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# Dragonfly (Insecta, Odonata) fauna of Nakhichevan Autonomic Republic (Azerbaijan)

Nataly Yu. Snegovaya

Zoological Institute NAS of Azerbaijan, proezd 1128, kvartal 504, Baku, AZ 1073, Azerbaijan.

Email: snegovaya@yahoo.com

## Abstract

The article presents new faunistic data on 33 Odonata species, based on the material collected by the author in 2012, 2016 and 2017 and a systematic research in 2018 throughout the Nakhichevan Autonomous Republic (AR). *Onychogomphus assimilis* (Schneider, 1845) is a new record for the fauna of Azerbaijan. Eight species were registered for the first time for the territory of Nakhichevan AR: *Lestes virens* Rambur, 1842, *Coenagrion scitulum* (Rambur, 1842), *Aeshna mixta* Latreille, 1805, *Anaciaeschna isoceles* (Müller, 1764), *Anax parthenope* (Selys, 1839), *Sympetrum sanguineum* (Müller, 1764), *Crocothemis erythraea* (Brullé, 1832), and *Selysiothemis nigra* (Vander Linden, 1825).

**Key words:** Odonata, fauna, Nakhichevan Autonomic Republic, Azerbaijan, *Onychogomphus assimilis*.

## Introduction

In our opinion, until recently, the order Odonata was among the poorly studied groups of animals in Azerbaijan, and regional information about the dragonfly fauna was not systematized and compiled. Some information about the fauna of Nakhichevan dragonflies is given in the works of Bartenev (1916, 1919, 1929, 1935) and Bartenev & Popova (1928) in which the authors list a total of 12 species for the territory of AR. Akramovsky (1939) supplements the list with 11 new species for Nakhichevan so that the number of species reaches 23. Recently, we have begun a systematic study of the dragonfly fauna in Azerbaijan, the results of which were published in Skvortsov & Snegovaya (2014, 2015a, b).

The study of the dragonfly fauna in Azerbaijan should make a significant contribution to the knowledge and assessment of the biodiversity of not only our country, but also the entire Caucasus region. In this regard, the study of dragonflies of the Nakhichevan AR, known for its unique endemic flora and fauna, which is one of the centers of speciation in the Caucasus (Kirichenko, 1938; Grossgeim, 1936), is of particular interest.

Nakhichevan AR occupies the southeastern part of the Transcaucasian Highland. Almost 75% of the territory lies at an altitude of over 1000 m. Most of the territory of the AR is covered by the Zangezur and Daralayaz ranges of the Lesser Caucasus. The highest peak is the Gapichig (Qapıcıq ) mountain (3904 m). While the territory of the AR com-

prises only 6.2% of the entire territory of the Republic of Azerbaijan, its flora comprises around 60% and the fauna 56% of Azerbaijan. Five out of 11 climate zones existing in the world are met in Nakhichevan AR. The main ecosystems are: semi-desert, mountainous with xerophyte shrubs, high-altitude mountain steppe, alpine meadows, subalpine meadows.

## Material and Methods

Collection of faunistic material was carried out during the summer in 2012, 2016 and 2017, and in the period from May to September of 2018 throughout the territory of the Nakhichevan AR in all districts (Fig. 1, 2).

All photos were taken by the author using Sony DSLR-A230 and Canon EOS 5D Mark III, with Tamron SP 90mm, F/2.8 Macro lens, in natural condition.

Specimens are deposited in the Laboratory of Terrestrial Invertebrates of the Zoological Institute NAS of Azerbaijan, Baku.

### Localities examined

**Djulfa district (Culfa district):**

**Loc. 1.** Erezin (ərəzin) (N39°07'09.6"; E45°36'16.3"; 1076 m a.s.l.), a small irrigation canal along a road.

**Loc. 2 Arafsa** (ərəfsə), 30.06.2018, a river section with woody vegetation along the banks and inundated areas in meadows along the Alindjachay river (N39°16'53.5"; E45°46'32.7"; 1555 m a.s.l.) (Fig. 2).

**Loc. 3.** Arafsa, 30.06.2018, a small stream on the slopes with grassy vegetation near Arafsa village. (N39°17'06.4"; E45°46'59.7"; 1591 m a.s.l.).

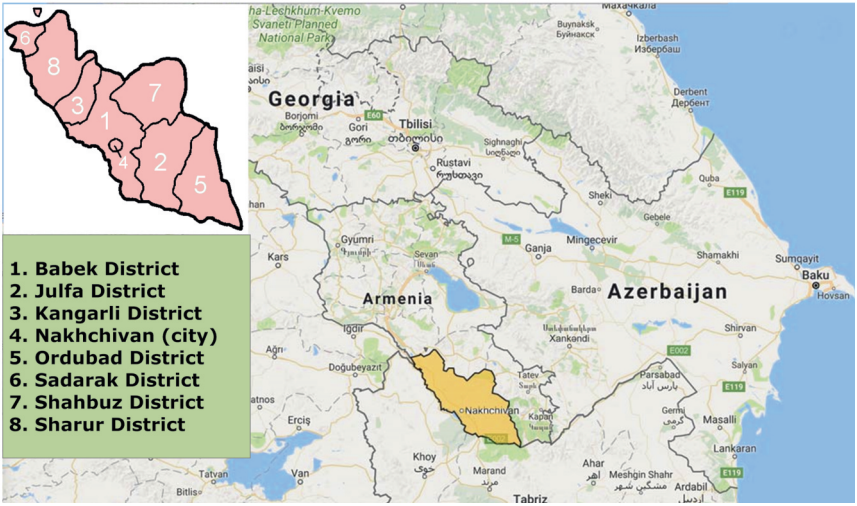
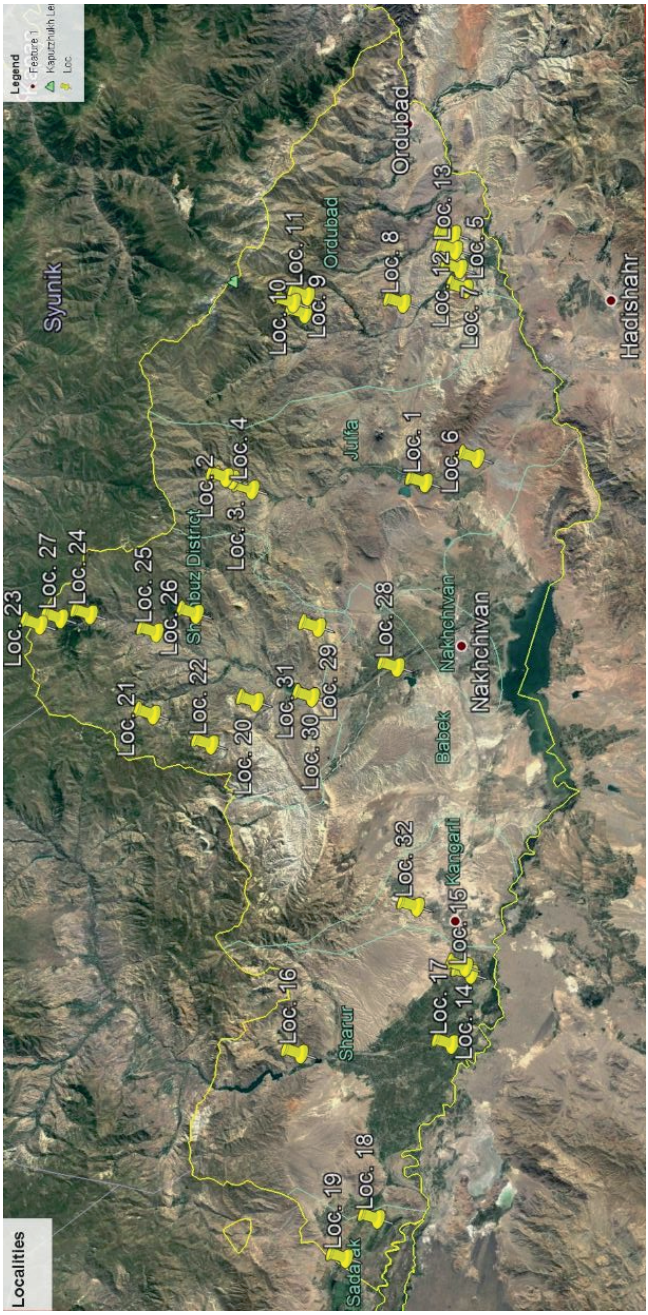



**Fig. 1. Map of Nakhichevan AR with districts indications.**




**Loc. 4.** Arafsa, 30.06. 2018, a pond with blackberry thickets and woody vegetation along the road (N39°16'16.85"; E45°44'50.31"; 1487 m a.s.l.).

**Loc. 5.** An irrigation canal with dense water vegetation along the central road Djulfa-Ordubad (Culfa-Ordubad), 1.07.2018 (N38°57'09.5"; E45°46'58.9"; 751 m a.s.l.).

**Loc. 6.** A small lake and small canal-like water spills, covered with cattail (*Typha* spp.) and reeds and ditches near the lake along the highway Djulfa-Ordubad, 1.07. 2018 (N39°03'29.9"; E45°35'11.1"; 876 m a.s.l.) (Fig. 3).

**Fig. 2. Map of localities**.

**Ordubad district:**

**Loc. 7.** Brook in the pasture near the highway Djulfa-Ordubad (N38°56'37.7"; E45°48'35.5"; 757 m a.s.l.) (Fig. 4).

**Loc. 8.** Bilyav (Biləv), Bashdizya (Başdizə), stretch of river Gilyanchay overgrown with trees (N39°00'57.4"; E45°49'15.8"; 951 m a.s.l.) (Fig. 5).

**Loc. 9.** Agdere (Ağdərə), a small "river 1" with areas of subalpine tall-herb meadows and areas with scattered stands of *Rosa* spp. and *Crataegus* spp. (N39°06'37.1"; E45°54'52.2"; 2007 m a.s.l.) (Fig. 6).

**Loc. 10.** Agdere, a small "river 2" with areas of subalpine tall-herb meadows and areas between trees and shrubs (N39°06'26.3"; E45°53'37.9"; 1535 m a.s.l.) (Fig. 7).

**Loc. 11.** Agdere (Ağdərə), a small rivulet between slopes and in a meadow where a group of hawthorn trees grows (N39°05'37.4"; E45°54'35.9"; 1889 m a.s.l.).

**Loc. 12.** Aza water reservoir, water spills and small reservoirs with *Typha* spp. and reeds (*Phragmites australis*) along the shores on a grassy meadow (N38°55'33.3"; E45°51'11.1"; 740 m a.s.l.) (Fig. 8, 9).

**Loc. 13.** Lake near Sabirkend (Sabirkənd) settlement with *Typha* spp. and reeds along the shores (N38°56'06.1"; E45°50'04.2"; 775 m a.s.l.) (Fig. 10).

**Sharur district (Şərur) district:**

**Loc. 14.** Pusyan, flooded meadow and along a channel with reed vegetation (N39°24'41.5"; E45°02'00.9"; 785 m a.s.l.) (Fig. 11).

**Loc. 15.** Tezekend (Təzəkənd), along the system of irrigation canals overgrown with reeds (N39°24'41.7"; E45°01'14.5"; 789 m a.s.l.) (Fig. 12).

**Loc. 16.** Arpachay (Arpaçay) water reservoir and small ponds covered with cattail and reed near the reservoir (N39°36'40.9"; E45°04'47.3"; 878 m a.s.l. (Fig. 13).

**Loc. 17.** Arabyengidja (ərəbyengicə): water spills and shallow reservoirs, sometimes overgrown with cattail and reeds (N39°28'31.3"; E44°57'33.8"; 793 m a.s.l.) (Fig. 14).

**Sederek district (Sədərək) district:**

**Loc. 18.** Sederek (Sədərək) small lakes and irrigation canal densely covered with reed (N39°39'25.4"; E44°49'38.8"; 803 m a.s.l.) (Fig. 15).

**Loc. 19.** Irrigation canal and a reed-covered lake along the road (N39°42'39.93"; E44°48'38.94"; 800 m a.s.l.).

**Shakhbuz district (Şahbuz) district:**

**Loc. 20.** Badamli (Badamlı), a small river and flood effected grassy vegetation and scattered trees along the banks (N39°24'41.3"; E45°30'36.2"; 1179 m a.s.l.).

**Loc. 21.** Guney Gishlag (Güney Qışlaq), a section of a small river flowing among trees and a section of the river Kukuychay (N39°30'24.9"; E45°35'07.2"; 1724 m a.s.l.).

**Loc. 22.** Shada (Şada), a small flooded area at a meadow (N39°28'41.3"; E45°30'07.5"; 1480 m a.s.l.).

**Loc. 23.** Batabat is a mountain lake, situated in the mountains along the bank of the upper reach of the Nakhichevanchay River. The lake is surrounded by alpine meadows, not far from the sources of the Kukuychay River (a tributary of Nakhichevan-

**Fig. 3. Alindjachay river section with woody vegetation along the banks.**

**Fig. 4. A small lake and small canal-like water spills, covered with *Typha* spp. and reeds along the highway Djulfa-Ordubad**

**Fig. 5. Inundated area in the grass meadow along the highway Djulfa -Ordubad.**

**Fig. 6. Bilyav, stretch of river Gilyanchay overgrown with trees.**

**Fig. 7. Agdere, small "river 1" with areas between vegetation along the banks trees and shrubs.**

**Fig. 8. Agdere, small "river 2" with areas of subalpine tall-herb meadows and areas between trees and shrubs.**

**Fig. 9. Aza water reservoir.**

**Fig. 10. Water spills and small reservoirs with *Typha* spp. and reeds along the shores on a grassy meadow near Aza water reservoir.**

**Fig. 11. Lake near Sabirkend settlement with *Typha* spp. and reeds along the shores.**

**Fig. 12. Pusyan, along a reed fringed channel.**

**Fig. 13. Tezekend, along the system of irrigation canals overgrown with reeds.**

**Fig. 14. Small pond covered with cattails and reeds near the reservoir near Arpachay water reservoir.**

**Fig. 15. Arabyengidja: water spills and shallow pond.**

**Fig. 16. Sederek small lakes and irrigation canal densely covered with reeds.**

**Fig. 17. Batabat mountain lake.**

**Fig. 18. Bichenek, along small river.**

**Fig. 19. Shakhbuz National park, Forest part along the road to Batabat lake.**

**Fig. 20. Near Botanical garden, densely reedy lake.**

**Fig. 21. Sirab, inundated meadow.**

**Fig. 22. Vaykhir (Vayxır), along river Nakhchivanchay.**

**Fig. 23. Between Khal-Khal (Xal-Xal) and Vaykhir settlements, along river Nakhchivanchay**.

chay). The lake is remarkable due to a floating peat island (N39°32'30.3"; E45°46'57.2"; 2127 m a.s.l.) (Fig. 16).

**Loc. 24.** Bichenek (Biçənək), along a small river (N39°29'35.0"; E45°45'04.1"; 1602 m a.s.l.) (Fig. 17).

**Loc. 25.** Kolani (Kolanı), along the Nakhchivanchay (Nakhichevanchay) River, river banks with trees and shrubs (N39°26'57.38"; E45°40'25.57"; 1361 m a.s.l.).

**Loc. 26.** Nursu, near a small river situated near a settlement with areas with woody vegetation and areas overgrown with reeds (N39°24'09.44"; E45°39'33.25"; 1522 m a.s.l.).

**Loc. 27.** Shakhbuz National park (Şaxbuz Milli Park), forest part along the road to Batabat lake (N39°31'14.1"; E45°46'20.0"; 1808 m a.s.l.) (Fig. 18).

**Babek district (Babək) district:**

**Loc. 28.** Near Botanical garden, lake densely overgrown with reed, and a flooded meadow (N39°16'04.1"; E45°25'31.8"; 949 m a.s.l.) (Fig. 19).

**Loc. 29.** Sirab, a flooded meadow (N39°18'29.2"; E45°32'16.9"; 1221 m a.s.l.) (Fig. 20).

**Loc. 30.** Vaykhir (Vayxır), along the Nakhichevanchay River, with areas with trees and shrubs and areas along the banks covered with reeds and rush (N39°21'38.5"; E45°28'00.7"; 1030 m a.s.l.) (Fig. 21).

**Loc. 31.** Between Khal-Khal (Xal-Xal) and Vaykhir settlements, along the Nakhichevanchay River, with areas with trees and shrubs and areas along the banks covered with reed and rush (N39°21'38.0"; E45°28'0"; 1008 m a.s.l.) (Fig. 22).

**Kengerli district (Kəngərli) district:**

**Loc. 32.** Yurdchu (Yurdçu), lake and flood effected meadow (N39°24'44.4"; E45°08'35.4"; 983 m a.s.l.).

## Recorded species

### Calopterygidae

*Calopteryx splendens intermedia* (Selys, 1887) (Fig. 24)

Loc. 2. 30.06.2018, 1 ♂, 1 ♀; Loc. 8. 26.06.2012, 3 ♂♂; 1.07.2018, 2 ♂♂; Loc. 21. 2.07.2018, 1 ♂; Loc. 25. 26.07.2016, 2 ♂♂, 1 ♀; 31.07.2018, 1 ♂; Loc. 28. 21-22.06.2012, 1 ♂;. 30.07.2018, 1 ♂, 1 ♀; Loc. 30. 2.07.2018, 3 ♂♂; 2.08.2018, 3 ♂♂; 31.08.2018, 1 ♀; Loc.

31. 29.08.2018, 1 ♂, 2 ♀♀; 30.08.2018, 2 ♂♂; Loc. 32. 3.07.2018, 1 ♂.

Bartenev (1929) recorded it in the Ordubad district; we found this species throughout the territory, with the exception of high mountain areas.

*Calopteryx splendens tschaldirica* Bartenef, 1909 (Fig. 25)

Loc. 15. 29.06.2018, 2♂♂ 1 ♀; Loc. 18. 3.07. 2018, 3 ♂♂.

Akramovsky (1939) recorded it for Nakhichevan from the valley of the Araks River in Ordubad. We discovered the species in the canals of Sharur and Sederek districts.

**Fig. 24. *Calopteryx splendens intermedia*, male (Loc. 2).**

**Fig. 25. *Calopteryx splendens tschaldirica*, male (Loc. 18).**

**Fig. 26. *Epallage fatime*, male (Loc. 2).**

**Fig. 27. *Lestes dryas*, male (Loc. 27).**

**Euphaeidae**

*Epallage fatime* Charpentier, 1840 (Fig. 26)

Loc. 2. 30.06.2018, 4 ♂♂, 1 ♀; 2.08.2018, 1 ♀; Loc. 8. 26.06.2012, 3 ♂♂, 2 ♀♀; 1.07.2018, 1 ♂, 2 ♀♀; Loc. 9. 28.07.2016, 1 ♀; 20-27.07.2017, 1 ♀; 4-7.07.2018, 2 ♂♂.

We have previously recorded the species for the territory of AR in 2012 (Skvortsov & Snegovaya 2014); it is recorded at altitudes of 900 m and higher in the Djulfa and Ordubad districts.

**Lestidae**

*Lestes dryas* Kirby, 1890 (Fig. 27)

Loc. 24. 26.07.2016, 1 ♂, 3 ♀♀; 31.07.2018, 1 ♂, 4 ♀♀; Loc. 27. 26.07.2016, 2 ♂♂, 2 ♀♀; 31.07.2018, 1 ♂, 3 ♀♀.

Bartenev & Popova (1928), as well as we (this paper) have recorded the species in the Shakhbuz district only.

*Lestes sponsa* Hansemann, 1823

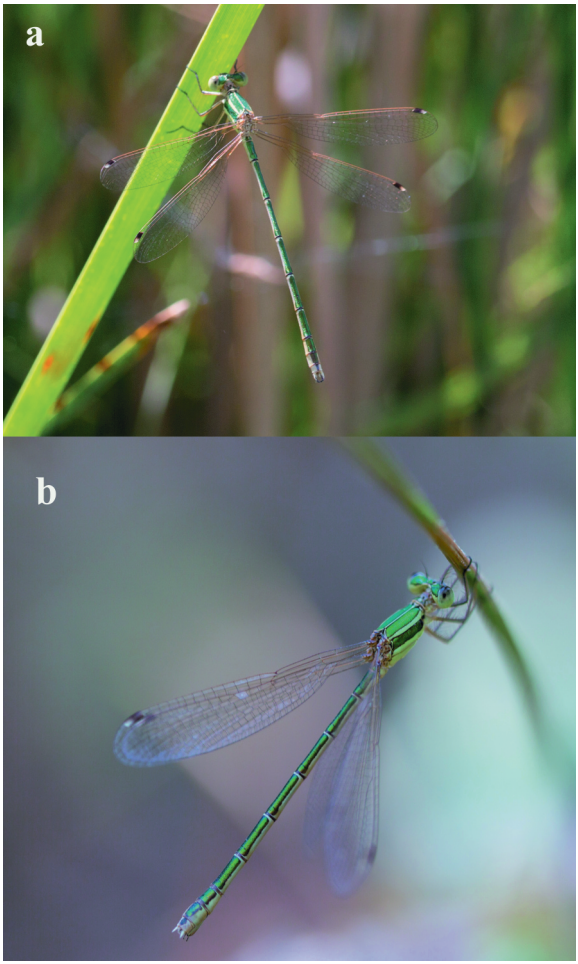
Loc. 27. 26.07.2016, 1 ♂.

Like the previous species, Bartenev (1919) and we (this paper) found this species in the Shakhbuz district only.

*Lestes virens* Rambur, 1842

Loc. 24. 26.07.2016, 4 ♂♂; 31.07.2018, 2 ♀♀; Loc. 27. 26.07.2016, 1 ♂, 4 ♀♀; 31.07.2018, 1 ♂, 1 ♀.

This is the first record from Nakhichevan. Prior to our research larvae were found by Kasymov (1972), and we recorded imagoes, in Lankaran and Shemakha (Skvortsov & Snegovaya 2015b).




*Lestes barbarus* (Fabricius, 1798) (Fig. 28)

Loc. 6. 1.07.2018, 3 ♂♂, 1 ♀♀; Loc. 7. 4.05.2018, 3 ♂♂; 1.07.2018, 2 ♂♂; Loc. 8. 1.07.2018, 1 ♂; Loc. 9. 29.07.2016, 1 ♀; 4-7.07.2018, 1 ♀; Loc. 12. 3.08.2018, 2 ♀♀; Loc. 14. 4.05.2018, 3 ♀♀; Loc. 15. 29.06.2018, 3 ♂♂, 2 ♀♀; Loc. 18. 3.07. 2018, 2 ♀♀; Loc. 19. 2.07.2018, 3 ♂♂; Loc. 24. 26.07.2016, 2 ♂♂; Loc. 27. 26.07.2016, 3 ♂♂; 31.07.2018, 3 ♂♂, 3 ♀♀; Loc. 32. 3.07.2018, 1 ♀.

Bartenev (1919) and we (this paper) recorded it everywhere in Nakhichevan.

**Fig. 28. *Lestes barbarus*, male (a) and female (b) (Loc. 27).**

**Fig. 29. *Sympecma fusca*, male (Loc. 24).**

*Sympecma fusca* (Vander Linden, 1820) (Fig. 29)

Loc. 6. 1.07.2018, 1 ♂, 1 ♀; Loc. 7. 1.07.2018, 2 ♂♂, 1 ♀; Loc. 9. 28.07.2016, 1 ♂; 9-12.06.2017, 1 ♀; 26-30.07.2018, 1 ♂; 1-3.09.2018, 2 ♂♂, 1 ♀; Loc. 24. 26.07.2016, 3 ♂♂, 2 ♀♀; Loc. 26. 1.08.2018, 2 ♂♂; Loc. 27. 4 ♂♂, 1 ♀, 23.06.2012; Loc. 28. 5.05.2012, 1 ♀; 21-22.06.2012, 2 ♂♂; 26.06.2012, 3 ♂♂, 1 ♀; September 2012, 2 ♀♀; Loc. 30. 2.07.2018, 1 ♂, 1 ♀ ; Loc. 31. 30.08.2018, 1 ♂, 1 ♀.

Bartenev (1919) recorded the species from Nakhichevan, Akramovsky (1939) from the Ordubad region, and we found it everywhere in Nakhichevan. The species coexists with *Sympecma paedisca*.

*Sympecma paedisca* Selys, 1887 (Fig. 30)

Loc. 2. 30.06.2018, 2 ♂♂, 2 ♀♀; 2.08.2018, 1 ♂; 2 ♀♀; Loc. 7. 8.05.2018, 1 ♂; 1.07.2018; Loc. 9. 4-7.07.2018, 2 ♂♂, 2 ♀♀; 26-30.07.2018, 5 ♂♂; 1-3.09.2018, 3 ♂♂; Loc. 14. 4.05.2018,

**Fig. 30. *Sympecma paedisca*, males (Loc. 2).**

1 ♂, 1 ♀; Loc. 15. 29.06.2018, 1 ♂; Loc. 21. 2.07.2018, 1 ♂, 1 ♀; Loc. 22. 2.07.2018, 1 ♂, 2 ♀♀; Loc. 26. 1.08.2018, 4♂♂, 2 ♀♀; 31.08.2018, 1 ♀; Loc. 32. 3.07.2018, 1 ♂.

Like the previous species, this one was recorded in the Ordubad district by Akramovsky (1939). Prior to our studies, information about the species was given according to larval stages by Kasymov (1965). We found it throughout the Nakhichevan AR.

**Coenagrionidae**

*Ischnura pumilio* (Charpentier, 1825) (Fig. 31)

Loc. 2. 30.06.2018, 2 ♂♂, 4 ♀♀; 2.08.2018, 1 ♂; Loc. 5. 1.07.2018, 1 ♂; Loc. 6. 1.07.2018, 7 ♂♂, 2 ♀♀; Loc. 7. 8.05.2018, 10 ♂♂, 4 ♀♀; 4.05.2018, 2 ♂♂; Loc. 12. 3.08.2018, 3 ♂♂, 2 ♀♀; Loc. 13. 3.08.2018, 3 ♂♂, 6 ♀♀; Loc. 14. 4.05.2018, 1 ♂; Loc. 20. 30.05.2018, 3 ♂♂; Loc. 22. 2.07.2018, 3 ♂♂, 2 ♀♀; Loc. 24. 24.06.2012, 3 ♀♀; Loc. 26. 1.08.2018, 4 ♂♂, 1 ♀; Loc. 28. 30.07.2018, 2 ♂♂, 1 ♀; Loc.29, 1.05.2018, 4 ♂♂, 2 ♀♀; Loc. 30. 2.07.2018, 2 ♂♂; Loc. 31. 30.08.2018, 3 ♂♂, 2 ♀♀; Loc. 32. 3.07.2018, 2 ♂♂.

Akramovsky (1939) recorded this species on the territory of the Ordubad district, and we found it everywhere in the territory of Nakhichevan.


*Ischnura elegans* (Vander Linden, 1820) (Fig. 32)

Loc. 1. 30.06.2018, 1 ♂; Loc. 6. 1.07.2018, 2 ♂♂, 3 ♀♀; 3.08.2018, 2 ♂♂, 1 ♀; Loc. 7. 4.05.2018, 4♂♂, 5 ♀♀; Loc. 12. 3.08.2018, 5 ♂♂, 1 ♀♀; Loc. 13. 3.08. 2018, 3 ♂♂, 1 ♀♀; 4.05. 2018, 11♂♂, 5 ♀♀; 29.06. 2018, 2 ♂♂, 2 ♀♀; Loc. 16. 4.05.2018, 3 ♂♂, 3 ♀♀; 3.07.2018, 2 ♂♂, 2 ♀♀; Loc. 17. 29.06.2018, 5 ♂♂, 3 ♀♀; Loc. 18. 3.07.2018, 5 ♂♂, 2 ♀♀; Loc. 19. 2.07. 2018, 1 ♂; Loc. 20. 30.05. 2018, 1 ♂, 1 ♀; Loc. 24. 24.06.2012, 2 ♀♀; Loc. 28. 5.05.2018, 5 ♂♂, 3 ♀♀; 4.06.

**Fig. 31. *Ischnura pumilio*, copula (a), female (b) and male (c) (Loc. 5).**


**Fig. 32. *Ischnura elegans*, male (a) and a copula (b) (Loc. 29).**

2018, 4 ♂♂, 3 ♀♀; 30.-07.2018, 2 ♂♂; 29.08. 2018, 8 ♂♂, 1 ♀; Loc. 29. 1.05. 2018, 2 ♂♂; Loc. 31. 30.08.2018, 5 ♂♂, 3 ♀♀; 21-22.06.-2012, 2 ♂♂.

We found the species in the territory of AR in 2012 (Skvortsov & Snegovaya 2014). During this study we found it everywhere in the territory of the Nakhichevan AR.

*Coenagrion scitulum* (Rambur, 1842)

Loc. 22. 2.07.2018, 7 ♂♂, 2 ♀♀.

On the territory of Azerbaijan, the species was recorded by Dumont (2004); we recorded it in Shemakha and Kedabek (Skvortsov & Snegovaya 2015b). On the territory of the Nakhichevan AR it was found for the first time.

*Coenagrion ornatum* (Selys, 1850) (Fig. 33)

Loc. 3. 30.06.2018, 11 ♂♂, 2 ♀♀; Loc. 8. 26.06.2012, 1 ♂; Loc. 9. 28.06.2012, 2 ♂♂, 1 ♀; 28.07.2016, 1 ♂; 4-7.07.2018, 1 ♂, 1 ♀; Loc. 11. 9-12.06.2017, 2 ♂♂; Loc. 20. 30.05.2018, 1 ♂, 1 ♀; Loc. 29. 29.05.2018, 1 ♂.

All specimens found by us in Nakhichevan and originally identified as *C. vanbrinkae* Lohmann, 1993 have anal appendages identical (the cerci tips are widely divergent) to the appendages shown in Kosterin & Ahmadi (2018) in fig. 28 a-b. Based on the reasons of the authors of that paper, as well as from the discussions in Boudot & Kulijer (2015), we also agree that *C. vanbrinkae* is a junior synonym of *C. ornatum*.

Akramovsky (1939) reported this species from the Ordubad region. We previously found the species in the territory of AR in 2012 (Skvortsov & Snegovaya 2014); except Ordubad, it

**Fig. 33. *Coenagrion ornatum*, male (Loc. 9).**

was found in Babek, Shakhbuz and Djulfa regions.

*Coenagrion puella* (Linnaeus, 1758) (Fig. 34)

Loc. 2. 30.06.2018, 3 ♂♂; 2.08.2018, 3 ♂♂; Loc. 8. 26.06.2012, 1 ♂; Loc. 24. 24.06.2012, 2 ♂♂, 1 ♀; Loc. 27. 4 ♂♂, 1 ♀, 23.06.2012.

We found it in the Djulfa, Ordubad and Shakhbuz districts. We recorded it for the first time on the territory of Nakhichevan (Skvortsov & Snegovaya 2014).

*Enallagma cyathigerum* (Charpentier, 1840) (Fig. 35)

Loc. 23. 31.07.2018, 15 ♂♂, 7 ♀♀; Loc. 27. 26.07.2016, 5 ♂♂, 4 ♀♀; Loc. 28. 5.05.2018, 7 ♂♂; 4.06.2018, 2 ♂♂, 3 ♀♀.

Given for Nakhichevan by Akramovsky (1939), we found it in the Shakhbuz and Babek regions.

**Platycnemididae**

Platycnemis dealbata Selys in Selys and Hagen, 1850 (Fig. 36)

Loc. 1. 30.06.2018, 3 ♂♂, 2 ♀♀; Loc. 8. 1.07.2018, 2 ♂♂, 1 ♀♀; Loc. 12. 3.08.2018, 2 ♂♂, 1 ♀; Loc. 14. 29.06.2018, 9 ♂♂, 5 ♀♀; Loc. 15. 29.06.2018, 8 ♂♂, 4 ♀♀; Loc. 16. 4.05.2018, 2 ♂♂, 1 ♀; Loc. 17. 29.06.2018, 7 ♂♂, 2 ♀♀; Loc. 18. 3.07.2018, 5 ♂♂, 6 ♀♀; Loc. 28. 4.06.2018, 1 ♂; 30.07.2018, 2 ♂♂; Loc. 25. 26.07.2016, 1 ♀; Loc. 30. 2.07.2018, 4 ♂♂, 2 ♀♀; 31.07.2018, 4 ♂♂, 1 ♀; Loc. 31. 30.08.2018, 7 ♂♂, 1 ♀.

Here we found the species almost everywhere in the territory of the Nakhichevan AR.

**Fig. 34. *Coenagrion puella*, males (Loc. 2).**


**Fig. 35. *Enallagma cyathigerum*, male (a), a copula (b) (Loc. 23).**


**Fig. 36. *Platycnemis dealbata*, 1850, male (a, c), a copula (b, d) (Loc. 18).**

**Aeshnidae**

*Aeshna mixta* Latreille, 1805

Loc. 10. 4-7.07.2018, 1 ♀.

Here we recorded it for the first time for the territory of the Nakhichevan AR in Ordubad and Shakhbuz (collected specimens lost) districts.

*Anaciaeschna isoceles* (Müller, 1764)

Loc. 28. 4.06.2018, 2 ♂♂.

On the territory of the Nakhichevan AR, we found it for the first time in the Babek district.

*Caliaeshna microstigma* (Schneider, 1845) (Fig. 37)

Loc. 9. 1-3.06.2018, 1 ♂; 4-7.07.2018, 4 ♂♂; 26-30.07.2018, 1 ♂; 9-12.06.2012, 2 ♂♂; Loc. 11. 26.07.2016, 2 ♂♂.

This species is reported for the Ordubad and Shakhbuz districts by Akramovsky (1939). We found it in the Ordubad district only.

**Fig. 37. *Caliaeshna microstigma*, male (Loc. 10).**

*Anax parthenope* (Selys, 1839)

Visually, Loc. 15. 4.05.2018; Loc. 20. 3.05.2018; Loc. 28. 5.05.2018.

The species was not recorded on the territory of the Nakhichevan AR before our research. Observations are given for Sharur, Shakhbuz and Babek districts.

**Gomphidae**

*Onychogomphus forcipatus albotibialis* Schmidt, 1954 (Fig. 38)

Loc. 2. 30.06.2018, 1 ♂, 1 ♀; same place, 2.08.2018, 1 ♂, 1 ♀; Loc. 6. 1.07.2018, 2 ♂♂, 1 ♀; Loc. 8. 1.07.2018, 2 ♂♂; Loc. 9. 26-30.07.2018, 2 ♂♂; 20-27.07.2017, 1 ♂; 28.07.2016, 4 ♂♂, 1 ♀♀; Loc. 20. 2.07.2018, 3 ♂♂; Loc. 25. 31.07.2018, 1 ♂; Loc. 26. 1.08.2018, 1 ♀; 26.07.2016, 2 ♂♂, 3 ♀♀; Loc. 30. 2.07.2018, 1 ♂, 1 ♀; 26.06.2012, 1 ♂; 20-26.07.2017, 1 ♂.

Bartenev (1919) (Khalilu, Nakhichevan) and Akramovsky (1939) (Ordubad region) gave another subspecies - *O. forcipatus unguiculatus* (Vander Linden, 1820). We indicate the subspecies *O. forcipatus albotibialis*, which occurs almost in the entire territory of the Nakhichevan AR.

**Fig. 38. *Onychogomphus forcipatus albotibialis*, males (Loc. 9).**

**Fig. 39. *Onychogomphus assimilis*, female (Loc. 25).**

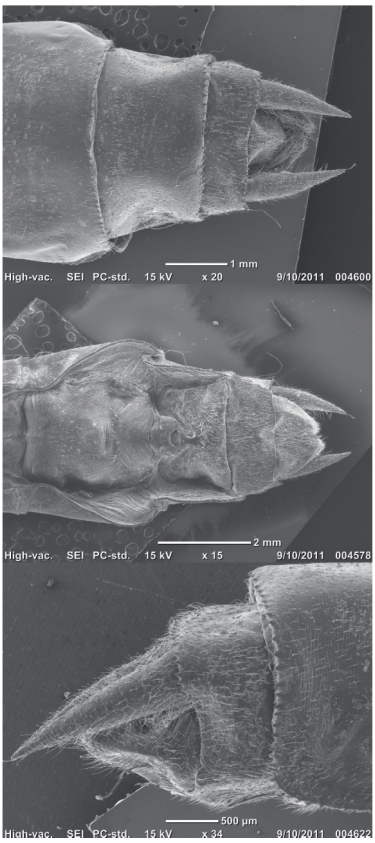



**Fig. 40. *Onychogomphus assimilis* anal appendages of a female (SEM).**

*Onychogomphus assimilis* (Schneider, 1845) (Figs. 39-40)

Loc. 25. 1 ♀, 1.08.2018

This is the first record of this species for the Azerbaijan fauna.

**Cordulegastridae**

*Cordulegaster nakhitschevanica* Skvortsov & Snegovaya, 2015 (Fig. 41)

Loc. 9. 28.06.2012, 1 ♂, 1 ♀; 28.07.2016, 2 ♂♂; 29.07.2016, 1 ♂; 20-26.07.2017, 2 ♂♂; 4-7.07.2018, 6 ♂♂; Loc. 10. 26-30.07.2018, 1 ♂; Loc. 11. 9-12.06.2017, 1 ♂, 1 ♀.

Akramovsky (1939) recorded it as *C. insignis* var. *nobilis* Morton, 1916. Skvortsov & Snegovaya (2015a) described it as a new species. It is recorded in the Ordubad and Shakhbuz (a visual observation) areas.

**Fig. 41. *Cordulegaster nakhitschevanica*, males (Loc. 9).**

**Fig. 42. *Orthetrum albistylum*, male (Loc. 16).**

**Libellulidae**

*Orthetrum albistylum* (Selys, 1848) (Fig. 42)

Loc. 16. 3.07.2018, 2 ♂♂; Loc. 17. 29.06.2018, 1 ♂.

The species was not recorded in the Nakhichevan AR before, we found it in the Sharur district.

*Orthetrum brunneum* (Fonscolombe, 1837)

Loc. 9. 9-12.06.2012, 1 ♀; 20-26.07.2017, 1 ♂, 3 ♀♀; Loc. 10. 2 ♂♂; 30.07.2016, 1 ♂; Loc. 14. 29.06.2018, 1 ♂, 1 ♀; Loc. 15. 29.06.2018, 2 ♀♀; Loc. 20. 30.05.2018, 1 ♀; Loc. 24. 24.06.2012, 1 ♀; Loc. 25. 26.07.2016, 2 ♂♂; Loc. 28. 21-22.06.2012, 4 ♂♂, 6 ♀♀; 7.06.2017, 1 ♀; 30.07.2018, 1 ♂, 1 ♀; 29.08.2018, 1 ♂, 1 ♀; Loc. 30. 2.07.2018, 1 ♂; Loc. 31. 30.08.2018, 1 ♂.

The species is widespread, Bartenev (1919) reported it from Nakhichevan (Khalilu) and Akramovsky (1939) from Ordubad district; we found it everywhere.

*Orthetrum coerulescens* (Fabricius, 1798) (Fig. 43)

Loc. 4. 30.06.2018, 5♂♂, 1 ♀; 2.08.2018, 2 ♂♂; Loc. 5. 1.07.2018, 3 ♀♀; Loc. 6. 1.07.2018, 1 ♂; Loc. 9. 4-7.07.2018, 1 ♂; 26-30.07.2018, 1 ♂; Loc. 12. 3.08.2018, 1 ♂, 3 ♀♀; Loc. 13. 3.08.2018, 1 ♂; Loc. 15. 29.06.2018, 1 ♀; Loc. 16. 3.07.2018, 2 ♂♂; Loc. 17. 29.06.2018, 1 ♂; Loc. 21. 2.07.2018, 1 ♂; Loc. 22. 2.07.2018, 1 ♀; Loc. 26. 1.08.2018, 2 ♀♀; Loc. 25. 26.07.2016, 3 ♂♂, 1 ♀; Loc. 28. 7.06.2012, 1 ♀; 4.06.2018, 4 ♂♂, 1 ♀; 30.07.2018, 1 ♂, 1 ♀♀; 29.08.2018, 2 ♂♂, 9 ♀♀; Loc. 29. 25.07.2016, 1 ♂; Loc. 30. 2.07.2018, 1 ♂, 1 ♀; 31.07.2018, 2 ♂♂, 1 ♀; Loc. 31. 30.08.2018, 3 ♂♂, 1 ♀.

Like the previous species it was found by Akramovsky (1939) in the Ordubad district; we found it throughout the territory of the AR.

**Fig. 43. *Orthetrum coerulescens*, male (Loc. 29).**

*Sympetrum flaveolum* (Linnaeus, 1758)

Loc. 24. 26.07.2016, 2 ♂♂; 31.07.2018, 3 ♀♀; Loc. 26. 1.08.2018, 1 ♂; Loc. 27. 26.07.2016, 2 ♂♂, 1 ♀; 31.07.2018, 4 ♂♂, 5 ♀♀.

It was reported for the territory of the Shakhbuz district by Bartenev (1916) (Bichenag). We also found it exclusively on the territory of the same area.

*Sympetrum fonscolombii* (Selys, 1840) (Fig. 44)

Loc. 5. 1.07.2018, 1 ♂, 3 ♀♀; Loc. 8. 26.06.2012, 1 ♀; Loc. 12. 3.08.2018, 4♂♂; Loc. 13. 3.08.2018, 2 ♂♂, 2 ♀♀; Loc. 14. 29.06.2018, 1 ♂; Loc. 15. 29.06.2018, 2 ♀♀, 4 ♀♀;

**Fig. 44. *Sympetrum fonscolombii*, males (Loc. 14).**

Loc. 17. 29.06.2018, 1 ♀; Loc. 18. 3.07.2018, 1 ♀; Loc. 23. 31.07.2018, 2 ♂♂, 1 ♀; Loc. 29. 25.07.2016, 4 ♂♂, 3 ♀♀; Loc. 31. 3.07.2018, 1 ♂, 3 ♀♀.

Bartenev (1919) reported the species for Nakhichevan. We found it everywhere throughout the territory of Azerbaijan.

*Sympetrum sanguineum* (Müller, 1764) (Fig. 45)

Loc. 2. 2.08.2018, 1 ♂, 6 ♀♀; Loc. 5. 1.07.2018, 1 ♀; Loc. 9. 20-26.07.2017, 1 ♂, 1 ♀; Loc. 14. 29.06.2018, 1 ♀; Loc. 15. 29.06.2018, 1 ♂, 1 ♀; Loc. 21. 2.07.2018, 2 ♀♀; Loc. 28. 30.07. 2018, 2 ♂, 3 ♀; Loc. 30. 2.07.2018, 2 ♂♂, 1 ♀; 31.07.2018, 4♂♂, 2 ♀♀; Loc. 31. 3.07.2018, 1 ♀.

**Fig. 45. *Sympetrum sanguineum*, males (Loc. 28).**

Here we report the species for the territory of Nakhichevan for the first time; it is found throughout the territory of Azerbaijan.

*Sympetrum meridionale* (Selys, 1841)

Loc. 5. 1.07.2018, 2 ♀♀; Loc. 8. 26.06.2012, 1 ♂; Loc. 9. 9-12.06.2012, 1 ♂; 30.07.2016, 1 ♂; 20-27.07.2017, 1 ♂; 4-7.07.2018, 1 ♂; Loc. 10. 9-12.06.2017, 1 ♀; Loc. 24, 26.07.2016, 1 ♂; Loc. 25. 26.07.2016, 1 ♀; Loc. 28. 21-22.06.2012, 1 ♂, 3 ♀♀; 30.07.2018, 1 ♂.

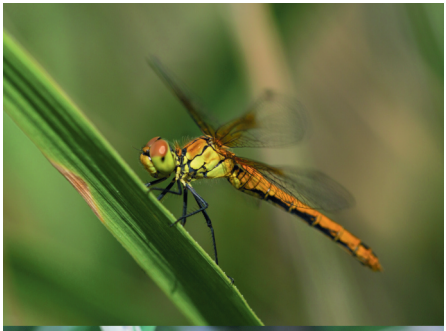


**Fig. 46. *Sympetrum striolatum*, males (Loc. 30).**

Bartenev (1919) recorded it in Nakhichevan (Khalilu) and Akramovsky (1939) in Ordubad district; we found it almost in the entire territory of Azerbaijan.

*Sympetrum striolatum* (Charpentier, 1840) (Fig. 46)

Loc. 2. 30.06.208, 2 ♂♂, 1 ♀; Loc. 6. 1.07.2018, 2 ♂♂, 2 ♀♀; Loc. 8. 1.07.2018, 1 ♀; Loc. 12. 3.08.2018, 2 ♂♂, 4 ♀♀; Loc. 18. 2.07.2018, 1 ♀; 3.07. 2018, 2 ♂♂, 1 ♀; Loc. 20. 30.05.2018, 1 ♂; Loc. 27. 31.07.2018, 1 ♀; Loc. 28. 7.06.2012, 2 ♂♂, 1 ♀; 4.06.2018, 1 ♀; Loc. 30. 2.07.2018, 1 ♂; 31.08.2018, 1 ♂.

Just as the previous species, Bartenev (1919) recorded it in the Nakhichevan (Khalilu), Akramovsky (1939) in the Ordubad district, and we also found it throughout the territory of the AR.

**Fig. 47. *Crocothemis erythraea*, male (Loc. 28).**

*Crocothemis erythraea* (Brullé, 1832) (Fig. 47)

Loc. 13. 3.08.2018, 1 ♀; Loc. 28. 4.06.2018, 2 ♂♂, 2 ♀♀; 30.07.2018, 4 ♂♂, 5 ♀♀; 29.08.2018, 1 ♂, 3 ♀♀.

We report the species from the territory of the Nakhichevan AR for the first time. It was found in Babek and Ordubad districts.

*Selysiothemis nigra* (Vander Linden, 1825)

Loc. 28. 30.07.2018, 2 ♂♂, 1 ♀; 29.08.2018, 1 ♀.

Just like the previous species, this one was recorded by us for the first time in the Nakhichevan AR. We found it in the territory of Babek district and in the surroundings of the Botanical Garden only.

## Discussion

According to literature data and the results of our research, the fauna of dragonflies in the Nakhichevan AR currently counts 35 species. In this paper, we present 33 species on the basis of the actual material collected. Two more species recorded by Akramovsky (1939) - *Erythromma viridulum*, *Onychogomphus flexuosus* - but not found by us, increase the list of species to 35. *Onychogomphus assimilis* is recorded for the first time for the fauna of Azerbaijan. The only specimen of this species was caught by us in the Shakhbuz district, not far from the village of Kolany on the banks of the river Nakhichevanchay. Eight species - *Lestes virens*, *Coenagrion scitulum Aeshna mixta*, *Anaciaeschna isoceles*, *Anax parthenope*, *Sympetrum sanguineum*, *Crocothemis erythraea*, *Selysiothemis nigra* - are reported for the first time for the territory of Nakhichevan AR.

Among the species recorded for the first time for the fauna of the Nakhichevan AR- *Lestes virens* – as well as the other representatives of the genus *Lestes* - *L. dryas*, *L. sponsa* – were found in the forest part of Shakhbuz district only, whereas we found *L. barbarus* practically throughout the entire territory of Nakhichevan. We encountered *Coenagrion scitulum* only once, not far from Shada village, also in Shakhbuz district at a small water spill. *Aeshna mixta* was noted by us twice from the Shakhbuz district in the village of Kyukyu (unfortunately this material was lost) and the Ordubad district, in the vicinity of Agdere. *Anaciaeschna isoceles* was recorded at the beginning of summer in the vicinity of the Botanical Garden only in the Babek environs. *Anax parthenope* was only visually observed by us at the beginning of summer in the environs of Sharur, Shakhbuz and Babek. *Cordulegaster nakhitschevanica* was also recorded by sight in the Shakhbuz district at Guney Gishlag village and at the Nakhichevanchay River.

Of the recently recorded 33 species, 25 are included in the IUCN Red List of Threatened Species in status Least Concern. *Coenagrion vanbrinkae* Lohmann, 1993 is included in the IUCN Red List of Threatened Species in status Data Deficient (but now was synonymized by Kosterin & Ahmadi (2018) with *C. ornatum*) and *Onychogomphus assimilis* – in status Vulnerable (Boudot, 2006; IUCN 2018). Taking into consideration the further disturbance of the habitat under the influence of natural and anthropogenic factors, some sensitive species may be in danger of local extinction. Therefore, to improve knowledge on the conservation status of these species, it is necessary to conduct further studies of dragonflies in the territory of Azerbaijan with a wider coverage.

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