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Review of *Hydrotaea dentipes* species group (Diptera, Muscidae)

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Abstract. A review of the world fauna of the *Hydrotaea dentipes* species group, with 23 taxa included, is offered. Three African species of *Hydrotaea* were newly included in the group and redescriptions of these species are given. Based on the comparison of *COI* sequences, the phylogenetic history of the *H. dentipes* group was examined and the monophyly of the group was confirmed. An alphabetical list of species with distributional data and taxonomic remarks is given. Three new synonymies are offered: *Hydrotaea cyrtoneurina* Zetterstedt, 1845 = *H. cyrtoneura* Seguy, 1938, **syn. nov**. = *H. indica* Shinonaga & Tewari, 2008, **syn. nov.**; *Hydrotaea fumifera* Walker, 1853 = *Hydrotaea fumifera abyssinica* Emden, 1943, **syn. nov.** An identification key for 12 species with clear identity is offered.

Keywords: Diptera, Muscidae, *Hydrotaea dentipes* group, identification key, synonymy, redescriptions

Обзор группы видов *Hydrotaea dentipes* (Diptera, Muscidae)

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Аннотация. Предлагается обзор мировой фауны группы *Hydrotaea dentipes*, включающей 23 таксона. Три африканских вида *Hydrotaea* были впервые включены в группу, даны их переописания. На основе сравнения последовательностей цитохромоксидазы была изучена филогенетическая история группы *H. dentipes*, подтверждена ее монофилия. Приведен алфавитный список видов с данными о распространении и таксономическими комментариями. Предложены три новых синонима: *Hydrotaea cyrtoneurina* Zetterstedt, 1845 = *H. cyrtoneura* Seguy, 1938, **syn. nov**. = *H. indica* Shinonaga & Tewari, 2008, **syn. nov**.; *Hydrotaea fumifera* Walker, 1853 = *Hydrotaea fumifera abyssinica* Emden, 1943, **syn. nov**. Предложен определительный ключ для 12 видов, чья идентичность не вызывает сомнений.

Ключевые слова: Diptera, Muscidae, группа видов *Hydrotaea dentipes*, определительный ключ, синонимия, переописания

Introduction

The *H. dentipes* species group was proposed in the genus *Hydrotaea* Robineau-Desvoidy, 1830 by Ringdahl (Ringdahl 1925) and, later, by Huckett (Huckett 1954). A detailed characteristic of the *H. dentipes* group was given by Hennig (Hennig 1962: 701). Hennig supposed that several American species also belong to this group. After Hennig's publication, several more species, presumably belonging to the *H. dentipes* group, were described from South Asia. In the present work I included four more previously known Afrotropical taxa into the *H. dentipes* group. Thus, the total number of taxa considered in this paper is 23. All these taxa are considered below in the alphabetical annotated list of species of the *H. dentipes* group with distributional data and taxonomic remarks. Those 12 species which I examined and which I consider as valid ones are boldfaced in the alphabetical list and included in the identification key. Other species I regard as synonyms or as taxa with unclear identity.

Species of the *H. dentipes* group have a slender, elongated body; and their body size is the largest in the genus. They have the following set of characters:

— *t3* with strong *pd*, which is at least 2x longer than tibia width;

— large size, body length 7–9 mm (rarely 6 mm in *H. maculithorax*);

— fronto-orbital plates in males are always separated by black frontal vitta, narrow (*H. similis* and *H. kashmirana*) or as wide as postpedicel (*H. palaestrica*);

— presutural *ac* present and almost as strong as presutural *dc*;

— vein M slightly curved forward before wing margin;

— frontal setae reaching the level of frontal triangle (♂);

— *f2* in basal half with a raw of several outside directed *a* setae which are at least as long as femur width (♂).

The *H. dentipes* group, like the genus *Hydrotaea* as a whole, seems to be native for Eurasia. Taking into account that the group is the most cold-resistant in the genus (several species are common in areas north of the Arctic Circle), the spread of the representatives of the *H. dentipes* group to the Nearctic region via the Bering Land Bridge is not surprising. In contrast, the time and circumstances of the colonisation of the Afrotropical region and South America is unknown.

Perhaps, representatives of the *H. dentipes* group (including tropical ones) are the most common among *Hydrotaea*. They are often found on excrements (*H. dentipes, H. similis, H. fasciata*) or carrion (*H. palaestrica, H. fumifera*). However, the taxonomy of the group is far from being clear for several reasons: (1) species of the group rarely have 'strong' diagnostic characters (Vikhrev 2013); (2) only few insect collections give an opportunity to compare directly species of this almost cosmopolitan group.

The publication consists of three parts: (1) the discussion of phylogenetical history of the *H. dentipes* group based on comparison of *COI* sequences; (2) the alphabetical list of 23 species with distributional data and taxonomic remarks; (3) the identification key for 12 species of the *H. dentipes* group with clear identity.

Material and methods

The specimens examined are deposited in the following museums:

MNHN — Muséum national d'Histoire naturelle, Paris, France;

ZIN — Zoological Institute, Saint Petersburg, Russia;

ZMHU — Museum für Naturkunde, Humboldt-Universität zu Berlin, Germany;

ZMUM — Zoological Museum of Moscow University, Russia.

Geographical coordinates are given in the decimal degrees format.

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

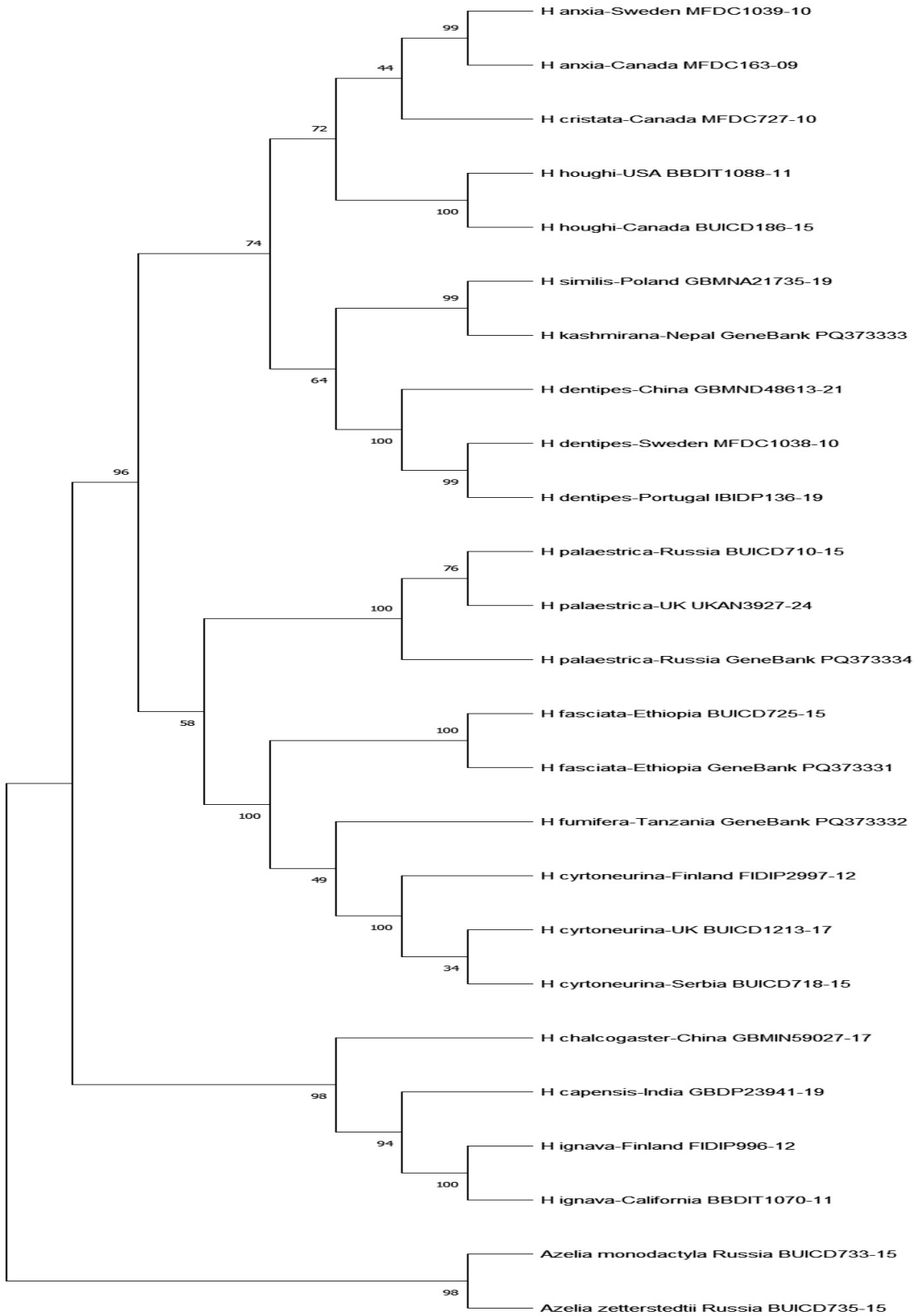

Fig. 1. Phylogenetic tree inferred from the barcoding fragment of the mitochondrial *COI* gene of *Hydrotaea* species by using the Maximum Likelihood method. Bootstrap supports in which the associated taxa clustered together is shown next to the branches

Рис. 1. Филогенетическое древо, построенное на основе фрагмента митохондриального гена *COI* видов *Hydrotaea* с использованием метода максимального правдоподобия. Процент деревьев, в которых соответствующие таксоны сгруппированы вместе, показан рядом с ветвями

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drial *COI* gene used in this study were downloaded from the Barcode of Life Data System public database (further in the text BOLD) (Taxonomy browser: Azeliinae 2024). Four *COI* sequences were obtained in the course of this study. Their sequencing was ordered from Lopukhin Federal Research and Clinical Center of Physical-Chemical Medicine, Russia, Moscow. They were submitted to the European Nucleotide Archive / GenBank. The phylogenetic analysis was carried out using a MEGA X package.

The *COI* sequences downloaded from BOLD are shown in the tree (Fig. 1) under the following accession numbers:

Hydrotaea anxia Zetterstedt, 1838: MFDC1039-10 and MFDC163-09;

H. capensis Wiedemann, 1818: GBDP23941-19;

H. chalcogaster Wiedemann, 1824: GBMIN59027-17;

H. cristata Malloch, 1918: MFDC727-10;

H. cyrtoneurina Zetterstedt, 1845: BUICD1213-17, BUICD718-15 and FIDIP2997-12;

H. dentipes Fabricius, 1805: MFDC1038-10; IBIDP136-19 and GBMND48613-21;

H. fasciata Stein, 1913: BUICD725-15;

H. houghi Malloch, 1916: BUICD186-15 and BBDIT1088-11;

H. ignava Harris, 1780: FIDIP996-12 and BBDIT1070-11;

H. palaestrica Meigen, 1826: BUICD710-15 and UKAN3927-24;

H. similis Meade, 1887: GBMNA21735-19;

Azelia monodactyla Loew, 1874: BUICD733-15

Azelia zetterstedtii Rondani, 1866: BUICD735-15.

Newly obtained sequences are shown in the tree (Fig. 1) under the following European Nucleotide Archive / GenBank accession numbers:

Hydrotaea fasciata Stein, 1913 (Etiopia, Goba): PQ373331;

H. fumifera Walker, 1853 (Tanzania, Mbeya Range): PQ373332;

H. kashmirana Pont, 1976 (Nepal, Mustang district): PQ373333;

H. palaestrica Meigen, 1826 (Russia, Moscow region): PQ373334.

Results and discussion

I. Molecular phylogeny of the *H. dentipes* group based on the comparison of *COI* sequences

Hennig (Hennig 1962: 701) was not sure whether the *Hydrotaea dentipes* group is really monophyletic. I tried to clarify the phylogeny of the group using available *COI* sequences from the BOLD and newly obtained sequences.

In the course of this work, phylogenetic trees were constructed with a more or less expanded set of other species of *Hydrotaea*, with or without some other Azeliini as an outgroup. The results for the *H. dentipes* group were almost the same, so I chose a more compact and visually simpler tree for this publication. In this tree, (Fig. 1) as outgroups were used two species of genus *Azelia* and three species *Hydrotaea* without apical tooth on *f1* in males: *Hydrotaea ignava* Harris, 1780; *H. capensis* Wiedemann, 1818, and *H. chalcogaster* Wiedemann, 1824. The species of *Hydrotaea* without the apical tooth on *f1* in males had been placed in the subgenus or genus *Ophyra*. However, the recent publication by Grzywacz et al. (Grzywacz et al. 2021) indicated that these species are inside the genus *Hydrotaea* according to molecular data. All the trees obtained by me were in accord with result of Grzywacz and colleagues. Also, my trees indicated that *Ophyra* forms a monophyletic clade, if to exclude the American (presently cosmopolitan) *H.* (*Ophyra*) *aenescens* Wiedemann, 1830, which showed no relationship with the Old World *Ophyra*.

The phylogenetic reconstruction obtained on the base of the *COI* barcoding fragment (Fig. 1) offered the following results.

1. The *H. dentipes* group as a whole is monophyletic. In the tree shown in Fig. 1 it has the support of 96.

2. *H. cyrtoneurina*, *H. fasciata*, *H. fumifera*, and *H. maculithorax* are closely related to each other clustering with the support of 100 (down

Figs. 2–4. African *Hydrotaea* with *Anthomyia*-pattern, dorsal view. 2 — *H. fasciata*, female; 3 — *H. fasciata*, male; 4 — *H. maculithorax*, male

Рис. 2–4. Африканские виды *Hydrotaea* с «*Anthomyia*-окраской» среднеспинки. 2 — *H. fasciata*, самка; 3 — *H. fasciata*, самец; 4 — *H. maculithorax*, самец

to 98 in other trees), further on, I denote them as the '*H. cyrtoneurina* clade'. This clade is also well supported morphologically as it is presented in the identification key below.

3. *H. cyrtoneurina* is distributed in the Central and Southern Palaearctic, as well as in the Oriental region. The African species of the *H. cyrtoneurina* clade (of which two were barcoded) are closely related to *H. cyrtoneurina*. This indicates that the African species are descendants of *H. cyrtoneurina*, which supposedly penetrated Africa in a colder and/or wetter epoch.

4. *H. palaestrica* unexpectedly turned out to be a sister species to the *H. cyrtoneurina* clade, though with support of 58 only. I did not find any morphological substantiation for this.

5. The remaining species of the *H. dentipes* group form two sister clades:

5.1. *H. similis* and *H. kashmirana* are closely related and form a clade with *H. dentipes*. It corresponds well to morphological data.

5.2. Earlier I supposed, as based on morphological characters, that *H. cristata* is related to *H. dentipes*. However, the molecular tree indicates that both North American species (*H. cristata* and *H. houghi*) are descendants of the circumpolar *H. anxia*.

II. Annotated list of species of the *Hydrotaea dentipes* group with detailed taxonomic comments

Hydrotaea anxia Zetterstedt, 1838

Hydrotaea bispinosa Zetterstedt, 1845

Material examined: DENMARK, *West Greenland*, Godhavn, 4.08.1968, J. Bocher, 1♂, 1♀; RUSSIA: *Chukotka* reg., Krasnoarmeysky (69.54° N, 172.00° E), 08–10.07.1963, K. Gorodkov, 5♂ (ZIN); *Murmansk* Reg., Murmansk, 68.97° N, 33.13° E, 08–14.07.2023, N. Vikhrev, 2♂; *Yamalo-Nenets* reg.: Schuchya River [67.5° N, 68.8° E], 02–27.07.1984, P. Basikhin, 13♂, 4♀; Kharp env., Cherny R, 66.82° N, 65.635° E, on carrion, 14.07.2019, N. Vikhrev, 2♂, 1♀; 5 km NE of Salekhard, on carrion, 16–19.07.2019, N. Vikhrev, 4♀♀ (all ZMUM).

DISTRIBUTION. North of 66.6° N, 66.8° E, Holarctic.

Hydrotaea cristata Malloch, 1918

Fig. 9

CANADA, *Manitoba* prov., Wapusk NP, 58.725° N, 93.464° E, 24.07.2007, A. Renaud, 1♂ (ZMUM).

Distribution. Widely distributed in Nearctic from Alaska to Mexico.

Remarks. As follows from the key below, the differences between this species and *H. den-*

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tipes are very weak. The ranges of these two species overlap widely in North America. I supposed that *H. cristata* is a descendant of an earlier event of introduction of *H. dentipes* to America and, subsequently, *H. dentipes* was introduced to America once again. However, my molecular data indicates that *H. cristata* is a descendant of the circumpolar *H. anxia*.

Hydrotaea cyaneiventris Macquart, 1851
See Remarks to *H. villosa*.

Hydrotaea cyrtoneura Seguy, 1938
Synonymized here, see *H. cyrtoneurina*.

Hydrotaea cyrtoneurina Zetterstedt, 1845

Hydrotaea cyrtoneura Seguy, 1938 **syn. nov.**
Hydrotaea indica Shinonaga & Tewari, 2008 **syn. nov.**

Type material examined: the holotype, of *H. cyrtoneura* Seguy, 1938, ♂: China, Chekiang (= *Zhejiang* prov., Hangzhou, 30° N, 120° E) (MNHN).

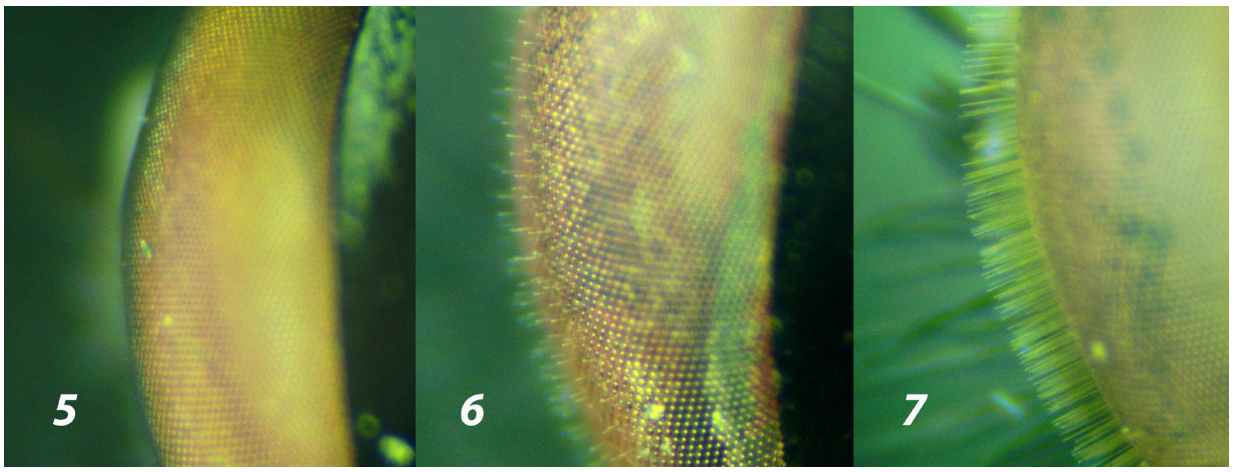
Other material examined: 60♂♀ from ZMUM, ZIN and MNHN collections from: AZERBAIJAN; BELARUS: *Gomel* and *Vitebsk* regions; FRANCE, Gers dept.; KAZAKHSTAN, *Almaty* Reg., RUSSIA: *Altai Republic*, *Crimea*, *Dagestan*, *Kaliningrad, Krasnodar, Mordovia*, *Moscow, Pskov*, *Vladimir, Voronezh* regions; SERBIA; SPAIN, *Alicante* prov.; TURKEY: *Antalya*, *Konya* and *Sakarya* provinces; TAJISKISTAN, Vahdat Distr.; UZBEKISTAN, *Tashkent* Reg.

Distribution. Widespread in the Palaearctic from W Europe to Korea. The northernmost records in European Russia are from 56° N. Also was recorded in the Oriental region: China (Henan), India (Tamil Nadu).

Synonymy. After the examination of the holotype of *H. cyrtoneura* in MNHN, Hennig (Hennig 1962) came to a conclusion that *H. cyrtoneura* slightly differs from *H. cyrtoneurina* by shorter postpedicel, wider cheeks, and longer hairs on the eyes. I had a possibility to re-examine the holotype of *H. cyrtoneura* and simultaneously to compare it with the material of *H. cyrtoneurina* from MNHN (only 1 male specimen in the collection) and specimens from ZMUM, which I prudently took with me. The intraspecific variability of ZMUM specimens is large, ♂: body length from 4.5 mm to 7.5 mm; eye more or less densely hairy; cheeks wider or narrower. The type of *H. cyrtoneura* has no significant peculiarities beyond the intraspecific variability. So, I regard that *H. cyrtoneura* is a synonym of the widespread and common *H. cyrtoneurina*, *Hydrotaea cyrtoneurina* Zetterstedt, 1845 = *Hydrotaea cyrtoneura* Seguy, 1938 **syn. nov.**
H. indica Shinonaga & Tewari, 2008 was described from a large series of both sexes from India, Tamil Nadu State, Western Ghats, Ooty (= Udhagamandalam) (11.4° N 76.7° E) 2200–2500 m. From Kodaikanal (also Western Ghats, Tamil Nadu, 10.25° N 77.50° E), *H. cyrtoneurina* was reported by Emden (Emden 1965). Kodaikanal is also situated above 2000 m a.s.l. and is only 150 km south of Ooty, which is the type locality of *H. indica*. The description of *H. indica* (Shinonaga, Tewari 2008: 212) fits the diagnostic characters of *H. cyrtoneurina*: hairy eyes; hairy notopleuron; *t3* with a row of *pv* setae. The main diagnostic character offered by Shinonaga and Tewari (Shinonaga, Tewari 2008) is that '*f2* in basal half with about 5 strong spine-like bristles on ventral surface'. *H. cyrtoneurina* has the same bristles. Shinonaga and Tewari (Shinonaga, Tewari 2008) compared *H. indica* with *H. dentipes* and *H. similis,* but have not compared it with *H. cyrtoneurina*. So, according to the principle 'no difference, no validity' (Vikhrev 2013), I propose the following synonymization: *Hydrotaea cyrtoneurina* Zetterstedt, 1845 = *H. indica* Shinonaga & Tewari, 2008 **syn. nov.**

Hydrotaea dentipes Fabricius, 1805

Material examined: over 400 ♂♀ from ZMUM and ZIN collections from: AZERBAIJAN; BELARUS: *Brest, Gomel, Minsk, Mogilev and Vitebsk* regions; FINLAND; MOLDOVA; MONGOLIA, *Uvs* aimak; MORROCO; NEPAL; RUSSIA: *Altai Republic*, *Amur*, *Arkhangelsk*, *Astrakhan*, *Buryatia*, *Crimea*, *Dagestan*, *Irkutsk*, *Khanty-Mansi*, *Kaliningrad, Khabarovsk*, *Komi*, *Krasnodar, Krasnoyarsk* (inc. Taimyr peninsula), *Kursk*, *Lipetsk*, *Magadan*, *Mordovia*, *Moscow*, *Murmansk*, *Nizhniy-Novgorod*, *Primorsky*, *Pskov*,



Figs. 5–7. 5 — *H similis*, bare male eye; 6 — *H. kashmirana*, male eye with short and sparse hairs; 7 — *H. fumifera*, male eye with long and dense hairs

Рис. 5–7. 5 — *H similis*, голый глаз самца; 6 — *H. kashmirana*, глаз самца с короткими и редкими волосками; 7 — *H. fumifera*, глаз самца с густыми и длинными волосками

Ryazan, *Tambov*, *Tver*, *Ulyanovsk*, *Vladimir*, *Volgograd*, *Vologda*, *Yaroslavl*, *Yamalo-Nenets*, *Zabaikalsky* regions; SERBIA; TURKEY: *Bolu*, *Duzce*, and *Sakarya* provinces; TAJIKISTAN, Vahdat Distr.

Distribution. Almost cosmopolitan. Widely distributed in the Palaearctic from the Arctic tundra to subtropics and in the Nearctic from Alaska to Quebec. It is present in the north of the Oriental region in N India, Nepal, N Vietnam. Also reported from the Neotropical region.

Hydrotaea fasciata Stein, 1913

Figs. 2–3

Type material examined: syntype, ♀, Africa or., Katona 904, Kilimandjaro (ZMHU).

Other material examined: ETHIOPIA: *Amhara* Reg.,15.8 km NEE Debre Birhan, 9.74º N, 39.66º E, 2940 m, 28.04.2015, O. Gorbunov, 3♂, 2♀; *Oromia* Reg.: 9 km S of Goba, Bale Mts., 6.933ºN, 39.951ºE, 3070 m, 19–20.03.2012, N. Vikhrev, 16♂, 15♀; Goba env, 7.024º N, 39.98º E, 2700 m, garden 6–11.12.2023, N. Vikhrev, 9♂, 5♀; *Addis-Ababa*, 9.00º N, 38.73º E, 2330 m, 10.01.2021, N. Vikhrev, 1♀ (all ZMUM).

Distribution. Known from Ethiopia, mostly from altitudes above 2000 m, described from N Tanzania, 'Kilimanjaro' with an unknown exact locality and altitude. Pont (Pont 2024) also reported it for S Africa and Uganda.

Descriptive notes. Initially Stein's type series consisted of 1♂ and 5♀, presently only 1♀ is stored in ZMHU. Available sources of information on *H. fasciata* are restricted to the original description (Stein 1913: 505) and the key to African *Hydrotaea* by Emden (Emden 1943: 80–81). Meanwhile, a representative series of this species in ZMUM allowed me to clarify some points.

Male, body length 7–7.5 mm, rarely 6 mm. *Head*. Eyes with long and dense hairs. Distance between eye margins more than width of antenna. Fronto-orbital plates matt-black. Aristal hairs shorter than basal diameter of arista. *Thorax* with an *Anthomyia*-like pattern, though it is not very distinct: dirty-black spots on dirty dark grey background with vague borders. Thoracic pattern better visible in posterodorsal view, worse in dorsal view as is shown in Fig. 3. Presutural part of scutum with a median (actually consists of two almost fused spots) and two lateral black spots; postsutural part of scutum also with a median and two lateral black spots; median spots wider than lateral ones; median spots fused with each other; lateral spots separate. Scutal chaetotaxy: 2+4 *dc*; 2 *prst ac*; notopleuron entirely hairy; prealar seta absent; katepimeron bare. *Wing* with vein M slightly curved forward at apex. Calypters yellow, halter black. *Legs*. *f1* with apical tooth; *t1* emarginated in basal half,

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without *p* seta. *f2* in basal half with: 3–4 outward directed *a* setae; 5–6 spinulose *v* setae; 6–7 spinulose *pv* setae. *t2* with 2–4 *pd* and 1(2) *ad*. *f3* near apex with 3–4 long *av* and 2–3 *pv*. *t3* densely setulose: 4–5 *av*, a row of *ad* (1–3 near apex strong), 1 strong *pd*, 5–7 *pv*. *Abdominal* tergites 3 and 4 dirty-grey dusted, with black median vitta and black band at posterior margin.

Females smaller than males, body length 6–7 mm. Eyes with short but dense hairs. Thoracic pattern as in male but much more distinct (Fig. 2), borders between black spots and grey background much sharper than in males. Prealar seta absent as in male (usually present in females of the *H. dentipes* group). Frons wide. Fore leg not modified. *f2* without long setae. *t3* with 3 *av*, 3 *ad*, 1 *pd*, without *pv*.

Hydrotaea fumifera Walker, 1853

Fig. 7

Hydrotaea fumifera abyssinica Emden, 1943 **syn. nov.**

TANZANIA, 10 km NEE of Mbeya, Mbeya Range pass, 8.847° S, 33.532° E, 2390 m, N. Vikhrev: 17–18.02.2017, 2♀; 24–29.12.2021; 10♂, 19♀ (ZMUM).

Distribution. Widespread in East Africa.

Synonymy. *H. f. abyssinica* was described in a key without the indication of type series (Emden 1943: 81–82). Such descriptions were prohibited from 1961, while earlier described taxa are valid. There are several problems with the description of that subspecies. (1) I suppose that Emden compared Walker's type with fresher specimens of *H. fumifera* in the British Museum of Natural History. Being 100 years older, Walker's type had red-brown legs, not black, because of fading rather than because of real differences in coloration. (2) The description of subspecies implies discussion of distributional boundaries between the nominotypical and new subspecies. This was not discussed. (3) I found it difficult to identify my Tanzanian series as *H. f. fumifera* or *H. f. abyssinica*, since their characters are contradictive. I see no reason to consider *H. f. abyssinica* as a valid taxon, so, *Hydrotaea fumifera* Walker, 1853 = *Hydrotaea fumifera abyssinica* Emden, 1943 **syn. nov.**

Hydrotaea fumifera abyssinica Emden, 1943 Synonymized here, see *H. fumifera*.

Hydrotaea houghi Malloch, 1916

Hydrotaea fuscisquama Aldrich, 1928

USA, *Rhode Island* state, Coventry, 41.69° N, 71.55° W, 27.04–15.05.2017, A. Medvedev, 60♂♀ (ZMUM).

Distribution. North America. According to de Carvalho & Couri (de Carvalho, Couri 2002) also Ecuador and Venezuela.

Hydrotaea indica Shinonaga & Tewari, 2008 Synonymized here, see *H. cyrtoneurina*.

Hydrotaea kashmirana Pont, 1976

Fig. 6

NEPAL: Rasuwa distr., Dhunche env., 28.098° N, 85.318° E, 2000 m, 7–9.06.2017, A. Ozerov. A. Medvedev, 6♂, 7♀; Mustang distr., Muktinath env., 28.82° N, 83.86° E, 3600 m, 1–9.07.2017, A. Medvedev, 9♂, 11♀.

Distribution. Known from India (Kashmir) and Nepal.

Remarks. As follows from the original publication (Pont 1975), *H. kashmirana* has bare eyes, while my specimens from Nepal have hairy eyes. Dr. Nigel Wyatt, curator of Diptera of the Natural History Museum, London, UK, kindly reexamined the holotype and confirmed that eyes are hairy, though the hairs are short and sparse, exactly as shown in Figs. 5–7.

Hydrotaea lalashanensis Shinonaga, 2006

Described from Taiwan, from a single male from an elevation of 1600 m. According to Shinonaga (Shinonaga 2006) , it is related to *H. cyrtoneurina* Zetterstedt, 1845 but differs from it by 2+3 instead of 2+4 *dc*.

Hydrotaea lasiopa Emden, 1965

Described from Burma, Kambaiti, 7000 feet (= Myanmar, Kan Paik Ti, 25.40° N 98.12° E, 2100 m), from three female specimens with strong *prst ac*, vein M apically curved, *t3* with strong *pd*. Eyes described as 'densely long-haired', which is atypical for females. Emden (Emden 1965: 328–329) compared his species with *H. cyrtoneurina*.

Hydrotaea maculithorax Stein, 1913

Fig. 4

TANZANIA, Makete, 9.26º S, 34.12º E, 2250 m, 19–24.12.2021, N. Vikhrev, 4♂.

Distribution. Known from Zimbabwe (Salisbury = Harare, 1500 m) and Tanzania, Makete, 2250 m.

Remarks. *H. maculithorax* was described from a single female from Zimbabwe.

Unfortunately, I have not properly examined the type in ZMHU where it is stored. According to the description by Stein (Stein 1913: 506), the female of *H. maculithorax* differs from the similar *H. fasciata* by smaller size, shining fronto-orbital plates and postsutural spots fused in black transversal band.

Four males collected in Makete have these characters and certainly differ from males of *H. fasciata*. I identified Tanzanian males as *H. maculithorax*.

Description of male. Body length 6 mm. *Head*. Eyes with long and dense hairs. Distance between eye margins less than width of antenna. Fronto-orbital plates narrow, shining. Arista virtually almost bare. *Thorax* with *Anthomyia*-like pattern, which is similar to that in *H. fasciata*, but more distinct (Fig. 4). Presutural part with median and small lateral spots; postsutural median and lateral spots fused in black transversal band. Scutal chaetotaxy: 2+4 *dc*; 2 *prst ac*; notopleuron entirely bare; prealar seta absent; katepimeron bare. *Wing* with vein M slightly curved forward at apex. Calypters yellow, halter black. *Legs*. *f1* with apical tooth; *t1* emarginated in basal half, without *p* seta. *f2* in basal half with: outward directed *a* setae; *av* and *pv* setae fine and short. *t2* with 2–3 *pd* and in apical quarter with a row of 5–6 fine *av*. *f3* with *av* and *pv* setae fine, about as long as femur width, near apex with 4–5 long *av* and *pv* setae. *t3* densely setulose, with *av*, *ad* and *pv* rows, 1 strong *pd*. *Abdominal* tergites 3 and 4 densely whitish-grey dusted, with black median vitta and black bands at posterior and anterior margins.

Hydrotaea mai Fan, 1965

See Remarks to *H. palaestrica*.

Hydrotaea nicholsoni Curran, 1939

Mentioned by Hennig (Hennig 1962) as Neotropical species presumably belonging to the *H. dentipes* group. According to the interpretation by de Carvalho & Couri (de Carvalho, Couri 2002), it may turn to be a synonym of *H. houghi* Malloch. Recently 40 specimens collected at high altitude in Ecuador have been identified as *H. nicholsoni*. Photos and *COI* sequences of all specimens were published in BOLD. The specimens are in a rather poor condition and they are mostly females. However, it is clear that the photographed specimens do not correspond to the description of *H. nicholsoni* (Curran 1939). The molecular data even indicate that they are not *Hydrotaea* but some other Muscidae.

Hydrotaea nubilicosta Malloch, 1923

Described from a single female from Colombia, Villavicencio (75 km SE of Bogota, lowland). Mentioned by Hennig (Hennig 1962) as presumably belonging to the *H. dentipes* group. I regard this single female as *nomen dubium*.

Hydrotaea palaestrica Meigen, 1826

Fig. 10

Hydrotaea mai Fan, 1965

Hydrotaea harpagospinosa Ni, 1982

Material examined. 90 specimens from: BELARUS: *Gomel*, *Minsk*, and *Mogilev* regions.

EUROPEAN RUSSIA: *Mordovia*, *Moscow*, *Pskov*, *Ryazan,* and *Tver* regions.

ASIAN RUSSIA: *Altai Rep* Reg., Seminsky Pass, Turala River valley, 50.99º N, 85.68º E, 1350 m, 8–12.07.2016, N. Vikhrev; 1♂; Ust-Koksa, Koksa R. bank (50.29º N, 85.55º E), 25.06.2007, O. Kosterin, 1♂; *Buryatia* Reg.: Kyren env., 51.7° N, 102.1° E, 750 m, 16–19.06.2021, E. Makovetskaya, 1♂; Turan env, 51.670° N, 101.684° E, 870 m, 09.06.2021, N. Vikhrev, 1♂; Mondy env, 51.67° N, 101.04° E, 1250 m asl, 17.06.2021, E. Makovetskaya, 1♂; *Krasnoyarsk* Reg.: Ergaki NP, 52.84° N, 93.25° E, 1450 m, 27–29.06.2017, N. Vikhrev, 2♂; Tanzybei env., 53.07° N, 93.13° E, 450 m, 28–29.05.2018, N. Vikhrev, 1♂; Krasnoyarsk env., Stolby, 56.11° N, 92.13° E, K. Tomkovich, 13–19.06.2011, 1♂;

Distribution. Palaearctic, from W Europe to 102° E. The Russian records are in a narrow range of latitudes from 50° N to 56° N., where *H. palaestrica* feeds on rotting meat, otherwise it is uncommon.

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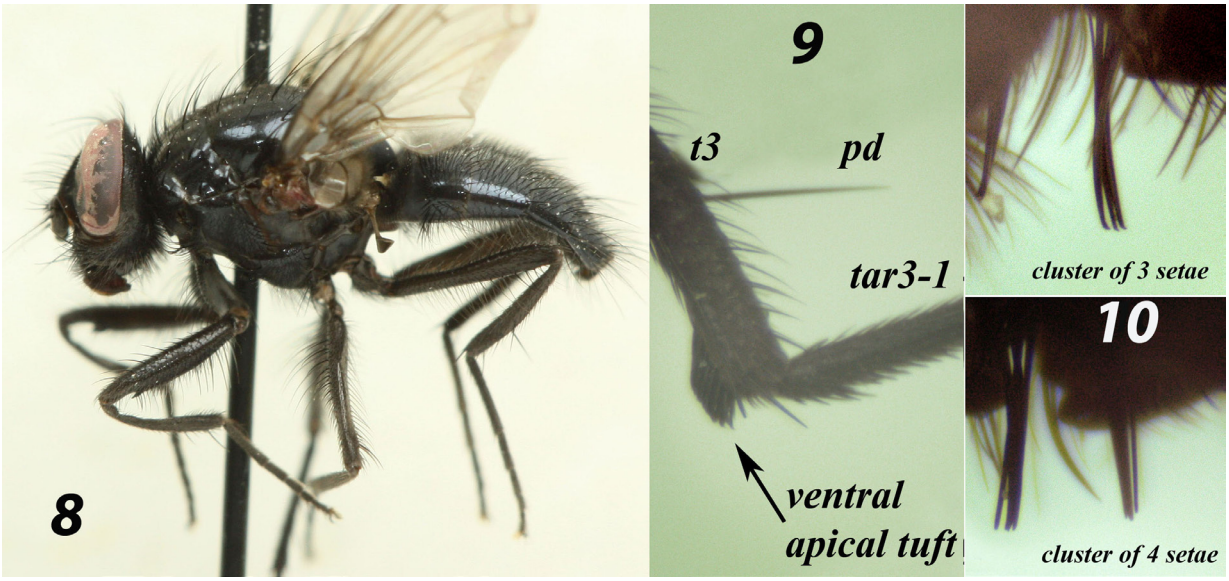

Figs. 8–10. 8 — *H villosa*, male, general view; 9 — *H. cristata*, male apex of *t3*; 10 — *H. palaestrica*, male, close-set cluster of spinulose setae on mid coxa

Рис. 8–10. 8 — *H villosa*, самец, общий вид; 9 — *H. cristata*, апикальный хохолок на *t3* самца; 10 — *H. palaestrica*, самец, кластер утолщенных щетинок на средней коксе

Discussion. *Hydrotaea mai* Fan, 1965 was described from China, Chinghai (Qinghai prov.), Haiyan [36.9° N, 101.0° E, 3000 m]. It was synonymyzed with *H. palaestrica* Meigen, 1826 by Xue & Chao (Xue, Chao 1998: 903). Fan (Fan 2008: 1020) again proposed *H. mai* as a valid species, which differs from *H. palaestrica* as follows: prealar seta present; frons wider than in *H. palaestrica*; only 1 pair of strong postsutural *ac*; mid coxa on posterior margin with a cluster of 5 setae. The width of the frons and amount of *post ac* setae are variable characters, they differ even in specimens collected in the same place and on the same date. The number of spinulose setae in the close-set cluster on the mid coxa is a character difficult to apply. Sometimes it is clear that the cluster consists of 3 setae, sometimes it presumably consists of 4 setae (Fig. 10), usually it is quite difficult to count these setae. The prealar seta is only applicable to males, in females of *H. palaestrica* (as well as in *H. dentipes* or *H. similis*) it is always present. Among the examined material only one male from Turan, Buryatia, has a distinct prealar seta. However, this male has 2 *post ac* and a cluster on mid coxa consisting of 4 setae, so Fan's diagnostic characters do not correlate with each other. That is why I follow Xue and Chao (Xue, Chao 1998) and regard *H. mai* as a synonym. Pont (Pont 2024) also regarded *H. mai* as a synonym.

Hydrotaea similis Meade, 1887

Fig. 5

Material examined, about 110 specimens from: BELARUS: *Gomel* and *Vitebsk* Reg.; RUSSIA: *Amur*, *Buryatia*, *Crimea*, *Ivanovo*, *Kaliningrad*, *Krasnodar*, *Kursk*, *Moscow*, *Murmansk*, *Primorsky*, *Pskov*, *Sakha (Yakutia)*, *Yamalo-Nenets* regions.

Distribution. Palaearctic. From W Europe to Far East; in European Russia from 69° N to 43° N.

Hydrotaea taiwanensis Shinonaga & Kano, 1987

Described from a large series from Taiwanese mountains, from elevations of 1600–2400 m. Since 1987, neither Shinonaga nor Kano have ever mentioned this species in their publications. The species has hairy eyes. According to Shinonaga and Kano (1987), *H. taiwanensis* differs from *H. cyrtoneurina* by hardly comprehensible characters of the chaetotaxy of *f1*. I have not proposed synonymy of *H. tai-*

wanensis with *H. cyrtoneurina* only because the differences from *H. cyrtoneurina* (a row of *pv* setae on *t3* and straight, blunted, spinulose *v* setae at basal half of *f2*) were not mentioned in the original description.

Hydrotaea vietnamensis Shinonaga, 1999
Described from Vietnam, Tam Dao, 1000 m [21.53° N, 105.56° E].
Description (Shinonaga 1999) fits *H. dentipes* with 2+3 instead of 2+4 *dc*.

Hydrotaea villosa Stein, 1904
Fig. 8
CHILE, *Los Lagos* Reg., Chiloe Isl., Cucao, 42.64° S, 74.11° W, 24–28.02.2017, A. Medvedev, 1♂ (Fig. 8, ZMUM).
COLOMBIA, Bogota, 201-62, 1♂, 1♀ (MNHN, I believe these are syntypes of *H. villosa*).
Distribution. Known from the western part of South America from Colombia to Chile.
Remarks. When I examined our specimen from Los Lagos, my first identification was *H. cyaneiventris* Macquart, 1851 as it is the oldest name, it fitted the interpretation of *H. cyaneiventris* proposed by de Carvalho & Couri (de Carvalho, Couri 2002) and it was collected at least in the same country. However, I have not seen the lectotype of *H. cyaneiventris* Macquart, 1851 in MNHN, which was designed by Pont (Pont 2012) and, according to Pont, must be in a poor condition. On the other hand, I examined syntypes of *H. villosa* and made descriptive notes which entirely fit the specimen from Los Lagos, as well as Malloch's (Malloch 1923: 669) descriptive notes on *H. villosa*. Thus, the identity of *H. villosa* is clear and I refer to this name in the identification key below.

A separate question is if *H. villosa* is a junior synonym of *H. cyaneiventris* Macquart, 1851. Its resolving requires collecting and examination of series of S American specimens and re-examination of the lectotype of *H. cyaneiventris* Macquart, 1851. Untill that, I prefer to regard *H. cyaneiventris* as a species with doubtful identity.

It is necessary to note that *Hydrotaea cyaneiventris* Macquart, 185**1** should not to be confused with Hydrotoea cyaneiventris Macquart, 1855, later described by the same author under the same name from Australia, which is a junior primary homonym of *Hydrotaea cyaneiventris* Macquart, 1851 and junior subjective synonym of *Hydrotaea rostrata* Robineau Desvoidy, 1830 (Pont 2024).

Key for the *Hydrotaea dentipes* group, ♂♂

1. Eyes bare (Fig. 5, except for *H. kashmirana* and *H. villosa* with short and sparse hairs as in Fig. 6). *t3* without *pv* setae. *f2* in basal half without straight, strong, and spinulose *v-pv* setae (except *H. similis*). **2**
— Eyes covered with long and dense hairs as in Fig 7. *t3* with a row of several *pv* setae (about as long as tibia width). *f2* in basal half with straight spinulose *v-pv* setae, which are distinctly stronger than *a-av* setae (except *H. maculithorax*). . . . . **9 (*H. cyrtoneurina* clade)**
2. Mid coxa on hind inner margin with a closeset cluster of 3–4 blunt spinulose setae (Fig. 10). *t2* with 2 strong *ad* in apical half. Abdomen densely grey dusted with distinct black median vitta. Frontal vitta wider than width of postpedicel. (Prealar seta absent or very weak. Notopleuron bare around *post ntp* seta. *f2* in basal half with shorter (at most 2x femur width) and sparser outcurved *a* and *av* setae than in *H. dentipes*. *t2* without row of short stubbly *ad* hairs. *f3* with fine ventral setae dense but short, at most as long as femur width. *t3* with about 3 *av*.) . . . . . ***palaestrica*** Meigen
— Mid coxa without modified setae. *t2* without strong *ad* (except *H. anxia* with 1 *ad*). Abdomen only finely grey dusted with less distinct median vitta. Frontal vitta narrower **3**
3. Apex of *t3* with ventral tuft of short, dense setae as in Fig. 9. *f2* with long and dense outcurved *a* and *av* setae in basal half, those 2–3x as long as femur width. (Frontal vitta slightly narrower than width of postpedicel. Prealar seta absent. Notopleuron bare around *post ntp* seta. *f2* with straight *pv* setae fine, but dense and long. *t2* without strong *ad*; with a row of short stubbly *ad* hairs. *t3* with about 3 *av*.) **4**

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— *t3* without ventral tuft at apex. *f2* with outcurved *a* and *av* setae shorter in basal half **5**

4. *f3* in basal half with fine ventral setae as long as femur width. Apical tuft on *t3* less distinct. Holarctic..... ***dentipes*** Fabricius

— *f3* in basal half with only short setulae. Apical tuft on *t3* more distinct (Fig 9). Nearctic ..... ***cristata*** Malloch

5. *t3* with 6–8 long *av*. Prealar seta absent. Notopleuron hairy around *post ntp* seta. Body length usually more than 8 mm. (Frontal vitta narrow, almost linear. *f2* with shorter (at most 2x femur width) and more srarce outcurved *a* and *av* setae in basal half. *t2* without strong *ad* seta. *f3* with ventral setae fine and sparse but longer than femur width.) **6**

— *t3* with 2–3 *av*. Prealar seta present. Notopleuron bare or hairy around *post ntp* seta. Body length usually less than 8 mm..... **7**

6. Eyes bare (Fig. 5). Calypters whitish-yellow. *f2* with *pv* setae strong and spinulose. Palaearctic ..... ***similis*** Meade

— Eyes hairy, though with rather short and sparsely hairs (Fig. 5). Calypters light brown. *f2* with *pv* setae fine. N India & Nepal..... ***kashmirana*** Pont

7. *t2* with 1 *ad* near apex; without short stubbly *a* hairs. Presutural part of scutum undusted. One prealar seta. (Notopleuron hairy around *post ntp* seta. Frontal vitta linear. Body with greenish or bluish metallic tint.) Circumpolar Holarctic species ..... ***anxia*** Zetterstedt

— *t2* without *ad* near apex; with a row of short stubbly *ad* hairs. Two prealar seta. N or S America..... **8**

8. Notopleuron bare around *post ntp* seta. Eyes bare or almost so. Body without metallic tint. Nearctic ..... ***houghi*** Malloch

— Notopleuron hairy around *post ntp* seta. Eyes hairy. Body with metallic tint (Fig. 8). Neotropical ..... ***villosa*** Stein

9. Thorax with *Anthomyia*-pattern (Figs 2–4): grey dusted, with 3 presutural and 3 postsutural dark spots. *t2* near apex with *ad* seta or *av* setae. Abdomen densely grey dusted **10**

— Thorax without *Anthomyia*-pattern, glossy black. *t2* without anterior seta(e). Abdomen with only fine grey dusting **11**

10. Body length usually 7–7.5 mm. Thorax (Fig. 12) with an indistinct *Anthomyia*-pattern: dirty black spots on dirty dark grey background with vague borders; postsutural median and lateral spots not fused. Notopleuron densely hairy. *t2* in apical quarter with 1 short, strong *ad*. *f2* in basal half with two rows of strong, spinulose *v* setae. Distance between eye margins more than width of antenna. Fronto-orbital plates entirely matt ..... ***fasciata*** Stein

— Body length 6 mm. Thorax (Fig. 13) with a distinct *Anthomyia*-pattern; postsutural median and lateral spots fused in black transversal band. Notopleuron bare. *f2* in basal half without rows of spinulose *v*, only with fine setae. *t2* in apical quarter with a row of 5–6 fine, longer *av*. Distance between eye margins less than width of antenna. Fronto-orbital plates partly shining ..... ***maculithorax*** Stein

11. Calypters yellow. Wings with yellowish tint. (♀: frontal triangle and fronto-orbital plates dusted.) Palaearctic and N Oriental ..... ***cyrtoneurina*** Zetterstedt

— Calypters dark brown. Wings with brownish tint. (♀: frontal triangle and fronto-orbital plates glossy.) Afrotropical ..... ***fumifera*** Walker

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