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RESEARCH ARTICLE

Review of the genus *Dioctria* Meigen, 1803 (Diptera: Asilidae) in Uzbekistan with the description of two new species

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Abstract

The article analyzes representatives of the fauna of the genus *Dioctria* of Uzbekistan. Two new species, *Dioctria abdullayevi* Mamanov et Rakhimov **sp. nov.** (Type locality: Kurama range (Western Tian Shan)) and *Dioctria hissarica* Mamanov et Rakhimov **sp. nov.** (Type locality: Hissar range (Western Hissar-Alai)), are described and illustrated. The new species can be distinguished from other species by several characteristics, including the shape of genitalia. The number of *Dioctria* species in Uzbekistan has now increased to 6. The distinctive features of the species of the genus *Dioctria* are analyzed comparatively, and the key to determining the representatives of the genus common in Uzbekistan is given.

Keywords
Asilidae, *Dioctria*, new species, Uzbekistan, Diptera, key, insect biodiversity

Introduction

The order Diptera includes more than 160,000 described species (Zhang 2013) and is divided into 244 families (The Catalogue of Life 2024). However, Diptera remains the least studied order of insects in Uzbekistan compared to other orders. In recent years, the biodiversity of the entomofauna of the Republic of Uzbekistan has been intensively studied. However, these studies cover only a few orders, for example, beetles (Halimov 2020; Khalimov 2023; Romantsov, Rakhimov 2023; Alimova et al. 2024), Hemiptera (Musayev et al. 2023; Lebedeva et al. 2024) or Hymenoptera (Medetov et al. 2024). Of the Diptera, only syrphid flies have been more or less studied (Daminova 1997, 2014; Rakhimov 2023).

Robber flies, or assassin flies (Asilidae) are a diverse family of active predators. The most recent classification divides Asilidae into 14 subfamilies based on morphological phylogeny, although many of these are not supported by molecular data (Cohen 2021). The family contains 569 genera (The Catalogue of Life 2024).

Although there are enough works on the fauna of the robber flies of Southwest and Central Asia (Rikhter 1968; Ler 2001, 2002; Bayrakdar and Hasbenli 2009; Mohammadi et al. 2017, 2020; Astakhov 2023), the fauna of the robber flies of Uzbekistan has been very poorly studied. Some information about the robber flies is found only in a few works (Ler 1965; Ergashev 1970; Bronstein 1981; Khalimov et al. 2023). In the work of S.G. Bronstein, the distribution of 105 robber flies species in Uzbekistan is noted. However, in this list, 15 species are uncertain of species status, and the existence of another 5 species is doubtful.

The genus *Dioctria* Meigen, 1803 is the largest genus of the subfamily Dioctriinae and one of the largest in the entire family, comprising 2 subgenera and 112 described species worldwide (The Catalogue of Life 2024). In the Palaearctic, the distribution of 85 to 98 species of this genus is noted; in the latter case, 10 of which are considered dubious species (Mohammadi et al. 2019; Lehr 1988). This genus has been revised several times. A revision of the genus *Dioctria* of Kazakhstan and Central Asia was carried out in 1965 by Lehr. Which 18 species are indicated for this territory. However, at the moment, females or males of a number of species from this list have not been described. For example, females of *D. lugens* Loew, 1873, *D. gussakovskii* Lehr, 1965 from the Hissar Range, male *D. hohlbecki* Lehr, 1965 from the Peter the Great Range and male *D. cornuta* Lehr, 2001 from Moldova have not been described (Lehr 1965; 2001). In recent years, the status of several taxa of this genus has been described: *D. pseudokazak* Astakhov, 2023 from Turkmenistan, *Dioctria faciata* Mohammadi, Talebi & Van den Broek 2020 from Iran (Mohammadi et al. 2020), *Dioctria meridionalis dagestanica* from the Caucasus (Astakhov 2018) were described, *Dioctria kazak* Lehr, 1965 and *Dioctria nigrescens* Lehr, 1965 (Asta-

khov 2023) were restored to the species status. All this proves that a detailed study of representatives of this genus can yield interesting results.

For the fauna of Uzbekistan, the first species (*Dioctria dispar* Loew, 1871) of the genus was noted by H. Loew. Later, J. Moucha and M. Hradsky (1963) noted the species *Dioctria niedli* Moucha et Hradsky, 1963 described from Aktash near Tashkent. In 1965, Lehr described the species *Dioctria zhelochovtzevi* Lehr, 1965 (Lehr 1965) from the same locality, and the author also indicates the distribution of *Dioctria dispar* Loew, 1871 and *Dioctria flavipennis* Meigen, 1820 in Uzbekistan. S.G. Bronstein reports the distribution of 3 species of the genus *Dioctria*. The species indicated for Uzbekistan by A.L. Ozerov The lake species *Dioctria kazak* Lehr, 1965 is apparently erroneous, since the location indicated on the label of the specimen (the upper reaches of the Yassi River) is not included in the territory of Uzbekistan (Ozerov 2005).

Thus, at the moment, 4 species of the genus *Dioctria* are known in Uzbekistan, which is very little for the fauna of the vast territory of the Republic, which has diverse environmental conditions.

During the study of materials from Uzbekistan, two series of specimens were discovered that differed significantly in morphology from previously described species. These specimens were compared with the revision by Lehr (2001, 2002) and the collection of primary types from the Zoological Institute of the Russian Academy of Sciences in Saint Petersburg, Russia, which led us to describe them as new species.

The aim of this study is to analyze the taxonomic diversity of representatives of the genus *Dioctria* in Uzbekistan.

Materials and methods

The article is based on materials collected by the authors in the period from 2010 to 2024. The samples were collected at different points in Uzbekistan, with maximum coverage of various biotopes (Fig. 1). Insects were collected using a standard entomological net. The determination of the material was made by the first and second authors. Male genitalia were dissected with a hook-tipped entomological pin. Dry hoverfly specimens were relaxed in a humidity chamber before removing the genitalia. The genitalia were cleaned in boiled 10% KOH solution for 3–5 min, then immersed in glacial acetic acid to neutralize the KOH, before being washed in ethanol to remove the acid. Finally, all such samples were stored in plastic microvials containing glycerin and pinned with the source specimen. All specimens are deposited in the Insect Collection of the Zoological Museum of Samarkand State University (Samarkand, Uzbekistan) – later SamSU.

The following references were used for the identification of specimens and geographical distribution of species: Lehr (1965, 1988, 2001, 2002) and Geller-Grimm et al. (2015). Morphological terminology of species mostly follows Lehr (1988, 2001, 2002), Geller-Grimm (2003) and Geller-Grimm et al. (2015). Photos were taken us-

ing a Canon EOS 1300D digital camera. Male genitalia were photographed using a Levenhuk MED D30T LCD digital microscope. A part of the images was merged into a single in-focus image using the imagestacking software Helicon Focus 7 and Adobe Photoshop cc version 20.0.5.

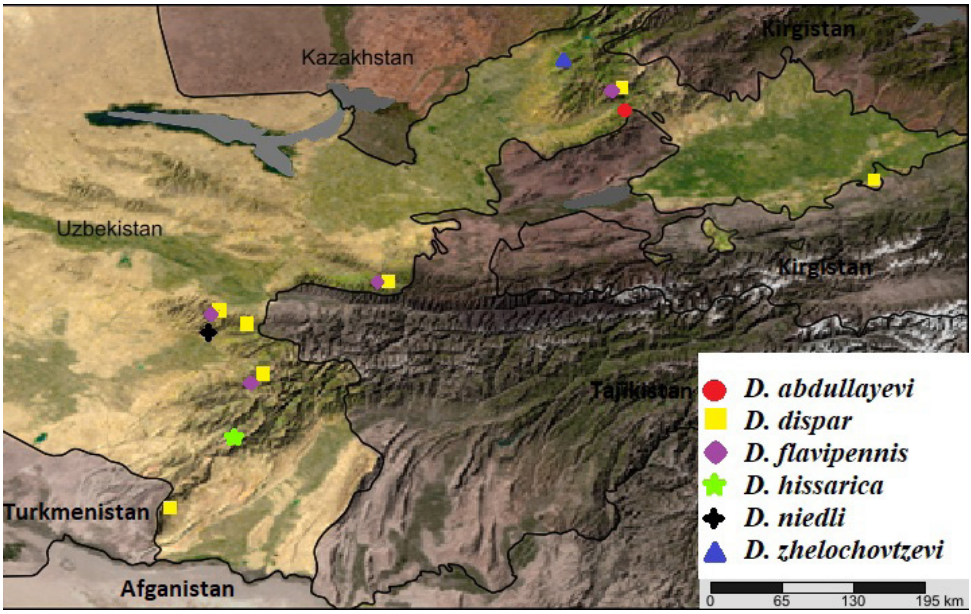


Figure 1. Distribution of species of the genus *Dioctria* in Uzbekistan.

Results and discussion

Order Diptera

Family Asilidae Latreille, 1802

Genus *Dioctria* Meigen, 1803

***1. Dioctria abdullayevi* Mamanov et Rakhimov sp. nov.**
http://zoobank.org/4EA4A3B7-0D5F-4F7D-BBD1-9FC8B4EE2B31
Fig. 2

Type material. Holotype: Male (SamSU), Uzbekistan, Tashkent region, Angren district, Kurama ridge 1 km S to Lashkerak village. Juniperus woodland (40.9047° N, 70.2103° E 1650 m a.s.l.), 27 May 2024 M. Rakhimov leg. Paratypes – 3♂♂, 5♀♀, with the same labels.

Diagnosis. The mystax is black, sparse in one arcuate row. The antennal socket bears two horn-shaped prominences on the sides (Fig. 3). The scutum is shiny,

black, without pollen. The proleg and mesoleg are yellow. The metalegs are black. The abdomen is shiny black (Fig. 2). The epandrium (Fig. 7B) has a semicircular notch on the basal side, in the middle of which there is a triangular outgrowth. The hypandrium (Fig. 7A) is semicircular in shape, the upper half of which is covered with several rows of hairs of different lengths. The underside has a triangular notch. The lateral process of the gonostylus at the apex with a semicircular notch.

Description. Male. The hairs on the palpus are yellow. The mystax consists of 9-13 sparse black hairs arranged in one arcuate row. The face, when viewed from the front and from above, is covered with thick pollen of a golden yellow hue. The antennae are black; their pedicel is clear but slightly shorter than the scape, and their ratio is 1.5:2.5. The pedicel is slightly smaller than the stylus. The sensory element is located in a well-marked pit. The hairs on the basal segments of the antennae are black. The antennal socket bears two horn-shaped prominences on the sides (Fig. 3). The frons and vertex are shiny black. The forehead decreases very sharply from the faceted eyes to the ocular triangle. The postcranium is shiny black, only along the edge of the eyes, with a narrow but well-marked band of pollen. The hairs on the postcranium are black; only from below is there an admixture of light.

The thorax is shiny and black. The scutum is without pollen. The middle stripe of the mesonotum and the spots of the lateral stripes are distinguished by short, light hairs. The anepisternum is circled in front from the top, and the back is circled with pollen. The katepisternum has a circled front side and a side in contact with the anepimeron. Meron on the anterior side and along the posterior edge with pollen bands.

Figure 2. *Dioctria abdullayevi* **sp. nov.**

Moreover, this stripe is thin on the front side and wide on the back edge and sometimes occupies almost a third of the sternite. The wing is slightly darkened, the anterior margin is yellowish, and the basal part is slightly darker than the apical part. The proleg and mesoleg are yellow, but all the tarsi and sometimes the tibia on the apical are black on the ventral side. The metalegs are black with a yellow stripe (ring) on the basal part of the femur and the joint of the femur and tibia. The first tarsomere of the metaleg is swollen. The piles and setas on the proleg and mesoleg are light, slightly yellowish. The piles on the metalegs are yellowish, on the inner side of the thigh with an admixture of darker ones. The setas on the metalegs are black or brown (Fig. 2).

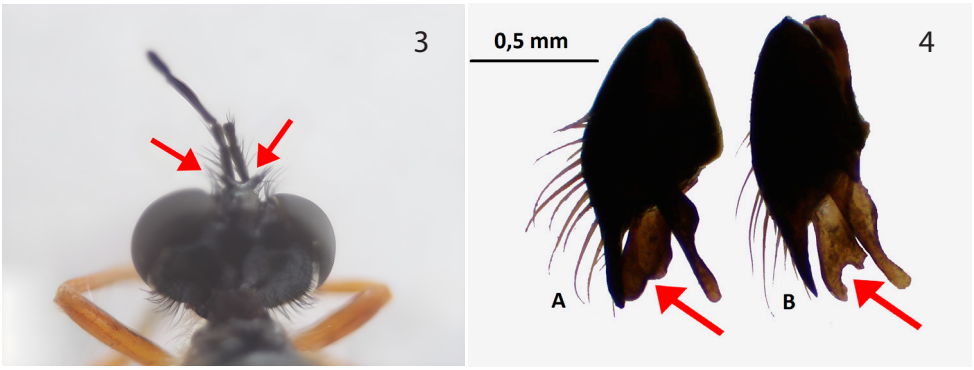
The abdomen is shiny black, and the microtrichia on it are black with an admixture of white on the dorsal side. Male genitals with long black setae. The epandrium (Fig. 7B) has a semicircular notch on the basal side, in the middle of which there is a triangular outgrowth. The hypandrium (Fig. 7A) is semicircular in shape, the upper half of which is covered with several rows of piles of different lengths. The underside has a triangular notch. The lateral process of the gonostylus at the apex with a falcate form (Fig. 4B). The length is 7–9 mm.

Female differs from the male in the following features: Mystax consists of 8–10 black setae. The antennae are black, and looks brown because of the pollen it.

The legs are reddish, but the protibia and mesotibia are at the tops, and the metalegs are black up to half. The tarsus are also black. The piles are light yellowish, the seta are yellow. The length is 7–10 mm.

Comparative notes. The species is similar to *Dioctria hissarica* Mamanov et Rakhimov, *Dioctria faciata* Mohammadi, Talebi & Van den Broek 2020 and *Dioctria cornuta* Lehr, 2001 but differ in several features. The male differs from *Dioctria faciata* by a completely black abdomen, the black colour of the basal segments of the antennae, a small difference in the length of the scapus from the pedicel (Fig. 3), yellow hairs on the palpi, the black colour of the postpronotal lobe and postalar callus, as the different shape of the hypandrium and the structure of the lateral process of the gonocoxite, in addition, females differ from females of *Dioctria faciata* by full yellow face pollination. The black colour of the mystax differs from *Dioctria cornuta*. It differs from *Dioctria hissarica* in the yellow colour of the proleg and mesoleg (Fig. 2), more noticeable prominences of the antennal socket, a noticeable location of the sensory element, a sharp decrease in the forehead from the faceted eyes to the ocular triangle, a well-marked pollen stripe along the edge of the eyes. There are also a number of differences in the structure of the genitals. The slightly elongated shape of the epandrium and the presence of a triangular outgrowth in its basal part, several rows of hair in the hypandrium and a triangular recess on its basal side (Fig. 7), as well as a semicircular recess at the top of the lateral process of the gonostylus (Fig. 4).

Etymology. The species is named after the Uzbek entomologist, associate professor of Samarkand State University Erkin Abdullayev, teacher of the authors of this species, for his contribution to science and comprehensive support of young entomologists.



Figures 3–4. 3. Head of *Dioctria abdullayevi* **sp. nov. 4.** Male gonostylus of *Dioctria hissarica* **sp. nov.** (**A**) and *Dioctria abdullayevi* **sp. nov.** (**B**).

2. *Dioctria dispar* Loew, 1871

Fig. 8A

Literature: (Lehr 1965, 1988, 2001; Bronstein 1981)

Material examined: Uzbekistan 1♀; Tashkent reg, Angren dist, Yangiabad campsite, Juniper woodlands and river bank; 41.1457° N, 70.1266° E; 17 May 2024; M. Rakhimov leg.; 2♂♂, 2♀♀; Andijan reg, Xujaobod dist, Imom ota vill; 40.5410° N, 72.6204° E; 21 May 2024; M. Rakhimov leg.; 1♂, 1♀; Turkestan ridge, Zomin National Park. Kizilmazor plateau 39.6163°N, 68.4327° E; 24 May 2023; M. Rahimov leg.; 1♂; Zamin reserve, Obikul river; 39.6231° N 68.3861° E; h=2000 m, 24 June 2023; M. Rakhimov leg.; 1♂, 4♀♀; Samarkand reg, Zarafshon ridge, Urgut dist, Yetti uyli valley; 39.43° N, 66.98° E; 14-17-May 2010; E. Abdullayev leg.; 1♂; Samarqand reg, Urgut district, Taktaqaracha pass, 39.3023° N, 66.8967° E; 15 June 2024; M. Rakhimov leg.; 1♂; Samarkand reg, Urgut dist, Saridukon pass, alpine meadows; 39.3297° N, 67.2072° E; h=2500 m, 8 June 2024; M. Rakhimov leg.; 1♀; Hissar reserve, Tamshush, cordon 38.9899° N, 67.3660° E; h-1850 m; 16 June 2024; M. Rahimov leg; 2♀♀; Hissar reserve, Miraki section, Tamshush river 38.97° N, 67.39° E; 14-15 June 2023; M. Rahimov leg.; 1♀; Hissar reserve, Mirkurak river 38.862° N, 67.272° E; 01 June 2023; M. Rahimov leg.; 1♂, 1♀; Surkhan reserve, Shalkan 37.865° N, 66.625° E, h: 1800-2000 m; 30 May 2023; M.Rakhimov leg.

Distribution. Uzbekistan, Tajikistan, Kirgizstan (Lehr 1988).

3. *Dioctria flavipennis* Meigen, 1820

Fig. 8B

Literature: (Lehr 1965, 2001; Bronstein 1981)

Material examined: Uzbekistan 1♀; Tashkent reg, Angren dist, Yangiabad campsite, Juniper woodlands and river bank; 41.1457° N, 70.1266° E; 17 May 2024;

M. Rakhimov leg.; 2♂♂, 1♀; Turkestan ridge, Zomin National Park. Kizilmazor plateau 39.6163°N, 68.4327° E; 24 May 2023; M. Rahimov leg.; M. Rahimov leg.; 3♀♀; Zomin reserve, Obikul river; 39.6231° N, 68.3861° E; h=2000 м; 24 June 2023; M.Rakhimov leg. 1♀; Samarkand reg, Zarafshon ridge, Urgut dist, Yetti uyli valley; 39.43° N, 66.98° E; 18 May 2010; E. Abdullayev leg.; 1♀; Samarkand reg, Zarafshon ridge, Urgut dist, Yetti uyli valley; 39.43° N, 66.98° E; 5 June 2023; S. Mamanov leg.; 1♀; Hissar reserve, Miraki section, Tamshush river; 38.9899° N, 67.3660° E; 14-15 June 2023;

Distribution. Europe: Austria, Bulgaria, Czech Republic, Slovakia, Germany, France, Hungary, Poland, Romania, Russia, Lithuania, Latvia, Estonia, Moldova, Ukraine, Belarus; Asia: Kazakhstan, Kyrgyzstan (Lehr 1988). This species is not listed in the Catalog of Palearctic Diptera for Uzbekistan, but Bronstein S.G. (1981) noted its distribution in the Zarafshan River valley in Uzbekistan.

4. Dioctria hissarica Mamanov et Rakhimov sp. nov.

http://zoobank.org/B88E7C8F-36E0-434A-8579-F1CFB4A3808A
Fig. 5

Type material. Holotype: Male (SamSU), Uzbekistan, Kashkadarya province, Dehkonobod district, Hissar ridge 10 km E to Dukonkhona village, (38.70° N, 67.30° E 3100 m a.s.l.), 03 June 2024 M.Rakhimov leg. Paratypes – 3♂♂, with the same labels.

Diagnosis. The mystax is black, in 2–3 rows. The antennal socket bears two small horn-shaped prominences on the sides. A narrow band of pollen along the edge of the eyes is practically not noticeable. The legs are mostly black. The abdomen is shiny black. The hypandrium (Fig. 7C) is semicircular in shape, the upper half of which is covered with one row of rare pile of different lengths. The underside has a semicircular notch. The lateral process of the gonostylus in front of the apex narrows at right angles without forming a semicircle.

Description. Male. The mystax consists of 13–20 black seta arranged in 2–3 rows. The face, when viewed from the front and from above, is covered with thick pollen of a golden yellow hue. The antennae are black, their pedicellus is clearly, but slightly shorter than the scapus, their ratio is 1.5:2.5. The length of the pedicellus is approximately equal to the length of the stylus. The apical sensor is located in a poorly visible pit. The setae on the basal segments of the antennae are black. The antennal socket bears two small horn-shaped prominences on the sides. The frons and vertex are shiny black. The forehead decreases smoothly from the faceted eyes to the ocular triangle. The postcranium is shiny black, and a narrow band of pollen along the edge of the eyes is almost invisible. The hairs on the back of the head are black; only from below is there an admixture of light.

The thorax is shiny and black. The scutum is without pollen. The middle stripe of the scutum and the spots of the lateral stripes are distinguished by very short light piles. The anepisternum are circled in front, from the top and the back are circled

with pollen. The katepisternum has a circled front side and a side in contact with the anepimeron. Meron on the anterior side and along the posterior edge with pollen bands.

Moreover, this stripe is thin on the front side and wide on the back edge and sometimes occupies almost a third of the sternite. The wing is slightly darkened, the anterior margin is yellowish, and the basal side is slightly darker than the apical part. The legs are mostly black; only the tibia of the prolegs and mesolegs are yellow on the anterobasal side, with 1/4–1/5 black in the apical part. The metalegs are black with a yellow spot of varying degrees on the anterobasal side. The first tarsomere of the metalegs is swollen. The piles and setas on the proleg and mesoleg are yellowish. The piles on the metalegs are yellowish, on the inside of the tibia and femur, with an admixture of darker ones. The setae on the metaleg are black.

The abdomen is shiny black, sparse and poorly visible short microtrichia on it are black. Male genitals with long black pile. The epandrium (Fig. 7D) has a semicircular notch on the basal side. The hypandrium (Fig. 7C) is semicircular in shape, the upper half of which is covered with one row of rare pile of different lengths. The underside has a semicircular notch. The gonostylus in front of the top narrows at right angles without forming a semicircle (Fig. 4). The length is 7–9 mm.

Female is unknown.

Comparative notes. The species is similar to *Dioctria abdullayevi* Mamanov et Rakhimov, *Dioctria faciata* Mohammadi, Talebi & Van den Broek 2020, *Dioctria cornuta* Lehr, 2001 and *Dioctria hohlbergi* Lehr, 1965 but differs in several characters. The male differs from *Dioctria faciata* in its completely black abdomen, the black colour of the basal antennal segments, the slight difference in the length of the scape from the pedicel, the yellow hairs on the palpus, the black colour of the postpronotal lobe and postalar callus, as well as the shape of the hypandrium and the structure of the lateral process of the gonocoxite; in addition, females differ from *Dioctria faciata* females have full yellow face pollination.

It differs from *Dioctria cornuta* in the black color of its mystax. It differs from *Dioctria abdullayevi* in the black colour of all legs (Fig. 6), less noticeable prominences of the antennal socket, poorly visible location of the apical sensor, a smooth decrease of the forehead from the compound eyes to the ocellar triangle, and a poorly visible strip of pollen along the edge of the eyes.

There are also a number of differences in the structure of the genitals. The slightly stocky shape of the epandrium and the absence of a triangular process in its basal part (Fig. 7D), the presence of only one row of hairs in the hypandrium (Fig. 7C) and the semicircular shape of the notch on its basal side, as the different structure of the lateral process of the gonostylus (Fig. 4A). It differs from *Dioctria hohlbergi* Lehr, 1965 in its black legs and the presence of two small horn-like prominences in the antennal socket.

Etymology. The species is named after the typical location - the Hissar ridge located in Uzbekistan and Tajikistan.

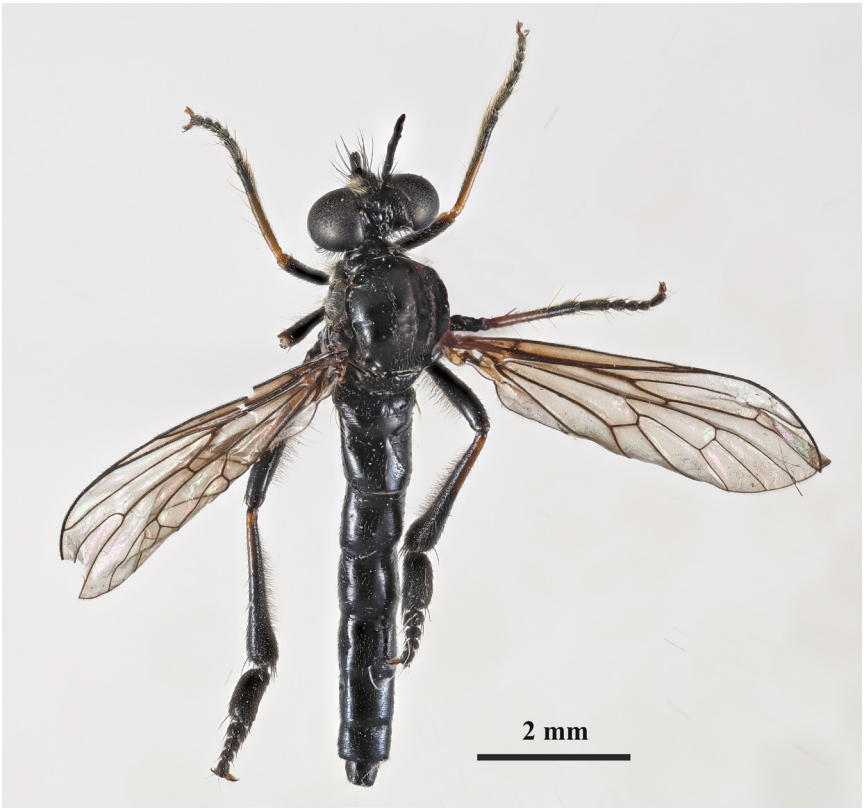


Figure 5. *Dioctria hissarica* Mamanov et Rakhimov **sp. nov.**

Figure 6. *Dioctria hissarica* lateral view.

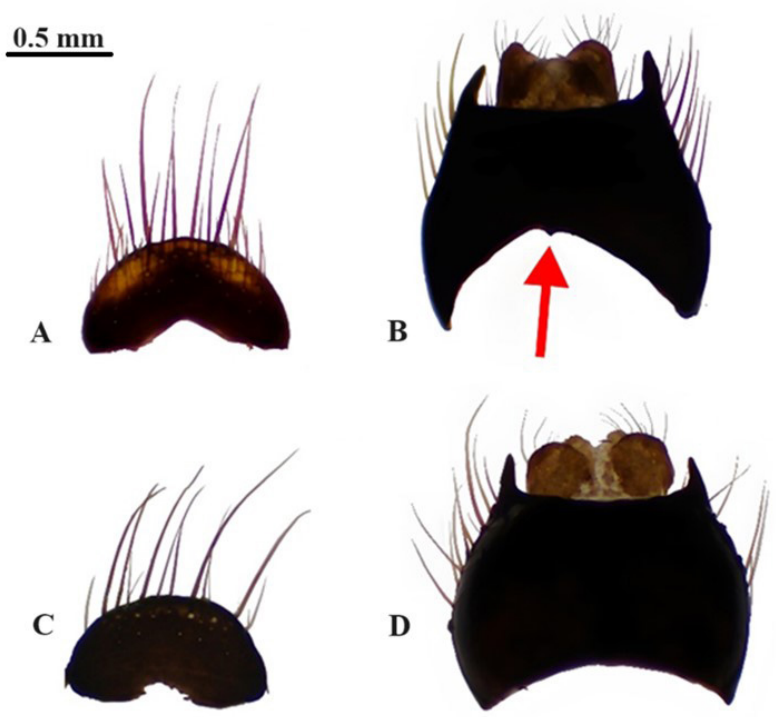


Figure 7. Male genitalia of *Dioctria* spp. hypandrium (A) and epandrium (B) of *D. abdullayevi*. Hypandrium (C) and epandrium(D) of *D. hissarica*.

5. Dioctria niedli Moucha et Hradsky, 1963

Fig. 8C

Literature: (Moucha et Hradsky 1963; Lehr 1965, 1988, 2001, 2002)

Material examined: 1♀; Uzbekistan, Samarqand reg, Urgut district, Amankutan village, Yulsoy river; 39.30° N, 66.95° E; 22 June 2024; S. Mamanov leg.

Distribution. Uzbekistan, Tajikistan (Lehr 1988).

Remarks. Recently, the subspecies of this species *Dioctria niedli kazak* Lehr, 1965 and *Dioctria niedli nigrescens* Lehr, 1965 were elevated to the status of distinct species – *Dioctria kazak* Lehr, 1965 and *Dioctria nigrescens* Lehr, 1965 (Astakhov 2023).

6. Dioctria zhelochovtzevi Lehr, 1965

Literature: (Lehr 1965, 1988, 2001)

Distribution. Uzbekistan (Lehr 1988).

Remarks. The species was described from Aktash, a mountainous area near Tashkent, based on A. Zhelokhovtsev's collections from 1923–1925. It is currently known that the holotype is stored in the Zoological Museum of Moscow State University (Ozerov 2005).

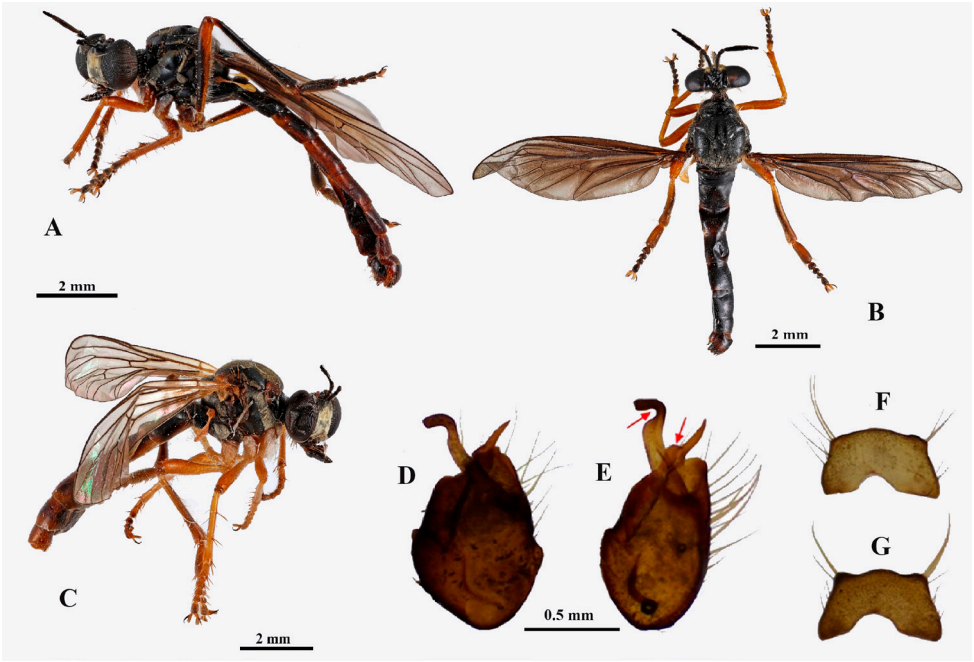


Figure 8. *Dioctria* spp.: *D. dispar* (**A**) *D. flavipennis* (**B**) *D. niedli* (**C**). Gonocoxite of *D. dispar* (**D**) and gonocoxite of *D. flavipennis* (**E**) hypandrium of *D. dispar* (**F**) and hypandrium of *D. flavipennis* (**G**).

Key to the Uzbekistan species of the genus *Dioctria* based on Lehr (1965)

1 On anepisternum there is a pollen spot only on the dorsal-posterior part . ..... ***Dioctria zhelochovtzevi* Lehr, 1965**

– The anepisternum are circled in front, on the top and on the back side. They are surrounded by pollen tomentum..... **2**

2 The antennal socket bears two horn-like prominences on its sides. The mystax is black **3**

– Antennal socket without horn-like prominences. The mystax is light..... **4**

3 The legs are mostly black .... ***Dioctria hissarica* Mamanov et Rakhimov**

– The proleg and mesoleg are rufous, but all the tarsi and sometimes the tibiae at the apices are black on the ventral side. The metalegs are black with

a yellow stripe (ring) on the basal part of the femur and at the articulation of the femur and tibia..... ***Dioctria abdullayevi*** **Mamanov et Rakhimov**

4 All antennal segments are black ***5***

– Both basal or first basal antennal segments rufous..... ***Dioctria niedli*** **Moucha et Hradsky, 1963**

5 The first antennal segment is approximately 3 times longer than the second. The mystax consists of more than 12-13 yellow hairs..... ***Dioctria flavipennis*** **Meigen, 1820**

– The first antennal segment is about 2 times longer than the second. The mystax is sparse, consisting of approximately 8-10 yellow hairs..... ..... ***Dioctria dispar*** **Loew, 1871**

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References

Alimova LKh, Umurzakova MS, Zokirova DF, Khamzaev RA, Normuradova G, Otakulov B, Pazilov A, Kudratov JA, Urazova RS, Khalimov FZ (2024) Diversity and features of the fauna of herpetobiont beetles (Carabidae, Tenebrionidae, Elateridae, Scarabaeidae) of the Lower Zeravshan, Uzbekistan. Biosystems Diversity 32(1): 73–82. http://dx.doi.org/10.15421/012407

Astakhov DM (2018) A New Subspecies of the Robber Fly *Dioctria meridionalis* Bezzi, 1898 (Diptera, Asilidae) from Daghestan. Entomological Review 98(7): 928–935. https://doi.org/10.1134/S0013873818070163

Astakhov DM (2023) New Data on the Systematics of the Asian Robber Flies of the Genus *Dioctria* Meigen, 1803 (Diptera, Asilidae) with the Description of a New Species from Turkmenistan. Entomological Review 103(2): 247–249. https://doi.org/10.1134/S0013873823020124

Bayrakdar F, Hasbenli A (2009) Contribution to the Geographic Distribution of *Dioctria* Meigen, 1803 Genus (Diptera, Asilidae). Turkish Journal of Zoology 33(1): 23–26. https://doi.org/10.3906/zoo-0712-5

Bronstein CG (1981) Robber flies (Asilidae, Diptera) of Uzbekistan. Questions of plant protection (collection of scientific articles). Samarkand State University, Samarkand, 4–21. [In Russian]

Cohen CM, Noble K, Cole TJ, Brewer MS (2021) The phylogeny of robber flies (Asilidae) inferred from ultraconserved elements. Systematic Entomology 46: 812–826. https://doi.org/10.1111/syen.12490

Daminova DB (1997) Hover flies (Diptera, Syrphidae) of the Nurata Reserve. Proceedings of nature reserves of Uzbekistan 2: 30–36. [In Russian]

Daminova DB (2014) The fauna of flies of the family Syrphidae (Diptera) of the plains of Uzbekistan. Bulletin of the Karakalpak State University named after Berdakh 4(25): 17–20. [In Russian]

Ergashev N (1970) Rober fly – is a possible regulator of the number of locusts. Priroda 2: 105. [In Russian]

Geller-Grimm F (2003) Identification key to the *Dioctria* species, Photographic atlas andidentification key to the robber flies of Germany. Ampyx-Verlag, Halle (Saale), CD-ROM.

Geller-Grimm F, Dikow T, Lavigne RJ (2015) Robber flies (Asilidae) database, species. Available from: http://www.gellergrimm.de/catalog/species.htm

Halimov F (2020) Seasonal dynamics of dominant species of soil predators (Coleoptera: Carabidae, Staphylinidae) in agrolandscapes and their potential gluttony. Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa" 63(2): 175–187. https://doi.org/10.3897/travaux.63.e54116

Khalimov F (2023) Composition and structure of the fauna of ground beetles (Coleoptera, Carabidae) of the Zerafshan Range. Acta Biologica Sibirica 9: 113–125. https://doi.org/10.5281/zenodo.7725474

Khalimov F, Rakhimov M, Khamzaev R, Abdullaev E, Usanov U (2023) Composition and structure of the entomofauna of *Ferula* (*Ferula kuhistanica*) in different sections of the Zarafshan Ridge. Journal of the Entomological Research Society 25(2): 275–286. https://doi.org/10.51963/jers.2023.86

Lebedeva NI, Kanyukova EV, Musaev DM, Mirzayeva GS, Valieva MN, Kholmatov BR (2024) The semiaquatic bugs (Heteroptera: Gerromorpha) of Uzbekistan. Acta Biologica Sibirica 10: 471–488. https://doi.org/10.5281/zenodo.11219323

Lehr PA (1965) Robber flies tribes Dioctria of Kazakhstan and Central Asia. Proceedings of the Institute of Plant protecting 9: 184–199. [In Russian]

Lehr PA (1988) Family Asilidae. Catalogue of Palaearctic Diptera. Vol. 5. Athericidae – Asilidae. Akadémiai kiadó, Budapest, 197–326.

Lehr PA (2001) Robber flies of the subfamily Dioctriinae stat. n. (Diptera, Asilidae) Asia. I. Taxonomy, ecology, phylogeny. Entomological Review 80(1): 194–208. [In Russian]

Lehr PA (2002) Robber flies of the subfamily Dioctriinae (Diptera, Asilidae) of Asia. II. Taxonomy and ecology. Entomological Review 81(2): 445–459. [In Russian]

Loew H (1871) Beschreibung europäischer Dipteren. Systematische Beschreibung der bekannten europäischen zweiflügeligen Insecten, von Johann Wilhelm Meigen. Vol. 2. s.n., Halle, 319 pp.

Medetov MZh, Embergenov MA, Kholmatov BR, Elmurodova MV, Rakhimov MSh, Tajibaeva JD (2024) Faunistical and ecological analysis of digger wasps (Hymenoptera:

Sphecidae, Crabronidae) in Uzbekistan. Acta Biologica Sibirica 10: 409–439. https://doi.org/10.5281/zenodo.11195851

Mohammadi R, Khaghaninia S, Astakhov D (2017) Study of the robber flies (Diptera: Asilidae) in East and West Azerbaijan provinces of Iran, with two new record species for the country. Journal of Insect Biodiversity and Systematics 3(3): 247–255. https://doi.org/10.52547/jibs.3.3.247

Mohammadi R, Talebi AA, Fathipour Y, Kazerani F, Broek R (2019) Review of the genus *Dioctria* Meigen, 1803 (Diptera Asilidae) from Iran with four new species records for the Iranian fauna. Redia 102: 3–11. http://dx.doi.org/10.19263/REDIA-102.19.01

Mohammadi R, Talebi AA, Fathipour Y, Kazerani F, & van den Broek R (2020) New Record and New Species of the Genus *Dioctria* Meigen, 1803 (Diptera: Asilidae) from Iran, with an Updated Checklist. Transactions of the American Entomological Society 146: 535–547. https://doi.org/10.3157/061.146.0306

Moucha J, Hradský M (1963) Zur Kenntnis der Raubfliegen vom Kaukasus und Zentralasien nebst Beschreibung dreier neuer Arten (Diptera, Asilidae). Acta Entomologica Musei Nationalis Pragae 35: 373–380.

Musayev D, Sattorov N, Abdullaeva J, Musaeva M, Saparov A, Kholmatov B, Yusupova A, Medetov M (2023) Plant Bugs (Heteroptera: Miridae) Development and Damage to Cotton Crop in Uzbekistan. WSEAS Transactions on Environment and Development 19: 329–340. https://doi.org/10.37394/232015.2023.19.29

Ozerov AL (2005) Primary types of Diptera (Insecta) in The Zoological Museum of Moscow State University (ZMUM). I. Families Acartophthalmidae, Asilidae, Carnidae, Conopidae, Dryomyzidae, Ephydridae, Lauxaniidae, Micropezidae, Milichiidae, Neottiophilidae, Pallopteridae, Piophilidae, Scathophagidae, Sepsidae. Russian Entomological Journal 14(2): 125–137.

Rakhimov MR (2023) Check list of hover flies (Diptera, Syrphidae) of west part of Zarafshan mountain ridge. Acta Biologica Sibirica 9: 167–193. https://doi.org/10.5281/zenodo.7835401

Richter VA (1968) Predator robber flies (Diptera, Asilidae) The Caucasus. Nauka, Leningrad, 285 pp. [In Russian]

Romantsov PV, Rakhimov MR (2023) New Data on the Leaf Beetles (Coleoptera, Chrysomelidae) of Middle Asia. Entomological Review 103(6): 639–646. https://doi.org/10.1134/S0013873823060052

The Catalogue of Life (2024) COL Version: 2024-07-18, Amsterdam, Netherlands. https://doi.org/10.48580/dgbqz

Zhang ZQ (Ed.) (2013) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness (Addenda, 2013). Zootaxa 3703: 1–82. https://doi.org/10.11646/zootaxa.3703.1.1