

REVIEW OF THE WORLD FAUNA OF THE GENUS *AZELIA* (DIPTERA, MUSCIDAE)

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[Вихрев Н.Е. Обзор мировой фауны рода *Azelia* (Diptera, Muscidae)]

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Key words: *Diptera*, *Muscidae*, *Azelia*, new species, new synonymies**Ключевые слова:** *Diptera*, *Muscidae*, *Azelia*, новые виды, новые синонимы

Summary. The world fauna of the genus *Azelia* is considered. Two new species, *A. spinosa* sp. nov. (from Serbia, southern European Russia and Kyrgyzstan) and *A. unguigera* sp. nov. (from N Vietnam) are described. Two new synonymies are proposed: *Azelia cilipes* Haliday, 1838 = *Azelia aequa* Stein, 1920, **syn. nov.** and *Azelia triquetra* Wiedemann, 1817 = *Azelia nuditibia* Emden, 1965, **syn. nov.** Revised key for identification of *Azelia* species is offered. Distributions of the species of *Azelia* are specified.

Резюме. Рассмотрена мировая фауна рода *Azelia*. Описано 2 новых вида: *A. spinosa* sp. nov. (из Сербии, юга европейской России и Киргизии) и *A. unguigera* sp. nov. (из Северного Вьетнама). Предложено 2 новых синонима: *Azelia cilipes* Haliday, 1838 = *Azelia aequa* Stein, 1920, **syn. nov.** and *Azelia triquetra* Wiedemann, 1817 = *Azelia nuditibia* Emden, 1965, **syn. nov.** Предложен переработанный определительный ключ для *Azelia*. Уточнены ареалы видов рода *Azelia*.

INTRODUCTION

Azelia Robineau-Desvoidy, 1830 is a small genus with 14-15 valid species worldwide. *Azelia* is characterized as follows: dark, small flies with body length 2.5-5.5 mm; inner posterior surface of hind coxa with setulae; anal vein short, extends less than half way to wing margin; eyes large, bare, with enlarged upper facets; male frons reduced to small triangle above lunula, with only 1 pair of inclinate frontals; arista almost bare to short pubescent; scutum anteriorly velvety black, posterior part of postsutural area brownish-grey dusted; 2+3 *dc*, *ac* in 2 rows (except for *A. beuki*); *t1* and *t2* with or without only 1 submedian *p*; fore tarsomeres slightly compressed laterally and produced ventrally (except for *A. fasciata*); *tar1-4* and *tar1-5* often with elongate *d* setulae; fore claws and pulvilli enlarged, outer claw bigger than inner one (except for *A. fasciata*); *f2* with 1-2 spine-like *v* seta(e); abdomen dusted with interrupted median stripe and paired lateral spots on each tergite (except for *A. aterrima*); male terminalia rather uniform. *Azelia* is certainly related to *Thricops* Rondani, 1856. Both genera have inner posterior surface of the hind coxa setulose; the fore tarsomeres compressed, *tar1-4* often with *d* setae; *tar2-3* often with fine waved *v* hair(s). Both genera have their centers of diversity in the temperate to cold zones of Palaearctic, they are well represented in Nearctic [Huckett, 1965], but totally (*Thricops*) or almost (*Azelia*) absent from the tropical zone and in Southern Hemisphere.

Species of *Azelia* usually are associated with dung of large herbivorous animals. Such animals became

rare in the wild, so are becoming their domesticated relatives grazing free. This circumstance, together with a small size and inconspicuous coloration make *Azelia* rather uncommon in collections. The small size makes the proper mounting of a specimen difficult and at the same time makes proper mounting necessary, because otherwise important diagnostic characters are hardly visible. *Azelia* is an unlucky genus with respect to safekeeping of type material, types of all species described in XIX century are unknown and most probably lost.

Besides, females of *Azelia* species are very much alike and in most cases unidentifiable, so only males, which are more rare, are presently suitable for taxonomic and faunistic use. (For this reason in the present paper I restrict consideration to males only).

In the last 5-6 years, ZMUM collection of *Azelia* was replenished by hundreds of freshly captured specimens. The examination of this material permitted to offer substantially reworked identification key, to describe overlooked species, to offer new synonymy and to specify distributional data.

In *Azelia* the male fore tarsus has about the same value for the diagnosis, as the genitalia in other groups: *tar1-3* has several short *av* spinules; *tar1-4* often bears characteristic *d* setulae; *tar1-5* often bears at apex characteristic short *pd* spinules. These modifications of the fore tarsus are widely used in the present identification key. A number of other diagnostic characters used in this paper at the first time. For example, the well-known diagnostic character of *A. monodactyla* is an elongate and dilated outer

claw of the fore tarsus, but actually *A. beuki* has about the same modification of this claw. There are several other characters which make *A. monodactyla* hardly mistakable (*t1* with *p* seta; *tar1-4* with a pair of straight, strong and long *d* spines with blunted apices; *tar2-3* ventrally with a set of 6-9 waved hairs; *f3* with submedian *pv* seta) which were never mentioned in previous descriptions of this species or identification keys of *Azelia* [Hennig, 1956; Gregor et al., 2003]. I believe that the offered characters for *A. monodactyla*, as well as characters newly indicated for other species of *Azelia* are reliable and helpful for identification.

A. neotropica, *A. fengi* and *A. plumitibia* were not examined by the author, but their taxonomy and diagnostic characters are discussed in "Remarks" to respective species. Information on *A. fengi* and *A. plumitibia* is insufficient and contradictory, I suppose that both species should be synonymized, that is why they are not included in the identification key. Description of *A. neotropica* is detailed and quality, but still I decided not to include it in the key, the more so because only its distribution in Southern Hemisphere is enough for identification.

MATERIAL AND METHODS

The majority of the specimens studied are in the Zoological Museum of Moscow University (ZMUM), in this case not indicated in text. Other collections are abbreviated as follows:

ZIN – Zoological Institute, St-Petersburg;

ZMHU – Museum für Naturkunde, Humboldt-Universität zu Berlin, Germany.

Localities (where possible) are given in a form: country, region, geographical coordinates, the later are given in the Decimal Degrees format. If coordinates were not present in an original label, they are provided in brackets. Countries and regions are listed in the alphabetical order.

The full names of regions of Russian administrative subdivision are an entangled result of political and historical events of no interest for zoology, so they are listed as name (taken from English version of Wikipedia) and word "region". There are 4 exceptions: Leningradskaya Oblast and Federal City St-Petersburg are listed as St-Petersburg region; Altai Krai and Altai Republic are listed respectively as Altai Krai region and Altai Republic region; Adygeya Republic enclave within Krasnodar region is listed under Krasnodar region.

The following abbreviations for morphological structures are used: *f1*, *t1*, *f2*, *t2*, *f3*, *t3* = fore-, mid-, hind- femur or tibia; *ac* = acrostichal setae; *dc* = dorsocentral setae; *a*, *p*, *d*, *v* = anterior, posterior, dorsal, ventral seta(e); *prst* – presutural, *post* – postsutural.

The abbreviation for the tarsi as *tar* followed by

a pair of digits separated by a hyphen was proposed by Vihrev [2011]: the first digit (1 to 3) gives the leg number and the second digit (1 to 5) the number of the tarsal segment. For example, *tar1-4* = 4-th segment of fore tarsus; *tar3-1* = hind basitarsus.

All illustrations are original.

EXAMINED MATERIAL AND TAXONOMIC NOTES

Azelia aterrima Meigen, 1826

Material examined:

Germany, Frankfurt am Oder (52.35N 14.55E), 22-29.08.1913, M. Riedel, 1♂ (ZMHU).

Poland: Stolp in Pommern [Slupsk, 54.5N 17.0E], 28.07.1929, O. Karl, 1♂; Pommern, Treptow an der Rega [Trzebiatow, 54.06N 15.26E], P. Stein, 20.08.1911, 1♂ (ZMHU).

Russia: **Amur** reg., Zeya env., [53.7N 127.3E], 2-4.07.1981, A. Ozerov, 4♂; **North Ossetia** reg., Buron env., (42.8N 44.0E), 7.07.1990, A. Ozerov, 2♂; **Primorsky** reg.: Kedrovaya Pad NR [Primorsky vill. env., 43.1N 131.5E], 19.09.1980, A. Shatalkin, 1♂; Kamenushka, Ussuri NR env., 43.62N 132.23E, 5.08.2013, I. Gomyranov, 1♂; **St-Petersburg** reg.: Yukki [60.11N 30.28E], 18.07-16.08.1931-33, A. Stackelberg, 6♂ (ZIN); Luga distr., Yaschera [59.15N 29.91E], A. Stackelberg, 19.08.1957, 1♂; 26.08.1960, 1♂ (ZIN); **Tver** reg., Centralno-Lesnoy NR [56.46N 32.97E], 18.7.1971, V. Kovalev, 1♂. **Vietnam**, **Lai Chau** prov., Sapa env.: 22.35N 103.77E, 1900 m asl, 16-19.04.2012, D. Gavryushin, 2♂, A. Ozerov, 1♂; 22.37N 103.76E, 1900 m asl, 26.05.2014, D. Gavryushin, 1♂, A. Ozerov, 2♂.

Distribution. Treated as a West European species in <http://www.faunaeur.org>, but reported by Pont [1986] for Mongolia (based on 1♂ from Hungarian Natural History Museum, Budapest, A. Pont, pers. comm.). New records from Russia (Amur and Primorsky regions) and Vietnam extended the known range of *A. aterrima* to Far East and the northern Oriental region. Still no records from Siberia are known.

Remarks. Hennig [1956] and Gregor et al. [2002] describe chaetotaxy of *t3* of *A. aterrima* as 2-3 *av* and 2-3 *pv*. Actually the position of these setae is turned at about 45 degrees relative to the typical one and should be described as follows: *t3* with 2(3) *aav* and 2(3) *v*. This 45° turn of *t3* setae is an additional diagnostic character.

All Palaearctic specimens of *A. aterrima* I have seen were collected in the second half of summer, from late July to August.

Azelia beuki Vihrev, 2012

Material examined:

Holotype ♂: **Thailand**, **Phang Nga** prov., Khao Lak env., 8.712N 98.254E, elephant camp, 16-21.12.2011, N. Vihrev (ZMUM).

India, Goa state, Sahakari spice farm, 15.408N 74.024E, 22.01.2008, N. Vikhrev, 1♂, 2♀.

Sri Lanka, Pinnawala 7.28N 80.39E, Elephant Foundation, 19-21.12.2012, N. Vikhrev, 2♂, 7♀.

Thailand: Kanchanaburi prov., Taweechai elephant camp, 14.215N 99.225E, 28.01.2014, N. Vikhrev, 1♀;

Mae Hong Son prov., Pai env., 19.31N 98.46E, on elephant dung, 15-20.11.2010, N. Vikhrev, 3♂, 10♀;

Phang Nga prov., Khao Lak env., 8.616N 98.245E, 8.712N 98.254E, 8.760N 98.284E and 8.840N 98.474E, near elephant camps, 14-24.12.2009-2011, N. Vikhrev, 45♂, 44♀; **Trat** prov., Ko Chiang Isl., elephant dung, 10-15.12.2011, N. Vikhrev, 3♂, 3♀.

Distribution. Oriental: India, Goa; Sri Lanka; Thailand: Kanchanaburi, Mae Hong Son, Phang Nga, Trat.

Remarks. Females of *A. beuki* are reliably distinguishable from females of other *Azelia* due to the following set of characters: presutural *ac* in 4 regular rows; frons with areas around insertion of interfrontal setae densely dusted; inner surface of upper parafacial with a narrow shining black stripe [Vikhrev, 2012].

Azelia cilipes Haliday, 1838

Col. pl. II: 1

Azelia aequa Stein, 1920 **syn. nov.** Type locality: USA, WA.

Material examined:

Holotype *A. aequa*, ♂: (USA, WA), Mt. Constitution (48.68N 122.83W), 31.07.1908, J. Aldrich, (ZMHU), with Stein's label *Azelia/aequa/sp.n.*

Armenia, Arzakend (Arzakan 40.45N 44.60E, 1550 m asl), 1.8.1969, V. Rikhter, 1♂ (ZIN).

Azerbaijan: Lankaran distr., Hirkan NP env., 38.66N 48.78E, 27.10.2008, N. Vikhrev & D. Gavryushin, 2♂; Yardymly distr., 38.93N 48.12E, 1700 m asl, 23-25.05.2009, K. Tomkovich, 1♂.

Belarus, Minsk reg., Barysaw, Berezina R., 54.256N 28.481E, 5.07.2013, D. Gavryushin, 4♂.

Bulgaria, Sandanski (41.57N 23.28E), deciduous forest, 4.10.1973, K. Gorodkov, 1♂ (ZIN).

Georgia: Ajara, Kintrishi NP (41.74N 42.05E), 26.05.1971, V. Kovalev, 1♂; W Georgia, Borjomi-Kharagauli NP (41.85N 43.25E), 07.1969, V. Kovalev, 1♂.

Estonia, Saaremaa Isl. (58.3N 22.5E), 19.09.1975, K. Gorodkov, 1♂ (ZIN).

Russia: Amur reg., Zeya (53.7N 127.3E) env., 2.07.1981, A. Shatalkin, 1♂; **Bashkortostan** reg., Beloretsk env., Nura R., 54.05N 58.27E, 6-13.08.2012, D. Gavryushin, 6♂; **Ivanovo** reg., Ivanovo env., (56.9N 41.1E), 26.07 and 26.09.1965, A. Lobanov, 2♂; **Kemerovo** reg., Novokuznetsk (53.8N 87.1E) env., 29.06.2011, O. Kosterin, 1♂; **Khabarovsk** reg., Vanino, 49.11N 140.31E, 9.06.2014, N. Vikhrev, 1♂; **Nenets** reg., Naryan-Mar (67.66N 53.08E), 8.07.2008, N. Vikhrev, 1♂; **Krasnodar** reg., Sochi distr., Akhun, 600 m asl, 43.55N 39.84E, 25.06.2008,

N. Vikhrev, 1♂; **Moscow** reg., Moscow, Strogino, 55.784N 37.403E, N. Vikhrev, 31.05.2011, 1♂; Naro-Fominsk env., 55.45N 36.88E, 10.06.2007, D. Gavryushin, 1♂; Kostino env., 56.31N 37.75E, 6-8.07.2007, N. Vikhrev, 3♂; **Novgorod** reg., Holm env. (57.15N 31.18E), 30.09.2000, K. Tomkovich, 1♂; **Primorsky** reg., 40 km SE of Ussuriysk (= Kamenushka, Ussuri NR env., 43.62N 132.23E), A. Shatalkin, 19.09.1987, 1♂, A. Ozerov, 6.09.1984, 2♂, I. Gomyranov, 3-4.08.2013, 1♂; **St-Petersburg** reg.: Yukki (60.11N 30.28E), 5-17.08.1932, A. Stackelberg, 5♂ (ZIN).

Distribution. Holarctic. E Palaearctic records are scarce, besides the material listed above was previously recorded for China, Laoning prov., Benxi (41.3N 123.8E) [Fan, 2008] and Russia, Altai Republic reg., Shebalinsky dist. [Sorokina, 2012].

Synonymy. *A. nebulosa* and *A. cilipes* easily differ from other *Azelia* and are distinctly related to each other. Five main characters (*av* on *t3*; absence of *v* hair on *tar2-3*; median *p* on *t2*; preapical *d* on *t2*; *av* on *tar3-1*) given in couplet 7 of identification key, reliably differentiate all examined specimens, singular specimens have only 4 of 5 main characters: 1♂ *A. cilipes* from Bashkortostan has *t2* without median *p*; 1♂ *A. cilipes* from Nenets region has 5 *av* on *t3*. Additional characters in couplet 7 of the key below (row(s) of dorsal setae and *pv* hairs on *t3*; abdominal pattern) are given in brackets because they are in my opinion strongly variable and hardly distinct. These characters are useful in identification specimens in bad condition or identification by photo.

In East Palaearctic *A. cilipes* tends to reduce length and density of dorsal setae on *t3*. In European specimens dorsal plumage consists of 6-12 long setae in addition to numerous fine hairs. In Far Eastern specimens 1♂ from Khabarovsk reg. and 1♂ from Primorsky reg. have 5-6 long setae on *t3*; 1♂ from Amur reg., 3♂ from Primorsky reg. and the holotype of *A. aequa* (USA, WA) have only 2-4 long dorsal setae on *t3* and fine hairs shorter and sparser. I do not regard length and density of *d* setae on *t3* as a good diagnostic character, because it does not correlate with other characters which are typical for *A. cilipes* and specimens with intermediate dorsal plumage on *t3* are present. That is why I propose the synonymy: *Azelia cilipes* Haliday, 1838 = *Azelia aequa* Stein, 1920, **syn. nov.**

Azelia fasciata Emden, 1951

Col. pl. II: 4

Material examined:

Kenya: Laikipia Co.: Thomson Falls env., 0.05N 36.38E, 2350 m asl, 23.12.2013, N. Vikhrev, elephant dung, 11♂, 21♀; Thomson Falls env., 0.05N 36.38E, 2350 m asl, 30.12.2013, N. Vikhrev, cow dung, 1♂; **Nyeri** Co., Bantu Lodge, 0.114S 37.042E, 1950m, 25-28.12.2013, N. Vikhrev, horse dung, 17♂, 5♀.

Distribution. Afrotropical: Uganda (type localities:

Ruwenzori, Namwamba Valley, 10100 ft = 3070 m asl and Kimbele = Kasese, 4500 ft = 1300 m asl [Emden, 1951], it is about 0.2N 30.0E) and Kenya.

Remarks. According to Emden's [1951] description *t1* without *p* seta, actually *t1* normally with a weak *p* seta, although sometimes broken or inconspicuous.

Azelia fengi Fan, 1965

No material examined. Type locality: China, Inner Mongolia prov., Boketu (48.75N 121.92E).

Remarks. I suspect that *Azelia fengi* Fan, 1965 is *A. cilipes* with partly reduced dorsal plumage on *t3* as it often takes place in males of *A. cilipes* from Far East. Unfortunately the data on these species is insufficient and contradictory. The available key on Chinese *Azelia* in English [Fan, 2008] contains many errors and/or misprints; even the descriptions in Chinese [Fan, 2008] translated in English are of little use, either because of again errors or absence of necessary information. Under these circumstances I prefer to put off the final decision.

Azelia gibbera Meigen, 1826

Material examined:

Poland, Reinerz Bad. (=Duszniki-Zdroj, 50.40N 16.39E), VII (July), M. Reidel, 1♂ (ZMHU).

Russia: Altai Republic reg., Shebalinsky dist., Peshanaya R., between Ilyinka and Baragash, 51.35N 85.18E, 29.07.2009, O. Kosterin, 2♂; **Bashkortostan** reg., Beloretsk env., Nura R., 54.05N 58.27E, 8-13.08.2012, D. Gavryushin, 7♂; **Khabarovsk** reg., Khabarovsk, 48.6N 135.1E, 2-6.06.2014, N. Vikhrev, 1♂; **Moscow** reg., Naro-Fominsk env., 55.45N 36.88E, 22.07.2010, D. Gavryushin, 1♂; **St-Petersburg** reg., Luga distr., Yaschera (59.15N 29.91E), 12-22.08.1957, A. Stackelberg, 5♂ (ZIN); **Tver** reg., Gouv. Petrograd, Govschitza (River) (56.87N 32.05E), 11.08.1931, A. Stackelberg, 1♂ (ZIN).

Serbia, Crni Vrh env., 43.407N 22.587E, 800 m asl, 16-22.09.2014, N. Vikhrev, 3♂.

Ukraine, Zakarpattia reg., Hoverla Mt. env., Kozmeschik (48.21N 24.48E), K. Gorodkov, 3.08.1964, 1♂ (ZIN).

Distribution. Holarctic, but the only Asian records were China, Xinjiang reg., Haba R., 48.3N 86.4E [Fan, 2008] and Russia, Altai Republic reg., Shebalinsky dist. [Sorokina, 2012]. In present publication one more Asian record from Khabarovsk region is added.

Azelia monodactyla Loew, 1874

Col. pl. II: 11, 12

Material examined:

Russia: Astrakhan reg., Baskunchak salt-lake, 48.19N 46.82E, 2-4.05.2010, K. Tomkovich, 1♂;

Crimea reg., Alushta-Rybachie, 44.7-8N 34.4-6E, 18-25.04.2014, N. Vikhrev, 6♂;

Khabarovsk reg., Khabarovsk, 48.6N 135.1E,

2-6.06.2014, horse dung, N. Vikhrev, 6♂;

Krasnodar reg.: Sochi distr., Adler env., 19.04-25.06.2008-11, N. Vikhrev, 15♂, Labinsk env., 10.06.2012, N. Vikhrev, 4♂, Dakhovskaya env., 44.201N 40.149E, 12.06.2012, K. Tomkovich, 14♂, Guzeripl, 44.005N 40.130E, 700 m asl, N. Vikhrev, 28.06.2011 and 11.06.2012, N. Vikhrev, 14♂; **Moscow** reg., Strogino, 55.784N 37.403E, 19-22.05.2011, 6♂; Sergiev Posad env., 56.331N 38.040E, horse dung, 27.06.2012, N. Vikhrev, 10♂; **Novosibirsk** reg., Peteni village, 54.43N 84.81E, 21.06.2012, O. Kosterin, 1♂; **Primorsky** reg., Andreevka env., 42.64N 131.13E, horse dung, 25-30.06.2014, N. Vikhrev, 3♂; Lotos Lake, 42.46N 130.64E, 1-3.07.2014, N. Vikhrev, 1♂; **Stavropol** reg., Stavropol env., 44.805N 41.858E, horse dung, 04.05.2013, N. Vikhrev, 1♂.

Turkey, Antalya prov., Titreyen L., 36.754N 31.457E, 01.06.2008, N. Vikhrev, 1♂.

Ukraine, Zakarpattia reg., 11 km NWW Yasinia (48.32N 24.22E), K. Gorodkov, 11.8.1964, 1♂ (ZIN).

Distribution. Palaearctic. Was recorded from Kazakhstan [Pont, 1986]; China: Mandschurei, Taoschan (= Heilongjiang prov., Taoshan distr., 45.8N 131.0E) [Hennig, 1956] and Laoning prov., Benxi (41.3N 123.8E) [Fan, 2008]; Japan [Gregor et al., 2002]. New records: Russia: Altai Republic reg. (Shebalinsky distr., 51.45N 85.28E, 924 m asl, 17.07.2011, V. Sorokina, 1♂ (V. Sorokina, pres. comm.)); Astrakhan, Crimea, Khabarovsk, Krasnodar, Moscow, Novosibirsk, Primorsky and Stavropol regions. The southernmost record is S Turkey, 36.754N.

Azelia nebulosa Robineau-Desvoidy, 1830

Col. pl. II: 2, 13

Material examined:

Azerbaijan: Lankaran distr., Hirkan NP, 38.66N 48.78E, 27.10.2008, N. Vikhrev & D. Gavryushin, 2♂.

France, Haute-Normandie reg., Seine-Maritime, Foret de Brotonne (49.44N 0.71E), 12.08.2009, G. Pennards, 1♂.

Kyrgyzstan, Issyk Kul prov., Grigorievka ravine, 42.783N 77.47E, 2000 m asl, 21.09.2013, N. Vikhrev, 1♂.

Russia: Amur reg., Zeya (53.7N 127.3E) env., 24.06.1982, A. Ozerov, 1♂; **Bashkortostan** reg., Beloretsk env., Nura R., 54.05N 58.27E, 8-13.08.2012, D. Gavryushin, 6♂; **Crimea** reg., Alushta-Rybachie, 44.7-8N 34.4-6E, 18-25.04.2014, N. Vikhrev, 5♂; **Ivanovo** reg., Ivanovo env., (57.1N 41.0E), 8.09.1965, A. Lobanov, 2♂; **Kaluga** reg., Rodinka, 54.77N 36.28E, 5.06.2012, D. Gavryushin, 1♂; **Krasnodar** reg.: Khosta env., 43.52N 39.87E, N. Vikhrev, 3-9.05.2011, 3♂, 23-25.06.2011, 7♂; Guzeripl env., Lagonaki plateau, 44.009N 39.994E, 1700 m asl, 10.06.2012, N. Vikhrev, 3♂; **Moscow** reg.: Naro-Fominsk env., 55.45N 36.88E, 6.06.2010, D. Gavryushin, 1♂; Kostino env., 56.31N 37.75E, 7-9.08.2007, N. Vikhrev,

5♂; **Novosibirsk** reg., horse dung, 55.0N 83.2E, 22.07.2012, O. Kosterin, 1 ♂; **St-Petersburg** reg., Luga distr., Yaschera (59.15N 29.91E), 9-26.08.1958, A. Stackelberg, 5♂ (ZIN).

Ukraine, Ivano-Frankivsk reg., Yaremche (48.45N 24.55E), 29.08.1972, V. Sychevskaya, 1♂.

Serbia, Crni Vrh env., 43.407N 22.587E, 800 m asl, 16-22.09.2014, N. Vikhrev, 2♂.

Vietnam, Lai Chau prov., road to Mt. Fansipan, 2095 m asl, 22.336N 103.784E, 04.04.2011, A. Medvedev, 1♂.

Distribution. Regarded as European species [Pont, 1986; Gregor et al., 2002], but actually distributed throughout Asia. Common in the Caucasus (Azerbaijan, Georgia and Russia, Krasnodar reg.) and S Ural (Bashkortostan); seems to be less common in Asia where was firstly recorded by Sorokina [2012] from Altai Republic, Turochaksky distr. Listed above for W Siberia, Novosibirsk reg.; Central Asia, Kyrgyzstan; Russian Far East, Amur reg. and N Vietnam, with only one specimen known from each of the Asian localities.

Remarks. European and Caucasian specimens of *A. nebulosa* as well as 2 males from W Siberia and Kyrgyzstan fit all diagnostic characters given in couplet 7 of the key below. Both E Asian specimens have aberrant chaetotaxy of *t2*: 1♂ from Amur region of Russia has *t2* with median *p* seta, though preapical *d* is present; 1♂ from N Vietnam has *t2* with median *p* seta and without preapical *d*. I incline to regard eastern specimens as manifestation of geographical variation of *A. nebulosa*.

Azelia neotropica Snyder, 1957

No material examined. Type locality: Argentina, Tucuman prov., (26.7S 65.0W).

Remarks. It is the only *Azelia* distributed in Southern Hemisphere. According to Snyder's description [1957] *A. neotropica* has the following main characters: body length – 3.5 mm; scutum anteriorly black, posterior part of postsutural area – brownish dusted; calypters brown, haltere black; *t1* without *p*; *tar1-4* with 2 *d* setulae 1.2-2.0x as long as *tar1-4* width; outer fore tarsal claw slightly clavate apically, inner claws shorter and sharp pointed; *f2* with *v* seta short and weak; *t2* without median *p*; *t3* with 1 short median *av* and 1 *av* near apex, setulae on *ad* surface elongated (0.8x as long as tibia width); abdomen with typical *Azelia*-pattern. (Snyder wrote that in *A. neotropica* in particular and in *Azelia* in general, the fore inner claw is enlarged whereas the outer is small. The actual situation is vice versa, Snyder's statement should be a *lapsus calami*.) Snyder compared *A. neotropica* with *A. triquetra*, from which *A. neotropica* differs by: *tar4-1* with 2 long *d* setulae; *f2* with *v* seta short and weak, not spine-like; *t3* with 1 short median *av* and with setulae on *ad* surface elongated.

Distribution. Argentina, Tucuman prov.

Azelia plumitibia Feng, Fan & Zeng, 1999

No material examined. Type locality: China, Sichuan prov., Mianyang (31.5N 104.7E), Fule Mountain Park, 600 m asl; paratypes 2♂: Sichuan prov., Ya'an, (30.0N 103.0E), 600 m asl.

Remarks. I suspect that *A. plumitibia* is the East Asian form of *A. nebulosa* with *t2* with *p* seta as in male of *A. nebulosa* from N Vietnam discussed above. Unfortunately the data on these species is insufficient, *A. nebulosa* was never considered, probably as "European, not Chinese species"; the amount of setae and hairs in dorsal plumage on *t3* is used as the main diagnostic character. Under these circumstances I prefer to put off the final decision.

Azelia parva Rondani, 1866

Col. pl. II: 3

Material examined:

Croatia, Satorina Mt., 1600 m asl (44.65N 15.05E), 15.06.1910, Meusel, 1♂ (ZMHU).

Kazakhstan, Kyzylorda reg., Kazaly env., 45.76N 62.30E, 15-19.05.2011, K. Tomkovich, 1♂.

Russia: Crimea reg., Kara Dag (44.93N 35.22E), 26.06.1981, L. Zimina, 1♂; **Kursk** reg., Streletska-ya steppe, oak forest, 51.6N 36.2E, 11.08.2008, N. Vikhrev, 1♂.

Turkmenistan, Lebap reg., Chardzhou env., (39.1N 63.6E), 25.04.1990, A. Ozerov, 1♂.

Distribution. Palearctic. Records are scarce, the only reliable Siberian record is from Irkutsk region, Solzan, 51.5N 104.2E [Sorokina & Pont, 2010]. The species was listed for Mongolia [Pont, 1986] and Turkey Giresun prov., Şebinkarahisar (40.29N 38.42E) [Pont, 1991]. Newly recorded here from Russia: Crimea and Kursk reg., Kazakhstan, Kyzylorda reg. and Turkmenistan, Lebap reg. Uncommon. Seems to inhabit rather dry open lowlands.

Azelia spinosa sp. nov.

Col. pl. II: 8, 10

Holotype, ♂, **Russia, Stavropol** reg., horse dung, 44.805N 41.858E, 04.05.2013, N. Vikhrev.

Paratypes 9♂:

Kyrgyzstan, Issyk Kul prov., Pokrovka (= Kyzyl-Suu, 42.34N 78.00E), 2.09.1962, P. Vtorov, 1♂.

Russia: Crimea reg., Rybachie, 44.8N 34.6E, horse dung, 18-25.04.2014, N. Vikhrev, 1♂; **Krasnodar** reg., Varenikovskaya env., 45.083N 37.586E, 27.04.2014, N. Vikhrev, 2♂; **Stavropol** reg., horse dung, 44.805N 41.858E, 04.05.2013, N. Vikhrev, 1♂; **Volgograd** reg., Breslavka env., 48.5355N 44.131E, horse dung, 30.04.2013, N. Vikhrev, 1♂.

Serbia, Surčin env., 44.78N 20.25E, 14.09.2014, N. Vikhrev, 3♂.

Description. Male. Dark, densely grey dusted species, body length 2.5-3.0 mm.

Head with big bare eyes, anterior facets enlarged.

Fronto-orbital plates narrow, light-grey dusted, black interfrontalia narrow, but visible all along the frons length (col. pl. II: 10). A pair of strong inclinate setae present near lunula, 1 pair of proclinate hairs in middle of frons, 1 pair of inclinate hairs in its upper third. Lunula conspicuous, whitish-grey dusted in dorsal view. Parafacials light-grey dusted, gena and occiput dark-grey. Palpi and antennae black, arisal hairs short, about half as long as basal diameter of arista.

Thorax with scutum and pleura densely and evenly grey dusted, so the typical for *Azelia* contrast in posterior view between the dusted posterior part of scutum and the black anterior part is absent. Thoracic setae: *dc* 2+3, presutural acrostichals in 2 rows, katepisternal 1+1. Wings hyaline, calypters whitish, halter pale yellow with yellow knob.

Legs black. *fl* with a row of 7-8 long *pv* setae. *t1* with distinct *p* seta. Fore tarsus typical for *Azelia* short and thick, tarsal segments compressed laterally, *tar1-1* and *tar1-2* together almost two times shorter than *t1*; apical segments of fore tarsus without conspicuous modifications: *tar1-3* anteriorly with 3 short *av* spinules; *tar1-4* with a pair of short dorsal setulae; *tar1-5* with short and weak spinule above outer claw; claws and pulvilli relatively short for *Azelia*. *f2* with submedian *v* spine, elongated *a* setae in basal half and 2 *pd* preapicals; *ad* surface covered with normal ground hairs. *t2* with rather weak submedian *p* seta. Inner posterior surface of hind coxa with 4 rather strong setulae. *f3* with 1 *av* seta at apex and with strong and straight submedian *pv* spine (distinctly longer and stronger than preapical *av* seta). *t3* with 1 strong *av* (col. pl. II: 8).

Abdomen densely grey dusted, with conspicuous black median and lateral spots typical for *Azelia*.

Diagnosis. The most important diagnostic characters of *A. spinosa* sp. nov. are: *f3* with submedian *pv* at least as strong and long as preapical *av*; scutum evenly grey dusted; black interfrontalia narrow, but visible between grey fronto-orbital plates all along the frons length; calypters white; *t1* with distinct *p* seta; *t2* with rather weak *p* seta; *t3* with only one strong *av*; body length 2.5-3.0 mm; outer claw on *tar1-5* only slightly longer than inner one, fore tarsus without remarkable modifications.

Etymology. The name refers to the strong *pv* spine on *f3*.

Ecology. Collected on horse dung on pasture under direct sunlight (as *A. monodactyla*), but *A. spinosa* sp. nov. prefers (or tolerates) more dry and trampled out pasture, sometimes with saltish soil.

Azelia trigonica Hennig, 1956

Col. pl. II: 6

Material examined:

Holotype ♂ and paratype 1♂ (ZIN): Gouv. Petrograd, Govschitza, 12.08.1931, A. Stackelberg (**Rus-**

sia, Tver reg., Govshitsa River, a short river between Luchanskoe L. and Volokta R., 56.87N 32.05E)

Kazakhstan, E-Kazakhstan reg.: Ust'-Chindagatuy, 49.25N 87.00E, 1750 m asl, 3-5.07.2012, O. Kosterin, 1♂; Katon-Karagay NP, meadow, 49.06N 85.66E, 26-27.07.2010, O. Kosterin, 1♂.

Russia: Altai Republic reg.: Ust-Koksa env., 50.27N 85.61E, 24.09.2011, O. Kosterin, 1♂; **Krasnodar** reg.: Guzeripl, 44.005N 40.130E, 700 m asl, 27-30.06.2011, N. Vikhrev, 1♂; Guzeripl env., 44.011N 40.033E, 1500 m asl, horse dung, 10-13.06.2012, N. Vikhrev, 35♂, Guzeripl env., Lagonaki plateau, 44.009N 39.994E, 1700 m asl, 10.06.2012, N. Vikhrev, 13♂; **Sakha (Yakutia)** reg., Verkhoysk (67.55N 133.39E) env., 31.07.1969, V. Sychevskaya, 1♂; **St-Petersburg** reg., Luga distr., Yaschera (59.15N 29.91E), 24-27.08.1957, A. Stackelberg, 2♂ (ZIN); **Tver** reg, Rzhev env, 56.21N 34.35E, horse dung, N. Vikhrev, 22.06.2012, 1♂, 18.08.2014, 1♂.

Serbia, Crni Vrh env., 43.407N 22.587E, 800 m asl, 16-22.09.2014, N. Vikhrev, 1♂.

Distribution. Regarded as European species [Pont, 1986; Gregor et al., 2003], but actually is present in Asia (E Kazakhstan; Russia: Altai Republic (firstly recorded by [Sorokina, 2012]) and Sakha-Yakutia). Seems to prefer northern regions, the southern findings (Caucasus and Serbia) are from mountainous country where *A. trigonoca* mostly presents at elevations of 1500 m asl and more.

Azelia triquetra Wiedemann, 1817

Col. pl. II: 5

Azelia nuditibia Emden, 1965: 331 **syn. nov.** Type locality: N E Burma (**Myanmar**), Kambaiti.

Material examined:

Kazakhstan, E-Kazakhstan reg., Ust'-Chindagatuy, 49.25N 87.00E, 1750 m asl, 3-5.07.2012, O. Kosterin, 1♂.

Netherlands, Amersfoort, Den Treek (52.1N 5.4E), 2.05.2009, G. Pennards, 1♂.

Russia: Amur reg., Zeya (53.7N 127.2E) env., 10.08.1981, A. Ozerov, 1♂; **Khabarovsk** reg, Khicha R., 690m, 49.05N 139.43E, 10.06.2014, N. Vikhrev, 12♂; **Krasnodar** reg., Guzeripl, 44.005N 40.130E, 700 m asl, 27-30.06.2011, N. Vikhrev, 1♂; Sochi distr., Akhun, 600 m asl, 43.55N 39.84E, 20.06.2008, N. Vikhrev & D. Gavryushin, 2♂; **Moscow** reg., Moscow, Strogino, 55.784N 37.403E, N. Vikhrev, 18-31.05.2011, 3♂, 5-18.07.2011, 2♂; Naro-Fominsk env., 55.45N 36.88E, D. Gavryushin, 16.08.2008, 2♂, 11.10.2008, 1♂; **St-Petersburg** reg.: Yukki (60.11N 30.28E), 19.07-5.08.1932, A. Stackelberg, 4♂ (ZIN); **Tver** reg, Rzhev env, 56.21N 34.35E, horse dung, N. Vikhrev, 22.06.2012, 1♂, 18.08.2014, 1♂; **Vladimir** reg., 56.06N 40.46E, 5.06.2011, N. Vikhrev, 1♂.

Serbia, Crni Vrh env., 43.407N 22.587E, 800 m asl, 16-22.09.2014, N. Vikhrev, 1♂.

Vietnam, Lai Chau prov., Sapa env., 22.35N 103.77E,

1900 m asl: 18.04.2012, A. Ozerov, 1♂; 16.04.2012, D. Gavryushin, 2♂.

Distribution. Holarctic and N Oriental (N Myanmar, N Vietnam). From E Palaearctic was known from Mongolia [Pont, 1986]. New E Palaearctic records: Kazakhstan, E Kazakhstan and Russia: Altai (Altai Republic reg., Shebalinsky distr., 51.52N 85.57E, 516 m asl, 16.7.2011, V. Sorkina, 1♂ (V. Sorokina, pres. comm.)) and Far East (Amur and Khabarovsk regions).

Synonymy. All ZMUM specimens from N Vietnam entirely fit Emden's description of *A. nuditibia*. On the other hand, Vietnamese specimens belong to *A. triquetra* by all significant diagnostic characters: fine structure of *tar1-5* and *tar1-4*; *f2* with *ad* surface covered with dense erect fine hairs; *t2* without *p* seta; *tar2-3* ventrally with 1-2 fine waved hairs. According to Emden [1965]: "In keys to the European species *A. nuditibia* will be traced to *A. triquetra*, but in this species the hind tibiae are furnished with a *pv* and *ad* row of fine half erect hairs, which are not present in the Burma species." I agree that ground setulae on posterior tibiae in specimens from North of the Oriental region usually are somewhat shorter than in most Palaearctic specimens of *A. triquetra*, but I believe that such differences are far from being reliable and not enough to regard *A. nuditibia* as a valid species. So, *Azelia triquetra* Wiedemann, 1817 = *Azelia nuditibia* Emden, 1965, **syn. nov.**

Azelia unguigera sp. nov.

Col. pl. II: 7, 9

Holotype, ♂, Vietnam, *Lai Chau* prov., Hoang Lien NP, 22.35N 103.77E, 1900 m asl, 18.04.2012, A. Ozerov.

Paratypes 2♂:

Vietnam, *Lai Chau*., Sapa env., 22.35N 103.77E, 1900m asl, D. Gavryushin, 19.04.2012, 1♂ and 22.05.2014, 1♂.

Description. Male. Dark species, body length 3.6-3.7 mm.

Head with big bare eyes, anterior facets enlarged. Fronto-orbital plates narrow, touching in posterior 2/3 of frons, black interfrontalia visible at anterior 1/3 of frons only. A pair of strong inclinate setae present near lunula, 1 pair of proclinate hairs before middle of frons. Parafacials, gena and occiput dark-grey. Palpi and antennae black, arisal hairs about as long as basal diameter of arista.

Thorax with scutum in posterior view with the typical for *Azelia* contrast between the dusted posterior part of scutum and the black anterior part. Thoracic setae: *dc* 2+3, presutural acrostichals in 2 rows, kat-episternal 1+1. Wings brownish, calypters brownish, halter yellow-brown.

Legs black. *f1* with a row of 8-9 long *pv* setae. *t1* without *p* seta. Fore tarsus typical for *Azelia* short and thick, tarsal segments compressed laterally, *tar1-1*

and *tar1-2* together almost two times shorter than *t1*; *tar1-3* with a row of 5 short *av* spinules; *tar1-4* with a remarkable set of 3 dorsal setulae: the inner one the longer (2.5x as long as tarsus width) and claw-like curved, the median one short and flattened (median setula may be hardly visible on the background of inner one), the outer one almost straight (1.5-2x as long as tarsus width); *tar1-5* without spinule(s); outer claw elongate and remarkably widened in basal part, without pointed apex (col. pl. II: 9). *f2* with submedian *v* spine, elongated setulae on *pd* surface and 2 *pd* preapicals; *ad* surface covered with normal ground hairs (col. pl. II: 7). *t2* with submedian *p* seta. *tar2-3* without *v* hair. Inner posterior surface of hind coxa with 3 setulae. *f3* with 1(2) *av* seta at apex. *t3* with 1 short (as long as tibia width) *av*, setulae on *ad* surface elongate.

Abdomen densely grey dusted, with conspicuous black median and lateral spots typical for *Azelia*.

Diagnosis. The most important diagnostic character of *A. unguigera* sp. nov. is the fine structure of fore tarsus: *tar1-3* with a row of 5 short *av* spinules; *tar1-4* with a remarkable set of 3 dorsal setulae, the inner one the longer (2-2.5x as long as tarsus width) and curved, the medial one short (as long as tarsus width), the outer one straight (2-2.5x as long as tarsus width); *tar1-5* without spinule; outer claw elongate and widened, with non-pointed apex.

Etymology. The species name (a Latin adjective in the feminine gender) refers to the most important diagnostic characters of *A. unguigera* sp. nov.: dilated outer claw of fore tarsus and long and strong claw-like curved *d* seta on *tar1-4*.

Azelia zetterstedtii Rondani, 1866.

Material examined:

Azerbaijan, *Lankaran* reg., Hirkan NP env., 38.66N 48.78E, 27.10.2008, N. Vikhrev, 1♂.

Finland: Naantali (60.47N 22.03E), L. Tiensuu, 1♂; Vasa (63.1N 21.6E), K. Frey, 1♂ (both Zoological Museum, Finnish Museum of Natural History, Helsinki Finland).

Kazakhstan, *Almaty* reg., Almaty, 43.218N 76.934, 11.06.2008, D. Gavryushin, 1♂.

Kyrgyzstan, *Issyk Kul* prov., Choktal env, 42.58N 76.75E, 1600 m asl, 22.09.2013, N. Vikhrev, 18♂.

Russia: *Altai Republic* reg.: Ust-Koksa env., 50.27N 85.61E, 24.09.2011, O. Kosterin, 1♂; Ongudaysky dist., Kurota env., 50.85N 85.98E, 930 m asl, 23-28.07.2008, O. Kosterin, 1♂. **Bashkortostan**

reg.: Abzakovo env., 53.8N 58.6E, 2-8.08.2008, K. Tomkovich, 1♂, Beloretsk env., Nura R., 54.05N 58.27E, 6-13.08.2012, D. Gavryushin, 1♂; **Komi** reg. Ust-Tsilma (65.43N 52.18E), 10.08.1978, K. Gorodkov, 1♂ (ZIN); **Krasnodar** reg.: Guzeripl, 44.005N 40.130E, 700 m asl, N. Vikhrev, 27-30.06.2011, 20♂, 11-14.06.2012, 5♂; Guzeripl env., Lagonaki

plateau, 44.009N 39.994E, 1700 m asl, 10.06.2012, N. Vikhrev, 8♂; **Moscow** reg., Strogino, 55.784N 37.403E, 22.05.2012, N. Vikhrev, 7♂; Sergiev Posad env., 56.331N 38.040E, horse dung, 27.06.2012, N. Vikhrev, 10♂; **Novosibirsk** reg., Novosibirsk, horse path, 54.842N 82.956E 20.07.2014, O. Kosterin, 1♂; **St-Petersburg** reg.: Yukki (60.11N 30.28E), 5-22.08.1932, A. Stackelberg, 5♂ (ZIN); **Tver** reg., Rzhev env., 56.21N 34.36E, horse dung, 22.06.2012, N. Vikhrev, 8♂, 56.21N 34.35E, horse dung, 18.08.2014, N. Vikhrev, 7♂; **Primorsky** reg., Razdolnoe env., 43.54N 131.84E, 25.06.2014, horse dung, N. Vikhrev, 6♂; Andreevka env., 42.64N 131.13E, horse dung, 25-30.06.2014, N. Vikhrev, 3♂.

Tajikistan, Dushanbe reg., Kondara, Varzob, (38.77N 68.82E), 16-21.09.1945, V.Gussakovsky, 3♂.

Distribution. Holarctic, but only few records from E Palaearctic were known: Tajikistan, Kondara [Henning, 1956]; China: NE Sichuan, E Qinghai and N Xinjiang regions [Fan, 2008]; Russia, Altai Republic [Sorokina, 2012]. Here records for Caucasus, Central Asia, W Siberia and Far East are added.

Identification key for *Azelia* ♂♂

1. Fore tarsus thin and long, *tar1-1* and *tar1-2* together almost as long as *t1*; fore tarsal segments not compressed laterally; *tar1-3* to *tar1-5* without remarkable setae or spines; claws and pulvilli unusually small for *Azelia* (col. pl. II: 4); posterior tarsi also thin and long, but less distinctly. Afro-tropical, known from Uganda (type locality) and Kenya. (Small species, body length 2.5-3 mm; calypteres and haltere black; *t1* normally with weak *p* seta, though sometimes broken or inconspicuous; *t2* with 1 long *p*; *f3* without *pv*; *t3* with 2(1) *av*.) ... *fasciata* Emden.
- Fore tarsus shorter and thicker, *tar1-1* and *tar1-2* together almost two times shorter than *t1*; tarsal segments compressed laterally; *tar1-3* to *tar1-5* usually with elongated setae or spines; claws and pulvilli elongated (col. pl. II: 5); posterior tarsi also thicker and shorter. Eurasia. 2
2. Presutural *ac* all hair-like, in 4 regular rows. *t3* with 1 *ad* (and 1 *av*). Legs (femora, tibiae and tarsi) yellowish. Upper facets of eyes remarkably enlarged. Tropical parts (lowlands) of Oriental region. (*t1* without *p*; *tar1-5* with outer claw elongate and dilated, with pointed apex (resembling that of *A. monodactyla*); *tar2-3* without ventral hair(s); *t2* with 1 *p*; *f3* without *pv*; calypteres and haltere light-brownish.) *beuki* Vikhrev.
- Presutural *ac* strong, in 2 rows. *t3* without *ad* or with a row of *ad* setae and hairs (*A. nebulosa* and *A. cilipes*). Legs dark, at most tibiae yellowish. Upper facets of eyes less enlarged. Palaearctic or northern, mountainous border of the Oriental re-

- gion 3
3. *t1* with distinct *p* seta. Calypteres white or transparent with brownish tint (in *A. monodactyla*). Small species, body length 2.5-3.3 mm. (*t2* with *p*, haltere yellow) 4
- *t1* without *p* seta. Calypteres from transparent with brownish tint to black. Larger species, body length 3 mm and more 6
4. *f3* without *pv* and with 2-3 preapical *av*. *t3* with a complete rows of strong *av* and fine *pv* setae. *tar3-1* in basal half with 2-4 elongated ventral setae (2.5-3x as long as *tar3-1* width, col. pl. II: 3). *tar1-4* with 2 short (as long as *tar3-1* width), but strong *d* spines with blunted apex *parva* Rondani.
- *f3* at middle with strong *pv* seta and with only 1 *av* near apex. *t3* with 1-2 *av* only. *tar3-1* without elongated ventral setae. *tar1-4* different 5
5. *tar1-5* with remarkably elongate and dilated outer claw. *tar1-4* with a pair of straight, strong, 2x as long as *tar1-4* width *d* spines with blunted apex. *tar2-3* ventrally with a set of 6-9 waved hairs (col. pl. II: 12). Only posterior part of scutum brownish-grey dusted, anterior part of scutum velvety black (posterior view). *f3* with submedian *pv* weaker and shorter than preapical *av*. Black fronto-orbital plates touch (col. pl. II: 11). Calypteres transparent with brownish tint. *t3* usually with 2 weaker *av*. Body length 2.8-3.3 mm *monodactyla* Loew.
- Outer claw on *tar1-5* without remarkable modifications, only slightly longer than inner one. *tar1-4* with only short (shorter than *tar1-4* width) setulae. *tar2-3* ventrally without hairs. Scutum evenly grey dusted. *f3* with submedian *pv* at least as strong and long as preapical *av* (col. pl. II: 8). Black interfrontalia narrow, but visible between grey fronto-orbital plates all along the frons length (col. pl. II: 10). Calypteres white. *t3* usually with only one stronger *av*. Body length 2.5-3.0 mm *spinosa* sp. nov.
6. *t3* with a row of long dorsal setae. Large species, body length normally 4.0-5.5 mm. Tibiae translucent yellowish. *ad* surface of *t3* covered with thick standaway hairs. (*tar1-4* with a pair of straight spines slightly longer than *tar1-4* width; *tar1-5* with 1 short curved spine above outer claw; *f2* on *ad* surface covered with dense erect fine hairs (best visible in dorsal view against whitish background) 7
- *t3* without dorsal setae. Smaller species, body length normally 3.0-4.0 mm. Tibiae black. *ad* surface of *t3* with common ground hairs. *tar1-4* and *tar1-5* different 8
7. *t3* with 5-10 *av* (col. pl. II: 2). *tar2-3* with fine long waved ventral hair and several shorter hairs (col. pl. II: 13). *t2* (except from specimens from E Asia) without *p* seta and with preapical *d* longer than tib-

- ia width. *tar3-1* with *av* setulae longer than width of tarsal segment (col. pl. II: 2). (Abdomen with black spots larger, at least on tergite 3 lateral spots are fused with median one. *t3* with a complete row of fine *pv* hairs. Dorsal setae on *t3* usually are longer and denser, with complete *ad-d* row and usually with 1-3 long *pd* setae near apex.)
 *nebulosa* Robineau-Desvoidy.
- *t3* with 1-4 *av* (col. pl. II: 1). *tar2-3* without fine waved ventral hair. *t2* with submedian *p* seta and without preapical *d*, if present, than weak, less than half as long as tibia width. *tar3-1* with *av* setulae shorter than width of tarsal segment (col. pl. II: 1). (Abdomen with black spots smaller, lateral spots are not fused with median ones. Dorsal setae on *t3* are shorter and sparser, placed in single *ad-d* row.)
 *cilipes* Haliday.
 - 8. *t2* without *p* seta. *tar1-5* at apex with a set of 5-6 short spinules placed in a line; outer claw almost 2 times longer and wider than inner one. (*f2* on *ad* surface covered with dense erect fine hairs, as in (col. pl. II: 6); *tar2-3* ventrally with 1-2 fine waved hairs (as in *A. nebulosa*, col. pl. II: 12) 9
 - *t2* with *p* seta. *tar1-5* at apex without set of spinules as above; outer claw less distinctly bigger than inner one 10
 - 9. *t3* only with 1-2 short (hardly longer than tibia width) *av* setae near apex *triquetra* Wiedemann.
 - *t3* with: 3-5 long (2.5-3x longer than tibia width) *av* setae in apical half, a complete row of 8-10 fine *pv* (2x as long as tibia width), 2-4 fine *p* in apical 1/3 ..
 *zetterstedtii* Rondani.
 - 10. *t3* with a single short (about as long as tibia width) *av* seta. *Azelia*-patterns on abdomen distinct. Knob of halter from yellow to brown, calypters brown ...
 11
 - *t3* with at least 2-3 *av-a* and 2-3 *pv-v* setae, all distinctly (about 2x) longer than tibia width. *Azelia*-patterns on abdomen indistinct (*A. gibbera*) or absent (*A. aterrima*). Knob of halter and calypters always black 12
 - 11. *tar1-3* with 2 short *av* spinules; *tar1-4* with short (shorter than tarsus width) and weak setulae; *tar1-5* with 2 short spinules directed over outer claw; outer claw slightly longer than inner one. *t2* with *p* seta weak and shorter than tibia width. *f2* on *ad* surface covered with dense erect fine hairs (col. pl. II: 6). *tar2-3* ventrally with 1-2 fine waved hairs (as in *A. nebulosa*, col. pl. II: 12)
 *trigonica* Hennig.
 - *tar1-3* with a row of 5 short *av* spinules; *tar1-4* with a remarkable set of 3 dorsal setulae, the inner one the longest (2-2.5x as long as tarsus width) and curved, the medial one short (as long as tarsus width), the outer one straight (2-2.5x as long as

- tarsus width); *tar1-5* without spinule; outer claw elongate and widened in basal part (col. pl. II: 9). *t2* with *p* seta strong and at least 1.5x longer than tibia width. *f2* on *ad* surface covered with normal ground hairs (col. pl. II: 7). *tar2-3* ventrally without fine waved hairs *unguigera* sp. nov.
- 12. *t3* with 2(3) *a-av* and with 2(3) *v* setae (sometimes look like *pvv*, but never as true *pv*). *tar1-4* without remarkable setulae. *Azelia*-patterns on abdomen absent. *f2* with 1 ventral spine *aterrima* Meigen.
- *t3* with a complete rows of 9-10 strong *av*, 8-10 fine *pv* and 7-8 fine shorter *v* setae. *tar1-4* with 2 long (2-2.5x as long as *tar1-4* width) pointed *d* setulae. *Azelia*-patterns on abdomen indistinct. *Azelia*-patterns on abdomen absent. *f2* with normally with 2 ventral spines *gibbera* Meigen.

Ecology. Most *Azelia* are associated with dung of large herbivorous animals, but some of them are less selective and may be found on carnivorous and omnivorous dung (in the first place human feces) namely: *A. cilipes*, *A. nebulosa* and *A. triquetra*. All these non-selective species are rather common. Other species require herbivorous dung and in this case several criteria are important. The bigger an animal, the bigger a dung heap; the bigger a dung heap the longer its period of desiccation. Among the large herbivorous animals the cow dung is less valuable in terms of nutrient content, because Artiodactyla mammals extract nutrients from plant mass more completely. The horse or elephant dung are more valuable, because Perisodactyla or Proboscidea mammals extract nutrients from plant mass less completely. Locality is also very important: a more wet area is better than a drier one; undisturbed sites like meadows, forest edges, river banks are always more promising than antropogenic ones; the longer and more often the site is used as pasture, the better. Hundreds years ago, when tarpans (*Equus ferus*) and aurochs (*Bos primigenius*) grazed across the Palaearctic or thousands years ago when mammoths were not yet extinct the situation for the complex of insects associated with herbivorous dung was different and much better. Presently grazing horses give the best approximation to former wild pastures and horse dung heaps are the best place to collect *A. monodactyla*, *A. parva*, *A. trigonica*, *A. zetterstedtii*, and *A. spinosa* sp. nov. Three more Palaearctic *Azelia* spp.: *A. aterrima*, *A. gibbera* and *A. unguigera* sp. nov. seem not to be associated with any substrate and may be found on low vegetation along small woodland rivers or streams, but more field observations are desirable. In tropical Asia domesticated elephants are still locally available (either in elephant riding sites or elephant sanctuaries). Once such site with at least some remnants of natural environment around is found, *A. beuki* will be collected.

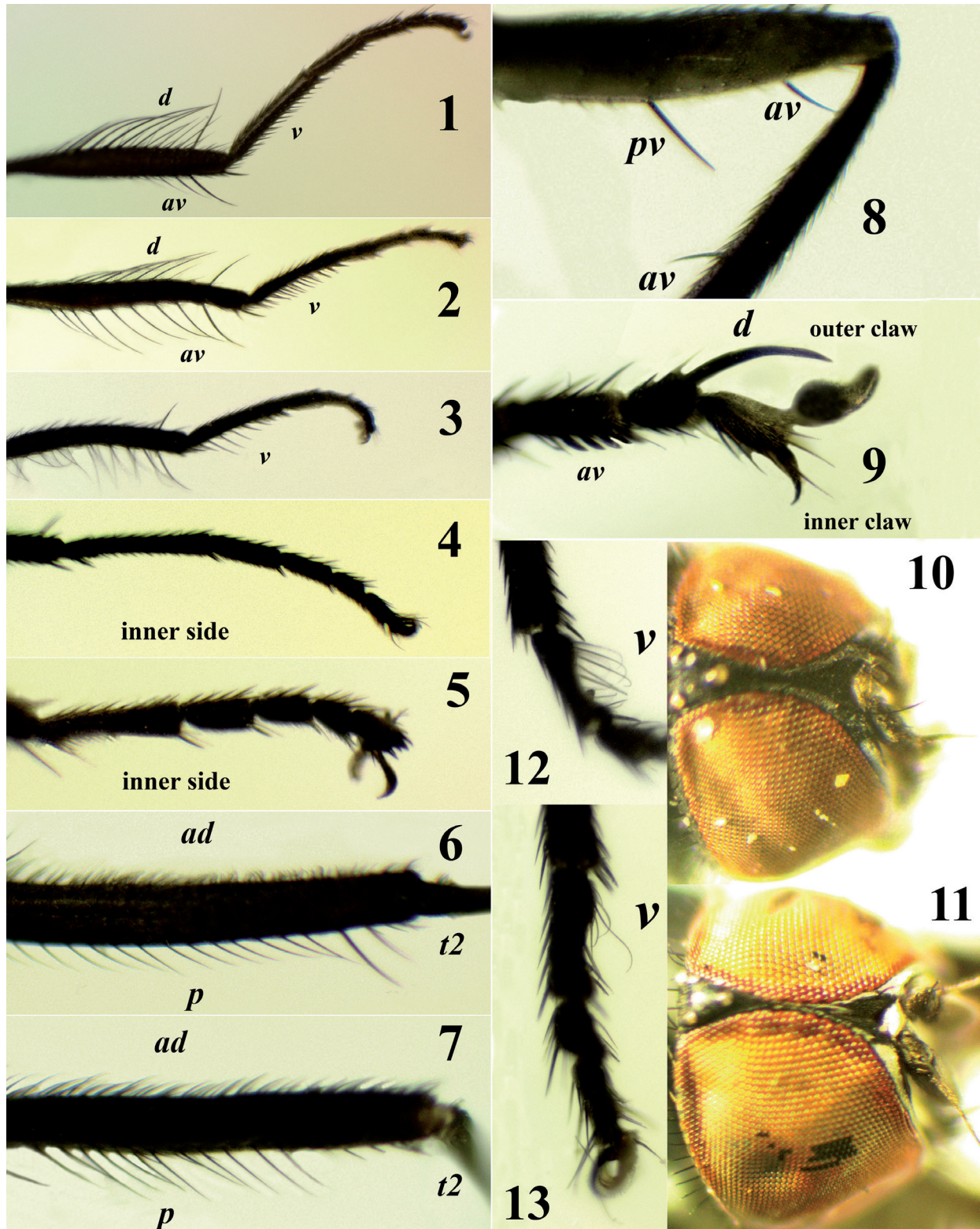
Since Carthage was destroyed, only wild elephants remained in Africa and a search for fresh wild elephant dung is a task which requires both patience and money. As soon as it was found (in Kenya) *A. fasciata* was collected. Nevertheless a few days later I discovered that dung of horses which grazed around Banty Lodge near Mt. Kenya was less rich but more predictable source of *A. fasciata*. So, I would like to seize an opportunity to express my opinion that grazing of horses or elephants near the natural reserves may be very important for the protection of otherwise rare insect species.

ACKNOWLEDGEMENTS

I thank Joachim Ziegler (Berlin) and Olga Ovchinnikova (St.-Petersburg) for the important material from ZMHU and ZIN respectively. I am grateful to Oleg Kosterin (Novosibirsk) for critical reading the text and valuable discussion. I thank Oksana Yermenko (Moscow) for valuable technical assistance and Vera Sorokina (Novosibirsk) for reviewing. I thank Dr. Li Shi (Hohhot, China) for her help in translating some Chinese data into English.

REFERENCES

- Emden F.I. van, 1951. Muscidae: C. – Scatophaginae, Anthomyiinae, Lispinae, Fanniinae and Phaoniinae // Ruwenzori Expedition 1934-35. London: British Museum (Natural History). Vol.2. No.6. P.325-710.
- Emden F.I. van, 1965. The fauna of India and the adjacent countries. // Diptera, Muscidae. Delhi: Government of India. Vol. 7, part 1. XIV + 647 pp.
- Fan Z. (editor), 2008. Fauna Sinica. Insecta, Vol. 49, Diptera Muscidae (1). Beijing: Science Press, 1186 p., 276 figs, 4 plates.
- Gregor F., Rozkosny R., Bartak M., Vanhara J., 2002. The Muscidae (Diptera) of Central Europe // Folia Facultatis Scientiarum Naturalium Universitatis Masarykianae Brunensis, Biologia 107. 280 p.
- Hennig W., 1956. Muscidae. (Part, Lieferung 194.) // Die Fliegen der palaearktischen Region / Lindner, E. (Ed.). Stuttgart: Schweizerbart. 63b. P. 97-144.
- Hockett H.C., 1965. The Muscidae of Northern Canada, Alaska, and Greenland (Diptera) // Memoirs of the Entomological Society of Canada, 42. P. 1-369.
- Pont A.C., 1986. Family Muscidae // Catalogue of Palaearctic Diptera 11 / Soós A, Papp L (Eds.). Budapest: Akadémia Kiadó. P. 57-215.
- Pont A. C., 1991. A preliminary list of the Fanniidae and Muscidae (Insecta: Diptera) from Turkey and the Middle East // Zoology in the Middle East, 5. P. 63-112.
- Snyder F.M., 1957. Notes and descriptions of some neotropical Muscidae (Diptera) // Bulletin of the American Museum of Natural History, 113 (6). P. 437-490.
- Sorokina V.S., 2012. Fauna of Muscidae (Diptera) of the Altai Mountains // Proceedings of the Russian Entomological Society. St. Petersburg, 83(1). P. 193-222.
- Sorokina V.S., Pont A.C., 2010. An annotated catalogue of the Muscidae (Diptera) of Siberia // Zootaxa, 2597. P. 1-87.
- Vikhrev N., 2011. Review of the Palaearctic members of the *Lispe tentaculata* species-group (Diptera, Muscidae): revised key, synonymy and notes on ecology // ZooKeys, 84. P. 59-70.
- Vikhrev N.E., 2012. Review of the Oriental *Azelia* Robineau-Desvoidy, 1830 (Diptera: Muscidae) // Russian Entomological Journal, 21 (1). P. 97-100.



Azelia, ♂: 1-3, hind leg: *A. cilipes* (1); *A. nebulosa* (2); *A. parva* (3). 4-5, fore tarsus: *A. fasciata* (4); *A. triquetra* (5). 6-7, f2, dorsal view: *A. trigonica* (6); *A. unguigera* sp. nov. (7); *A. spinosa* sp. nov., hind leg (8). *A. unguigera* sp. nov.: apical part of fore tarsus (9). 10-11, head dorsal: *A. spinosa* sp. nov. (10); *A. monodactyla* (11). 12-13, tar2-3: *A. monodactyla* (12); *A. nebulosa* (13)

Azelia, ♂: 1-3, задняя нога: *A. cilipes* (1); *A. nebulosa* (2); *A. parva* (3). 4-5, передняя лапка: *A. fasciata* (4); *A. triquetra* (5). 6-7, f2, вид сверху: *A. trigonica* (6); *A. unguigera* sp. nov. (7); *A. spinosa* sp. nov., задняя нога (8). *A. unguigera* sp. nov., передняя лапка (9). 10-11, голова сверху: *A. spinosa* sp. nov. (10); *A. monodactyla* (11). 12-13, tar2-3: *A. monodactyla* (12); *A. nebulosa* (13)