



## Taxonomic study of the genus *Tabanus* Linnaeus, 1758 (Diptera: Tabanidae) in East Azarbaijan province with three species as new records for the Iranian fauna

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**ABSTRACT.** Based on specimens collected from East Azarbaijan province during 2016–2017 as well as specimens which already had been collected during 2007–2015 and deposited at ICHMM, overall 18 species of the genus *Tabanus* were recognized which among them, *Tabanus armenicus* (Krober, 1928), *Tabanus maculicornis* Zettersted, 1842 and *Tabanus nemoralis* Meigen, 1820 are new records to the Iranian Tabanidae fauna. Diagnostic characters as well as their informative photos are given.

**Key words:** Tabanidae, *Tabanus*, Iran, East Azarbaijan province, New records

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### Introduction

The family Tabanidae (horse flies) is a large family of the Brachycera, include 121 genera and 4290 described species belonging to four subfamilies (Pangoniinae, Chrysopsinae, Tabaninae and Sceptsidinae) (Manrique-Saide et al., 2001). The genus *Tabanus* of the subfamily Tabaninae has 1050 species worldwide and 173 species in the Palaearctic region (Olsufjev, 1969). Females are bloodsucker and males are found on flowers, near water resources or flying in forests and pathways.

The principal characteristics of these flies are as follow: body size varies from medium to large; mostly black to greyish-black species; either with pale abdominal pattern of median triangles and sub lateral

patches or with more or less distinct brown lateral patterns; eyes bare or hairy, without or with one or four bands; facets equal in size, more or less sharply separated large facets on the upper part of eyes in males; females usually with well developed frontal calli in specific shape and arrangement, no ocellar swelling; frons narrow to broad, 1-3 antennal segments with more or less distinct dorsal tooth, four terminal flagellar segments, wing mostly hyaline, without pattern; basicosta pubescent (Chaval et al., 1972).

Al-Talafha et al. (2004) recorded *Tabanus lunatus* Fabricius, 1794 and *Tabanus unifaciatus* Loew, 1858 from Jordan. Kilic (2001–2014) studied the family Tabanidae

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in Turkey and recorded several species of the genus *Tabanus*. [Sabr et al. \(2017\)](#) recorded *Tabanus indare* Hauser, 1939 from Iraq.

Before this study 43 species of the genus *Tabanus* had been identified from Iran ([Abbasian-Lintzen, 1962, 1964](#); [Sadegi and Zeegers, 2005](#); [Dousti et al., 2011](#); [Samiei et al., 2017](#)). Regarding the important role of these flies as vectors of serious diseases to vertebrates, their importance as pollinators and as respects that this taxon was poorly studied in East Azarbaijan province (Iran), this study was aimed to identifying *Tabanus* members in the studied areas.

### Material and methods

Materials were collected by a standard entomological sweeping net and Malaise traps from East Azerbaijan province during 2016–2017, as well as the specimens which had been collected during 2007–2015 and kept in the Insect Collection of Professor Hassan Maleki Milani, Tabriz, Iran (ICHMM). The specimens are stored in glass vials containing 75% ethanol. Studied material were collected from various plants in grassland and open forests habitats near to rural areas having various species of Astraceae, Apiaceae, Ronunculaceae, Caryophyllaceae and Lamiaceae as well as the existence of streams and rivers along with the presence of expanded wetlands.

East Azarbaijan province is located in the northwest of Iran, with X from 36°45' to 39°26' N, Y from 45°5' to 48°22' E. The species were identified according to [Chaval et al. \(1972\)](#). The geographical distribution of the studied species mostly were provided by [Kilic \(1999\)](#) and [Abbasian-Lintzen \(1964\)](#).

### Results

In this study, 18 species of the genus *Tabanus* from East Azarbaijan province were collected and identified, among them, *Tabanus armenicus* (Krober, 1928), *Tabanus*

*maculicornis* Zettersted, 1842 and *Tabanus nemoralis* Meigen, 1820 are new records for Iranian fauna. The studied *Tabanus* Lineaus, 1758 species alphabetically listed as follows:

#### *Tabanus armenicus* (Krober, 1928) (Figs 1–2)

**Material examined:** East Azarbaijan province: Arasbaran (Chichakli), 38°39' N, 46°31'E, 2140m, (1 ♀), 16 July 2013, leg.: S. Khaghaninia.

**Distribution:** Armenia, Azerbaijan, Georgia ([Chaval et al., 1972](#)). **New record for the Iranian fauna.**

**Diagnostic characters:** Face covered by long white hairs, lower callus black and rectangular, median callus slender; mesonotum with longitudinal stripes; plura with grey dusting and long hairs, wing vein R<sub>4</sub> without appendix.

#### *Tabanus autumnalis* Linnaeus, 1761

**Material examined:** East Azarbaijan province: Osku (Kandovan), 37°45'N, 46°18'E, 2840m, (1 ♀, 1 ♂), 5 August 2011; Arasbaran (Aynali), 38°35'N, 46°14'E, 1532m, (1 ♀), 28 April 2014, leg.: S. Khaghaninia.

**Distribution:** Armenia, Azerbaijan, Belgium, Cyprus, Egypt, Finland, France, Georgia, Germany, Greece, Iraq, Iran, Italy, Netherlands, Palestine, Russia, Spain, Sweden, Switzerland, Turkey, Ukraine.

#### *Tabanus bactrianus* Olsufjev, 1937

**Material examined:** East Azarbaijan province: Arasbaran (Aynali), 38°35'N, 46°14'E, 1532m, (1 ♂), 28 April 2014, leg. S. Khaghaninia.

**Distribution:** Afghanistan, Iran, Kazakhstan ([Pape & Thompson, 2018](#)).

#### *Tabanus bifarius* Loew, 1858

**Material examined:** East Azarbaijan province: Arasbaran (Makidii), 38°50'N, 46°54'E, 1656m, (19 ♀), 9 June 2010; Arasbaran (Uskulu), 38°52'N, 46°53'E, 1536m, (11 ♀),

22 May 2014; Arasbaran (Chichakli), 8°39'N, 46°31'E, 2140m, (39 ♀, 1 ♂), 16 July 2013; Arasbaran (Aynali), 38°35'N, 46°14'E, 1532m, (5 ♀), 28 April 2014, Kaleybar (Abeshahmad), 38°51'N, 46°59'E, 1783m, (5 ♀), 1 July 2017, leg.: S. Khaghaninia.

**Distribution:** Albania, Armenia, Austria, Azerbaijan, Bulgaria, Czech Republic, France, Georgia, Germany, Greece, Hungary, Iran, Italy, Macedonia, Netherlands, Romania, Russia, Slovakia, Spain, Syria, Turkey, Ukraine, Former Yugoslavia.

*Tabanus bromius* Lineaus, 1758

**Material examined:** East Azarbaijan province: Arasbaran (Chichakli), 38°39'N, 46°31'E, 2140m, (2 ♀), 2 July 2012; Marragheh (Kordadeh), 37°27'N, 46°26'E, 1563m, (1 ♀), 2 July 2013; Arasbaran (Aynali), 38°35'N, 46°14'E, 1532m, (5 ♀), 28 April 2014, leg.: S. Khaghaninia.

**Distribution:** All European and Asian countries.

*Tabanus cordiger* Meigen, 1820

**Material examined:** East Azarbaijan province: Horand (Qaradarvish), 38°54'N, 47°20'E, 1221m, (1 ♀), 3 June 2013, leg.: S. Khaghaninia.

**Distribution:** All European countries, Armenia, Azerbaijan, Canary Island, China, Georgia Iran, Islands, Japan, Morocco, Russia, Turkey.

*Tabanusg lacopis* Meigen, 1820

**Material examined:** East Azarbaijan province: Arasbaran (Chichakli), 38°39'N, 46°31'E, 2140m, (1 ♀), 24 June 2014, leg.: S. Khaghaninia.

**Distribution:** All European countries, Caucasus, China, Iran, Mongolia, Russia, Turkey.



**Figures 1-2.** *Tabanus armenicus* (Krober, 1928) (Female): **1.** Lateral view, **2.** Frontal view of head.

***Tabanus lunatus* Fabricius, 1794**

**Material examined:** East Azarbaijan province: Horand (Qaradarvish), 38°54'N, 47°20'E, 1221m (1 ♀), 2 July 2012; Bostan-Abad (Qurigol), 37°54'N, 46°42'E, 1918m, (1 ♀), 14 August 2013, leg.: S. Khaghaninia.

**Distribution:** Albania, Algeria, Armenia, Azerbaijan, Bulgaria, Egypt, France, Greece, Iran, Iraq, Italy, Jordan, Lebanon, Morocco, Palestine, Poland, Portugal, Romania, Russia, Spain, Syria, Tunisia, Former Yugoslavia (Samiei et al., 2017).

***Tabanus maculicornis* Zettersted, 1842**

(Figs 3–5)

**Material examined:** East Azarbaijan province: Jolfa (Siahsaran), 38°53'N, 45°57'E, 685m, (1 ♀), 2 May 2013, leg.: S. Khaghaninia.

**Distribution:** All European countries, Azerbaijan, Georgia, Iran (**New record**), Kazakhstan, Russia, Turkey.

**Diagnostic characters:** Eyes dark brown with three bands; lower callus dark brown in square shape, median callus oval and black; face covered with white hairs; mesonotum with indistinct longitudinal stripes; R<sub>4</sub> without appendix; halter dark brown.

***Tabanus miki* Brauer, 1880**

**Material examined:** East Azarbaijan province: Bostan-Abad (Shahyordi), 37°43'N, 46°32'E, 2888m, (2 ♀), 21 July 2007; Arasbaran (Chichakli), 38°39'N, 46°31'E, 2140m, (1 ♀), 6 July 2017, leg.: S. Khaghaninia.

**Distribution:** All European countries, Central Asia, Caucasus, Iran, Turkey.

***Tabanus mofidii* Leclercq, 1960**

**Material examined:** East Azarbaijan province: Jolfa (Siahrood), 38°53'N, 45°47'E, 738m, (2 ♀), 2 May 2013, leg.: S. Khaghaninia.

**Distribution:** Southern Europe, Central Asian countries, Algeria, Caucasus, Iran Turkey (Pape & Thompson, 2018).

***Tabanus nemoralis* Meigen, 1820** (Figs 6–9)

**Material examined:** East Azarbaijan province: Shabestar (Khameneh), 38°16'N, 45°27'E, 1586m, (1 ♀), 3 August 2014; Kaleybar (Abeshahmad), 38°51'N, 46°59'E, 1783m, (5 ♀), 1 July 2017, leg. S. Khaghaninia.

**Distribution:** Algiers, France, Iran (**New record**), Italy, Libya, Morocco, Portugal, Spain, Tunisia (Chaval et al. 1972).

**Diagnostic characters:** Eyes greenish with three broad band; lower callus squared and black, median callus oval and brown; mesonotum with distinct longitudinal stripes; R<sub>4</sub> with appendix; halter dark brown.

***Tabanus quaturnotatus* Meigen, 1820**

**Material examined:** East Azarbaijan province: Kaleybar (Abeshahmad), 38°51'N, 46°59'E, 1783m, (5 ♀), 1 July 2017, leg.: S. Khaghaninia.

**Distribution:** Armenia, Azerbaijan, Bulgaria, Czech Republic, France, Georgia, Greece, Hungary, Iran, Italy, Macedonia, Morocco, Netherlands, Romania, Russia, Slovakia, Spain, Tunisia, Turkey, Turkmenistan, Ukraine, Former Yugoslavia.

***Tabanus regularis* Jaennicke, 1866**

**Material examined:** East Azarbaijan province: Arasbaran (Chichakli), 38°39'N, 46°31'E, 2140m, 1 ♀, 8 August 2016, leg.: S. Khaghaninia.

**Distribution:** Algeria, Armenia, Azerbaijan, Bulgaria, Cyprus, France, Greece, Georgia, Iran, Italy, Jordan, Morocco, Palestine, Portugal, Russia, Spain, Tunisia, Turkey, Ukraine, Former Yugoslavia.

***Tabanus spectabilis* Loew, 1858**

**Material examined:** East Azarbaijan province: Kaleybar (Abasabad), 38°51'N, 46°58'E, 1568m, (1 ♀), 31 May 2014, leg.: S. Khaghaninia.

**Distribution:** Afghanistan, Albania, Armenia, Bulgaria, Caucasus, Dagestan, France, Greece, Hungary, Iran, Iraq, Italy, Kazakhstan, Macedonia, Morocco, Romania, Russia, Spain, Turkmenistan, Ukraine, Former Yugoslavia.

***Tabanus spodopteroides* Olsufjev, Mouch & Chaval, 1969**

**Material examined:** East Azarbaijan province: Osku (Kandovan), 37°45'N, 46°18'E, 2840m, (1 ♀, 1 ♂), 5 August 2011, leg.: S. Khaghaninia.

**Distribution:** All European countries, Iran, Morocco, Turkey (Dousti et al., 2011).

***Tabanus tergestinus* Egger, 1859**

**Material examined:** East Azarbaijan province: Bostan-Abad (Qurigol), 37°54'N, 46°42'E, 1918m, (1 ♀), 14 August 2013; Arasbaran (Uskulu), 38°52'N, 46°53'E, 1536m, (7 ♀), 22 May 2014; Arasbaran (Chichakli),

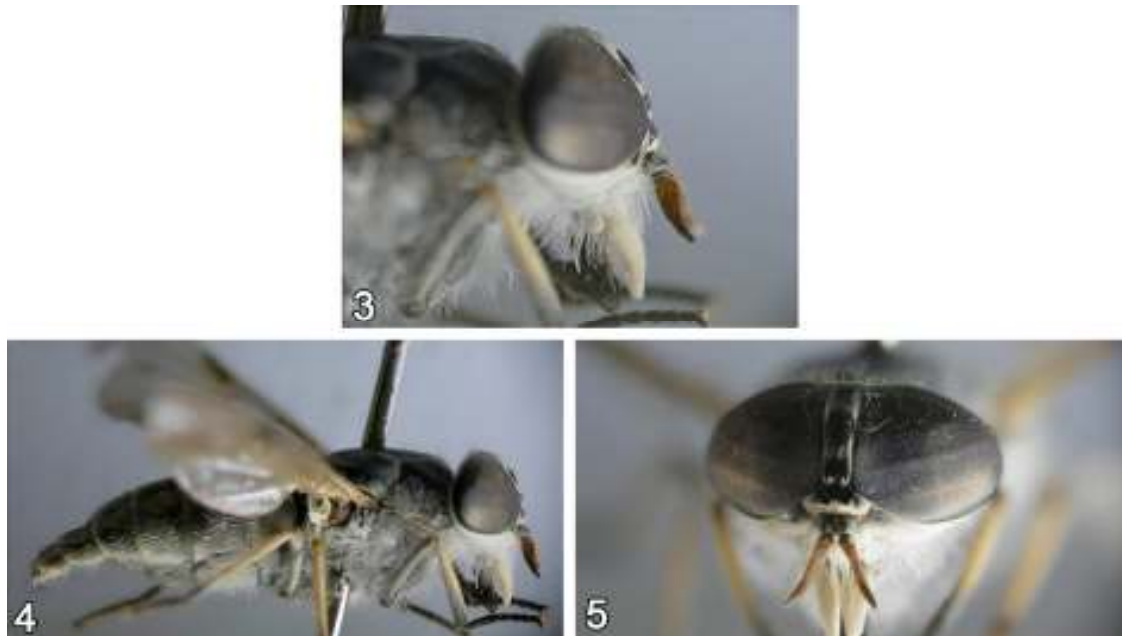
38°39'N, 46°31'E, 2140m, (17 ♀), 8 August 2016, leg.: S. Khaghaninia.

**Distribution:** Albania, Armenia Austria, Azerbaijan, Bulgaria, Czech Republic, Dagestan, France, Georgia, Germany, Greece, Hungary, Iran, Italy, Macedonia, Romania, Russia, Slovakia, Spain, Switzerland, Ukraine, Former Yugoslavia.

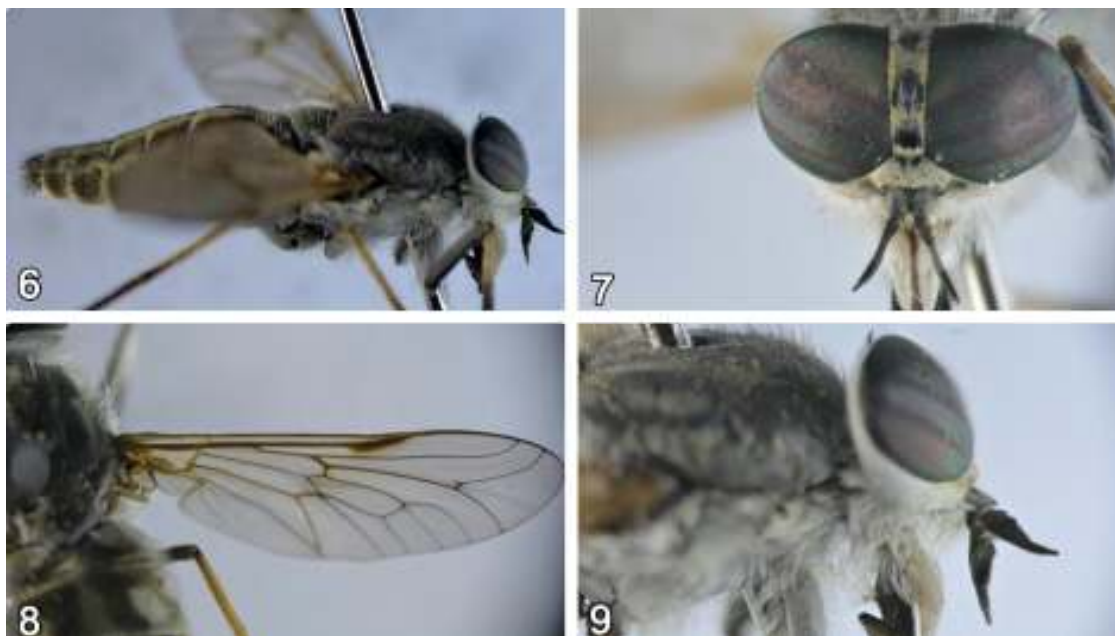
***Tabanus unifasciatus* Loew, 1858**

**Material examined:** East Azarbaijan province: Arasbaran (Chichakli), 38°39'N, 46°31'E, 2140m, (2 ♀), 2 July 2012, leg.: S. Khaghaninia.

**Distribution:** Albania, Armenia Austria, Azerbaijan, Bulgaria, Czech Republic, France, Germany, Georgia, Greece, Hungary, Iran, Italy, Jordan, Macedonia, Morocco, Palestine, Portugal, Romania, Russia, Saudi Arabia, Slovakia, Syria, Switzerland, Turkey, Turkmenistan, Ukraine, Former Yugoslavia .



**Figures 3–5.** *Tabanus maculicornis* Zettersted, 1842 (female): 3. Lateral view of head, 4. Lateral view, 5. Frontal view of head.



Figures 6-9. *Tabanus nemoralis* Meigen, 1820 (female): 6. Lateral view, 7. Frontal view of head, 8. Wing, 9. Lateral view of head.

### Discussion

The species *Tabanus bactrianus* is a rare one and its distribution is limited to the part of the Caucasian region including Iran too. The present study shows that this species prefer hot and dry habitats which is in agreement to Chaval et al. (1972). As Iranian and Turkish tabanids fauna are somewhat similar (Kilic, 1999), it seems the mentioned neighbor countries have similar climates mostly.

According to the results of the previous studies (Olsofjev, 1969), it was revealed that diversity and frequency of the populations of the horse flies are directly correlated to the presence of water, organic matter, weather conditions, humidity, temperature, seasonal changes and also the presence of livestock in the area. This was also a case in our study.

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### Conflict of Interests

The authors assert that there is no conflict of interest regarding the publication of this paper.

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## مطالعه رده‌بندی جنس *Tabanus* Linnaeus, 1758 (Diptera: Tabanidae) در استان آذربایجان شرقی با سه گزارش جدید برای فون ایران

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**چکیده:** بر اساس نمونه‌های جمع‌آوری شده از استان آذربایجان شرقی در سال‌های ۱۳۹۵ و ۱۳۹۶ و همچنین نمونه‌هایی که در سال‌های ۱۳۸۶-۱۳۹۴ جمع‌آوری و در کلکسیون حشرات پروفیسور حسن ملکی میلانی (ICHMM) نگهداری شده بود مجموعاً ۱۸ گونه از جنس *Tabanus* Linnaeus, 1758 شناسایی گردید که سه گونه *Tabanus maculicornis* Zetterstedt, *Tabanus armenicus* (Krober, 1928) و *Tabanus nemoralis* Meigen, 1820 برای فون ایران جدید هستند. ویژگی‌های افتراقی و تصاویر آن‌ها ارائه شده است.

**واژگان کلیدی:** *Tabanus*, Tabanidae, استان آذربایجان شرقی، ایران، گزارش‌های جدید