

TAXONOMIC NOTES ON THE *HYDROTAEA IRRITANS* SPECIES-GROUP
(DIPTERA, MUSCIDAE)

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[Вихрев Н.Е. Заметки по таксономии видов группы *Hydrotaea irritans* (Diptera, Muscidae)]

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Ключевые слова: *Hydrotaea irritans* species-group, Muscidae, Diptera

Summary. The revised key for males of the *Hydrotaea irritans* species-group is proposed. Difficulties with identification of females of the *H. irritans* group are discussed. New distributional data for species of the *H. irritans* group and redescription of the little known *H. himalayensis* Pont, 1975 are given.

Резюме. Предложен полностью переработанный ключ по самцам группы *Hydrotaea irritans*. Обсуждаются проблемы определения самок. Приведены новые данные по распространению видов группы *H. irritans* и дано переопределение малоизвестного вида *H. himalayensis* Pont, 1975.

INTRODUCTION

The closeness between several species of *Hydrotaea* Robineau-Desvoidy, 1830 considered in the present paper was first noted by Hockett [1954]. Hennig [1962] included them into the *Hydrotaea irritans* species-group with 7 species: *H. borussica* Stein, 1899 (Eurosiberian); *H. irritans* (Fallen, 1823) (Eurosiberian); *H. meridionalis* Portschinsky, 1882 (W Europe, Crimea, Caucasus); *H. pandellei* Stein, 1899 (Eurosiberian); *H. pellucens* Portschinsky, 1879 (W Europe); *H. penicillata* (Rondani, 1866) (Submediterranean) and *H. scambus* (Zetterstedt, 1838) (Holarctic). After Hennig's revision, *H. himalayensis* Pont, 1975 was described from the North of the Oriental region, but the material listed below shows that *H. himalayensis* is rather a Palaearctic species confined to high mountain regions of Central Asia and the Caucasus.

Males of *H. irritans* group have *f3* and *t3* strongly curved; *f2* ventrally with strong spines; *t3* with a tuft of approximated setae on ventral surface (see: *Material and Methods*), arista relatively long haired (at least subequal to arisal basal diameter). Females of *H. irritans* group have the frontal triangle, fronto-orbital plates and parafacialia densely dusted; *prst ac* hair-like, strong *prst ac* setae absent; *t3* with *pd* seta.

It seems that the center of biodiversity of the *H. irritans* group is in Europe. From Europe, several species spread to Siberia, the northernmost one (*H. scambus*) to the Nearctic and several species reached the Caucasus, probably in one of the glacial epochs. The *H. irritans* group is poorly represented in East Palaearctic, only one species is recorded from Japan; only two species are formally listed for China*; it is absent in Africa and South Asia. That also supports the European origin of the species-group.

* *H. pandellei* and *H. scambus* formally listed for China as belonging to the *H. irritans* group in couplet 17 in [Xue et al., 2007: 283-284, "hind femur long and curved, swollen on distal half; hind tibia curved weakly S-shaped, becoming broad on distal half, on ventral surface with setae or a cluster of setae (*irritans* species-group) . . . 17"]. Apart from these two species, several more taxa described from China may well belong to this group too. At least, *H. scambus changbaiensis* Xue, Zhang & Liu, 1994 surely should belong to the same group. This subspecies is con-

sidered in couplet 45 in [Xue et al., 2007: 288] together with *H. zhaomenga* Xue, 1994 without any mention of the *H. irritans* group. The difference between *H. scambus changbaiensis* and *H. scambus scambus* is unclear, while the data on *H. zhaomenga* is contradictory: in Xue et al. [1998: 907, Fig. 2103Fp], the male *t2* of *H. zhaomenga* is shown with 2 *p* and 1 *pv* setae, whereas in Xue et al., [2007] there is no mention of *pv* seta on *t2*. One more possible Chinese species from the *H. irritans* group is *H. subscambus* Xue, Wang & Du, 2007 named so due to "its similarity to *H. scambus*", but differs "from the latter by the fuscous male calypter; mid tibia without *pv*, [with] 2 *p*; hind tibia straight..." [Xue et al., 2007: 295]. In my opinion, it is not possible to infer any relevant information from the available publications of the cited Chinese authors, so I had not included these species into the *H. irritans* group in the present paper.

Examination of large series of specimens suggested that presence of the yellow colour on abdomen, which is used in most keys [Hennig, 1962; Fonseca, 1968; Gregor et al., 2002] as an important diagnostic character, may be a matter of variation. This circumstance, along with consideration of the little known species *H. himalayensis* Pont, 1975, demanded a revision of the identification key for this group. In the revised key I use the presence/absence of the yellow colour on the abdomen as a secondary diagnostic character at most.

Identification key is given for males only, the identification of the females in the *H. irritans* group is especially difficult, for example, females of *H. irritans* and *H. penicillata* are regarded as "not reliably distinguishable" [Gregor et al., 2002]. In the *Note on identification of females* I report the problems I met in identifying females of *H. borussica*, *H. pandellei* and *H. meridionalis*. I came to conclusion that the presence of a pair of undusted spots on tergite 3 most probably is neither a specific character of *H. borussica*, nor a diagnostic character at all, but a feature of aged females of different species. If so, the faunistic records of species of the *H. irritans* group should be revised, because they often based on female specimens. For this reason I included in the distribution data only records based on male specimens. In *Material examined* I listed females of *H. borussica*, *H. irritans*, *H. meridionalis* and *H. pandellei*, collected in association with males, in brackets and with "?" mark and didn't mention females not associated with males.

MATERIAL AND METHODS

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

ZIN – Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia;

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

The names of the collectors are abbreviated as follows: KT – Konstantin Tomkovich, NV – Nikita Vkhrev. Geographical coordinates are given in the Decimal Degrees format.

The following abbreviations for morphological structures are used: *fl*, *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.

The presence on the ventral surface of *t3* a tuft of setae is an important diagnostic character in males of the *H. irritans* group, the only species without this ventral tuft is *H. irritans*. The setae forming these tufts are set closely at their base and are even more converging at apex. There are two types of this tuft. The submedian tuft (*mtuft*) is situated at middle of tibia or slightly below middle and consists of several longer and apically curved setae. The subapical tuft (*atuft*) is situated distinctly below middle, in apical third of tibia and consists of a several shorter and straight setae. Both *mtuft* and *atuft* are always located at strictly ventral position. At the same level as *atuft* the spinulose *av* to *v* setae of various length are often present; if these setae are not approximated basally and apically I do not refer to these setae as a “tuft” in the key.

SYSTEMATICS

Hydrotaea borussica Stein, 1899

Col. pl. III: 5

Material examined.

Syntype, ♂: 8.08.1891 (former Gross-Raum Königsberg, presently **Russia, Kaliningrad** reg., Ryabinovka, 54.42N 20.65E [Pont, 2013: 61]) (ZMHU).

Germany, Ludwigsthal [49.06N 13.24E], 13.07.1911, 1♂, (ZMHU).

Russia: Chelyabinsk reg.: Zlatoust env., 55.3°N 59.8°E, 850 m asl, 18-24.07.2008, KT, 2♂, (7♀?); **Ivanovo** reg.: Ivanovo env. [≈57.0°N 41.0°E], 15.06.1965, G. Veselkin, 1♂; **Krasnodar** reg.: Sochi distr., Psekhako Mt. 2000 m asl, 43.69°N 40.37°E, 14-18.VI.2008, KT, 1♂; Adygea, Lagonaki plateau, 44.0°N 40.1°E, 700 m asl, 28.06.2011, NV, 2♂; **Krasnoyarsk** reg.: Krasnoyarsk env., 56.11°N 92.13°E, 14-23.07.2009, KT, 1♂, (4♀?); **Moscow** reg.: Dmitrov Distr., 56.31°N 37.76°E, 04-26.07.2008-9, NV, 24♂, (51♀?); **St-Petersburg** reg. (=Leningrad oblast): Luga distr., 23.06-14.07.1955-68, A. Stackelberg, 13♂ (ZIN); Kiperot Pen., 60.48°N 28.55°E, 20.07.2012, KT, 5♂; **Tver** reg., Derbovezh L., 56.33°N 31.97°E, 21.06.2012, NV, 1♂.

Distribution. Europe; Caucasus; Asian Russia: S Ural (Chelyabinsk reg.) and W Siberia: Novosibirsk reg. [Sorokina, 2006] and Krasnoyarsk reg.

Hydrotaea himalayensis Pont, 1975

Col. pl. III: 1-3

Material examined.

Kazakhstan, Shymkent prov., Aksu-Zhabagly Nat. Res., [≈ 42.4°N 70.5°E], 21 and 28.05.1966, L. Zimina, 2♂.

Russia, Krasnodar reg.: Sochi distr., Psekhako Mt., 43.69°N 40.37°E, 2000 m asl., 14-18.06.2008, KT, 1♂; Lagonaki plateau, 44.014°N 39.980°E, 1900 m asl, attracted on human body, 13.06.2012, NV; 1♂.

Tajikistan: Dushanbe reg.: Gissar Range, Varzob gorge env., 38.835°N 68.964°E, 1900 m asl, 2-4.06.2010, KT, 1♂, (2♀?).

Distribution. Europe: Russia, Krasnodar reg.; Asia: India, Kashmir state [Pont, 1975]; Kazakhstan, Shymkent reg.; Tajikistan, Dushanbe reg. All records are from the altitudes from 1900 m asl and higher.

Remarks: Type locality of this species is: India, *Kashmir* reg., Gulmarg [34.06°N 74.38°E], 2650 m asl. Usually India is regarded as a part of the Oriental region but the North-Indian fauna is a mixture of the Palaeartic and Oriental species and at the altitudes above 2500 m asl the Palaeartic component predominates over the Oriental one. The ZMUM material listed above prove these considerations, *H. himalayensis* seems to be a high mountain species widely distributed in Central Asia and the Caucasus. The records from Krasnodar region of Russia show that *H. himalayensis* should even be included into European fauna.

Identification of the examined specimens as *H. himalayensis* seemed to me doubtful. However recently Dr. Vera Sorokina (Novosibirsk) kindly examined the holotype of *H. himalayensis* in Natural History Museum, London. According to her (pers. comm.) the ZMUM specimens are similar to the holotype, some minute differences do not exceed variability between specimens from the Caucasus and Central Asia, so I incline to believe that the ZMUM specimens belong to *H. himalayensis*. *H. himalayensis* has the following set of diagnostic characters: thorax shining black with a reduced dusting (as in *H. scambus*); *f2* with ventral spines of the *H. borussica* type shown on Fig. 5; *t2* with elongated *ad* setulae; mid basitarsus with a brush of *pv* setulae (much less dense and shorter than in *H. irritans*) and sparse row of *a-av* setulae; *f3* with a complete row of strong and dense *av* setae; *t3* with *mtuft* absent and *atuft* present; halteres black; abdomen black.

The description of *H. himalayensis* by Pont [1975] is detailed and clear, but it was based on a single and old specimen, so I think that redescription based on fresh and more representative material will be useful.

Redescription

Male: black species, body length 6-7.5 mm (col. pl. III: 1).

Head. Eyes bare, minimal distance between eyes equal to diameter of anterior ocellus. Fronto-orbital plates touch in middle, interfrontalia visible only in anterior and posterior thirds of frons.

Parafacial 0.5x as wide as width of antenna, gena linear. Fronto-orbital plates, interfrontalia, parafacials, gena and occiput matt black. Fronto-orbital plates with 9-12 pairs of stronger inclinate setae in lower 2/3 and with 2-3 pair of weaker reclinate setulae. Antenna black, arista with hairs subequal or slightly shorter than basal diameter of arista. Palpi black, mentum of proboscis thinly dusted.

Thorax entirely shining black, without dusting, densely covered with long ground setulae.

Chaetotaxy: *prst ac* hairs in about 6 dense rows; 2+4 *dc*; 1+2 intraalar; 1+2 supraalar; katepisternal setae 1+1, meron and katepimeron bare, notopleuron hairy. Wing clear, base conspicuously yellow. Calypters yellow, haltere black.

Legs black. *f1* with two typical ventral hooks at apex; a row of *pd* setae; dense hairs on *p* surface and 3-4 long *pv* setae at basal 1/4. *t1* emarginate on ventral surface in basal

half; in apical half with a row of 7-8 stronger *pv* setae (2 times as long as tibia width) and with 8-9 shorter and finer *pv-v* hairs. *f2*: *a*, *v* and *p* surfaces covered with fine hairs about as long as femur width; basal half of *v* surface with 6-9 strong blunt spine-like setae placed in 2-3 irregular rows; 2 *p* preapicals. *t2* with 2 strong *p* setae and with a complete row of fine *ad* hairs (about as long as tibia width). Mid basitarsus with a brush of *pv* setulae (much less dense and shorter than in *H. irritans*) and sparse row of *a* setulae. *f3* elongated and curved; a complete row of *av* setae consists of 5-7 long (2-3 times as long as femur width) setae at apical 1/3 and less long (slightly longer than femur width) setae on basal 2/3; a usual *ad* row present. *t3* S-shaped; chaetotaxy: 10-14 *ad* setae in basal 2/3; *atuft* of 3-5 close-set straight setae (about as long as tibia width); 2 long *pd* setae in apical 1/3; dense *av* to *pv* setae in apical 1/3.

Abdomen black, densely grey dusted, black median vitta wide and distinct on tergites 1+2 and 3, narrow and less distinct on tergites 4 and 5. Male terminalia shown on col. pl. III: 2-3, though it has a low diagnostic value in *Hydrotaea*.

Note. Available specimens from the Caucasus are more robust than from Central Asia. The length of the row of *ad* setulae on *t2* and *a* setulae on mid basitarsus is variable, this length does not correlate with the Caucasian versus Central Asian origin of the specimens. Setae forming *atuft* are weak in Central Asian and stronger in Caucasian specimens.

Female. Two females collected together with male in Tajikistan are provisionally assumed to belong to *H. himalayensis*. Females have dull black fronto-orbital plates and greyish-black palpal and gena; presutural *ac* hair-like; halter black.

Hydrotaea irritans (Fallen, 1823)

Material examined.

Abkhazia: Ritsa Lake, 43.474°N 40.514°E, 1200 m asl, 3.06.2012, O. Mosolov, 6♂, (2♀?).

Russia: *Chelyabinsk* reg.: Zlatoust env., 55.3°N 59.8°E, 850 m asl, 18-24.07.2008, KT, 6♂, (5♀?); *Krasnodar* reg.: Sochi distr., Psekhako Mt. 2000 m asl, 43.69°N 40.37°E, 14-18.06.2008, KT, 11♂; Adygea, Lagonaki plateau, 44.11°N 40.02°E, 1500 m asl, 15-17.06.2009, KT, 12♂, (6♀?); Khos-ta env., 43.53°N 39.88°E, 100-300 m asl, 24.06.2011, NV, 5♂; *Krasnoyarsk* reg.: Krasnoyarsk env., 56.11°N 92.13°E, 14-23.07.2009, KT, 2♂, (7♀?); *Mordovia* reg.: 54.8°N 43.3°E, 30.06.1982, G. Veselkin, 1♂; *Moscow* reg.: Dmitrov Distr., 56.31°N 37.76°E, 04-26.07.2008-9, NV, 2♂; *Novosibirsk* reg., Lysaya Sopka, 55.08°N 83.88°E, *Stipa pennata* steepe, 6.06.2013, O. Kosterin, 1♂; *Ryazan* reg., Kasimov env., Zalesnoe, 54.969°N 41.327°E, 23.07.2013, NV, 1♂.

Turkey: *Bolu* prov.: Kibricik env., 1450 m asl, 40.45°N 31.87°E, 31.VIII.2009, NV, 1♂, (3♀?); Kartalkaya env., 1600-1700 m asl, 40.62°N 31.81°E, 16-18.VI.2010, NV, 12♂, (12♀?).

Distribution. Europe; Turkey; Asian Russia: Chelyabinsk reg., Altai Republic reg. [Sorokina, 2012], Krasnoyarsk reg., Novosibirsk reg., Tyumen reg. [Sorokina & Pont, 2010].

Hydrotaea meridionalis Portschinsky, 1882

Col. pl. III: 7

Material examined.

Lectotype, ♂: [Ukraine, *Crimea*] Tauria, designated by A. Pont 2000 (ZIN), without abdomen and right hind leg, otherwise in good condition.

Abkhazia: Ritsa Lake, 43.474°N 40.514°E, 1200 m

asl, 3.06.2012, O. Mosolov, 1♂.

Germany: Pichelsberg, 30.06-8.07, 3♂; Sachsen, Genthin, 27.07.1892, prof. P. Stein, 2♂ (ZMHU); Westpr., Rosenberg, coll. Duda, 2♂ (ZMHU).

Russia: *Krasnodar* reg.: Sochi distr., Psekhako Mt. 2000 m asl., 43.69°N 40.37°E, 14-18.06.2008, KT, 4♂, (2♀?); Adygea, Lagonaki plateau, 44.11°N 40.02°E, 1450 m asl, 15-17.06.2009, KT, 17♂, (13♀?); Adygea, Lagonaki plateau, 44.01°N 40.03°E, 1500 m asl., 28.06.2011, NV, 1♂; Dakhovskaya env., 44.20°N 40.15°E, 500 m asl, 12.06.2012, KT, 1♂.

Distribution. Reliably known from W Europe, Crimea [Portschinsky, 1882] and the Caucasus. Probably present in Turkey, but no male specimen is so far known from this country. As far as I know, several records for Siberia given by Sorokina and Pont [2010] are based on female specimens only, which may belong to the type IV females of *H. borussica* (see *Note on identification of females* below). My doubts are supported by the fact that *H. borussica* is reliably known from Siberia whereas the nearest to Siberia records of *H. meridionalis* are in 3000-4000 km South-West.

Hydrotaea pandellei Stein, 1899

Col. pl. III: 4, 6

Material examined.

Germany, Reinerz, 28.06, Riedel, 4♂, (ZMHU).

Italy, Sudtirol, Schutt am Weissen Knott, 2030 m, 29.06-4.07.2009, C. Lange & J. Ziegler, 1♂, (ZMHU).

Kazakhstan, E-Kazakhstan reg., 49.22°N 87.19°E, 2300 m asl, 01.07.2012, O. Kosterin, 4♂.

Russia: *Chelyabinsk* reg.: Zlatoust env., 55.3°N 59.8°E, 850 m asl, 18-24.07.2008, KT, 1♂; *Khanty-Mansi* reg.: Khanty-Mansiysk, 60.9°N 68.7°E, 7-13.07.2010, KT, 1♂; *Krasnoyarsk* reg.: Krasnoyarsk env., 56.11°N 92.13°E, KT, 13-19.06.2011, 4♂; *Moscow* reg.: Dmitrov distr., 56.31°N 37.76°E, 08.06-08.07.2007-09, NV, 11♂, (40♀?); *Murmansk* reg.: Laplandskiy Nat. Res. [≈67.6°N 32.7°E], 19-30.07.1975, V. Sychevskaja, 5♂, (10♀?); *Novosibirsk* reg.: 54.54°N 83.37°E, on *Marmota baibacina* holes, 21.06.2012, O. Kosterin, 2♂, (7♀?); *St-Petersburg* reg.: Luga distr., 25.06-06.07.1956-67, A. Stackelberg, 3♂ (ZIN); *Tomsk* reg.: Bakchar [57.0°N 82.1°E], 9-19.07.1972, P. Polyakova, 29♂, (over 300♀?).

Distribution. Eurosiberian, excluding S Europe; Asia: China; Japan; Kazakhstan, E Kazakhstan reg.; Mongolia; Russia: Chelyabinsk reg., Altai Republic reg. [Sorokina, 2012], Krasnoyarsk reg., Khanty-Mansi reg., Kurgan reg. [Sorokina, 2006], Novosibirsk reg., Tomsk reg.

Remarks: I suppose that *H. pandellei* and *H. meridionalis* form the sister clade to other species of the *H. irritans* group, the chaetotaxy of male *f2* (see couplet 1 of the identification key below and col. pl. III: 4 and 5) makes dividing of these two species unmistakable. The keys for *Hydrotaea* [Hennig, 1962; Fonseca, 1968; Gregor et al., 2002] separated *borussica-meridionalis-pellucens* from other species of *Hydrotaea* by the yellow base of abdomen, so any special comparison of yellowish-abdomened *Hydrotaea* species with *H. pandellei* seemed unnecessary. However some specimens of *H. pandellei* from the western part of the natural range (e.g. from Germany or St-Petersburg reg., Russia) have the base of abdomen more or less yellowish (col. pl. III: 6). Often the yellow-abdomen specimens of *H. pandellei* in collections of ZIN and ZMHU were erroneously identified as *H. pellucens* or *H. meridionalis*, indicating that although these specimens are old, collected 50-80 years ago, the abdomen was yellow(ish) when the specimens were fresh. Taking into account the variability of the colour of the abdomen, in the identification key

for the *H. irritans* group given below this character is used as a secondary one only.

Hydrotaea pellucens Portschinsky, 1879

Hydrotaea angulata Stein, 1899

Material examined.

Lectotype, ♂ [Belarus], Mogilev, Dnepr [≈53.89°N 30.34°E], designated by A. Pont 2000 (ZIN), in excellent condition.

Syntype ♂ *H. angulata*, Genthin [Germany, Saxony-Anhalt reg., 52.40N 12.15E], 26.05.1895, (ZMHU)

Germany: Berlin, Pichelsberg, 11.07, 1♂. Berlin, Finken- kung, 30.05.1952, 1♂; Berlin, Spandau, 6-19.06. 1955, 4♂; Frankfurt Oder, M.P. Riedel, 4♂, (all ZMHU).

Russia, St-Petersburg reg.: Yukka [≈60.11°N 30.28°E], 18VI-07.07.1932-33, A. Stackelberg, 4♂ (ZIN); Yukka [≈60.11°N 30.28°E], 23.06.1933, B. Rohdendorf, 1♂.

Distribution. The species seems to be restricted to the western part of Europe. Records for Siberia [Sorokina and Pont, 2010], as far as I know, are based on female specimens and I doubt that being absent even in eastern part of Europe *H. pellucens* is present in Siberia.

Hydrotaea penicillata (Rondani, 1866)

Material examined.

Bulgaria, Bulgarien, Pirin Geb, 1000-1800 m asl, Ban- sko [41.8°N 23.5°E], 15-25.06.1938, Zwick & Roehl, 2♂, (ZMHU).

France, Corsica [*Corsica*], Monte d'Oro [42.14°N 9.10°E], 25-26.07.1899, 2♂, (ZMHU).

Greece: Kerkini Lake env., 41.2°N 23.1°E, 29.V and 07.07.2008, G. Ramel, 2♂.

Turkey: Bolu prov.: Kartalkaya env., 40.62°N 31.81°E, 1600 m asl, 18.06.2008, NV, 1♂.

Distribution. S Europe and Turkey.

Hydrotaea scambus (Zetterstedt, 1838)

Material examined.

Russia: Amur reg.: Zeya env., (≈53.7°N 127.3°E), 7-8.07.1981, A. Ozerov & A. Shatalkin, 2♂; **Karelia** reg.: Biological Station, 66.55°N 33.10°E, 3-4.07.2010, 2♂, A. Ozerov; **Khakassia** reg.: Shira env., 54.5°N 90.1°E, 21-27.06.2011, KT, 2♂; **Khanty-Mansi** reg.: Shapsha, 61.09°N 69.44°E, 14-16.07.2010, KT, 4♀; **Murmansk** reg.: Lap- landskiy Nat. Res. [≈67.6°N 32.7°E], 19-26.07.1975, V. Sychevskaja, 9♀; **Primorsky** reg.: Sikhote-Alin (about 46°N 135°E), 08.08.1978, D. Scherbakov, 1♂; **Tomsk** reg.: Bakchar [57.0°N 82.1°E], 9-19.07.1972, P. Polyakova, 6♂, 41♀; **Sakha (=Yakutia)** reg.: Yakutsk env. [≈62.0°N 129.7°E], 6-14.07.1962, A. Zhelokhovtsev, 2♂, 2♀.

Distribution. Holarctic. In Europe have been found only in Fennoscandia, including Karelia and Murman- sk reg. of Russia. Asia: China; Mongolia; Russia: Amur reg., Altai Republic reg. [Sorokina, 2012], Khakassia reg., Khanty-Mansy reg., Novosibirsk reg. [Sorokina, 2006], Primorsky reg., Tomsk reg., Sakha-Yakutia reg.

Remarks: Males from Amur and Primorsky regions of Russia slightly differ from other examined specimens by presence of a row of fine straight *ad* setulae on *t2*. I think that more material from Far East requires to estimate the taxonomic value of this difference.

Key for males of the *Hydrotaea irritans* species-group

1. Mid femur with 3-4 ventral spines placed all along femur width in one sparse ventral row: 1 spine in basal 1/3, 1-2 spine(s) submedian, 1 spine in apical 1/3, in addition 1-2 weaker spines may present; spines short, as long or hardly longer than femur width (col. pl. III: 4) 2

– Mid femur with more numerous and densely placed ven- tral spines restricted to basal 2/5 of femur; spines placed in 1 to 3 (*v*, *pv*, *av*) rows; the longest spines 1.5-2 times longer than femur width (see col. pl. III: 5) 3

2. *t3* ventrally with *mtuft* absent; *atuft* consists of 5-6 ap- proximated straight setae, slightly longer than tibia width. *t3* with 2 *pd*. Scutum in posterior view only thinly dusted, with subshining vittae. Mid tarsus ventrally with dense curled hairs all along. Halter with a black knob and abdomen dark, densely grey dusted (but some specimens have halter with a brown knob and abdomen basally yel- low). Abdomen dark or yellow in basal half only *pandellei* Stein

– *t3* ventrally with *mtuft* of 4-5 closely approximated, long (2x tibia width), apically curved setae; *atuft* absent. *t3* with 1 *pd*. Scutum in posterior view evenly and densely grey dusted. Mid tarsus bare, at most with several out- standing hairs. Halter with yellow knob. Abdomen yel- low on basal half or more *meridionalis* Portschinsky

3. Eyes densely hairy, hairs at least as long as antenna width. [Ventral spines on *f2* set in 1 row. Halters yellow. Thorax and abdomen densely dusted. *t3* with a row of long (at least twice tibia width) *ad* in basal half. *t3* with *mtuft* consisting of 15-20 long, apically curved setae; *atuft* absent.] *penicillata* (Rondani)

– eyes bare or with short and sparse hairs 4

4. *t3* ventrally with *mtuft* of a single flattened, apically back-curved, long and strong seta; *atuft* absent. *t2* with 1-2(3) *pv* setae in addition to usual *pd* setae. [*f3* with strong straight outstanding *pv* seta before middle. *f2* in basal half with ventral spines in 2-3 irregular rows. Hal- ters black. Processes of sternite 5 apically with a tuft of dense setae. *t1* with remarkably long and strong *d* preapi- cal.] *scambus* (Zetterstedt)

– *t3* with *mtuft* consisting of several not flattened apically curved setae or absent. *t2* without *pv* seta(e) in addition to usual *pd* setae 5

5. Disc of scutum almost undusted, shining black (Fig. 1). Halters black. *f3* with a complete row of strong *av*. [*t3* with *mtuft* absent; *atuft* consists of 3-4 straight setae. *f2* with 7-8 ventral spines placed in 2-3 irregular rows. *t2* with a row of *a* setulae.] *himalayensis* Pont

– disc of scutum with distinct grey dusting. Halters yellow to yellow-brown. Strong *av* restricted to apical 1/3 of *f3* 6

6. *t3* ventrally without both *mtuft* or *atuft* of approximated setae. Mid basitarsus ventrally all along with character- istic brush of setae and hairs: strong setae 1.5 times lon- ger than tarsus width, fine hairs among them shorter and curved apically. Abdomen dark. [Ventral spines on *f2* set in 1 row of 4-5 spines.] *irritans* (Fallen)

– *t3* ventrally with tuft of approximated setae. Mid basytar- sus not as above. Abdomen at least partly yellow 7

7. *t3* ventrally with *mtuft* absent; *atuft* consists of 4-6 straight, shorter (1.5x tibia width) setae. *t3* in basal half with *ad* setae about as long as tibia basal width. Ventral spines at middle of *f2* numerous (15-20) and set in 3 ir- regular rows, *av*, *v* and *pv* spines of about equal length. Abdomen usually yellow only on lateral sides of tergite 1, 2 *pellucens* Portschinsky

– *t3* ventrally with *mtuft* consisting of 15-20 apically curved, long (2.5x tibia width) setae; *atuft* absent. *t3* in basal half with *ad* setae 2-3 times as long as tibia basal width. Ventral spines on *f2* set in 2 regular rows, *v* row with 5-7 strong spines, *pv* row with 4-5 much weaker spines (Fig. 5). Abdomen mostly yellow (ter-

gites 1, 2 to 4) *borussica* Stein

Notes on identification of females

Unfortunately, my observations on females of the *H. irritans* group led me to mostly negative statements, but still I think that these statements are worth to be shared.

Reputedly females of *H. borussica* are thought to be easily distinguishable due to the presence of a pair of undusted spots on tergite 3 [Hennig, 1962; d'Assis-Fonseca, 1968; Gregor et al., 2002]. At the same time the abdomen colour is a matter of disagreement: it is reported as entirely dark, by Hennig [1962] and Gregor et al. [2002] or the abdomen is more or less yellowish at the base according to d'Assis-Fonseca [1968]. D'Assis-Fonseca [1968] mentioned that females with a spotted but dark abdomen collected in late summer were otherwise indistinguishable from very common (in UK) *H. irritans* and presumably regarded such females as a result of hybridization between *H. irritans* and *H. borussica*. I have quite different interpretation of the origin and the diagnostic significance of these shining abdominal spots.

During 5 field seasons I collected material on the small area around my house in Moscow region, Dmitrov distr., 56.318-306°N 37.728-816°E. This circumstance permitted me to presume that fauna of the *H. irritans* group in this area is limited to 3 recorded species only: uncommon *H. irritans*, with only 2 males of this more thermophilic species were collected and two species rather common at semi-open sites like forest edges and forest glades: *H. pandellei* and *H. borussica*. Males and much more numerous females of the latter two species were attracted by human body, freshly trampled grass, rotten meat and faeces. Behaviour of males and females seemed similar, both sexes feed on meat or faeces, but after feeding fly out without copulating or ovipositing. Males *H. pandellei* were collected mostly in June, males *H. borussica* in July. The associated females may be divided into 4 types:

I. With entirely grey abdomen without shining spots on tergite 3.

II. With entirely grey abdomen with 2 more or less distinct shining spots on tergite 3.

III. With abdomen more or less yellowish at base, but still with 2 more or less distinct shining spots on tergite 3.

IV. With abdomen yellow(ish), without any trace of shining spots on tergite 3.

Variability is significant but gradual. The shining abdominal spots vary from large spots extended from the anterior to the posterior margins of the tergite 3 to indistinct small traces of shabby dusting. The presence of yellow colour on the abdomen varies from slight yellowish tint at lateral sides of tergite 1+2 to the yellow colour reaching tergite 5. The presutural *ac* hairs in 4-6 rows, with 0-2 pair of stronger setae. *t3* with 1(2) *av*, 1(2) *ad*, 1(2) *pd*.

In June the majority of females belonged to types I and II, in July females of all types were present, in August the majority of females belonged to types III and IV.

The best explanation of this data in my opinion is:

1. The presence or absence of shining spots on tergite 3 is not a genetic character, but a result of wiping of abdominal dusting by wings in aged female specimens.

2. The abdominal spots may present in females of several species of the *H. irritans* group: my females of types I and II belonged to *H. pandellei*; females of types III and IV belonged to *H. borussica*; while the Fonseca's late summer "hybrid *irritans*" probably belonged to *H. irritans*. Females of *H. pandellei* and *H. borussica* collected in Dmitrov district might be preliminary divided by the following key couplet:

– abdomen entirely dark. Halter with whitish stalk and brownish knob. Presutural *ac* usually all hair-like. June – July *pandellei* Stein
– abdomen more or less yellowish. Halter with yellowish stalk and knob. Presutural *ac* usually with 1-2 pairs of stronger setae. July – August *borussica* Stein

This key couplet fits ZMUM female specimens from other localities but less confidently because fewer specimens are available and they were collected during only short period during only one field season. For example, there is a series collected by K. Tomkovich in mid June in the Caucasus which consists of dozen males of *H. meridionalis*, a single male of *H. borussica* and dozen females with yellowish abdomen which are indistinguishable from type IV females from Moscow region. These females could belong to *H. meridionalis* but I suspect that more probably they belong to *H. borussica*. In this case females with entirely yellow abdomen collected by me in August in mountains of Turkey would belong to *H. meridionalis*, but unfortunately no male was collected in the Turkey to prove or disprove this interpretation. So, the problem of identification of females of the *H. irritans* group remains open.

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COLOR PLATE III

ЦВЕТНАЯ ТАБЛИЦА III



Hydrotaea himalayensis Pont: male lateral view – 1; terminalia dorsal – 2; terminalia lateral – 3. Mid femur, posterior view: *Hydrotaea pandellei* Stein – 4; *Hydrotaea borussica* Stein – 5. *Hydrotaea pandellei* Stein, male with yellowish abdomen – 6; *Hydrotaea meridionalis* Portschinsky, male – 7.