMNH); OUMNH—Oxford University Museum of Natural History, Oxford, United Kingdom; ZIN—Zoological Institute, The Russian Academy of Sciences, St Petersburg, Russia.

Identification. The most recent taxonomic treatments are cited in the discussion of each species. In these sources there are also keys to species and details concerning the known distribution and biology of the species.

ID number. A label with a ten-digit number preceded by “KR”, e.g. “KR0000002626”, is pinned to each specimen that I have identified, referring to an entry in my database of determinations. To save space, only the last four digits are cited in the species lists below.

Localities. The text used by Pont (2018: 8–11) in his list for collection sites is used here, with slight modifications. One locality (*Tavush*: Ttu Jur, 13.vii.2018) is not listed by Pont (2018), since it was visited after his paper was in press. Provinces are in italics and listed alphabetically, whereas localities within the provinces are ordered as in the list of collection sites and by date. Note that although latitude and longitude are given in the DMS system, the symbol for minutes is omitted (e.g., N40°43 E45°06 instead of N40°43' E45°06'), following Pont (1980).

Height above sea level. I have used the values given by Pont (2018) in the collection site list, which in some cases differ slightly from the labels by having been rounded to the nearest 10 m.

Geographical names. Apart from Pont’s collection site list, the spelling of geographical names in most cases follows *The Times Atlas of the World, Millennium Edition 2000*, but in some cases *Google Earth* or *Google Maps*.

Russian name. I have rendered the name of Vera Andreevna Richter as “V. Richter”, even though the British transliteration of the Russian spelling would be “V. Rikhter” (cf. bottom line of yellow label in Fig. 24).

Distributions. These are mostly taken from Rognes (1991a, 2002) or *Fauna Europaea* (Rognes 2013). When a species range is limited, a country-by-country list is given under the heading Distribution.

Dissections. “Dissected” in the text means that terminalia have been dissected according to the procedure explained in Rognes (2009) and examined in detail in glycerol. Abdominal tergites 1+2–5 have been glued to a piece of card on the pin above the labels, and sternites 1–5 and the terminalia have been placed in glycerol in a glass microvial pinned below the uppermost label.

Photography. The photographs of the male terminalia of *Pollenia agneteeae* **sp. nov.** (Figs 10–17) and *P. paragrugini* (Figs 27–33) were taken by Verner Michelsen, Copenhagen, by use of a Leica MZ16A microscope with a mounted Leica DFC420 camera. The software used was Leica Application Suite V4, with built-in stacking facilities. Other photographs were taken by myself. Labels were photographed with an Olympus TG2 camera using the zoom option at the highest magnification. The method used for other photographs is explained in Rognes (2009, 2012). Images were edited with Adobe Photoshop Elements version 9.0.3.

Results

Family CALLIPHORIDAE

Subfamily CALLIPHORINAE

Bellardia bayeri (Jacentkovský, 1937)

Most recent taxonomic treatment. Rognes (1991a).

Material. *Aragatsotn*: Lake Kari, N40°28 E44°11, 3190 m, 19.vii.2011, 2 ♂ [2714, 2715 (both dissected)]; 18.vii.2016, 2 ♂ [2716, 2717]. *Shirak*: Mantash stream, Nerkin Mantash, N40°39 E44°03, 1950 m, 21.v.2012, 3 ♂ [2718 (dissected), 2719, 2721]. *Tavush*: Haghartsin [monastery] environs, N40°48 E44°53, 1440–1560 m, 23.vii.2015, 1 ♂ [2721].

Previous Armenian records. Schumann (1986) listed *Bellardia osetica* Khitsova, a junior synonym of *B. bayeri*, from Armenia, but this is an error. The type locality of *B. osetica* Khitsova is “Severo-Osetinsky ASSR” [now Respublika Severnaya Osetiya-Alanya = North Ossetia], which is in Russia, so there appears to be no earlier record of *B. bayeri* from Armenia.

Distribution. Western Palaearctic Region. Nearctic Region (USA, Massachusetts).

Bellardia vulgaris (Robineau-Desvoidy, 1830)

Most recent taxonomic treatment. Rognes (1991a).

Material. *Aragatsotn*: River Amberd near Amberd fortress, N40°24 E44°14, 2210 m, 25.vi.2010, 1 ♂ [2728];

27.v.2012, 2 ♂ [2729, 2730 (dissected)]; River Kasakh between Alagyaz and Aparan, N40°37 E44°20, 1950 m, 19.v.2012, 5 ♂ [2722–2726, 2722 dissected]; 31.vii.2015, 1 ♂ [2727 (dissected)]; 1 km S of Sipan, N40°43 E44°16, 2100 m, 19.v.2012, 1 ♂ [2731]. *Tavush*: Ttu jur, N40°44 E44°53, 1420–1710 m, 13.vii.2018, 1 ♂ [2765]. *Lori*: Stream 2 km E of Kurtan, N40°58 E44°33, 1280 m, 23.v.2012, 1 ♂ [2732].

Previous Armenian records. Under the entry of *Bellardia agilis* (Meigen) (a junior synonym of *B. vulgaris*) in the Palaearctic catalogue, Schumann (1986) lists “... TC (Arm)...” [TC = Transcaucasus; “Arm” = Armenia] among the country records. I am not aware of the source for this record. In his revision of the Palaearctic *Bellardia* Robineau-Desvoidy species, Schumann (1974) does not mention Armenia under his discussion of *Bellardia agilis*.

Distribution. Western Palaearctic Region. Nearctic Region (USA, New Jersey).

***Bellardia* spp.**

In the collection were the following 28 *Bellardia* females that I have not identified to species.

Material. *Aragatsotn*: Sipan, N40°43 E44°16, 2100 m, 18.vi.2010, 3 ♀ [2733, 2734, 2735]; Lake Kari, N40°28 E44°11, 3190 m, 19.vii.2011, 1 ♀ [2736]; 18.vii.2016, 1 ♀ [2737]; River Kasakh between Alagyaz and Aparan, N40°37 E44°20, 1950 m, 18.vi.2010, 1 ♀ [2738]; 19.v.2012, 10 ♀ [2739–2748]; 31.vii.2015, 1 ♀ [2749]; Mt Aragats, N40°29 E44°11, 3240–3350 m, 21.vii.2015, 1 ♀ [2750]; 3450–3560 m, 29.vii.2015, 1 ♀ [2751]; Below Spitak Pass, N40°45 E44°16, 2300 m, 31.vii.2015, 1 ♀ [2752]. *Kotayk*: Tsakhkadzor, Mt Teghenis, wood, N40°32 E44°41, 2240 m, 17.vi.2010, 1 ♀ [2753]; 21.vi.2010, 1 ♀ [2754]; Tsakhkadzor, Mt Teghenis, heath, N40°32 E44°41, 2240 m, 21.vi.2010, 3 ♀ [2755, 2756, 2757]; Tsakhkadzor, Mt Teghenis, wood & edge of wood, N40°32 E44°41, 2270 m, 17.vii.2011, 1 ♀ [2758]. *Syunik*: River Meghri at Lichk, N39°03 E46°10, 1760 m, 23.vii.2011, 1 ♀ [2759]. *Vayots Dzor*: River Arpa W of Vayk, N39°41 E45°23, 1280 m, 27.vii.2011, 1 ♀ [2760].

***Calliphora rohdendorfi* (Grunin, 1966)**

Most recent taxonomic treatments. Grunin (1966: 898, as *Abago rohdendorfi*), Grunin (1970b, as *Abago rohdendorfi*), Schumann & Ozerov (1992), Rognes (1997), Szpila (2015).

Material. *Kotayk*: Tsakhkadzor, Mt Teghenis, wood & edge of wood, N40°32 E44°41, 2270 m, 17.vii.2011, 1 ♀ [2526].

Previous Armenian records. “near Ankavan, July 7, 1969”, 1 ♂ (V. Richter) [= Hankavan in Kotayk province]; “Akhundov, Razdan district, Aug. 5, 1969”, 1 ♂ (V. Richter) [= Hrazdan in Kotayk province] (Grunin 1970b).

Remarks. *Abago rohdendorfi* was described by Grunin (1966) from Krasnodarskiy Krai in Russia, at the “foothill of Mt. Abago”, on the basis of “a single male in a poor state of preservation” (Grunin 1970b). I have not been able to find Mt Abago on a map, but Abago is a locality in the modern Adygeya Republic [Respublika Adygeya], which is surrounded in its entirety by Krasnodarskiy Krai. Grunin (1970b) added the following records from the Caucasus: (1) “Krasnodar Territory, in the Kavkazskiy reservation in the Adygey Autonomous Region”; (2) “Stavropol’ Territory, Karachayevo-Cherkes Autonomous Region, Teberda reservation”; and (3) “Armenia” (spelling of localities taken from the translation of the original Russian paper in Entomological Review, Washington). The two localities in Armenia are cited above. Schumann (1986) recorded the species from Armenia and Georgia, though I have not been able to find the source for the record from Georgia. Schumann & Ozerov (1992) collected several specimens in North Ossetia in Russia, and moved the species to the genus *Calliphora* Robineau-Desvoidy. The species was recently recorded in large numbers in Germany by Adaschkiewitz & Gossner (2014), and was subsequently found also in Poland (Szpila 2015). Theo Zeegers collected it in Lagodekhi Nature Reserve, Kakheti province in eastern Georgia in 2012 (pers. comm., 1 duplicate male received). *Calliphora rohdendorfi* is very similar in external appearance to *Calliphora subalpina* (Ringdahl, 1931), but the terminalia in both sexes are very different. It has most likely been overlooked in the area between Germany and the Caucasus.

Distribution. Armenia, Georgia, Germany, Poland, Russia (Respublika Adygeya; Karachayevo-Cherkesskaya Respublika; Respublika Severnaya Osetiya-Alaniya).

***Calliphora vicina* Robineau-Desvoidy, 1830**

Most recent taxonomic treatments. Rognes (1991a), Tantawi *et al.* (2017).

Material. *Aragatsotn*: River Amberd near Amberd fortress, N40°24 E44°14, 2210 m, 27.v.2012, 1 ♂ [2511]. *Gegharkunik*: Sevan Monastery, N40°33 E45°01, 1920 m, 13.vi.2010, 1 ♂ [2510]. *Kotayk*: River Marmarik at Hankavan, N40°38 E44°31, 1920 m, 21.vi.2010, 2 ♂ 1 ♀ [2512, 2513, 2514]; Tsakhkadzor, Mt Teghenis, heath, N40°32 E44°41, 2280–2360 m, 30.vii.2015, 1 ♀ [2515]. *Tavush*: Haghartsin monastery environs, N40°48 E44°53, 1430–1560 m, 6.vii.2016, 1 ♀ [2654]; Joukhtak Vank, N40°45 E44°48, 1500 m, 9.vii.2016, 1 ♂ [2653]. *Vayots Dzor*: River Amaghu below Noravank church, N39°41 E45°14, 1460 m, 15.vi.2010, 2 ♂ 1 ♀ [2507, 2508, 2509]; Kechut, N39°48 E45°40, 1960 m, 27.vii.2011, 1 ♀ [2516].

Distribution. Cosmopolitan, in temperate and subtropical regions.

***Calliphora vomitoria* (Linnaeus, 1758)**

Most recent taxonomic treatments. Rognes (1991a), Tantawi *et al.* (2017).

Material. *Kotayk*: River Dalar at Aghveran, N40°30 E44°35, 1710 m, 23.vi.2010, 1 ♂ [2518]; River Marmarik at Hankavan, N40°38 E44°31, 1920 m, 21.vi.2010, 1 ♀ [2519]; Tsakhkadzor, Mt Teghenis, wood, faeces trap, N40°32 E44°41, 2240 m, 13.vii.2016, 1 ♂ 3 ♀ [2649, 2650, 2651, 2652].

Distribution. Widely distributed in the Palaearctic and Nearctic regions; also Oriental Region.

***Cynomya mortuorum* (Linnaeus, 1761)**

Most recent taxonomic treatment. Rognes (1991a).

Material. *Aragatsotn*: River Kasakh at Alagyaz, N40°40 E44°18, 2050 m, 18.vi.2010, 1 ♂ [2528]; River Kasakh between Alagyaz and Aparan, N40°37 E44°20, 1950 m, 19.v.2012, 1 ♀ [2529]. *Kotayk*: Tsakhkadzor, Mt Teghenis, heath, N40°32 E44°41, 2400 m, 17.vii.2011, 1 ♂ [2527].

Distribution. All over the Palaearctic Region; only Alaska and Greenland in the Nearctic Region.

Subfamily CHRYSOMYINAE

***Chrysomya albiceps* (Wiedemann, 1819)**

Most recent taxonomic treatments. Zumpt (1956), Dear (1985), Rognes (2002).

Material. *Syunik*: River Meghri at Lichk, N39°03 E46°10, 1760 m, 23.vii.2011, 1 ♀ [2506].

Distribution. Palaearctic (except for northernmost regions), Afrotropical, Oriental and Neotropical regions (Grassberger *et al.* 2003; Whitworth 2010). It recently expanded its distribution northwards in Europe (Grassberger *et al.* 2003), reaching Poland (Szpila *et al.* 2008).

***Protocalliphora azurea* (Fallén, 1817)**

Most recent taxonomic treatment. Rognes (1991a).

Material. *Gegharkunik*: River Argichi, N40°09 E45°16, 1920 m, 24.vi.2010, 1 ♀ [2533].

Distribution. All over the Palaearctic Region.

Subfamily LUCILIINAE

***Lucilia ampullacea* Villeneuve, 1922**

Most recent taxonomic treatment. Rognes (1991a).

Material. *Tavush*: Aghavnavank, N40°43 E45°06, 1260–1320 m, 7.vii.2016, 1 ♂ [2632].

Distribution. All over the Palaearctic Region; also Oriental Region.

Lucilia bufonivora Moniez, 1876

Most recent taxonomic treatments. Rognes (1991a), Tantawi & Whitworth (2014).

Material. *Aragatsotn*: 1 km S of Sipan, N40°43 E44°16, 2100 m, 18.vi.2010, 1 ♂ [2489 (dissected)].

Distribution. Scattered throughout the Palaearctic Region; also Nearctic Region (southwestern Canada).

Remarks. Obligatory parasite of frogs and toads.

Lucilia caesar (Linnaeus, 1758)

Most recent taxonomic treatments. Rognes (1991a); Picard *et al.* (2018).

Material. *Kotayk*: River Dalar at Aghveran, N40°30 E44°35, 1710 m, 23.vi.2010, 1 ♀ [2485]. *Syunik*: River Kashtuni, Chaimazi, N39°20 E46°28, 1120 m, 24.vii.2011, 2 ♂ 1 ♀ [2478, 2479, 2487]. *Tavush*: Gosh Lake, N40°43 E45°01, 1490 m, 24.vii.2015, 2 ♂ [2482, 2483]. *Vayots Dzor*: River Amaghu below Noravank church, faeces trap, N39°41 E45°14, 2020 m, 18.v.2012, 1 ♂ [2481]; River Arpa near Vayk, N39°41 E45°30, 1280 m, 27.vii.2011, 1 ♂ [2480]. *Yerevan*: Yerevan City, River Hrazdan, N40°11 E44°30, 960 m, 21.vii.2011, 2 ♂ [2476, 2477].

Distribution. All over the Palaearctic Region, except in northernmost areas.

Lucilia richardsi Collin, 1926

Most recent taxonomic treatments. Rognes (1991a, 2003).

Material. *Kotayk*: Tributary of River Hrazdan at Bjni, N40°28 E44°40, 1510 m, 17.vi.2010, 1 ♀ [2488].

Distribution. Western Palaearctic Region, including Georgia and Kazakhstan.

Lucilia sericata (Meigen, 1826)

Most recent taxonomic treatment. Rognes (1991a).

Material. *Shirak*: Lake Arpi National Park, Shaghik, N41°04 E43°36, 2030 m, 16.vii.2016, 1 ♀ [2634].

Distribution. Cosmopolitan.

Lucilia silvarum (Meigen, 1826)

Most recent taxonomic treatments. Rognes (1991a), Tantawi & Whitworth (2014).

Material. *Aragatsotn*: River Aragats (tributary of River Kasakh) at Aragats, N40°29 E44°19, 2110 m, 18.vi.2010, 1 ♂ [2497 (dissected)]; River Kasakh between Alagyaz and Aparan, N40°37 E44°20, 1950 m, 18.vi.2010, 1 ♂ [2496 (dissected)]. *Vayots Dzor*: Stream feeding Gerger Reservoir, N39°44 [40 on label] E45°33, 2070 m, 26.vii.2011, 1 ♀ [2502].

Distribution. Widespread in the Palaearctic and Nearctic regions.

Subfamily MELANOMYIINAE

Melinda gentilis Robineau-Desvoidy, 1830

Most recent taxonomic treatment. Rognes (1991a).

Material. *Kotayk*: Tsaxhkadzor, Mt Teghenis, wood, N40°32 E44°41, 2240 m, 17.vi.2010, 1 ♀ [2542].

Distribution. Widespread in the Palaearctic Region.

***Melinda viridicyanea* (Robineau-Desvoidy, 1830)**

Most recent taxonomic treatment. Rognes (1991a).

Material. *Kotayk*: Tsaxhkadzor, Mt Teghenis, wood & edge of wood, N40°32 E44°41, 2270 m, 17.vii.2011, 1 ♂ [2536]; Tsaxhkadzor, Mt Teghenis, wood, N40°32 E44°41, 2240 m, 28.v.2012, 1 ♀ [2537]; Tsaxhkadzor, Mt Teghenis, heath, N40°32 E44°41, 2280–2360 m, 30.vii.2015, 2 ♀ [2538, 2539]. *Syunik*: River Vorovan, Vaghatin, N39°30 E46°07, 1400 m, 25.vii.2011, 1 ♀ [2540]. *Tavush*: Parz Lich, N40°45 E44°58, 1870 m, 25.v.2012, 1 ♂ [2535]; 2 km N of Parz Lich, N40°45 E44°57, 1490 m, 5.vii.2016, 1 ♂ [2648 (dissected)].

Distribution. Widespread in the Palaearctic Region, east to Xinjiang in China (Fan 1997).



FIGURE 1. Armenia, Aragatsotn Province, Mt Aragats, heath at 3500 m, 13 August 2017.

Subfamily POLLENIINAE

***Pollenia agneteeae* sp.nov.**

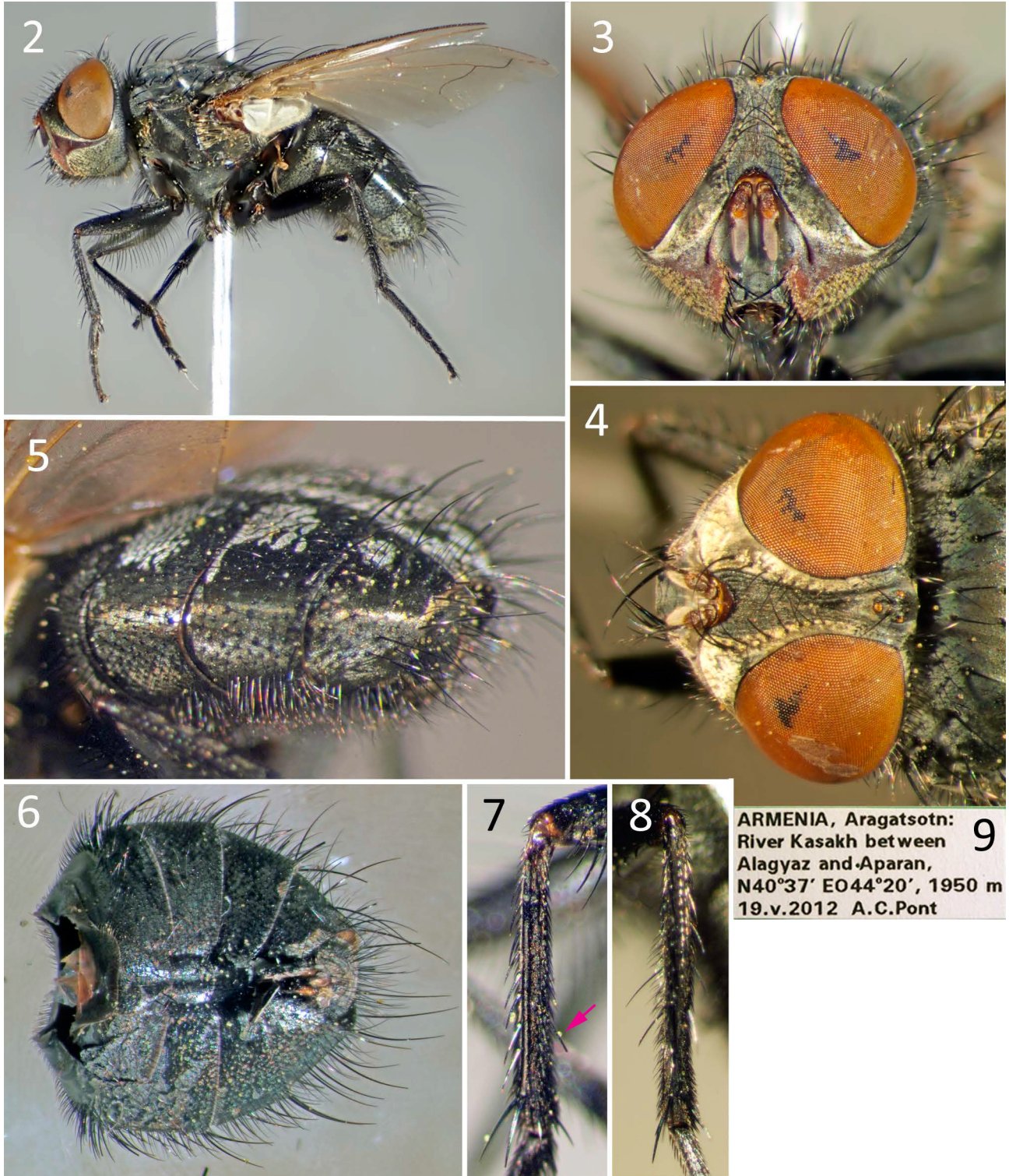
(Figs 2–17)

urn:lsid:zoobank.org:act:3C8A9E3D-C48F-48E7-A393-3BCF30A56480

Type material. Holotype ♂ (NHMUK), labelled (1) ARMENIA, Aragatsotn: / River Kasakh between / Alagyaz and Aparan, / N40°37' E044°20', 1950 m / 19.v.2012 A.C.Pont (Fig. 9); (2) HOLOTYPE (m) / *Pollenia agneteeae* sp. nov. / K. Rognes des. 2018 [printed on red label]; (3) KR0000002605 [printed on white label].

Condition. The left wing is somewhat torn. The left mid leg below the left femur and the whole right hind leg are lacking (Fig. 2). I had an accident with the specimen and destroyed the outer segment of the fore tarsus of the right leg. The right lobe of ST5 was displaced (Fig. 6) and the sternite is broken into two parts (Fig. 17).

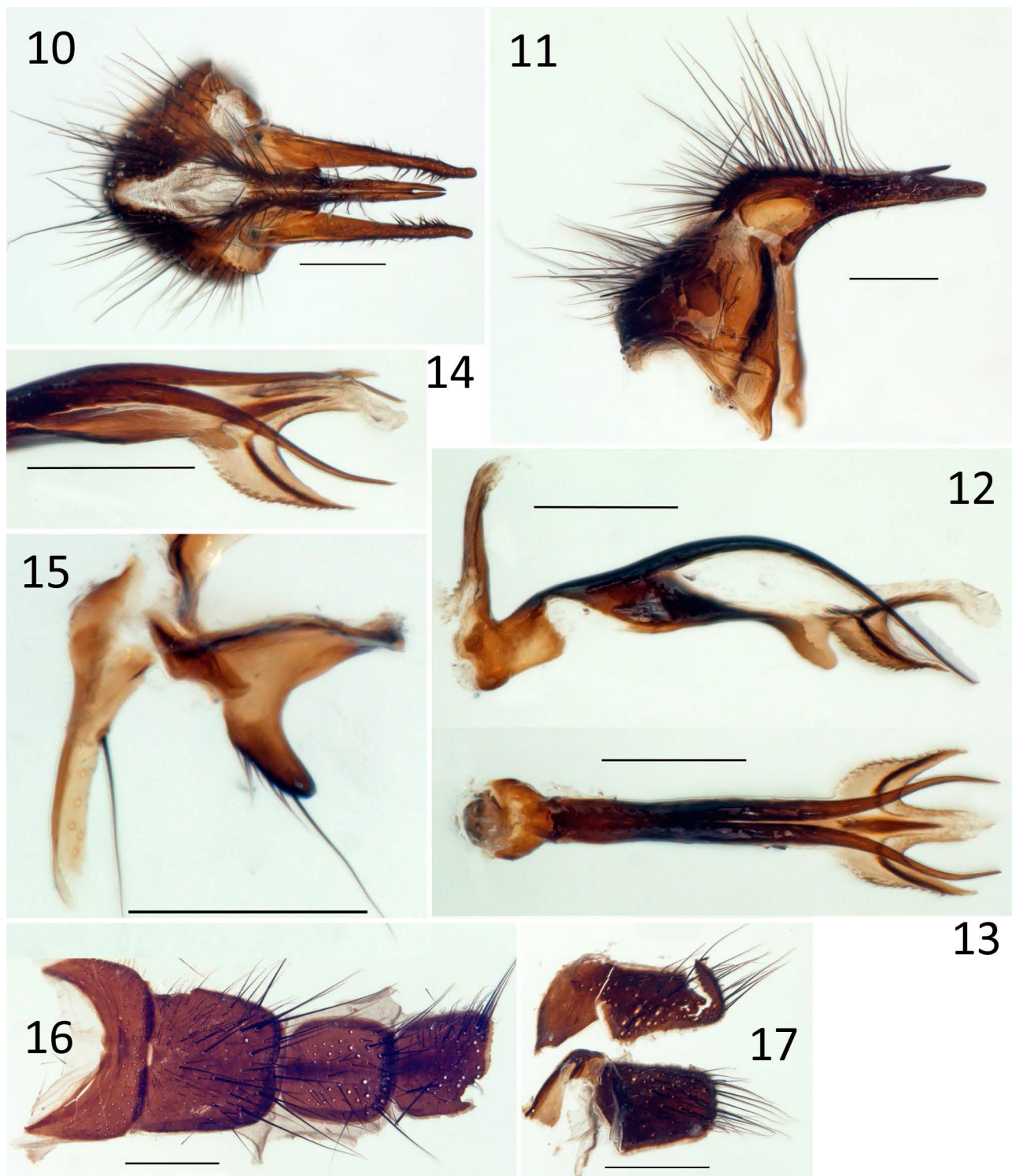
Etymology. The species is named in honour of my wife and companion for more than 40 years of fly work. The specific name is a noun in the genitive case, formed from the modern personal name of a woman (ICZN 1999, Article 31.1.2) by adding the suffix *-ae* to the stem *agnete*.



FIGURES 2–9. *Pollenia agnetee* sp. nov., holotype ♂ (NHMUK). 2. Habitus, left lateral view, before dissection. 3. Head, anterior view. 4. Head, dorsal view. 5. Detached abdomen, dorsolateral view. 6. Detached abdomen, ventral view. 7. Left fore tibia, dorsolateral view; arrow points to posteroventral seta. 8. Left hind tibia, anterolateral view. 9. Label.

Diagnosis. As a member of the *Pollenia semicinerea* species-group (Rognes 1988), it is separable from all its congeners by the very broad frons and very elongate and distinctive cerci and surstyli.

Description. *Male.* Length: about 9 mm (holotype measured after dissection). Ground colour black.



FIGURES 10–17. *Pollenia agnetae* sp. nov., holotype ♂ (NHMUK). 10. Epandrium, cerci and surstyli, posterior view. 11. Epandrium, cerci and surstyli, left lateral view. 12. Phallus, left lateral view. 13. Phallus, dorsal view. 14. Distal half of distiphallus, left dorsolateral view. 15. Pre- and postgonites. 16. ST1–4. 17. ST5. Scale bars: 0.25 mm (Figs 10–15); 0.5 mm (Figs 16–17).

Head. Frons at narrowest point/head width ratio 0.150 (Figs 3–4). Frontal vitta almost twice as broad as fronto-orbital plate at level of tip of ocellar triangle. Frontal vitta black; fronto-orbital plate, genal dilation and parafacial

with thick layer of greyish-yellow microtrichosity. Facial membrane black. Genal dilation with black ground setulae. Area between anterior end of genal dilation, lower end of parafacial and vibrissa reddish. Lunula shiny reddish-brown, pedicel brownish-red, first flagellomere black. Facial carina distinct. Vibrissa well above lower facial margin. Occiput centrally with pale setulae hardly invading posterior end of genal dilation. Palpus black.

Thorax with almost no microtrichosity except on slope at anterior end. Yellow curly “Pollenia hairs” sparse, mostly confined to (1) a small area around anterior thoracic spiracle, (2) the hind edge of the anepisternum, where it forms a dense brush behind the row of anepisternal marginal setae, (3) a dense cluster in upper part of anepimeron, just below lesser ampulla, and (4) on postalar wall. Pleuron with black setulae, but some pale setulae in upper posterior corner of katapisternum. Both thoracic spiracles yellowish-brown. Halter yellow. 3 postpronotal (“humeral”) setae; 1 outer and 1 inner posthumeral seta; 2 presutural and 3 postsutural acrostichal setae; 2 presutural and 3 postsutural dorsocentral setae; 1 presutural and 2 postsutural intra-alar setae; 3 supra-alar setae; 2 notopleural setae; 2 post-alar setae. Scutellum with 3 pairs of strong and 1 pair of weak marginal setae (latter on one side only) and 1 pair of discal scutellar seta near posterior margin; scutellum about twice as wide as long. Coxopleural streak present. *Wing*. Basicosta and tegula black. Costagium and veins yellow. Node at junction of humeral crossvein and subcosta bare on underside of wing. Cell r_{4+5} open. Second costal sector bare on underside of wing. Node at junction of R_{2+3} and R_{4+5} with a few small setulae on upper and under sides of wing. Calypters pure white, also rim and hairs along rim. *Legs*. Fore tibia with 1 posteroventral seta and a row of shorter anteroventral ones (Fig. 7). Mid tibia with 1 large anterodorsal setae and 1 smaller one above it; 2 small posterior setae; 1 small posteroventral seta; 1 large ventral seta. [Left] hind tibia at middle with erect and elongate ground setulae (Fig. 8) [like in *P. rudis*; see Rognes (1987: fig. 20)]; with 2 anteroventral setae, 2–3 anterodorsal and 3–4 posterodorsal setae. Dorsal preapical seta on hind tibia much shorter than basitarsus. Hind tarsus as long as hind tibia (Fig. 2). All femora with black posteroventral ground vestiture.

Abdomen with conspicuous microtrichosity, with tessellations shifting according to angle of view. Dorsal side with adpressed ground vestiture (Figs 2, 5), ventral side with erect, elongate, and densely set ground vestiture (Fig. 5). ST1–5 as in Figs 6, 16–17. ST2–4 all slightly longer than wide. *Terminalia* (Figs 10–15). Cerci and surstyli narrow and long. Cerci (Figs 10–11) slightly bent backwards distally, very narrow throughout in posterior view, slightly and evenly converging, a small cleft present at tip; in proximal two-thirds with long erect setae in lateral view (Fig. 11). Surstylus narrowing evenly towards tip in lateral view, with a rounded tip; extreme tip slightly bending outwards in posterior view (Fig. 10); surstyli converging slightly in posterior view (Fig. 10); surstylus with short, rather strong setae in less than distal half of inner surface—beginning a short distance behind tip—and with short weak setulae on outer surface in posterior view. Phallus with a median hypophallic lobe projecting midventrally slightly behind base of paired lateral hypophallic lobes. Latter with a rather narrow central sclerotisation (Figs 12, 14). Pre- and postgonites as in Fig. 15.

Relationships. The dark body colour, the thin layer of microtomentum on the body, the black basicosta and tegula, and the narrow cerci, together with the structure of the phallus, suggest that *P. agnetee* **sp. nov.** belongs in the *Pollenia semicinerea* species-group as defined by Rognes (1988). However, the very broad male frons at its narrowest (0.15x head width) separates it from other members of the group, where the frons is about 1–1.5x as wide as anterior ocellus and narrower than distance between posterior ocelli inclusive (Rognes 1988: 316). The frons to head width ratio is 0.013–0.032 in *P. grunini* Rognes, 0.016 in *P. mystica*, 0.014–0.026 in *P. pectinata* Grunin and 0.020–0.050 in *P. semicinerea* Villeneuve (Rognes 1988). Only *P. paragrugini* Rognes has a similar ratio (0.031–0.100) to that of *P. agnetee* **sp. nov.**, but the terminalia of *P. paragrugini* are very different (see Figs 10–15 and 27–32).

***Pollenia amentaria* (Scopoli, 1763)**

Most recent taxonomic treatments. Rognes (1991a, 1992), Szpila & Draber-Mońko (2008).

Material. *Tavush*: Haghartsin monastery environs, N40°48 E44°53, 1440–1700 m, 10.viii.2017, 1 ♂ [2631].

Previous Armenian records. Rognes (1988: 325) mentioned that 1 ♂ and 1 ♀ of *Pollenia amentaria* had been set aside by Grunin in the ZIN collection together with all material of *P. mystica* and *P. paragrugini*, with a note to the effect that he regarded them all as forming a new taxon, “*Pollenia semicinerea* ssp.n.1969”. I identified both specimens after dissection. The male is from Armenia, Syunik province (“14 km from Gorisa, okr. Sisiana, 26 July

1970”), while the female is from Georgia (“Khando, 20 km NW of Akhalkalaki, 8 August 1970”). Both specimens were collected by V. Richter.

Distribution. Widespread in the Palaearctic Region, east to Xinjiang in China.

Pollenia bulgarica Jacentkovský, 1939

Most recent taxonomic treatment. Rognes (1991b).

Material. *Aragatsotn*: River Kasakh between Alagyaz and Aparan, N40°37 E44°20, 1950 m, 31.vii.2015, 3 ♂ 2 ♀ [2562, 2563, 2564, 2565, 2566]. *Tavush*: Aghavnavank, N40°43 E45°06, 1260–1320 m, 11.viii.2017, 1 ♂ [2628]; Ttu jur, N40°44 E44°53, 1420–1710 m, 13.vii.2018, 1 ♂ 1 ♀ [2761 (dissected), 2762].

Previous Armenian records. “Yerevan district, Usch.r.Berdadzor [gorge of the river Berquidadzor]”, 7.ix.1971, 1 ♂ (V. Richter leg.); 6.ix.1971, 1 ♀ (V. Richter leg.) (Rognes 1991b: 469).

Distribution. Armenia, Azerbaijan, Bulgaria, Greece, Hungary, Moldova, Romania, Slovakia, Turkey (Rognes 1991b), Iran (Parchami-Araghi *et al.* 2014).

Pollenia dasypoda Portschinsky, 1881

Most recent taxonomic treatments. Rognes (1988, 1992, 2002).

Material. *Aragatsotn*: River Kasakh between Alagyaz and Aparan, N40°37 E44°20, 1950 m, 31.vii.2015, 1 ♂ 1 ♀ [2567, 2571]. *Kotayk*: Tsakhkadzor, Mt Teghenis, wood, faeces trap, N40°32 E44°41, 2240 m, 28.v.2012, 1 ♀ [2570]. *Lori*: Stream 2 km E of Kurtan, N40°58 E44°33, 1280 m, 23.v.2012, 1 ♂ [2568]. *Syunik*: Brnakot, N39°28 E45°59, 1670 m, 26.vii.2011, 1 ♀ [2569].

Distribution. Austria, Bulgaria, Czech Republic, Egypt, Germany, Greece, Hungary, Iran, Israel, Italy, Kazakhstan, Lebanon, Moldova, Poland, Romania, Russia, Slovakia, Syria (Golan Heights), Tajikistan, Turkey, Ukraine, West Bank, India, Pakistan (Rognes 2002; Parchami-Araghi *et al.* 2014).

Pollenia griseotomentosa (Jacentkovský, 1944)

Most recent taxonomic treatments. Rognes (1991a), Whitworth (2006).

Material. *Tavush*: Haghartsin monastery environs, N40°48 E44°53, 1440–1700 m, 10.viii.2017, 1 ♀ [2630]; Parz Lich, N40°45 E44°58, 1870 m, 25.v.2012, 3 ♀ [2590, 2591, 2592].

Distribution. Widely distributed in Europe; also Canada and USA.

Pollenia mystica Rognes, 1988

Most recent taxonomic treatment. Rognes (1988).

Material. *Aragatsotn*: Mt Aragats, N40°29 E44°11, 3240–3350 m, 21.vii.2015, 2 ♂ [2545, 2550]; 3380–3420 m, 21.vii.2015, 1 ♂ 3 ♀ [2544, 2552, 2553, 2554]; 3190–3350 m, 29.vii.2015, 2 ♂ 4 ♀ [2546, 2547, 2555, 2556, 2557, 2558]; 3450–3560 m, 29.vii.2015, 3 ♂ 3 ♀ [2543 (dissected), 2548, 2549, 2559, 2560, 2561]; 3530–3550 m, 13.viii.2017, 3 ♂ 2 ♀ [2616, 2617, 2618, 2619, 2620]; 3520–3580 m, 13.vii.2015, 3 ♂ 4 ♀ [2621, 2622, 2623, 2624, 2625, 2626, 2627]; 3310 m, 16.viii.2017, 1 ♂ 1 ♀ [2614 (dissected), 2615]; River Kasakh between Alagyaz and Aparan, N40°37 E44°20, 1950 m, 31.vii.2015, 1 ♂ [2551].

Distribution. Armenia (this paper), Georgia (holotype and a single paratype) (Rognes 1988).

Remarks. The holotype male from Georgia was collected on stones at 2460 m, whereas the female paratype from Georgia was collected “in upper levels of forest” (Rognes 1988: 325, citing label text in Russian). In Armenia it is mostly a high altitude species collected on heath above the treeline (Fig. 1). It is a very dark species with an almost imperceptible layer of microtrichosity on the abdomen, divided lengthwise according to the angle of view: one half appearing evenly but very thinly microtrichose, the other half appearing shiny black. Under some light

angles, the abdomen has a slight dark greenish sheen. The male frons is very narrow, about as wide as anterior ocellus.

***Pollenia paragrugini* Rognes, 1988**

(Figs 18–33)

Most recent taxonomic treatment. Rognes (1988).

Material. *Aragatsotn*: Mt Aragats, N40°29 E44°11, 3240–3350 m, 21.vii.2015, 1 ♂ [2606 (dissected)], 1 ♀ [2607]; 3190–3350 m, 29.vii.2015, 1 ♀ [2608]; 3520–3580 m, 13.viii.2017, 1 ♀ [2613]; 3270–3310 m, 16.viii.2017, 1 ♂ [2609 (dissected)], 3 ♀ [2610, 2611, 2612].

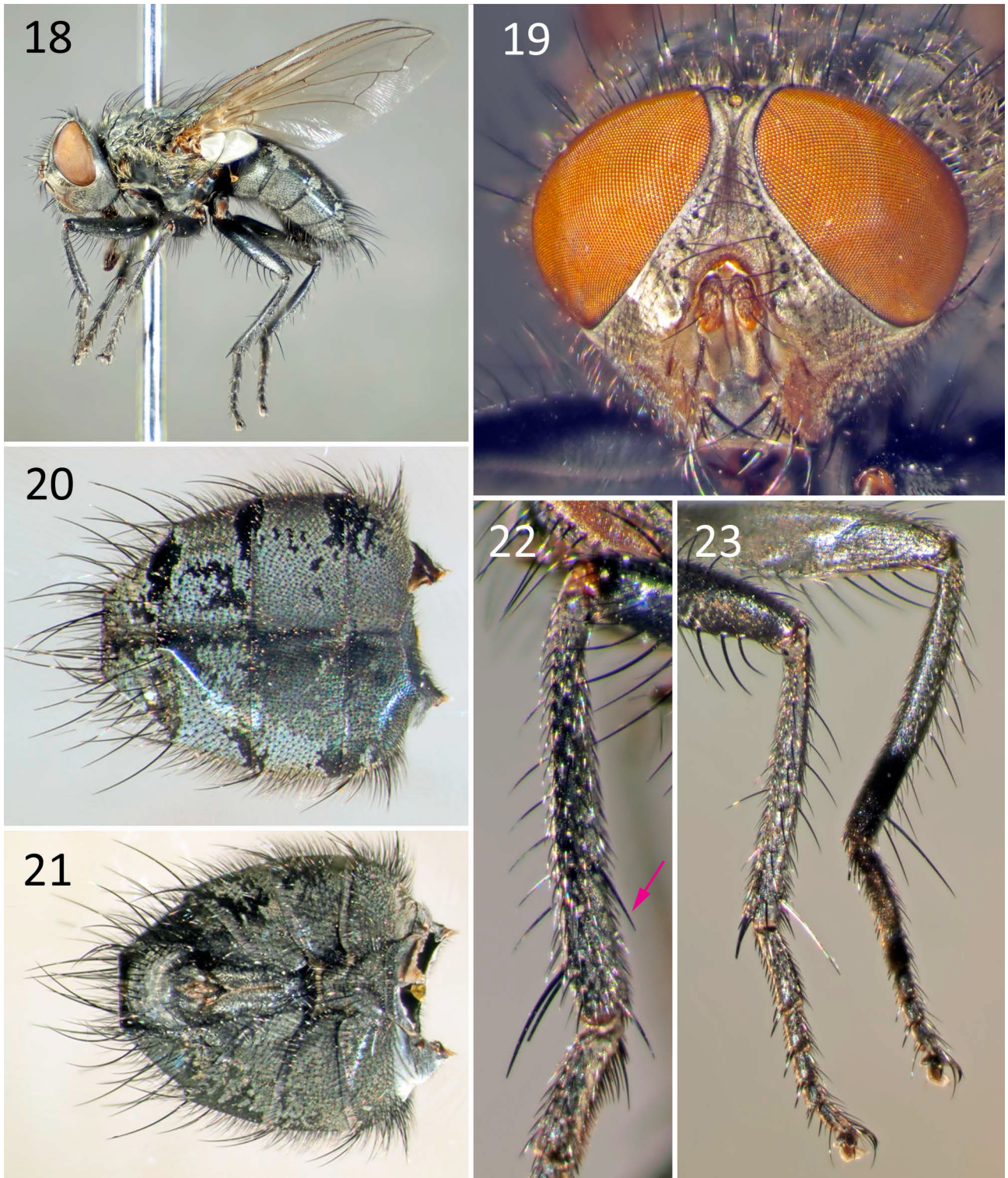
Previous Armenian records. *Aragatsotn* or *Kotayk*: Hankavan (as “okr. Ankavana” on label), 13.vii.1965, 1 ♂ (V. Richter leg.) (paratype) (Rognes 1988).

Remarks on taxonomy. *Head.* In the males the frons at narrowest point/head width ratio is variable, ranging between 0.031 and 0.100 (n = 5) (Figs 24–26). Individual measurements are: 0.031–0.039 (mean 0.034, n = 3) (holotype and 2 paratypes; Rognes 1988) (Fig. 24), 0.063 [2609] (Fig. 25) and 0.100 [2606] (Fig. 26). *Legs.* Fore tibia with 1 posteroventral seta (Fig. 22). Mid tibia with 2 anterodorsal setae, the lower one largest, 2 posterodorsal setae and 2–3 posterior setae. Mid tibia without a ventral seta in males of the Mt Aragats material, but such a seta is present in the females and in the all-male type material (holotype and 2 paratypes). Hind tibia with 5–7 anterodorsal, 6–7 posterodorsal and 1–4 anteroventral setae. All male tarsi shorter than tibiae (Fig. 23). Hind tibia with a long preapical dorsal seta, as long as basal tarsomere of hind tarsus (Fig. 23). Hind tibia without erect “rudis-type” (Rognes 1987) anteroventral and ventral ground setulae. *Abdomen.* In males, the dorsal side of the abdomen has semierect ground vestiture (Fig. 18) and the ventral side has ground vestiture that is not erect, not densely set or finer than the one dorsally, but slightly longer. Dorsal microtrichosity is present, but not always as even as shown in Fig. 20. Usually there is a shifting pattern, often divided at the midline, one half being dark, the other whitish, according to the angle of view. ST1–5 are shown in Figs 21 and 33. ST2–4 are all shorter than wide, becoming shorter and wider towards ST4, which is very short. *Male terminalia.* These are shown in Figs 27–32. Both males from the Mt Aragats material have terminalia as shown in the figures and are obviously conspecific, in spite of the different frons width. The photographs of the cerci and surstyli (Figs 27–28) conform to the black and white ink drawings of the holotype shown in Rognes (1988: figs 25–26). The cerci and surstyli of the holotype have been re-examined and also correspond perfectly with the photographs. The different distance from the tip of the cerci to the tip of the surstyli [compare fig. 25 in Rognes (1988) with Fig. 27] is most likely due to a different angle of observation, and is not a species-specific trait. The central sclerotisation of the hypophallic lobes (Figs 29, 31) is rather broad, and similar to the one shown for the holotype in Rognes (1988: fig. 27). Neither of the two Mt Aragats males have the paraphallic processes (Fig. 30) converging to the same extent as shown in the drawing of the holotype (Rognes 1988: fig. 28). Re-examination of the distiphallus of the holotype (in glycerol for about 30 years) revealed that the paraphallic processes converge to about the same degree as seen in the Mt Aragats material (Fig. 30), suggesting that the original manual drawing is somewhat artefactual. The tip of the paraphallic processes is armed in the holotype and appears obliquely truncated (Rognes 1988: figs 28–29). I have not been able to examine these details in the Mt Aragats material.

Concluding remarks. I have never met with such a large intraspecific variability of the male frons in any species of *Pollenia* as the one shown by *Pollenia paragrugini*. It may have something to do with the high altitude at which these flies live. I have considered the possibility that the Mt Aragats material might represent a *Pollenia* species other than *paragrugini*, but could not find any convincing arguments in the external morphology—apart from the broader frons and the lack of a ventral mid tibial seta in the males—or in the male terminalia. I therefore consider the Armenian material from Mt Aragats as belonging to the taxon *P. paragrugini*.

Distribution. Azerbaijan (holotype and 1 paratype: Nakhchivan Autonomous Republic: 8 km S Betschenagsku Pass), Armenia (1 paratype and additional records in this paper).

Note. There is an error in Rognes (1988) as regards the type locality. The locality “... ‘8 km S Bigenak perevala’ [Bichenakskiy Pass]” was assigned erroneously to Armenia, but the label of the holotype and one paratype places it in “Нахичеванск. [= Nakhichevansk.]” in Azerbaijan (Fig. 24).



FIGURES 18–23. *Pollenia paragrugini* Rognes, 1988, ♂ from Mt Aragats, 3240–3350 m, 21.vii.2015, specimen ID KR0000002606 (NHMUK). **18.** Habitus, left lateral view, before dissection. **19.** Head, anterior view. **20.** Detached abdomen, dorsal view. **21.** Detached abdomen, ventral view. **22.** Left fore tibia, dorsolateral view; arrow points to posteroventral seta. **23.** Left and right hind tibiae, external and internal view.

***Pollenia pediculata* Macquart, 1834**

Most recent taxonomic treatment. Rognes (1991a).

Material. *Aragatsotn*: River Aragats (tributary of River Kasakh) at Aragats, N40°29 E44°19, 2110 m, 18.vi.2010, 1 ♂ 1 ♀ [2572, 2581]; River Aragats at Aragats, N40°29 E44°19, 2110 m, 19.vii.2011, 1 ♀ [2576]; River Kasakh at Alagyaz, N40°40 E44°18, 2050 m, 18.vi.2010, 1 ♂ 1 ♀ [2574, 2582]; River Kasakh between Alagyaz and Aparan, N40°37 E44°20, 1950 m, 18.vi.2010, 1 ♂ [2573]. *Gegharkunik*: River Argichi, N40°09 E45°16, 1920 m, 24.vi.2010, 2 ♀ [2583, 2584]; River Tsakkar south of Noratus, N40°11 E45°14, 1920 m, 24.vi.2010, 1 ♂ 1 ♀ [2575, 2585]. *Kotayk*: Tributary of River Hrazdan at Bjni, N40°28 E44°40, 1510 m, 17.vi.2010, 1 ♀ [2586]; River Dalar at Aghveran, N40°30 E44°35, 1710 m, 23.vi.2010, 1 ♀ [2587]. *Syunik*: River Vorovan, Vaghatin, N39°30 E46°07, 1400 m, 25.vii.2011, 2 ♀ [2577, 2578]; River Meghri at Lichk, N39°03 E46°10, 1760 m, 23.vii.2011, 1 ♀ [2580]; River Sisyan near Ashotavan, N39°28 E46°01, 1660 m, 25.vii.2011, 1 ♀ [2579]. *Tavush*: Aghavnavank, N40°43 E45°06, 1260–1320 m, 7.vii.2016, 1 ♀ [2640]; 2 km N of Parz Lich, N40°45 E44°57, 1490 m, 5.vii.2016, 1 ♀ [2642]; 10.vii.2016, 1 ♀ [2641]; Ttu jur, N40°44 E44°53, 1420–1710 m, 13.vii.2018, 1 ♂ 1 ♀ [2763, 2764].

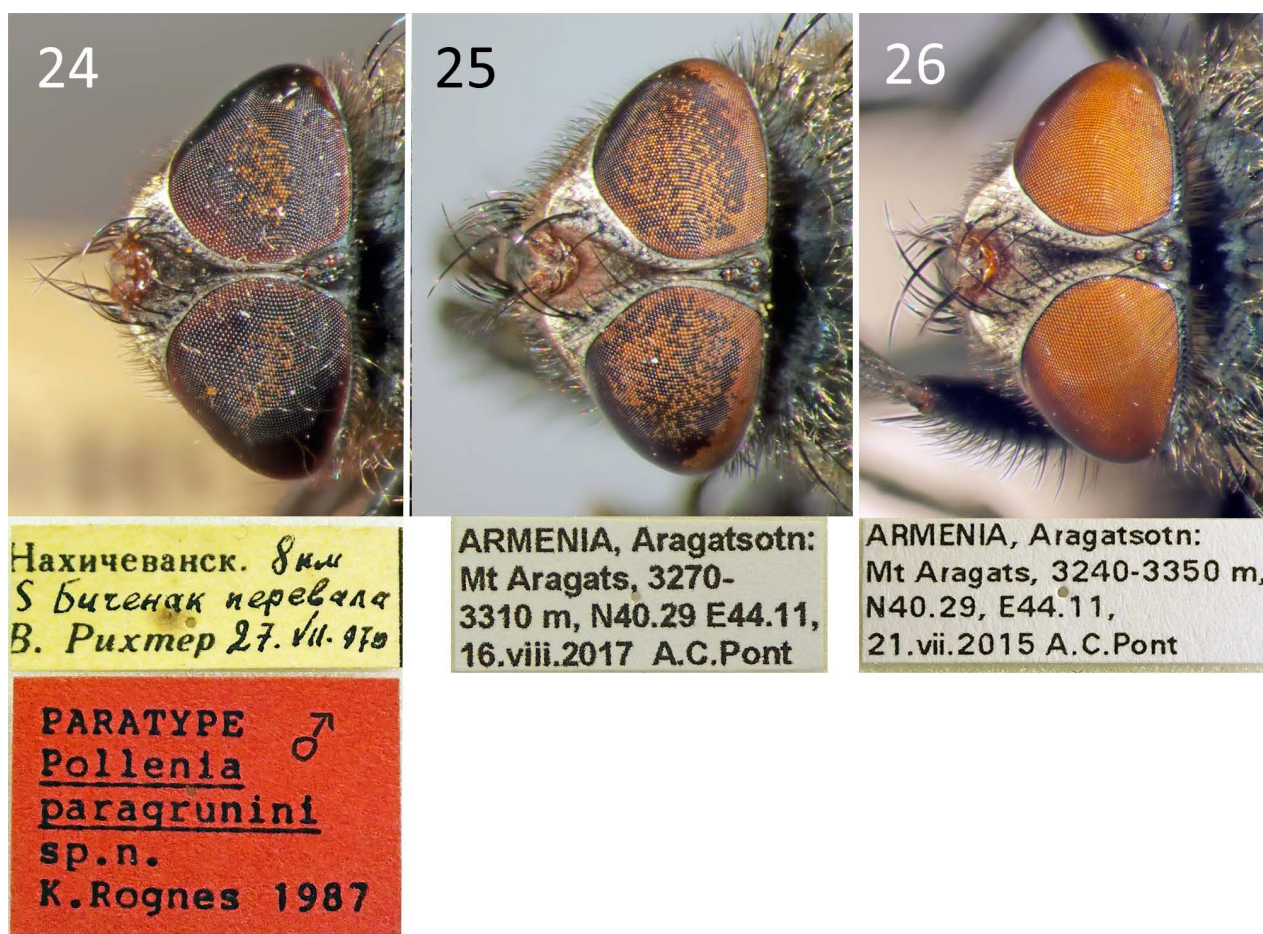
Distribution. Very common and widespread in the Holarctic Region, including northern India and Pakistan; China (Xinjiang). Introduced in New Zealand and South Africa.

Pollenia rudis (Fabricius, 1794)

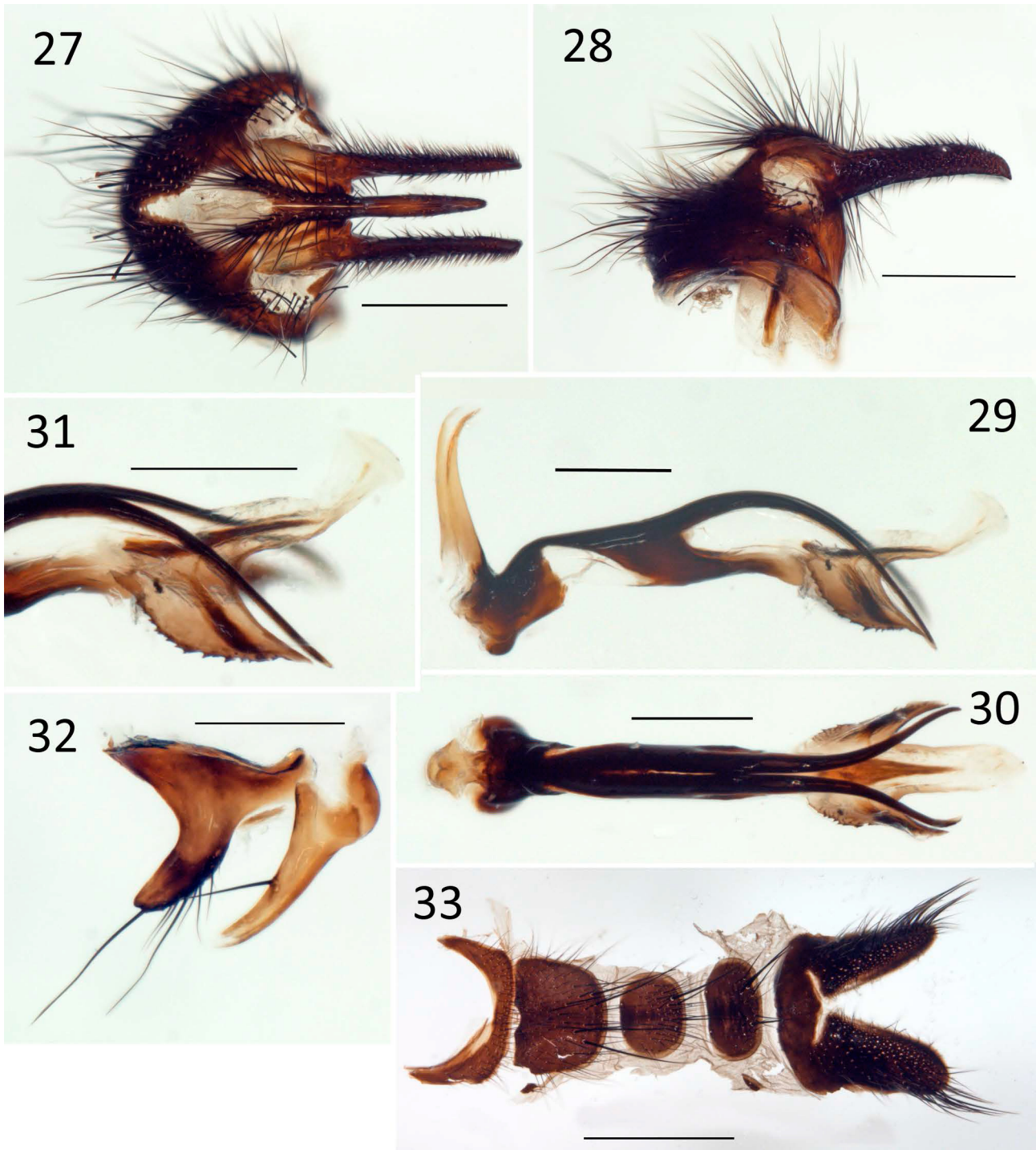
Most recent taxonomic treatment. Rognes (1991a).

Material. *Kotayk*: River Marmarik at Hankavan, N40°38 E44°31, 1920 m, 21.vi.2010, 1 ♀ [2599]. *Tavush*: Gosh Lake, N40°43 E45°01, 1430 m, 8.vii.2016, 1 ♀ [2647]; Haghartsin monastery environs, N40°48 E44°53, 1440–1560 m, 23.vii.2015, 1 ♂ [2598].

Distribution. Widely distributed in the Holarctic Region, including Japan; also Hawaii and New Zealand.



FIGURES 24–26. *Pollenia paragrugini* Rognes, 1988, ♂ heads, dorsal view, with corresponding labels. **24.** Paratype (ZIN). **25.** Male from Mt Aragats, 3270–3310 m, 16.viii.2017, specimen ID KR0000002609 (NHMUK). **26.** Male from Mt Aragats, 3240–3350 m, 21.vii.2015, specimen ID KR0000002606 (NHMUK).



FIGURES 27–33. *Pollenia paragrugini* Rognes, 1988, ♂ from Mt Aragats, 3240–3350 m, 21.vii.2015, specimen ID KR0000002606 (NHMUK). **27.** Epandrium, cerci and surstyli, posterior view. **28.** Epandrium, cerci and surstyli, left lateral view. **29.** Phallus, left lateral view. **30.** Phallus, dorsal view. **31.** Distal half of distiphallus, left dorsolateral view. **32.** Pre- and postgonites. **33.** ST1–5. Scale bars: 0.5 mm (Figs 27–28); 0.25 mm (Figs 29–32); 1 mm (Fig. 33).

***Pollenia viatica* Robineau-Desvoidy, 1830**

Most recent taxonomic treatment. Rognes (1991a, as *pallida* Rohdendorf; 1991b).

Material. *Aragatsotn*: Below Spitak Pass, N40°45 E44°16, 2300–2380 m, 31.vii.2015, 1 ♂ [2600, dissected], 4 ♀ [2601, 2602, 2603, 2604]. *Tavush*: Haghartsin monastery environs, N40°48 E44°53, 1440–1700 m, 10.viii.2017, 1 ♂ [2629, dissected].

Previous Armenian records. Rognes (1991a: 230) reported *P. viatica* (as *pallida*) from Armenia. Rognes (1991b: 494) corrected this, pointing out that the record was based on a misidentified female of *P. mediterranea* Grunin from “8 km ‘S Bigenak perevala’ [Bichenakskiy Pass]” in Nakhchivan, thus in Azerbaijan (see Rognes 1991b: 476).

Distribution. Widely distributed in the Western Palaearctic Region, east to Kazakhstan, Uzbekistan and Kyrgyzstan, south to Syria (Golan Heights), Israel and West Bank.

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