Russian Entomol. J. 30(3): 345–360

A review of the shore-fly genus *Ephydra* Fallén, 1810 (Diptera: Ephydridae) of Russia

Обзор видов мух-береговушек рода *Ephydra* Fallén, 1810 (Diptera: Ephydridae) фауны России

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KEY WORDS: Diptera, Ephydridae, *Ephydra*, new species, Russia, description, key.
КЛЮЧЕВЫЕ СЛОВА: Diptera, Ephydridae, *Ephydra*, новый вид, Россия, описание, определительная таблица.

ABSTRACT. The species composition and distribution of the shore-flies of the genus *Ephydra* Fallén, 1810 (Diptera, Ephydridae) of the fauna of Russia are completely revised for the first time. In total, 9 species were found: *E. afghanica* Dahl, 1961, *E. attica* Becker, 1896, *E. glauca* Meigen, 1830, *E. japonica* Miyagi, 1966, *E. macellaria* Egger, 1862, *E. pseudomurina* Krivosheina, 1983, *E. riparia* Fallén, 1813, *E. scholtzi* Becker, 1896, and one new species, *E. villosa* sp.n. The new species belongs to the *glauca* species group and differs from *E.glauca* in the number of intra-alar setae and inwardly curved surstyli covered with long setae. It was found in Irkutsk Oblast. The data on the distribution of *Ephydra* species on the territory of Russia and the Palearctic Region are updated. *E. attica* is recorded from Kazakhstan, Uzbekistan, Tajikistan, Turkey and Morocco for the first time; *E. glauca* is newly recorded from Ukraine, Kazakhstan and Uzbekistan; likewise, the following represent new country records, *E. macellaria* for Kyrgyzstan, Tajikistan and Mongolia; *E. pseudomurina* for Ukraine, Azerbaijan, Georgia, Kazakhstan and Tajikistan; *E. riparia* for Kazakhstan and *E. scholtzi* for Tajikistan. A key to species found on the territory of Russia is compiled.

РЕЗЮМЕ. Впервые полностью ревизованы состав и распространение мух-береговушек рода *Ephydra* Fallén, 1810 (Diptera, Ephydridae) фауны России. Всего обнаружено 9 видов: *E. afghanica* Dahl, 1961, *E. attica* Becker, 1896, *E. glauca* Meigen, 1830, *E. japonica* Miyagi, 1966, *E. macellaria* Egger, 1862, *E. pseudomurina* Krivosheina, 1983, *E. riparia* Fallén, 1813, *E. scholtzi* Becker, 1896, и один новый для науки вид *E. villosa* sp.n. Новый вид относится к группе видов *glauca* и отличается от *E.glauca* количеством интраалярных щетинок и загнутыми вовнутрь сурстилями, покрытыми длинными щетинками. Он найден в Иркутсткой области. Уточнены данные по распространению видов *Ephydra* на территории России и Палеарктики. *E. attica* впервые найден в Казахстане, Узбекистане, Таджикистане, Турции и Марокко; *E. glauca* — на Украине, в Казахстане и Узбекистане; *E. macellaria* — в Киргизии, Таджикистане и Монголии; *E. pseudomurina* — на Украине, в Азербайджане, Грузии, Казахстане и Таджикистане; *E. riparia* — в Казахстане и *E. scholtzi* — в Таджикистане. Составлена определительная таблица видов, встречающихся на территории России.

Introduction

The genus *Ephydra* currently includes 34 species of the world fauna [Mathis, Zatwarnicki, 1995; El-Moursy *et al*., 2006]. Their distribution across zoogeographic regions is uneven, with 19 species recorded from the Palaearctic Region, 12 species from the Nearctic Region, 4 species known from the Afrotropical Region, 1 species from the Oriental Region, 3 species

How to cite this article: Krivosheina M.G., Ozerov A.L. 2021. A review of the shore-fly genus *Ephydra* Fallén, 1810 (Diptera: Ephydridae) of Russia // Russian Entomol. J. Vol.30. No.3. P.345–360. doi: 10.15298/rusentj.30.3.15

from the Neotropical Region, and 1 species from the Australasian-Oceanian Region.

Most of the species are distributed in one zoogeographic region only; however, 6 species are known from the territory of two or more regions: *Ephydra riparia* Fallén, 1813 is the only Holarctic species; *E. macellaria* Egger, 1862 and *E. flavipes* (Macquart, 1844) are registered in the Palearctic and Afrotropical Regions, *E. japonica* Miyagi, 1966 — in the Palaearctic and Oriental Regions, *E. packardi* Wirth, 1971 — in the Nearctic and Neotropical Regions, and *E. millbrae* Jones, 1906 — in the Nearctic, Neotropical and Australasian-Oceanian Regions [Mathis, Zatwarnicki, 1995].

For the territory of Russia, taking into account the current synonymy, 4 species have been previously indicated: *E. scholtzi* Becker, 1896, *E. glauca* Meigen, 1830, *E. riparia*, and *E. macellaria* [Nartshuk, 1970].

Subsequent studies made it possible to identify additional 5 species: *E. afghanica* Dahl, 1961, *E. attica* Becker, 1896, *E. japonica*, *E. murina* Wirth, 1975 and *E. pseudomurina* Krivosheina, 1983 [Krivosheina, 2010; Przhiboro, Shadrin, 2012].

The study of the collection materials of the Zoological Museum of Moscow State University (ZMUM) and the Zoological Institute of the Russian Academy of Sciences, St.-Petersburg (ZISP) made it possible to expand our understanding of the composition and the distribution of species of the genus *Ephydra* on the territory of Russia.

The genus *Ephydra* Fallén, 1810 belongs to the tribe Ephydrini [Mathis, Zatwarnicki, 1995]. Among the Palaearctic genera, it is closest to the genus *Setacera* Cresson, 1930 [Krivosheina, Ozerov, 2020].

These two genera are actually similar in habitus and differ from the other representatives of the tribe Ephydrini in the micropubescent or pectinate arista, in the presence of 5 pairs of dorsocentral setae, in straight claws, and in the absence of pulvilli. The essential distinction between the genera is the presence of 2 (*Setacera*) or 3 (*Ephydra*) fronto-orbital setae. The larvae of these genera are also similar, but the creeping welts in the representatives of *Setacera* are less developed, and these larvae are inactive and develop among floating algae, while the larvae of *Ephydra* actively move over the bottom of a water reservoir, periodically coming to the surface, and are attached to algae and other floating substrates immediately prior to pupation [Krivosheina, 1987, 2003]. In addition, the larvae of the genus *Setacera* develop in fresh- and saltish-water reservoirs, and those of the genus *Ephydra*, in salty-water reservoirs only, standing the salinity up to 250‰. The larvae of both genera feed on detritus and microscopic algae and bacteria.

At the present time the genus *Ephydra* is divided into two subgenera: *Halephydra* Wirth, 1971 with the only species *E. gracilis* Packard, 1871, distributed in Australasian/Oceanian, Nearctic and Neotropical Regions and *Ephydra*, differing from it mainly in developed cruciate interfrontal setae and subshining coloration [Mathis, Marinoni, 2016]. Besides Wirth [1975] and subsequent authors distinguished three species groups among *Ephydra*: *bivittata*, with the only palaearctic species *E. bivittata* Loew, 1860, not registered in Russia, *glauca* and *riparia*.

The representatives of the two species groups, *glauca* and *riparia* from the subgenus *Ephydra*, distributed in Russia are discussed in the present work. The list of species is given in alphabetic order. The differences between the two species groups are described in the key.

Material and methods

The specimens examined for this study are deposited in the Zoological Museum, Moscow State University, Russia (ZMUM) and Zoological Institute of Russian Academy of Sciences, St. Petersburg, Russia (ZISP).

The majority of original Russian geographical names are given in transliteration, but names of some large geographical regions follow these indicated in Google Earth software.

The data on distributions are cited as follows: Russia is in the first place, other countries of the world are given after a m-dash [—].The terminology used in the generic and species descriptions follows McAlpine [1981], Cumming & Wood [2009], and Stuckenberg [1999].

Morphological structures used for illustrations were examined with a Nikon SMZ645 zoom stereomicroscope and then photographed using an eTREK DCM900 digital camera attached in place of an eyepiece of monocular microscope. Resulting batches of images were processed with CombineZP software, editing of stacked images was performed in Adobe Photoshop.

Taxonomic part

Genus *Ephydra* Fallén, 1810

Ephydra Fallén, 1810: 22 (feminine). Type species: *Ephydra riparia* Fallén, 1813, designated by Curtis, 1832.

DIAGNOSIS. Medium-sized flies, body length 4–5.5 mm; face prominently convex and pubescent, oral margin with setae; 3 (rarely 4) lateroclinate fronto-orbital and 5 (2+3) dorsocentral setae; claws straight; pulvilli not developed.

DESCRIPTION. Shiny bluish-green metallic or more or less matt pollinose species with broad head and small eyes.

Head. Face strongly swollen with vertical lower portion, covered with hairs, oral margin with a row of strong vertical setae; clypeus hidden (Figs 1, 2). Frons flat, frontal vitta shiny metallic, with a pair of cruciate strong or weak interfrontal setae; 3–4 pairs of lateroclinate fronto-orbital, 1 pair of ocellar, pairs of strong outer vertical and inner vertical setae; postocular setae well developed (Fig. 1) or short and thin (Fig. 2). Antenna blackish, greyish dusted; arista short (very short) pubescent (Fig. 2) or pectinate on dorsal surface (Fig. 6).

1

2

3

4

Figs 1–4. Head, lateral view (1, 2) and scutum (3, 4) of *Ephydra* spp.: 1, 3 — *E. glauca* Meigen; 2 — *E. sholtzi* Becker; 4 — *E. riparia* Fallén.

Рис. 1–4. Голова, сбоку (1, 2) и среднеспинка (3, 4) *Ephydra* spp.: 1, 3 — *E. glauca* Meigen; 2 — *E. sholtzi* Becker; 4 — *E. riparia* Fallén.

Figs 5–6. Wing of *Ephydra riparia* Fallén (5) and antenna of *Ephydra pseudomurina* Krivosheina, lateral view (6).

Рис. 5–6. Крыло *Ephydra riparia* Fallén (5) и усик *Ephydra pseudomurina* Krivosheina, сбоку (6).

Thorax black, pollinose. Acrostichals setulose in many irregular rows at least in front of transverse suture (Fig. 4) or in two distinct rows (Fig. 3), dorsocentrals 2+3, intra-alars (0–2)+(0–2), supra-alars 2+1, postpronotal 1, notopleurals 2, postalars 2. Scutellum black, pollinose, with two pairs of strong setae. Anepisternum with 1 strong seta and a row of long hairs on posterir margin. Katepisternum with 1 strong seta in upper posterior corner.

Wing clear, with brownish tinge, without spots (Fig. 5). Calypters, margins of calypters and halteres yellow.

Abdomen black, pollinose. Structures of male terminalia considerably modified depending on species group (see below).

Ephydra afghanica Dahl, 1961
Figs 7, 16, 25, 34.

afghanica Dahl, 1961: 87 (*Ephydra*). Type-locality: Dahlah, Qandahar (22 km N) (Afghanistan).

MATERIAL. **Astrakhan' Oblast**: Lake Baskunchak (48.193°N 46.813°E), 2–4.V.2010, K.P. Tomkovich (2 ♂♂, ZMUM); **Khakassia**: salt lake Beljo (54.65ºN 90.18ºE), 382 m, 1–3.VII.2011, K.P. Tomkovich (1 ♂, ZMUM).

ADDITIONAL MATERIAL. **Armenia**: Parakar (40.164ºN 44.413ºE), 11.IX.1962, V. Richter (1 ♂, ZISP); **China**: Kurlyk [= Lake Hurleg Hu, 37.28°N 96.89°E], eastern Baingol, Caidam, V. 1895, coll. Roborowsky et Kozlov (1 ♂, ZISP); **Kyrgyzstan**: Lake Issyk-Kul', Rybach'e [=Balykchi] (42.465ºN 76.182ºE), 1600 m, 16.VIII.1969, K. Gorodkov (2 ♂♂, ZISP); **Turkmenistan**: 30 km NW of Ashgabat (38.164ºN 57.960ºE), 16.IV.1983, 18.IV.1983, M. Krivosheina (21 ♂♂, ZMUM); Ashgabat (37.934ºN 58.387ºE), 15.XI.1983, N. Krivosheina (2 ♂♂, ZMUM); Bayram-Ali (37.618ºN 62.162ºE), 18–19.IV.1930, P. Bogush (1 ♂, ZISP); **Uzbekistan**: Aral Sea, Syr-Dar'inskaya Distr., 30.V.1928, N. Olenev, V. Popov (11 ♂♂, ZISP); Golodnaya step' Station [= Gulistan (40.500ºN 68.784ºE)], Khodzh. U.[=Khodzhentskiy uezd], 17.V.1903, G. Yakobson (1 ♂, ZISP); Kzyl-Grad, Kungrad env. (39.889ºN 66.600ºE), 6–8.VII.1939, P. Vel'tishchev (2 ♂♂, ZISP); Mekhnatabadskiy Distr., Yangier (40.276ºN 68.816ºE), 15.V.1980, M. Krivosheina (1 ♂, ZMUM).

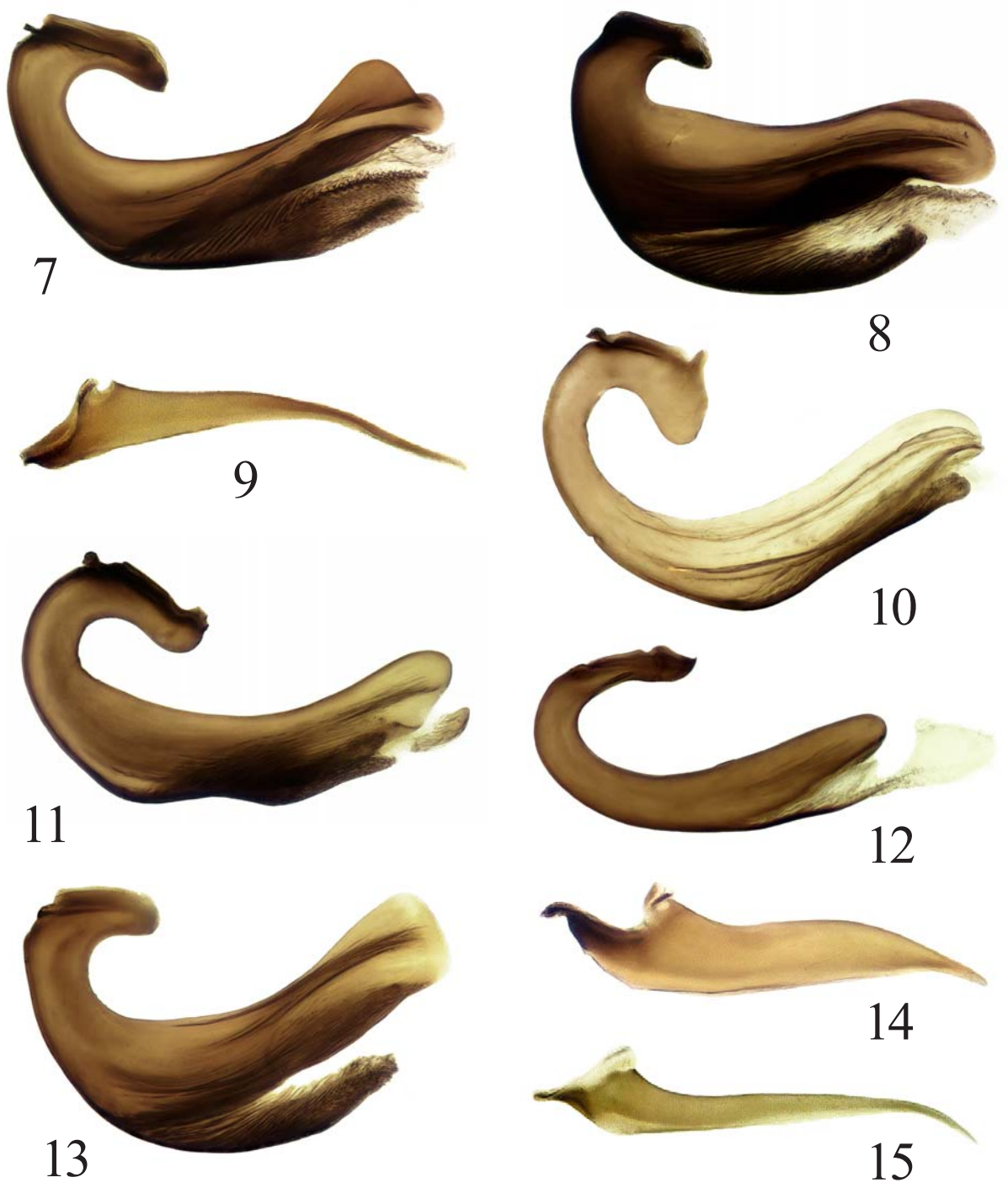
DESCRIPTION. *Head* grey pollinose except metallic shining frontal vitta and upper face, with bluish-greenish tinge; fronto-orbital plate grey pollinose. 3–4 long fronto-orbital setae, anterior interfrontal setae thin and short, no more than 1/3 of ocellar seta. Postocular setae short and thin. Palpus yellow. Antenna blackish, greyish dusted; arista pectinate on dorsal surface. Gena and parafacial golden-grey dusted.

Thorax black, densely golden-grey pollinose. Scutum subshining with brownish stripes. Acrostichals setulose in many irregular rows, intra-alars absent.

Legs yellow, tarsi of all legs sometimes darkened dorsally.

Abdomen black, grey pollinose, subshining with bluish-green tinge. Tergite 5 about 2–2.5 times as long as tergite 4. Male genitalia large, as long as tergites 4+5. Epandrium round-oval in dorsal (posterior) view, surstyli thin and curved, parallel-sided apically (Fig. 25). Epandrium parallel-sided in lateral view (Fig. 34); surstylus straight, narrowed apically, with small median emargination. Aedeagus with broad tip in lateral view (Fig. 7). Gonite stout at base with slender tip in lateral view (Fig. 16).

NOTE. The species resembles *E. attica* in yellow coloration of legs; it is the only species with thin and curved surstyli in dorsal view; this character is clearly



Figs 7–15. Aedeagus of *Ephydra* spp., lateral view: 7 — *E. afghanica* Dahl; 8 — *E. attica* Becker; 9 — *E. glauca* Meigen; 10 — *E. japonica* Miyagi; 11 — *E. macellaria* Egger; 12 — *E. pseudomurina* Krivosheina; 13 — *E. riparia* Fallén; 14 — *E. sholtzi* Becker; 15 — *E. villosa* sp.n.

Рис. 7–15. Эдеагус *Ephydra* spp., сбоку: 7 — *E. afghanica* Dahl; 8 — *E. attica* Becker; 9 — *E. glauca* Meigen; 10 — *E. japonica* Miyagi; 11 — *E. macellaria* Egger; 12 — *E. pseudomurina* Krivosheina; 13 — *E. riparia* Fallén; 14 — *E. sholtzi* Becker; 15 — *E. villosa* sp.n.

visible even in dry specimens.

DISRTIBUTION. Russia: Astrakhan (incl. Krivosheina [2010]), Khakassia. — Palearctic: Afghanistan, Azerbaijan, Bulgaria, China, Jordan, Mongolia, Turkey, Turkmenistan, Uzbekistan (incl. Wirth [1975]; Krivosheina [1986]; Mathis & Zatwarnicki [1995]; Hu & Yang [2002]; Beschovski [2009]); Armenia (**first record**), Kyrgyzstan (**first record**).

Ephydra attica Becker, 1896
Figs 8, 17, 26, 35.

attica Becker, 1896: 222 (*Ephydra*). Type-locality: Athens (Greece).

MATERIAL. **Astrakhan' Oblast**: Lake Baskunchak (48.193°N 46.813°E), 29.IV–4.V.2010, K.P. Tomkovich (38 ♂♂, ZMUM); same place, 17.VI.2003, A. Ovchinnikov (3 ♂♂, ZISP); Kharabali (47.393°N, 47.248°E), salt lake, 4.VI.2009, P. Mel'nik (6 ♂♂, ZMUM); **Crimea**: Kerch env. (45.2ºN 36.1ºE), 26.IV.2014, N. Vikhrev (1 ♂, ZMUM); **North Ossetia – Alania**: Sukhotskoe (43.674ºN 44.442ºE), 30 km SW of Mozdok, 3.VIII.1988, A. Ozerov (5 ♂♂, ZMUM); **Stavropol' Krai**: Stavropol' (45.045ºN 41.973ºE), 5.V.1909, B. Uvarov (1 ♂, ZISP).

ADDITIONAL MATERIAL. **Azerbaijan**: Alekseevka [now Dashtatyuk (38.686ºN 48.748ºE), 12 km SW of Lankaran, 25.VIII.1932, D. Znoyko (1 ♂, ZISP); **Kazakhstan**: Almaty env. (43.283ºN 76.906ºE), 28.VI.1944, A. D'yakonov (1 ♂, ZISP); **Morocco**: Qued Tensift (31.726ºN 8.326ºW), 21.III. and 25.III.2009, N. Vikhrev (2 ♂♂, ZMUM); **Tadjikistan**: Tigrovaya balka Nature Reserve (ca. 37.351ºN 68.485ºE), Dzhilikul' env., 17.IV.1988, N. Krivosheina (1 ♂, ZMUM); **Turkey**: Dilek Milli Park (ca. 37.66ºN 27.14ºE), 12.XII.2006, N. Vikhrev (1 ♂, ZMUM); Samandag env. (36.089ºN 35.975ºE), 14–16.IV.2010, N. Vikhrev (1 ♂, ZMUM); Kopru (37.075ºN 31.232ºE), 10.IX.2009, N. Vikhrev (1 ♂, ZMUM); **Uzbekistan**: Aral Sea, Syr-Dar'inskaya Distr., 30.V.1928, N. Olenev, V. Popov (6 ♂♂, ZISP).

DESCRIPTION. *Head* golden or silvery-grey-bluish pollinose except metallic shining frontal vitta and upper face; fronto-orbital plate grey pollinose. 3–4 long fronto-orbital setae, 3 interfrontal setae thin and short, anterior seta strongest, 1/3 as long as ocellar. Postocular setae short and thin. Palpus yellow. Antenna blackish, greyish dusted; arista pectinate on dorsal surface on 2/3. Gena and parafacial grey dusted.

Thorax black, grey pollinose. Scutum grey pollinose, subshining with greenish tinge. Acrostichals setulose in many irregular rows, intra-alars absent.

Legs. Femora from yellow to black, grey dusted; tibiae and tarsi yellow, darkened dorsally.

Abdomen black, grey pollinose, subshining with bluish tinge. Tergite 5 about to 1.5–2 times as long as tergite 4. Male genitalia large, as long as tergites 4+5. Epandrium round-oval in dorsal (posterior) view (Fig. 26), a little wider near base of surstyli; surstyli straight and widened at apex, parallel-sided apically, with many relatively long perpendicular hairs. Epandrium parallel-sided in lateral view (Fig. 35); surstylus straight, broad, pointed apically. Aedeagus with round tip in lateral view (Fig. 8). Gonite stout at base with round tip in lateral view, subapical process of moderate length (Fig. 17).

NOTE. The species resembles *E. afghanica* in yellow coloration of legs in some specimens, but differs in the shape of surstyli which are widened apically in dorsal view and covered with setae. The specimens with dark tibiae may be separated from *E. macellaria* by the presence of long setae on surstyli; this character is clearly visible even in dry specimens.

DISRTIBUTION. Russia: Astrakhan Oblast (incl. Krivosheina [2010]), Crimea (incl. Krivosheina [2014]), North Ossetia – Alania, Orenburg Oblast [Shayhutdinova, Krivosheina, 2020], Stavropol' Krai. — Palearctic: Algeria, Bulgaria, Canary Islands, Greece, Egypt, Turkmenistan [Wirth, 1975; Mathis & Zatwarnicki, 1995; El-Hawagry *et al*., 2018; Krivosheina, 2010]; Azerbaijan (**first record**), Kazakhstan (**first record**), Morocco (**first record**), Tadjikistan (**first record**), Turkey (**first record**), Uzbekistan (**first record**).

Ephydra glauca Meigen, 1830
Figs 1, 3, 9, 18, 27, 36.

glauca Meigen, 1830: 120 (*Ephydra*). Type-locality: not given (? Germany).

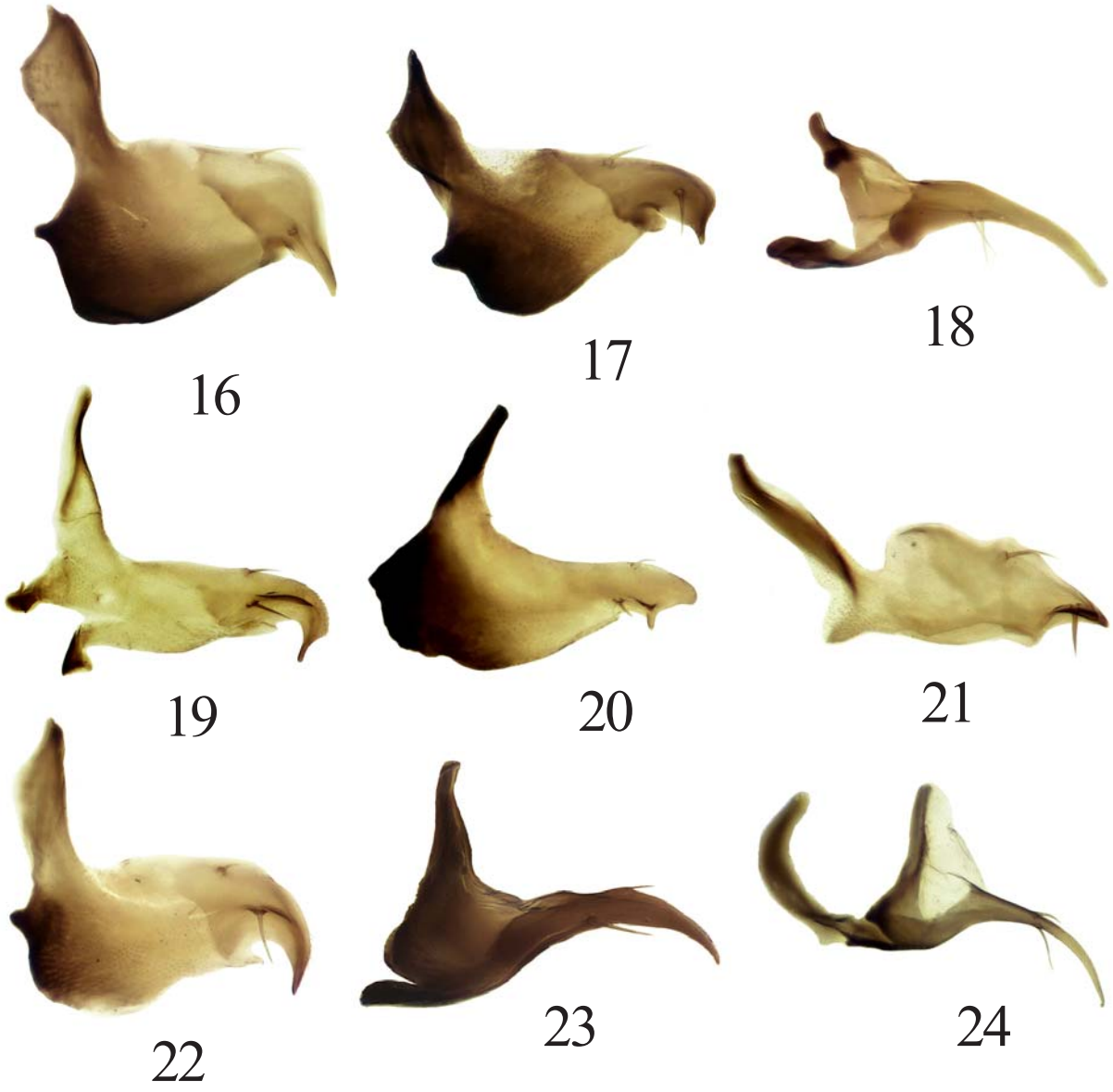
obscuripes Becker, 1896: 222 (*Ephydra*). Type-locality: Sarepta [part of Volgograd] (Russia).

MATERIAL. **Altai**: Klyuchi (52.25ºN, 79.16ºE), lake Klyuchevskoe bank, 20.VI.2009, O. Kosterin (1 ♂, 1 ♀, ZMUM); Lake Kolyvanovskoe (51.363ºN 82.191ºE), 8.IX.2007, O. Kosterin (1 ♂, 1 ♀, ZMUM); **Astrakhan' Oblast**: salt lake Baskunchak (48.193°N 46.813°E), near fresh pond, 2–6.V.2010, K. Tomkovich (7 ♂♂, 1 ♀, ZMUM); same place, 17.06.2003, A. Ovchinnikov (6 ♂♂, 1 ♀, ZISP); **Khakassia**: Borets (54.445°N 90.33°E), salt pond, 28.VI.2011, K. Tomkovich (1 ♀, ZMUM); Lake Shunet (54.419ºN 90.227ºE), 5.VII.1897, Yu. Vagner (1 ♂, ZISP); Prigorsk env. (53.92°N 91.44°E), 15.VII.2017, N. Vikhrev (3 ♂♂, ZMUM); salt lake Beljo (54.65ºN 90.18ºE), 382 m, 1–3.VII.2011, K.P. Tomkovich (4 ♂♂, ZISP); **Novosibirsk Oblast**: Novosibirsk, Zaeltsovsky Park, Ob'-river bank, 15.IX.2007 (2 ♂♂, 2 ♀♀, ZMUM); Novosibirsk, Akademgorodok (54.825ºN 83.113ºE), 1.VII.2009, O. Kosterin (3 ♂♂, 1 ♀, ZMUM); **Omsk Oblast**: Cherlak-Krasny Oktyabr' env. (54.133ºN 75.011ºE), 30.V.2009, O. Kosterin (1 ♂, ZMUM); Omsk, Solenoe Lake (54.885ºN 73.347ºE), 30.VI.2008, O. Kosterin (2 ♂♂, 2 ♀♀, ZMUM); same place, 29.VI.2013, O. Kosterin (2 ♂♂, ZMUM); Omsk, River Irtysh left floodland (54.952ºN 73.355ºE), reeds and salinas, 3.IV.2008, O. Kosterin (4 ♂♂, 3 ♀♀, ZMUM); **Orenburg Oblast**: Irgizly (52.959ºN 57.024ºE), 24.VI.1899, Yakobson & Shmidt (2 ♂, ZISP); **Stavropol' Krai**: Bol'shoy Tambukan (ca. 43.961ºN 43.158ºE), 1909, A. Skorikov, "Ephydra obscuripes Beck., Stackelberg det." (9 ♂♂, 16 ♀♀, ZISP); **Tuva**: Dus-Khol salt lake (51.36ºN 94.45ºE), 700 m, 2–5.VII.2017, N. Vikhrev (2 ♂♂, ZMUM); **Yakutia**: Lake Abalakh (61.676ºN 131.178ºE), 6 km W of Ele-chey, saline meadow near lake, 16.VIII.2011, L. Sivtseva (1 ♂, ZMUM); Lake Mokhsogollokh (salt), Kempendyay env. (62.033ºN 118.651ºE), on water surface, 23.VI.2011, L. Sivtseva (3 ♂♂, 1 ♀, ZMUM); Lake Muosany, 52 km ENE of Kempendyay (62.278ºN 119.44ºE), on water surface, 23.VI.2011, L. Sivtseva (1 ♂, 6 ♀♀, ZMUM); **Zabaikalsky Krai**, 20 km NE of Solov'evsk (49.896ºN 115.699ºE), 22.V.1959, K. Grunin (1 ♂, ZISP).

ADDITIONAL MATERIAL. **Kazakhstan**: SW Kazakhstan, Narynkol [= Raiymbek] District, lake Tuzkol (43.006ºN 79.971ºE), 31.VIII.1959, P. Lehr (3 ♂♂, ZISP); Shortandy (51.698ºN 70.997ºE), 19.VI.1938, B. Kuzin (1 ♂, ZISP); May-Emer, Turgaysk. O., 29.VI.1928, V. Popov (1 ♂, 1 ♀, ZISP); Borovoe [Burabay, 53.083ºN 70.307ºE), 2, 12.VII., 14.VII.2006, N. Dvoretskaya (4 ♀♀, ZMUM); 36 km SSE of Aktogay (46.64ºN 79.861ºE), 400 m, 13.VI.2014, V. Zinchenko (1 ♂, ZISP); **Ukraine**: Golaya Pristan' (46.524ºN 32.521ºE), 18.VII.1977, on decaying plants of salt lake, E. Klechkovskiy (3 ♂♂, ZMUM); Chernomorskiy Nature Reserve (ca. 46.314ºN 31.890ºE), cordon Geroyskiy, 6.VII.1977, E. Klechkovskiy (2 ♀♀, ZMUM); Aleshki (46.62ºN 32.719ºE), 18.VI.1926, L. Zimin (1 ♂, ZISP); **Uzbekistan**: Aral Sea, Syr-Dar'inskaya Distr., 30.V.1928, N. Olenev, V. Popov (5 ♂♂, 1 ♂, ZISP); Ayakguzhumdy (40.738ºN 63.745ºE), 7.VI.1965, E. Nartshuk (1 ♂, ZISP).

DESCRIPTION. Body-length 4.5–5.5 mm.

Head (Fig. 1) grey pollinose except metallic shining frontal vitta, with greenish tinge; upper face pollinose; fronto-orbital plate grey or brownish pollinose. 3–4 (rarely 5) long fronto-orbital setae, 3 pairs of interfrontal setae, of which anterior strong, 1/2 as long as



Figs 16–24. Gonite of *Ephydra* spp., lateral view: 16 — *E. afghanica* Dahl; 17 — *E. attica* Becker; 18 — *E. glauca* Meigen; 19 — *E. japonica* Miyagi; 20 — *E. macellari*a Egger; 21 — *E. pseudomurina* Krivosheina; 22 — *E. riparia* Fallén; 23 — *E. sholtzi* Becker; 24 — *E. villosa* sp.n.

Рис. 16–24. Гонит *Ephydra* spp., сбоку: 16 — *E. afghanica* Dahl; 17 — *E. attica* Becker; 18 — *E. glauca* Meigen; 19 — *E. japonica* Miyagi; 20 — *E. macellari*a Egger; 21 — *E. pseudomurina* Krivosheina; 22 — *E. riparia* Fallén; 23 — *E. sholtzi* Becker; 24 — *E. villosa* sp.n.

ocellar. Postocular setae well developed. Palpus dark, grey pollinose. Antenna blackish, greyish dusted; arista short pubescent on dorsal surface on basal 1/2. Gena and parafacial greyish pollinose.

Thorax black, densely grey pollinose, not subshining. Scutum with brownish fuse spots and stripes (Fig. 3). Acrostichals setulose in two rows, intra-alars 1+(0–2) (Fig. 3).

Legs black, densely grey dusted; tarsi of all legs yellowish ventrally.

Abdomen black with greenish tinge, densely grey pollinose. Tergite 5 approximately equal in length to tergite 4. Male genitalia small, as long as tergite 5. Epandrium elongate in dorsal (posterior) view (Fig. 27), wider in cercal half; surstylus narrowed apically. Epandrium parallel-sided in lateral view (Fig. 36); surstylus is at obtuse angle to epandrium, bifurcate apically, one lobe thin. Aedeagus with slender pointed tip in lateral view (Fig. 9). Gonite stout at base with curved distal part and slender tip in lateral view (Fig. 18).

NOTE. The species differs in acrostichal setae arranged in two rows, presence of well developed postocular setae and dense grey pollinosity, upper face, scutum and abdomen not subshining.

DISTRIBUTION. Russia: Altai, Astrakhan' Oblast, Khakassia, Novosibirsk Oblast, Omsk Oblast, Orenburg Oblast, Stavropol' Krai, Tuva, Volgograd Oblast, Yakutia, Zabaikalsky Krai. — Palearctic: Algeria, Bulgaria, France, Hungary, Italy, Mongolia, Poland, Romania, Turkey [Mathis, Zatwarnicki, 1995]. Kazakhstan (**first record**), Ukraine (**first record**), Uzbekistan (**first record**).

Ephydra japonica Miyagi, 1966
Figs 10, 19, 28, 37.

japonica Miyagi 1966: 137 (*Ephydra*). Type-locality: Hokkaido: Sapporo (Japan).

MATERIAL. **Primorsky Krai**: Kedrovaya Pad' Nature Reserve (43.104ºN 131.512ºE), 26.VI.1940, A. Monchadskiy (1 ♂, ZISP); same place, 25.VIII.1980, A. Shatalkin (2 ♂♂, ZMUM); 40 km SO of Ussuriysk (43.634ºN 132.222ºE), 30.VII.1983, 6.VIII. 1983, A. Ozerov (2 ♂♂, ZMUM); Melkovodnoe (42.861ºN 133. 618ºE), A. Ozerov (9 ♂♂, ZMUM); Posiet (42.67ºN 130.82ºE), seashore, 25–30.VI. and 31.VII.2014, N. Vikhrev (3 ♂♂, ZMUM); Andreevka (42.7ºN 131.1ºE), 25–30.VI.2014, N. Vikhrev (1 ♂, ZMUM).

DESCRIPTION. *Head* golden-grey or bluish-grey pollinose except metallic shining frontal vitta and upper face, with bluish-greenish tinge; fronto-orbital plate grey or brownish pollinose. 3–4 long fronto-orbital setae, anterior interfrontal setae thin and short, no more than 1/3 of ocellar. Postocular setae thin and short. Palpus yellow basally and darkened apically. Antenna blackish, brownish dusted; arista short pubescent on dorsal surface on basal ½ or a little more. Gena grey dusted, parafacial golden.

Thorax black, densely brown pollinose. Scutum dark subshining with brownish stripes. Acrostichals setulose in many irregular rows, intra-alars absent.

Legs. Femora black or yellowish, grey dusted, tibia and tarsi of all legs yellowish, darkened dorsally.

Abdomen black, grey pollinose, subshining with greenish tinge. Tergite 5 golden in some specimens, 2 times as long as tergite 4. Male genitalia large, as long as tergites 4+5. Epandrium round-oval in dorsal (posterior) view (Fig. 28), surstyli straight and not widened at apex, parallel apically. Epandrium of one width in lateral view (Fig. 37); surstylus broad, narrowed but not pointed, round and curved apically. Aedeagus with round tip in lateral view (Fig. 10). Gonite with curved narrow tip in lateral view (Fig. 19).

NOTE. The species is close to *E. riparia*, differing from it in the shape of surstyli, which are not widened apically in dorsal view, and in rounded apex of surstyli in lateral view. Besides, the abdominal tergite 5 of male is golden, contrasting to grey-greenish coloration of other tergites. Our figures of surstyli are made from strictly dorsal position. Turned a little laterally one can see position given by Wirth [1975].

DISRTIBUTION. Russia: Primorsky Krai. — Palearctic: China, Japan (Hokkaido), Korea (South); Oriental: Japan (Ryukyu Islands, Bonin Islands) [Wirth, 1975].

Ephydra macellaria Egger, 1862
Figs 11, 20, 29, 38.

macellaria Egger 1862: 779 (*Ephydra*). Type-locality: Trieste (Italy).

alandica Frey 1909: 12 (*Ephydra*). Type locality: Åland Islands, Hammarudda (Finland).

MATERIAL. **Altai**: Kosh-Agach env. (50.01ºN 88.66ºE), 1750 m, 2–4.VII.2016, N. Vikhrev (3 ♂♂, ZMUM); **Karelia**: Primorsky env. (66.549ºN, 33.133ºE), salt pool, 1.VIII.2018, A.V. Markov (2 ♂♂, ZMUM).

ADDITIONAL MATERIAL. **Kyrgyzstan**: Choktal env. (42.58ºN 76.75ºE), 1600 m, 19–22.IX.2013, N. Vikhrev (1 ♂, ZMUM); **Mongolia**: Uver-Khangayskiy aymak, Samon Boyan Ulan, 1800 m, 3.VI.1987, O. Gorbunov (2 ♂♂, ZMUM); **Tadjikistan**: Tigrovaya balka Nature Reserve, 15.IV.1986, N. Krivosheina (1 ♂, ZMUM); Lochor (38.383ºN 68.704ºE), 19.V.1939, E. Smirnov (1 ♂, ZMUM); **Turkmenistan**: Kushka env. (35.281ºN 62.342ºE), 20.V.1991, A. Ozerov (1 ♂, ZMUM); 30 km NW of Ashgabat (38.164ºN 57.960ºE), 16.IV.1983, 18.IV.1983, M. Krivosheina (2 ♂♂, ZMUM); Ashgabat (37.934ºN 58.387ºE), 15.XI.1983, N. Krivosheina (2 ♂♂, ZMUM); **Morocco**: S of Essaouira, 31.37ºN, 9.71ºW, 25.III.2009, pond, 27.III.2009, sand dune, 28.III.2009, N. Vikhrev (6 ♂♂, ZMUM); Marrakech, Qued Tensift, 21.III.2009 N. Vikhrev (1 ♂, ZMUM); **Canary Islands**: Tenerife, Teno Peninsula, temporary pool, lowland, 25–30.III.2011, N. Vikhrev (10 ♂♂, ZMUM).

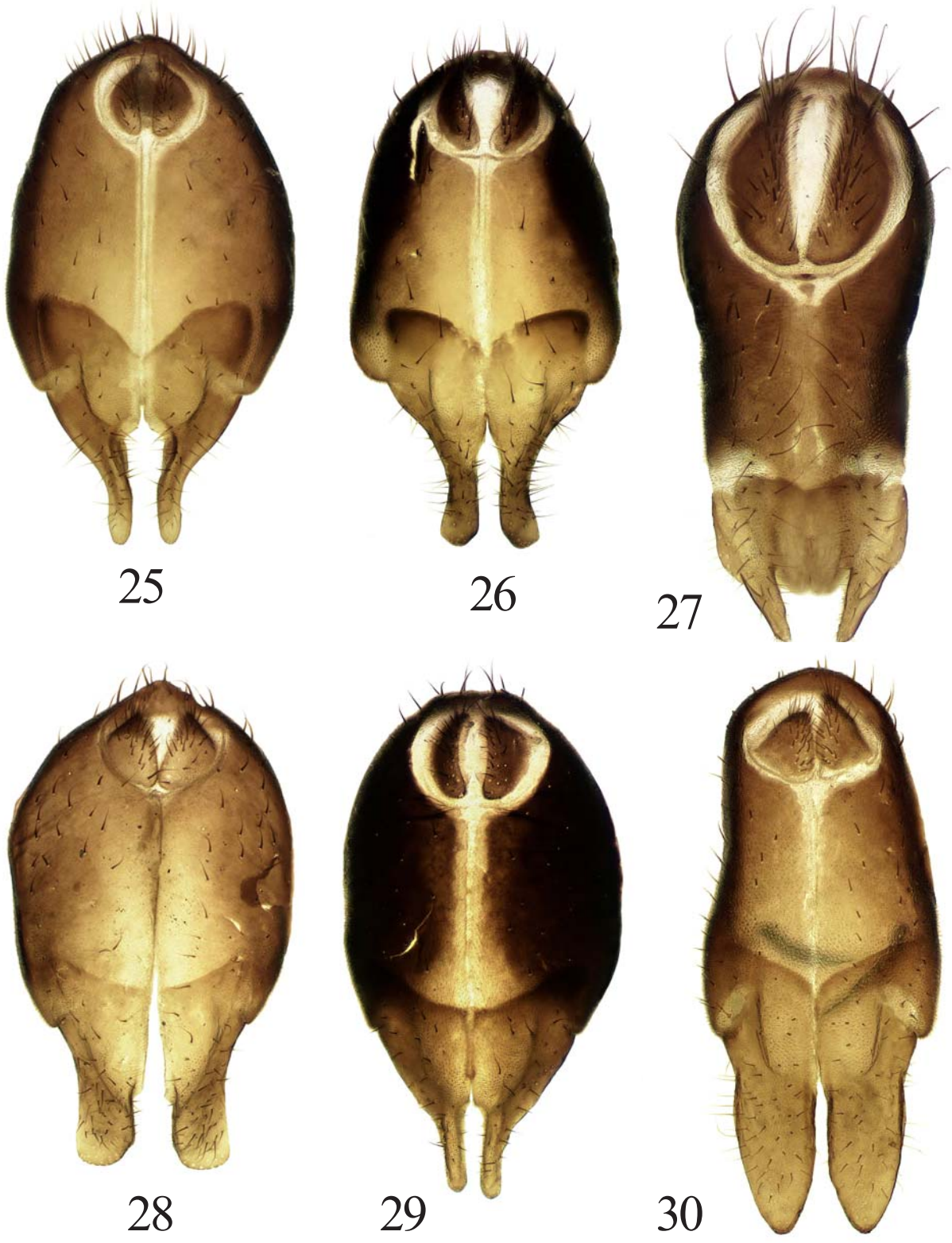
DESCRIPTION. *Head* whitish-grey (*alandica*) or grey (*macellaria*) pollinose except metallic shining frontal vitta and upper face, with bluish-greenish tinge; fronto-orbital plate grey pollinose. 3 long fronto-orbital setae, anterior interfrontal thin and about 1/3 of ocellar. Postocular setae thin and short. Palpus yellow-grey to dark grey. Antenna black, brown dusted; arista pectinate on dorsal surface. Gena and parafacial whitish-grey or greyish-golden dusted.

Thorax black, densely whitish-grey or grey pollinose. Scutum whitish-grey pollinose or metallic subshining. Acrostichals setulose in many irregular rows, intra-alars absent.

Legs black, densely greyish pollinose; tarsi yellowish.

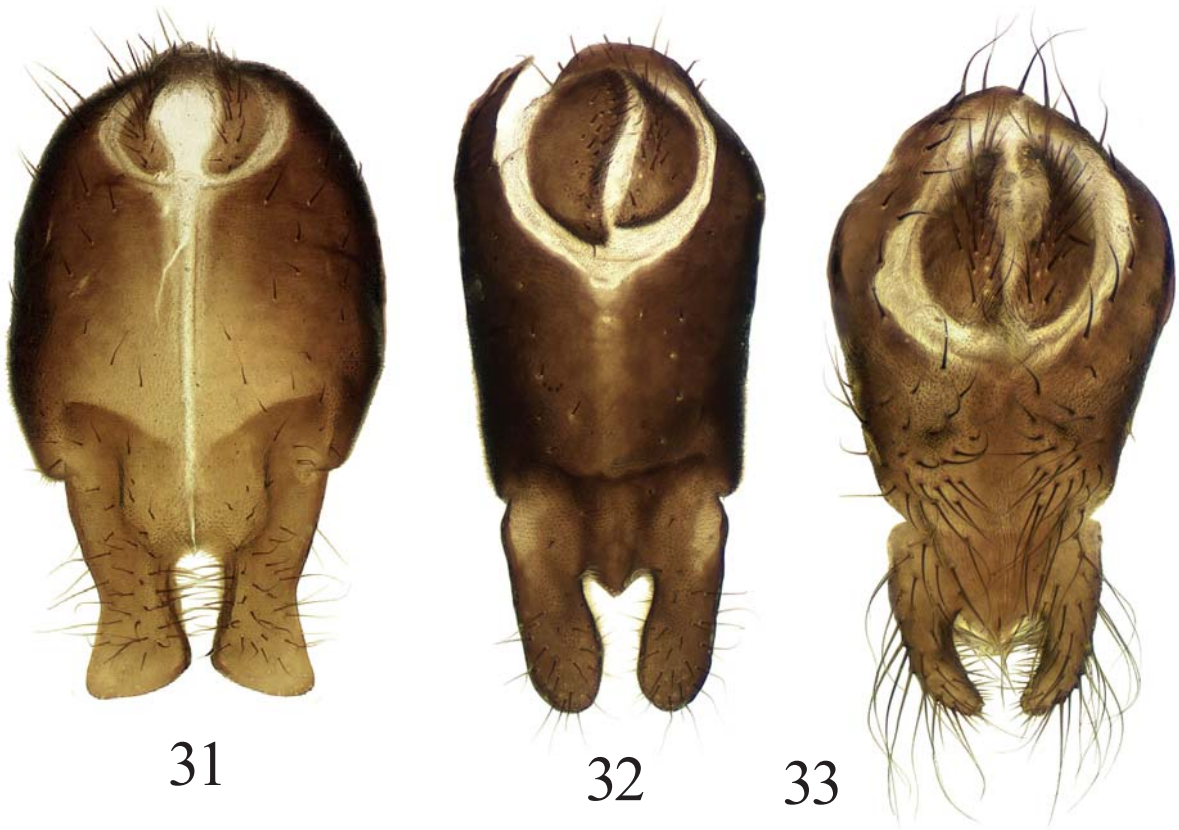
Abdomen black, densely whitish or grey pollinose, subshining with greenish tinge or without metallic tinge. Tergite 5 about 1.3–1.5 as long as tergite 4. Male genitalia large, as long as tergites 4+5. Epandrium elongate-oval in dorsal (posterior) view (Fig. 29), surstylus narrow and straight, covered with few short hairs. Epandrium parallel-sided in lateral view (Fig. 38), surstyli broad, narrowing and round apically. Aedeagus with round pointed tip in lateral view (Fig. 11). Gonite stout at base with rounded distal part in lateral view, appendage of gonite is located at significant distance from the tip (Fig. 20).

NOTE. The species differs from *E. afghanica* in dark coloration of fore femora. The absence of long hairs on surtylus and unique shape of gonite with protruding apical lobe and narrow appendage placed at significant distance from it separate *E. macellaria* from *E. attica* and make it possible to determine this species with confidence. Mathis & Zatwarnicki [1995] mentioned "Caucasus" as the area of distribution of this species. However, all specimens from Caucasus, which we found in the collection, belong to *E. attica*.



Figs 25–30. Epandrium and surstyli of *Ephydra* spp., dorsal view: 25 — *E. afghanica* Dahl; 26 — *E. attica* Becker; 27 — *E. glauca* Meigen; 28 — *E. japonica* Miyagi; 29 — *E. macellaria* Egger; 30 — *E. pseudomurina* Krivosheina.

Рис. 25–30. Эпандриум и сурстили *Ephydra* spp., сверху: 25 — *E. afghanica* Dahl; 26 — *E. attica* Becker; 27 — *E. glauca* Meigen; 28 — *E. japonica* Miyagi; 29 — *E. macellaria* Egger; 30 — *E. pseudomurina* Krivosheina.



Figs 31–33. Epandrium and surstyli of *Ephydra* spp., dorsal view: 31 — *E. riparia* Fallén; 32 — *E. sholtzi* Becker; 33 — *E. villosa* sp.n.
Рис. 31–33. Эпандриум и сурстили *Ephydra* spp., сверху: 31 — *E. riparia* Fallén; 32 — *E. sholtzi* Becker; 33 — *E. villosa* sp.n.

The species is divided into 2 subspecies. *E. macellaria alandica* differs in entirely whitish-grey dusted coloration and is distributed in Finland, Norway and Sweden on the shore of Baltic Sea [Wirth, 1975] and in Russia on the shore of White Sea. The second subspecies *E. macellaria macellaria* differs in metallic greenish subshining frons, scutum and abdomen and is widely distributed in the Palaearctic and Afrotropical Regions. Male genitalia of these subspecies are identical.

DISTRIBUTION. Russia: Altai, Karelia. — Afrotro-pical: Cape Verde Islands; Palearctic: Afghanistan, Algeria, Azores, Bulgaria, Canary Islands, China (NE Tibet), Cyprus, Czech Republic, Egypt, Finland, France, Germany, Great Britain, Greece, Iran, Italy, Libya, Madeira Islands, Malta, Morocco, Netherlands, Norway, Romania, Sweden, Tunisia, Turkmenistan, Ukraine [Mathis, Zatwarnicki, 1995]; Kyrgyzstan (**first record**), Mongolia (**first record**), Tadjikistan (**first record**).

Ephydra pseudomurina Krivosheina, 1983
Figs 6, 12, 21, 30, 39.

pseudomurina Krivosheina 1983: 368 (*Ephydra*). Type-locality: Mekhnatabadskiy Distr., Yangier [40.276ºN 68.816ºE] (Uzbekistan).

MATERIAL. **Astrakhan' Oblast**: salt lake Baskunchak (48.193°N 46.813°E), 17.06.2003, A. Ovchinnikov (9 ♂♂, ZISP); same place, 2–4.V.2010, K. Tomkovich (3 ♂♂, ZMUM); Kharabali (47.393ºN, 47.248ºE), salt lake, 4.VI.2009, P. Mel'nik (1 ♂, ZMUM); **Crimea**: Kerch env. (45.2ºN 36.1ºE), 26.IV.2014, N. Vikhrev (2 ♂♂, 5 ♀, ZMUM); Dzhankoy (45.71ºN 34.4ºE), 19.V.1963, K. Gorodkov (1 ♂, ZISP); Koktybel' (44.964ºN 35.241ºE), 1–8.IX.2007, K. Tomkovich (1 ♂, ZMUM); Lake Koyanskoe (45.025ºN 36.111ºE), reared, 2008, A. Przhiboro (1 ♂, ZISP); **Krasnodar Krai**: Ubinskaya (44.74ºN 38.54ºE), 8.VI.1971, V. Kovalev (1 ♂, ZMUM); **Rostov Oblast**: Gigant vill. (46.507ºN 41.34ºE), on the light, 17–22.VI.2009, A. Koval (1 ♂, ZMUM).

ADDITIONAL MATERIAL. **Azerbaijan**: Avrora [=Hirkan, 38.67ºN 48.799ºE], 19.V.1981, N. Krivosheina (1 ♂, ZMUM); **Georgia**: Tiflis [=Tbilisi, 41.71ºN 44.791ºE], 1903, K. Satunin (2 ♂♂, ZISP); **Kazakhstan**: Golodnaya step', 7.VII.1959, P. Lehr (1 ♂, ZISP); **Tadjikistan**: Nature Reserve Tigrovaya balka, 15.IV. 1986, 15–17.V.1987, N. Krivosheina (2 ♂♂, ZMUM); **Turkmenistan**: Ashgabat (37.934ºN 58.387ºE), 15.XI.1983, N. Krivosheina (2 ♂♂, ZMUM); Repetek (38.563ºN 63.178ºE), 27.XII.1965, K. Gorodkov (2 ♂♂, ZISP); same place, 25.I.1966, V. Zaitzev (1 ♂, ZISP); Lake Sarygamysh (ca. 42.052º9N 57.697ºE), 19–26.IV.1984, M. Krivosheina (1 ♂, ZMUM); **Ukraine**: Odessa, Kuyal'nitskiy liman (ca. 46.565ºN 30.717ºE), 16.IX.1938, B. Rohdendorf (7 ♂♂, ZMUM); same place, 21.VI.1926, L. Zimin (2 ♂♂, ZISP); Odessa env. (ca. 46.466ºN 30.719ºE), salt puddle near oil tank, 8.V.1926, L. Zimin (2 ♂♂, ZMUM); Aleshki (46.62ºN 32.719ºE), 18.VI.1926, L. Zimin (2 ♂♂, ZISP); Chernomorskiy Nature Reserve (ca. 46.314ºN 31.890ºE), cordon Geroyskiy, 6–7.VII.1977, E. Klechkovskiy (16 ♂♂, ZMUM); **Uzbekistan**: Mekhnatabadskiy Distr., Yangier (40.276ºN 68.816ºE), 12.V.–10.VI.1980, M. Krivosheina (17 ♂♂, 20 ♀♀, ZMUM); Khiva (41.394ºN 60.381ºE), 22.III.1927, L. Zimin; Aral Sea, Syr-Dar'inskaya Distr., 30.V.1928, N. Olenev, V. Popov (1 ♂, ZISP).

DESCRIPTION. *Head* golden-grey pollinose except metallic shining frontal vitta and upper face, with bluish-greenish tinge; fronto-orbital plate golden pollinose. 3–4 long fronto-orbital setae, anterior interfrontal thinner and 1/3 as long as ocellar. Postocular setae weak and short. Palpus yellow. Antenna blackish, greyish dusted; arista pectinate on basal half of dorsal surface (Fig. 6). Gena and parafacial greyish dusted.

Thorax black, grey pollinose. Scutum metallic subshining with greenish tinge. Acrostichals setulose in many irregular rows, intra-alars absent.

Legs. Femora yellow, greyish dusted or yellow; tibiae and tarsi of all legs yellow, darkened dorsally.

Abdomen black, grey pollinose, metallic subshining with greenish tinge. Tergite 5 about 1.5–2.0 times as long as tergite 4. Male genitalia large, as long as tergites 4+5. Epandrium elongate in dorsal (posterior) view (Fig. 30); surstylus broad, rounded apically. Epandrium parallel-sided in lateral view (Fig. 39); surstylus with oval median protuberance. Aedeagus with rounded tip in lateral view (Fig. 12). Gonite stout at base in lateral view, bifurcate apically, of complex shape, giving different images if slightly rotated (Fig. 21).

NOTE. Wirth [1975] described *E. murina* from the territories of Iraq (holotype), Bulgaria, Iran, Romania, Turkey and Ukraine. The figures of surstyli dorsally were closer to *E. flavipe*s, relatively broad basally and evenly tapering apically. Krivosheina [1983] described the species *E. pseudomurina* from Uzbekistan; surstyli of this species are broad almost to the tip and narrowed at the very apex. The same species was described by Hu & Yang [2001], who did not see the previous work, under the name of *E. hejingensis* Hu & Yang, 2001. Beschovsky [2009] gave figures of surstyli the same as in *E. pseudomurina* and determined this species as *E. murina*. Przhiboro & Shadrin [2012] registered the same species in Russia under the name of *E. murina*. Krivosheina [2010] obviously had two morphological forms of *E. pseudomurina*. However we discovered specimens of *Ephydra* from Tajikistan, which surstyli are closer to the figures given for *E. murina* by Wirth [1975]. This prevented us from synonymizing *pseudomurina*, *hejingensis* and *murina* in the present work. We leave the solution to this question for the future, when the holotype of *E. murina* becomes available for study.

DISRTIBUTION. Russia: Astrakhan' Oblast (incl. Krivosheina [2010]), Crimea (incl. Przhiboro & Shadrin, [2012]; Krivosheina [2014]), Krasnodar Krai, Orenburg Oblast [Shayhutdinova, Krivosheina, 2020], Rostov Oblast. — Palearctic: Turkmenistan, Uzbekistan [Krivosheina, 1983, 1986, 2010; Mathis, Zatwarnicki, 1995]; Azerbaijan (**first record**), Georgia (**first record**), Kazakhstan (**first record**), Tadjikistan (**first record**), Ukraine (**first record**).

Ephydra riparia Fallén, 1813
Figs 4, 5, 13, 22, 31, 40.

riparia Fallén, 1813: 246 (*Ephydra*). Type-locality: Sweden.

albula Meigen, 1830: 115 (*Ephydra*). Type-locality: not given (? Germany).

salina von Heyden, 1843: 228 (*Ephydra*). Type-locality: Creuznach, Rhein-Preussen (Germany).

halophila von Heyden, 1844: 203 (*Coenia*). Type-locality: Nauheim (Germany).

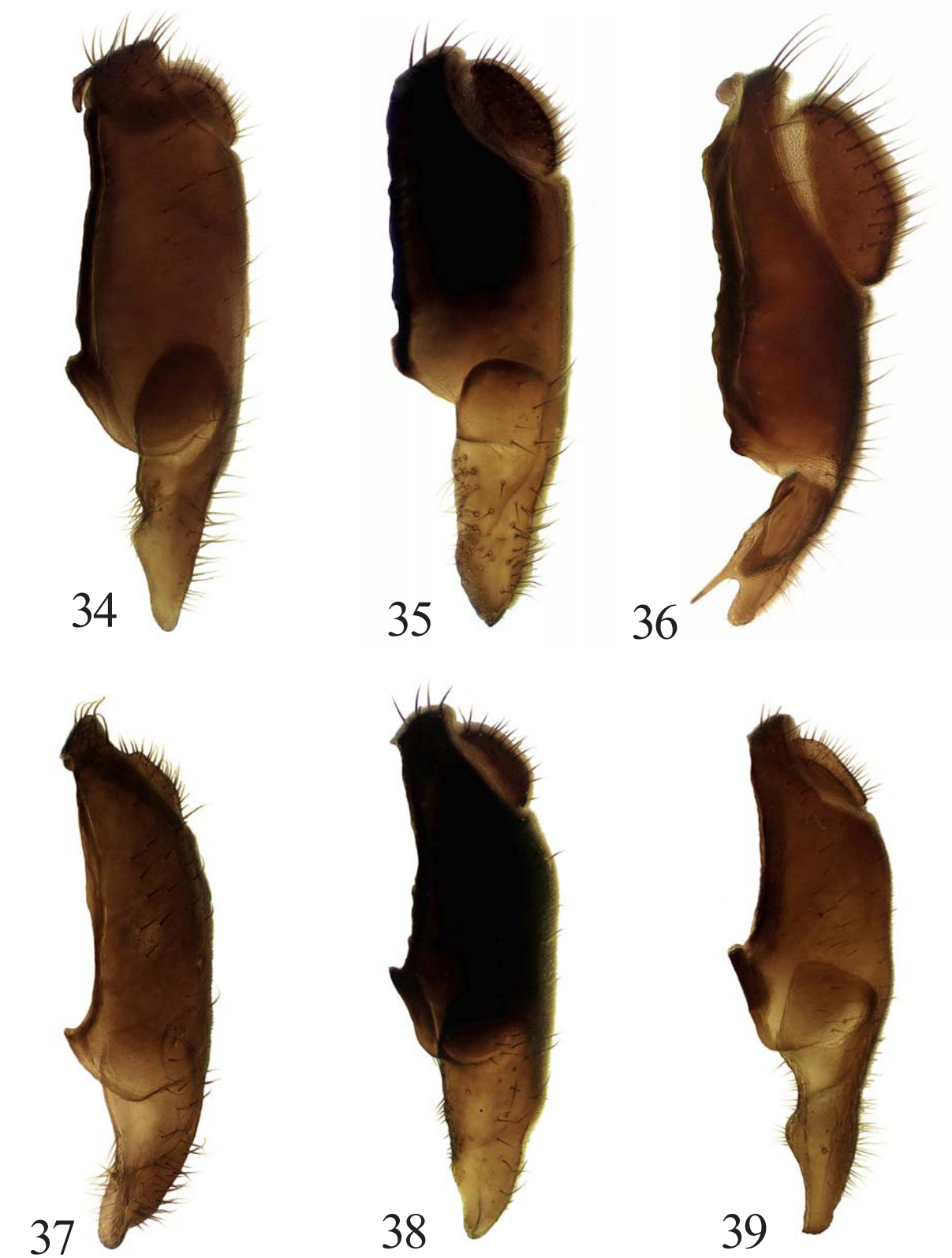
salinae Zetterstedt, 1846: 1812 (*Ephydra*). Type-locality: "Gryphia" [= Pomerania: Gryfice] (Poland).

strenzkei Giordani Soika, 1960: 456 (*Ephydra*). Type-locality: Wilhelmshaven (Germany).

MATERIAL. **Amur Oblast**: Zeya (54.087ºN 126.871ºE), 20.VI.1978, A. Shatalkin (1 ♂, ZMUM); **Chukotka**: Anadyr (64.725ºN 177.471ºE), swampy lake shore, 13.VIII.1966, K. Gorodkov (22 ♂♂, 12 ♀♀, ZISP); Goryachie klyuchi (54.512ºN 159.973ºE), on the surface of a puddle, water t37º, air t9º, 7.VIII.1963, K. Gorodkov (23 ♂♂, ZISP); **Crimea**: Dzhankoy (45.719ºN 34.407ºE), 19.V.1963, K. Gorodkov (2 ♂♂, ZISP); Lake Koyanskoe (45.025ºN 36.111ºE), reared, 2008, A. Przhiboro (1 ♂, ZISP); **Bashkiria**: Muraptal Distr., Kazlair saltish (52.455°N 55.76°E), K. Tomkovich (1 ♂, ZMUM); **Buryatia**: Kyakhta (50.353ºN 106.448ºE), waterlogged meadow, 25.VIII.1958, K. Gorodkov (1 ♂, ZISP); 15 km E of Kyakhta, solonchak, (50.337ºN 106.700ºE), 24.VII.2012, A. Medvedev (4 ♂♂, ZMUM); **Kamchatka Krai**: Apuka (60.444ºN 169.601ºE), an island at the mouth of the Apuka River, on rotten puddles, 7.VIII.1959, K. Gorodkov (14 ♂♂, ZISP); Na-lychevo (53.507ºN 158.756ºE), 2.X.2009, L. Lobkova (1♂, ZMUM); Petropavlovsk-Kamchatsky (53.013ºN 158.657ºE), 28.V.1908, A. Derzhavin (2 ♂♂, ZISP); **Krasnodar Krai**: Golubitskaya (45.323ºN 37.274ºE), 25.VI.1990, E. Narchuk, (1 ♂, ZISP); Gelendzhik distr., Krinitsa env. (44.395°N 38.341°E), River Pshaga, 6–13.IX.2009, K. Tomkovich (1 ♂, ZMUM); **Leningrad Oblast**: Leningrad [=Saint Petersburg] env. (59.878ºN 29.069ºE), 11 and 13.VII.1984, 12.VIII.1984, M. Krivosheina (5 ♂♂, ZMUM); Petrograd [=Saint Petersburg (59.924ºN 30.326ºE)], 13.IV.1919, A. Stackelberg (1 ♀, ZISP); **Moscow Oblast**: Dmitrov env. (56.316ºN 37.725ºE), 2.IX.2006, N. Vikhrev (1 ♂, 1 ♀, ZMUM); **North Ossetia – Alania**: Sukhotskoe (43.674ºN 44.442ºE), 30 km SW of Mozdok, 3.VIII.1988, A. Ozerov (1 ♂, ZMUM); **Omsk Oblast**: Cherlak-Krasny Oktyabr' env. (54.133ºN 75.011ºE), 30.V.2009, O. Kosterin (1 ♀, ZMUM); Omsk, Solenoe Lake (54.885ºN 73.347ºE), 3.IV. and 30.VI.2008, 29.VI.2013, O. Kosterin (2 ♂♂, 3 ♀♀, ZMUM); Omsk, Irtysh River (54.99°N 73.32°E), 22.VII.2011, O. Kosterin (1 ♀, ZMUM); Omsk: River Irtysh left floodland (54.952ºN 73.355ºE), reeds and salinas, 11.IV.2008, O. Kosterin (1 ♂, ZMUM); **Primorsky Krai**: 40 km SO of Ussuriysk (43.634ºN 132.222ºE), 5.VIII.1983, 6.VIII.1983, 13.VIII.1983, 18.VII.1984, 12.VII.1985, A. Ozerov (22 ♂♂, ZMUM); Vozdvizhenka (43.900ºN 131.943ºE), garden, 26.X.1968, K. Gorodkov (1 ♂, ZISP); **Rostov Oblast**: Marga-ritovka [=Margaritovo] (46.929ºN 38.872ºE), 22.V.1953, B. Mamaev (1 ♂, ZMUM); **Yakutia**: Lake Elegin, Amgino-Yakutskiy Trakt, (ca. 61.305ºN 131.327ºE), Yakutsk Expedition RAS, 18.VIII.1925, V. Bianki (1 ♂, ZISP).

ADDITIONAL MATERIAL. **Kazakhstan**: Chesnokovo env. (51.153ºN 50.453ºE), Derkol River, 26.VIII.2012, K. Tomkovich (1 ♂, ZMUM); **Ukraine**: Alyoshki (46.621ºN 32.716ºE), lower Dnieper, sweeping, 18.VI.1926, L. Zimin (1 ♂, ZISP); Odessa, Kuyal'nitskiy Bay (ca. 46.565ºN 30.717ºE), 16.IX.1938, B. Rohdendorf (1 ♂, ZMUM); Odessa env. (ca. 46.466ºN 30.719ºE), salt puddle near oil tank, 8.V.1926, L. Zimin (1 ♂, ZMUM); Golaya Pristan' (46.524ºN 32.521ºE), 18.VII.1977, E. Klechkovskiy (1 ♂, ZMUM); Chernomorskiy Nature Reserve (ca. 46.314ºN 31.890ºE), cordon Geroyskiy, 6.VII.1977, E. Klechkovskiy (3 ♂♂, ZMUM); Zheleznyy port env. (46.124ºN 32.287º1E), Tendrovskiy Bay, 25.VII.1977, E. Klechkovskiy (1 ♂, ZMUM); Rybach'e env. (44.772ºN 34.598ºE), Dnepro-Bugskiy Bay, 13.VII.1977, E. Klechkovskiy (1 ♂, ZMUM).

DESCRIPTION. *Head* brownish-bronze or greyish pollinose except metallic shining frontal vitta and upper face, with dark greenish or bluish tinge; fronto-orbital plate brownish pollinose. 3 long fronto-orbital setae, anterior interfrontal seta 2 times thinner and shorter than ocellar. Postocular setae thin and short.



Figs 34–39. Epandrium and surstyli of *Ephydra* spp., lateral view: 34 — *E. afghanica* Dahl; 35 — *E. attica* Becker; 36 — *E. glauca* Meigen; 37 — *E. japonica* Miyagi; 38 — *E. macellaria* Egger; 39 — *E. pseudomurina* Krivosheina.

Рис. 34–39. Эпандриум и сурстили *Ephydra* spp., сбоку: 34 — *E. afghanica* Dahl; 35 — *E. attica* Becker; 36 — *E. glauca* Meigen; 37 — *E. japonica* Miyagi; 38 — *E. macellaria* Egger; 39 — *E. pseudomurina* Krivosheina.

Figs 40–42. Epandrium and surstyli of *Ephydra* spp., lateral view: 40 — *E. riparia* Fallén; 41 — *E. sholtzi* Becker; 42 — *E. villosa* sp.n.
Рис. 40–42. Эпандриум и сурстили *Ephydra* spp., сбоку: 40 — *E. riparia* Fallén; 41 — *E. sholtzi* Becker; 42 — *E. villosa* sp.n.

Palpus yellow to dark brown, brownish pollinose. Antenna blackish, greyish dusted; arista pectinate on dorsal surface on basal 2/3 or more. Gena greyish dusted, parafacial bronze dusted.

Thorax black, densely brown pollinose. Scutum subshining. Acrostichals setulose in many irregular rows, intra-alars absent (Fig. 4).

Legs. Femora black densely grey dusted or yellowish grey pollinose basally, tibia and tarsi of all legs yellowish, tarsi sometimes darkened apically.

Abdomen black, subshining, grey pollinose. Tergite 5 about 2 times as long as tergite 4. Male genitalia large, as long as tergites 4+5. Epandrium oval in dorsal (posterior) view (Fig. 31); surstylus widened apically. Epandrium parallel-sided in lateral view (Fig. 40); surstylus broad and narrowed apically, with acute tip. Aedeagus with broad apex in lateral view (Fig. 13). Gonite stout at base in lateral view, with curved and slender distal part (Fig. 22).

NOTE. The species has variable coloration and it is not easy to determine it from external characters. However it is the only species with surstyli broad and significantly widened apically in dorsal view. Lateral view of surstylus resembles *E. japonica*, but the apex acute, not rounded.

DISRTIBUTION. Russia: Amur Oblast, Chukotka, Crimea (incl. Przhiboro & Shadrin [2012]), Bashkiria, Bu-ryatia, Kamchatka Krai, Krasnodar Krai, Leningrad Oblast, Moscow Oblast, North Ossetia – Alania, Omsk Oblast, Primorsky Krai, Rostov Oblast, Yakutia. — Palearctic: Afghanistan, Austria, Azores, Belgium, Bulgaria, Canary Islands, China (Nei Mongol), Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Madeira Islands, Mongolia, Ne-therlands, Norway, Poland, Romania, Sweden, Tunisia, Ukraine [Mathis & Zatwarnicki, 1995]; Kazakhstan (**first record**); Nearctic: Canada, United States [Mathis, Zatwarnicki, 1995].

Ephydra scholtzi Becker, 1896
Figs 2, 14, 23, 32, 41.

scholtzi Becker, 1896: 220 (*Ephydra*). Type-locality: "Breslau" [= Wrocław in Silesia] (Poland).

krogerusi Frey, 1930: 93 (*Ephydra*). Type-locality: Karelian Isthmus, Sakkola, Valkjarvi, Siikajoki, Karlo (Russia).

strandi Duda, 1942: 28 (*Ephydra*). Type-locality: "Nidden" [= Nida on Kuršiu Peninsula] (Lithuania).

MATERIAL. **Amur Oblast**: 52 km N of Zeya Town (54.087ºN 126.871ºE), 5.VII.1978, A. Shatalkin (1 ♂, ZMUM); **Kamchatka Krai**: Koryaki (53.280ºN 158.210ºE), 50 km W of Petropavlovsk-Kamchatsky, shallow, 21.VII.1978, A. Zinoviev (1 ♂, ZISP);

Kozyrevsk (56.049ºN 159.865ºE), shore of River Kamchatka, 27. VI.1984, N. Krivosheina (1 ♂, ZMUM); Kronotskiy Nature Reserve (ca. 54.749ºN 160.724ºE), 28.VIII.1985, L. Lobkova (1 ♂, ZMUM); **Leningrad Oblast**: Nizhnyaya Bronna (59.921ºN 29.621ºE), 28.VII.1918, A. Stackelberg (1 ♀, ZISP); Sestroretsk (60.0916ºN 29.956ºE), 19.VIII, A. Stackelberg (1 ♂, 1 ♀, ZISP); Leningrad env. (59.878ºN 29.069ºE), 13.VII.1984, 25.VII.1984, M. Krivosheina (11 ♂♂, ZMUM); **Nizhegorod Oblast**: Dzerzhinsk (56.21ºN 43.62ºE), 16–18.VIII.2009, N. Vikhrev (1 ♂, ZMUM); **Yakutia**: Lensk (60.727ºN 114.943ºE), 14.IX.1987, K. Gorodkov (1 ♂, ZISP);

ADDITIONAL MATERIAL. **Kazakhstan**: sands Kyzylkum, 30 km S of Samarskoe (ca. 48.716ºN 83.352ºE), 3–4.VIII.1987, E. Nartshuk (1 ♂, 6 ♀♀, ZISP); **Mongolia**: Central aimag [=Töv aimag], 20 km S of Ulan-Bator (ca. 47.717ºN 106.925ºE), 2.VII. 1967, V. Zaitsev (1 ♂, ZISP); **Tadjikistan**: Stalinabad [=Dushanbe (38.569ºN 68.774ºE)], 8.VII.1945, V. Gussakovskiy (1 ♂, ZISP).

DESCRIPTION. *Head* (Fig. 2) silvery-grey pollinose except metallic shining frontal vitta and upper face, with bluish-greenish tinge; fronto-orbital plate grey pollinose. 3 long fronto-orbital setae, anterior interfrontal seta strong, a little shorter, than ocellar. Postocular setae short and thin. Palpus grey. Antenna blackish, greyish dusted; arista very short pubescent on dorsal surface on basal 1/2 (Fig. 2). Gena and parafacial silvery-grey dusted.

Thorax black, densely grey pollinose. Scutum metallic subshining with brownish stripes. Acrostichals setulose in two rows, intra-alars 1+2 (often weak).

Legs. Femora and tibia black, except yellow bases of tibiae, densely greyish dusted; tarsi of all legs yellowish, tarsomeres 4 and 5 darkened.

Abdomen black with greenish tinge, golden-grey pollinose, subshining. Tergite 5 approximately equal in length to tergite 4. Male genitalia small, as long as tergite 5. Epandrium elongate in dorsal (posterior) view (Fig. 32), wider in cercal half; surstylus broad and oval. Epandrium parallel-sided in lateral view (Fig. 41); surstylus is continuation of epandrium, with short median lobe. Aedeagus relatively wide with pointed tip in lateral view (Fig. 14). Gonite with broad basal part and slender pointed tip in lateral view (Fig. 23).

NOTE. The species is easily determined by the following combination of characters: acrostichal setae in two rows and postocular setae short and thin. Additional diagnostic characters may be silvery grey coloration of face and dark femora and tibiae.

DISRTIBUTION. Russia: Amur Oblast, Kamchatka Krai, Karelia, Leningrad Oblast, Nizhegorod Oblast, Yakutia. — Palearctic: Bulgaria, Denmark, Finland, France, Germany, Lithuania, Netherlands, Poland, Romania, Sweden [Mathis, Zatwarnicki, 1995]; Tadjikistan (**first record**), Kazakhstan (**first record**), Mongolia (**first record**).

Ephydra villosa Krivosheina et Ozerov, **sp.n.**
Figs 15, 24, 33, 42.

MATERIAL. Holotype ♂, Russia: Irkutsk Oblast, Baikal Lake, Sakhyurta env., MRS [=river station Malomorskaya) (53.017ºN 106.883ºE)], 19.VII.1962, Gorodkov (ZISP). Paratype ♂ with same label (ZMUM).

DESCRIPTION. Medium sized flies, body length 5–5.5 mm.

Head golden-brown pollinose except metallic shining frontal vitta and upper face, with greenish tinge; fronto-orbital plate brownish pollinose. 3 long fronto-orbital setae, anterior interfrontal strong, about 1/2 of ocellar. Postocular setae strong. Palpus dark grey. Antenna blackish, brownish dusted; arista short pubescent on dorsal surface on basal 1/2. Gena and parafacial golden dusted.

Thorax black, brownish pollinose. Scutum subshining with bluish-greenish tinger. Acrostichals setulose in two rows, intra-alars 2+2.

Legs. Femora and tibia black, densely greyish dusted; tarsi of all legs yellowish, but tarsomeres 4 and 5 darkened.

Abdomen black, grey pollinose, subshining. Tergite 5 approximately equal in length to tergite 4. Male genitalia small, as long as tergite 5. Epandrium oval in dorsal (posterior) view (Fig. 33), wider in cercal part, covered with long setae; surstyli relatively broad and curved, covered with many long setae. Epandrium curved in lateral view (Fig. 42); surstylus is at obtuse angle to epandrium, with short subapical tooth. Aedeagus long and narrow with pointed tip in lateral view (Fig. 15). Gonite with broad basal part and slender pointed tip in lateral view (Fig. 24).

NOTE. The species is close to *E. tibetensis* Wirth, 1975, differing from it in extremely developed setae and hairs on body and the structure of male genitalia; surstylus with well separated subapical tooth in lateral view, aedeagus with long apical narrow part, gonite significantly narrowed apically and curved at the very tip. From *E. scholtzi* the new species differs in strong postocular setae and from *E. glauca* in weaker pollinosity and the presence of subshining surfaces on upper face, scutum and abdomen. From both species it differs in the development of 2+2 intra-alar setae.

DISRTIBUTION. Russia: Irkutsk Oblast.

Key to species of the genus *Ephydra* of Russia

1. Anterior acrostichal setae in two distinct rows (*e.g.*, Fig. 3); tarsal claws generally nearly as long as tarsomere 5; male aedeagus nearly straight, lacking recurved basal process (*e.g.*, Fig. 9) (The *glauca* group) 2
– Anterior acrostichal setae in many irregular rows (*e.g.*, Fig. 4); tarsal claws generally no more than half of tarsomere 5; male aedeagus with strongly recurved basal process (*e.g.*, Fig. 8) (The *riparia* group) 3
2. Postocular setae short and thin (Fig. 2). Surstylus in dorsal view elongate-oval (Fig. 32), in lateral view as in Fig. 41. Aedeagus (Fig. 14). Gonite (Fig. 23) .... *E. scholtzi* Becker
– Postocular setae strong, well developed (Fig. 1) 4
3. Body densely grey pollinose, upper face, scutum and abdomen not subshining, 1+2 intra-alar setae present. Surstylus in dorsal view wide basally and thin apically (Fig. 27), in lateral view as in Fig. 36. Aedeagus (Fig. 9). Gonite (Fig. 18) ..... *E. glauca* Meigen
– Body golden-grey pollinose, upper face, scutum and abdomen subshining, 2+2 intra-alar setae present. Surstylus

in dorsal view curved and covered with many setae (Fig. 33), in lateral view as in Fig. 42. Aedeagus (Fig. 15). Gonite (Fig. 24) ..... *E. villosa* sp.n.

4. Tergite 5 of male 2 times or more as long as tergite 4 5
– Tergite 5 of male 1.3–1.7 times but no more than 2 times as long as tergite 4 7
5. Legs yellow. Surstylus in dorsal view very thin and curved (Fig. 25), in lateral view as in Fig. 34. Aedeagus (Fig. 7). Gonite (Fig. 16) ..... *E. afghanica* Dahl
– Femora black or yellow, grey dusted 6
6. Anterior interfrontal seta 1/2 as long as ocellar. Abdomen unicolor. Surstylus in dorsal view widened apically (Fig. 31), in lateral view pointed apically (Fig. 40). Aedeagus (Fig. 13). Gonite (Fig. 22) .... *E. riparia* Fallén
– Anterior interfrontal seta 1/3 as long as ocellar. Male abdominal tergite 5 often golden, contrasting to grey coloration of other tergites. Surstylus in dorsal view straight and not widened (Fig. 28), in lateral view broadly rounded and curved (Fig. 37). Aedeagus (Fig. 10). Gonite (Fig. 19) ..... *E. japonica* Miyagi
7. Palpus yellow-grey to dark grey. Tergite 5 of male 1.3–1.5 as long as tergite 4. Surstylus in dorsal view thin and straight, not covered with long setae (Fig. 29), in lateral view as in Fig. 38. Aedeagus (Fig. 11). Gonite (Fig. 20) ..... *E. macellaria* Egger
– Palpus yellow. Tergite 5 of male 1.5–2.0 as long as tergite 4 8
8. Femora yellow, greyish dusted, or yellow. Surstylus in dorsal view broad and rounded apically, covered with short setae (Fig. 30), in lateral view asymmetrical with median lobe (Fig. 39). Aedeagus (Fig. 12). Gonite (Fig. 21) ..... *E. pseudomurina* Krivosheina
– Femora yellow or black, grey dusted. Surstylus in dorsal view thin, parallel, widened at the most apex, covered with long setae (Fig. 26), in lateral view broad, symmetrical, pointed at apex (Fig. 35). Aedeagus (Fig. 8). Gonite (Fig. 17) ..... *E. attica* Becker

Acknowledgements. We are very grateful to Dr. Olga Ovchinnikova and Mrs. Galina Suleymanova for the help during our work in ZISP with the material of *Ephydra*. We also thank Mr.Dmitry Gavryushin for valuable comments and text editing.

The investigation was fulfilled within the State project of the Institute of Ecology and Evolution, Russian Academy of Sciences (M.G. Krivosheina) and within the framework of the State project No 121032300105-0 of Lomonosov Moscow State University (A.L. Ozerov).

References

Becker Th. 1896. Dipterologische Studien IV. Ephydridae // Berliner Entomologische Zeitschrift. Bd.41. H.2. S.91–76.

Beschovski V.L. 2009. [Shore flies (Insecta: Diptera: Ephydridae, Tethinindae, Canacidae)] // Fauna of Bulgaria. Vol. 28. Sofia: Academical Press "Prof. Marin Drinov". 440 p. [In Bulgarian]

Cumming J.M., Wood D.M. 2009. Adult morphology and terminology // Brown *et al*. (eds.). Manual of Central American Diptera. Vol.1. Ottawa: National Research Council Press. P.9–50.

Dahl R.G. 1961. Ephydridae (Diptera Brachycera) from Afghanistan, Contribution à l'étude de la faune d'Afghanistan 15 // Entomologisk Tidskrift. Vol.82. No.1–2. P.87–90.

Duda O. 1942. Neue oder ungenügend bekannte Zweiflügler der paläarktischen Region aus meiner Sammlung. 2. Fortsetzung // Deutsche Entomologische Zeitschrift. H.1–4. S.1–39.

Egger J. 1862. Dipterologische Beiträge. Fortsetzung der Beschreibungen neuer Dipteren // Verhandlungen der kaiser-lich-königlichen Zoologisch-Botanischen Gesellschaft in Wien. Bd.12. S.777–784.

El-Hawagry M.S., Zatwarnicki T., Ayman M.E. 2018. Catalogue of the Egyptian Ephydroidea (Diptera: Schizophora: Acalyptratae) // Zootaxa. Vol.4444. No.3. P.201–246. doi.org/10.11646/zootaxa.4444.3.1

El-Moursy A.A., Negm F.H., El-Hawagry M.S., Ayman M. E. 2006. Review of the subfamily Ephydrinae (Ephydridae, Diptera) from Egypt, with a description of a new species // Bulletin of the Entomological Society of Egypt. Vol.83. P.71–97.

Fallén C.F. 1810. Specimen entomologicum novam Diptera disponendi methodum exhibens. Berlingianis. Lundae [= Lund]. 26 p.

Fallén C.F. 1813. Beskrifning öfver några i Sverige funna Vattenflugor (Hydromyzides) // Kongliga Vetenskaps-Aca-demiens Handling. Ser.3. S.240–257.

Frey R. 1909. Mitteilungen über finnländische Dipteren // Acta Societatis pro Fauna et Flora Fennica. Bd.31. H.9. S.1–23.

Frey R. 1930. Neue Diptera brachycera aus Finnland und angrenzenden Ländern // Notulae Entomologicae. No.10. S.82–94.

Giordani Soika A.G. 1960. Beschreibung einer neu entdeckten Art der Ephydriden-Gattung *Ephydra* Fallén (Diptera) // Deutsche Entomologische Zeitschrift. Bd.7. H.4–5. S.456–457.

Heyden C.H.G. von. 1843. Ueber Insekten die an den Salinen leben // Stettiner Entomologische Zeitung. Bd.4. H.8. S.227–229.

Heyden C.H.G. von. 1844. Ferne Nachrichten über Insecten der Salinen // Stettiner Entomologische Zeitung. Bd.5. H.6. S.202–205.

Hu X., Jang D. 2001. New species and new records of the genus *Ephydra* Fallén (Diptera, Ephydridae) from China // Studia dipterologica. Bd.8. H.2. S.529–537.

Krivosheina M.G. 1983. [A new species of the fly genus *Ephydra* Fll. (Diptera, Ephydridae) from Uzbekistan] // Entomologicheskoe obozrenie. Vol.62. No.2. P.367–370 [in Russian].

Krivosheina M.G. 1985. [Ephydridae (Diptera) new for the USSR] // Entomologicheskoe obozrenie. Vol.64. No.2. P.419–422 [in Russian].

Krivosheina M.G. 1986. [To the biology of the shore-flies (Diptera, Ephydridae) of anthropogenic landscapes of the desert zone] // Nauchnye Doklady Vysschei Shkoly. Biologicheskie Nauki. No.5. P.40–43 [in Russian].

Krivosheina M.G. 1987. [On the fauna of shore-flies (Diptera, Ephydridae) of the Far East] // Lehr P.A., Kanyukova E.V. (eds.). Taksonomia nasekhomych Sibirii i Dal'nego Vostoka SSSR. Vladivostok. P.116–123 [in Russian].

Krivosheina M.G. 2003. To the biology of flies of the genus *Ephydra* Fallén, 1810, with the descriptions of larvae of seven Palaearctic species (Diptera: Ephydridae) // Russian Entomological Journal. Vol.12. No.1. P.79–86.

Krivosheina M.G. 2010. Shore-flies (Diptera, Ephydridae) of Lake Baskunchak // Euroasian Entomological Journal. Vol.9. No.4. P.666–667.

Krivosheina M.G. 2014. [To the fauna of Crimean shore-flies (Diptera: Ephydridae)] // Eversmannia. Vol.39. P.42–44 [in Russian].

Krivosheina M.G., Ozerov A.L. 2020. A Review of the Shore Fly Genus *Setacera* Cresson, 1930 (Diptera, Ephydridae) in the fauna of Russia // Entomological Review. Vol.10. No.8. P.1190–1200. doi: 10.1134/S0013873820080114

Mathis W.N., Marioni L. 2016. Revision of Ephydrini Zetterstedt (Diptera: Ephydridae) from the Americas south of the United States // Zootaxa. Vol.4116. No.1. P.1–110. doi.org/10.11646/zootaxa.4116.1.1

Mathis W.N., Zatwarnicki Ò. 1995. World Catalog of Shore Flies (Diptera: Ephydridae) // Memoires of Entomology, International. Vol.4. P.1–423.

McAlpine J.F. 1981. Morphology and terminology-adults // McAlpine J.F., Peterson B.V., Shewell G.E., Teskey H.J., Vockeroth J.R., Wood D.M. (Coordinators). Manual of Nearctic Diptera. Vol.2.

Ottawa: Research Branch. Agriculture Canada. Monograph 27. P.9–63.

Meigen J.W. 1830. Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. 6. Schulz-Wundermann. Hamm. 401 S.

Miyagi I. 1966. Descriptions of three new species of Ephydridae, with one unrecorded species from Japan (Diptera, Ephydridae) // Kontyû. Vol.34. No.2. P.136–140.

Nartshuk E.P. 1970. [Fam. Ephydridae – shore flies] // Bei-Bienko G.Ya. (ed.). Opredelitel' nasekomykh Evropeiskoi chast SSSR. Leningrad: Nauka. P.363–389 [in Russian].

Przhiboro A., Shadrin N. 2012. Mass occurrence of flies of the genus *Ephydra* (Diptera: Ephydridae) at the coastline zone of hypersaline coastal lagoons in the Eastern Crimea // Marine ekological journal. Vol.11. No.1. P.24.

Shayhutdinova A.A., Krivosheina M.G. 2020. Invertebrates of hypergaline reservoirs of the Orenburg Region (Russia) // Russian Entomological Journal. Vol.20. No.3. P.337–342.

Stuckenberg B.R. 1999. Antennal evolution in the Brachycera (Diptera), with a reassessment of terminology relating to the flagellum // Studia Dipterologica. Bd.6. S.33–48.

Wirth W.W. 1975. A revision of the brine flies of the genus *Ephydra* of the Old World (Diptera: Ephydridae) // Entomologica Scandinavica. Vol.6. No.1. P.11–44.

Zatwarnicki T., Kahanpää J. 2014. Checklist of the family Ephydridae of Finland (Insecta, Diptera) // ZooKeys. Vol.441. P.339–346. doi: 10.3897/zookeys.441.7448

Zetterstedt J.W. 1846. Diptera scandinaviae disposita et descripta. Tomus quintus. Officina Lundbergiana. Lundae [= Lund]. P.1739–2162.