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# An unexpected discovery of the drosophilid fly *Gitona distigma* Meigen, 1830 (Diptera: Drosophilidae) in the nests of the sand martin *Riparia riparia* (Linnaeus, 1758), with notes on morphology and distribution

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**Abstract.** During excavations of the nests of the sand martin *Riparia riparia* (Linnaeus, 1758), large numbers of adults of the drosophilid fly *Gitona distigma* Meigen, 1830 (Diptera: Drosophilidae) were found. Flies of this genus are widespread in Africa and are found in Australia and India. Of the six Palaearctic species, only *G. distigma* was recorded in temperate latitudes. The adults of this species feed on fermenting substrates, and the larvae develop in the inflorescences of Asteraceae. Obviously, adults of *G. distigma* entered the nests of sand martins for overwintering.

**Key words:** Diptera, Drosophilidae, *Gitona distigma*, nest, *Riparia riparia*, Russia, Saratov Region.

## Неожиданная находка мухи-дрозофилиды *Gitona distigma* Meigen, 1830 (Diptera: Drosophilidae) в гнездах береговой ласточки *Riparia riparia* (Linnaeus, 1758), с заметками по морфологии и распространению

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**Резюме.** При раскопках гнезд береговой ласточки *Riparia riparia* (Linnaeus, 1758) были в большом количестве обнаружены имаго мух-дрозофилид *Gitona distigma* Meigen, 1830 (Diptera: Drosophilidae). Мухи этого рода широко распространены в Африке, встречаются в Австралии и Индии. Из шести палеарктических видов в умеренных широтах отмечен только *G. distigma*. Имаго этого вида питаются на бродящих субстратах, а личинки развиваются в соцветиях сложноцветных Asteraceae. Вероятно, имаго *G. distigma* проникли в гнезда береговой ласточки для зимовки.

**Ключевые слова:** Diptera, Drosophilidae, *Gitona distigma*, гнездо, *Riparia riparia*, Россия, Саратовская область.

## Introduction

The genus *Gitona* Meigen, 1830 includes 14 species in the world fauna [Brake, Bachli, 2008; Evenhuis, Pape, 2025], a significant part of which is confined to regions with a warm climate.

Seven species are recorded in the Afrotropical region. *Gitona darwendalei* Duda, 1935 and *G. magnipalpis* Duda, 1936 are described from Zimbabwe, *G. inornata* Seguy, 1933 and *G. gossypii* Seguy, 1933 – from Mozambique, *G. ethiopica* Tsacas et Teshome, 1981 – from Ethiopia, *G. pauliani* Seguy, 1951 was described from Madagascar and is also distributed in Ethiopia. The species *G. stuckenbergi* Tsacas, 1990 is described from South Africa.

One species, *G. incohata* Bock, 1982, is known in Australia.

Six species are recorded in the Palaearctic. *Gitona microchaeta* Seguy, 1941 is described from Morocco, *G. distans* Bezzi, 1924 is known from Cyprus and Pakistan, *G. beckeri* Duda, 1924 – in Uzbekistan and China, *G. valentinae* Maca, 1988 (V.S. Sidorenko supposed that this species is a synonym of *G. distigma* Meigen, 1830) –

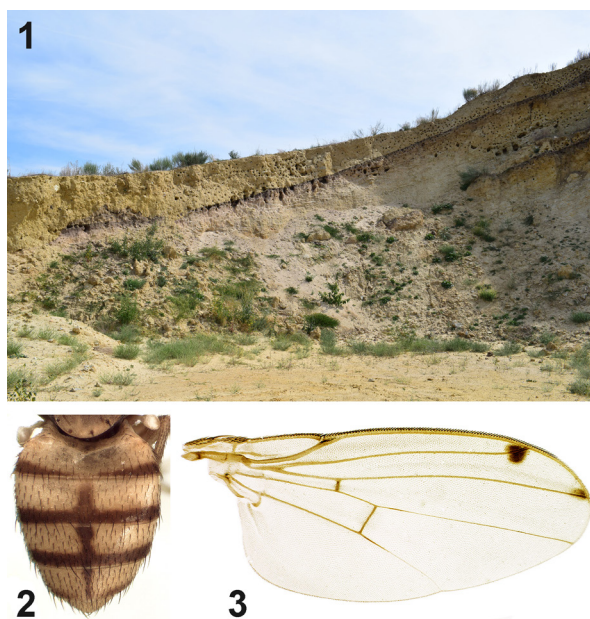
in Uzbekistan. The species *G. canariensis* Duda, 1934 is recorded on the Canary Islands, and *G. distigma* is widespread throughout the Palaearctic region. It is believed that *G. distigma* is the only species distributed in Russia [Sidorenko, 2008].

The genus *Gitona* is quite easily differentiated from closely related genera of the subfamily Steganinae by a micropubescent arista, costal vein C, reaching along the wing margin only to R4+5, fused wing cells bm and dm, a developed facial carina and a smaller number of rows of acrostichal ac setae (up to 8).

Among the three species distributed in Europe, *G. canariensis*, which does not have dark spots on the wings, is very different in appearance [Bachli et al., 2004]. The other two European species (*G. distans* and *G. distigma*) have two dark spots on the apex of R2+3 and R4+5 [Bachli et al., 2004].

## Material and methods

Adult flies in large numbers were found during the excavation of burrows with nests of sand martins in a



Figs 1–3. Habitat and details of male structure of *Gitona distigma*.  
1 – sandy quarry with sand martin nests in the vicinity of Demkino village, Saratov Region; 2 – abdomen, dorsal view; 3 – wing, dorsal view.

Рис. 1–3. Местообитание и детали строения самца *Gitona distigma*.

1 – песчаный карьер с гнездами береговой ласточки в окрестностях д. Демкино, Саратовская область; 2 – брюшко, сверху; 3 – крыло, сверху.

sand quarry. The burrows are located in the sandy cliff of the quarry at a height of 2–3 m. The length of the colony was up to 7 m. The entrance holes of the burrows were extended in a chain of 2–6 tiers in the upper third of the cliff (Fig. 1).

The flies were placed in 70% ethanol, in which they were stored until identification.

The terminology used in this article is based on the work of Sidorenko [2008].

#### *Gitona distigma* Meigen, 1830 (Figs 2, 3)

**Material.** 52♂, 48♀ (collection numbers N 46, N 47, N 48, Institute of Ecology and Evolution of the Russian Academy of Sciences, Moscow, Russia), Russia, Saratov Region, Kvalynsk District, Demkino vill. env., sandy quarry, 52.267003°N / 47.796580°E, from the nests of the sand martin *Riparia riparia* (Linnaeus, 1758), 4.11.2021 (E.N. Kondratiev).

**Diagnosis.** Relatively large, body length 4 mm, yellowish-brown flies. The face is yellowish, with gray pollination, the width of the face is greater than the height, the facial keel is high and wide, the genae are yellow, the height of the gena is slightly more than 0.25 of the largest diameter of the eye, the vertex is framed with white. Antennae yellow-brown, flagellomere 1 oval, almost 1.5 times longer than pedicel. Palpi yellowish. The pleurae are brownish-yellow with diffuse blackish areas. The halteres are brownish-yellow. Legs are single-coloured, brownish-yellow. The abdomen is shiny, yellow, with dark bands along the posterior margin and dark median stripes, clearly expressed on tergites III–V; tergite VI with an indistinct band and a small dark median spot.

The species *G. distigma* differs from the closely related species *G. distans* primarily in the structure of the wing: the distal-medial cross-vein dm-cu of *G. distans* is significantly removed from the radial-medial vein r-m [Bachli et al., 2004: 60, figs 127–128]. In addition, in *G. distigma* the dark spot on the apex of R2+3 is rounded, the spot on the apex of R4+5 is well developed (Fig. 3), and the median expansion of the dark stripes on the abdomen reaches the anterior margin on tergites III–V (Fig. 2).

In *G. distans* the dark spot on the apex of R2+3 is longitudinally oblong, the spot on the apex of R4+5 is less developed [Bezzi, 1924: 255, figs A, B], the median expansion of dark stripes on the abdomen does not reach the anterior margin on tergites III–V.

**Biology.** Adults of *Gitona*, like many other drosophilids, most likely feed on liquefied fermenting substrates of plant origin, including tree sap. Thus, adults of *G. distigma* were caught in beer traps [Gornostaev et al., 2023]. The larvae of *G. distigma* develop in the inflorescences of different species of sow thistles (*Sonchus arvensis* L., *S. oleraceus* L.), prickly tartar (*Onopordon acanthium* L.) [Ashburner, 1981] and other Asteraceae [Ferrari, 1987], damage fruits of *Moringa oleifera* Lam. (Moringaceae) [Chellamuthu et al., 2017]. Little is known about the biology of other species of the genus, except for the species *G. distans*, which was bred from figs [Bezzi, 1924]. Adults of *Gitona* spp. are sometimes found indoors on windows [Sidorenko, 2008].

**Distribution.** Europe and Asia: Spain, France, Germany, Austria, Slovenia, Croatia, Serbia, Macedonia, Switzerland, Czech Republic, Italy, Hungary, Slovakia, Poland, Romania, Belarus, Ukraine, Kazakhstan, Uzbekistan, Tajikistan, India, China, Mongolia [Sidorenko, 2008; Chellamuthu et al., 2017]. Russia: Lipetsk Region, Voronezh Region, Rostov Region, Adygea, Dagestan, Mordovia, Saratov Region, Samara Region, Novosibirsk Region, Altai, Irkutsk Region, Yakutia, Khabarovsk Region, Primorskiy Region [Sidorenko, 2008; Gornostaev, Luypina, 2023; Gornostaev et al., 2023].

## Discussion

We found adult flies in fairly large numbers when excavating sand martin nests in the autumn (November). By this time, the swallows leave the nests, and they remain empty.

Many species of Diptera typically overwinter at the adult stage. At the same time, their numbers may increase by the end of summer. Such cases are widely known, for example, for *Thaumatomyia notata* (Meigen, 1830) (Chloropidae) [Nartshuk, 2009], when clouds of these small flies penetrate into rooms, accumulate on windows and penetrate into all cracks.

Larvae of *D. distigma* are phytophagous. The fertility of adults is quite high: the female lays 200–230 eggs, the full development cycle of one generation does not exceed 36 days [Chellamuthu et al., 2017]. Like *Thaumatomyia notata*, cases of accumulations on indoor windows are known for *G. distigma* [Sidorenko, 2008]. All this gives us reason to assume that in our case, the adults of *G. distigma* entered the nests of the sand martin for overwintering.

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