

UDC 595.44

DISTRIBUTION OF THE SPIDER *ZELOTES AZSHEGANOVAE* (ARANEI, GNAPHOSIDAE) ON THE EAST EUROPEAN PLAIN

K. V. Evtushenko¹, N. Yu. Polchaninova², S. L. Esyunin³

¹Schmalhausen Institute of Zoology, NAS of Ukraine,
vul. B. Khmelnytskogo, 15, Kyiv, 01030 Ukraine
E-mail: evt@izan.kiev.ua

²V. N. Karazin National University of Kharkiv
Maid. Svobody, 4, Kharkiv, 61022 Ukraine
E-mail: polchaninova@mail.ru

³Perm State University
Bukireva str., 15, Perm, 614990 Russia
E-mail: Sergei.Esyunin@psu.ru

Distribution of the Spider *Zelotes azsheganovae* (Aranei, Gnaphosidae) on the East European Plain. Evtushenko, K. V., Polchaninova, N. Yu., Esyunin, S. L. — Data on *Zelotes azsheganovae* Esyunin et Efimik, 1992 distribution in the East European Plain (Ukraine, Russia) are summarized. The species occurs mainly in the wood and steppe belt, preferring plots of meadow steppe, forest edges and glades. A list of material, distribution map, photographs and drawings of male and female copulatory organs are provided.

Key words: Aranei, Gnaphosidae, *Zelotes azsheganovae*, geographic and habitat distribution, East European Plain.

Распространение паука *Zelotes azsheganovae* (Aranei, Gnaphosidae) на Восточноевропейской равнине. Евтушенко К. В., Полчанинова Н. Ю., Есюнин С. Л. — Обобщены данные о распространении *Z. azsheganovae* Esyunin et Efimik, 1992 на Восточноевропейской равнине (Россия, Украина). Вид преимущественно отмечается в лесостепной зоне, для обитания предпочитает участки луговой степи, опушки и поляны лесных биотопов. Приведены материал, карта распространения, фотографии и рисунки строения половых аппаратов самца и самок.

Ключевые слова: Aranei, Gnaphosidae, *Zelotes azsheganovae*, географическое распространение, биотопическая приуроченность, Восточноевропейская равнина.

Introduction

A gnaphosid spider *Zelotes azsheganovae* Esyunin et Efimik, 1992 was described from the Southern Urals (Esyunin, Efimik, 1992): the holotype from Troitsk District of Chelyabinsk Region and paratypes from three localities in Bashkortostan. Later, the species was illustrated based on the material from the South-Western Altai Mts and recorded from Novosibirsk City (Russia, West Siberia) and North Kazakhstan (Marusik et al., 1996). Spiders were collected in singletons, mainly by hands, in various habitats: birch, aspen and pine forests, forb-feather grass and shrub steppes, stony screes. More abundant material (31 individuals) was obtained by pitfall trap collecting in a forest stand in Novosibirsk. Since that time, *Z. azsheganovae* was repeatedly found in the Middle and Southern Urals (Tuneva, Esyunin, 2002), and Altai (Azarkina, Trilikauskas, 2013).

In the East European Plain, *Z. azsheganovae* was recorded for the first time in Penza Region (Polchaninova, 2008). Then it was registered, misidentified as *Zelotes apricorum* (L. Koch, 1876), in Kursk (Polchaninova, 2001, 2004), Belgorod (Polchaninova, 2001; Ponomarev, Polchaninova, 2006), and Kharkiv Regions (Polchaninova, 2003). Later, it was described as *Zelotes arzanovi* Ponomarev et Tsvetkov, 2006 from Krasnodar Province (Ponomarev, Tsvetkov, 2006; synonymy in Mikhailov, 2010). The geographic range of this species was described as European-Southwestern Siberian (Azarkina, Trilikauskas, 2013) or East European-Siberian (Polchaninova, Prokopenko, 2013). The aim of this work is to revise and summarize all the data on geographic and habitat distribution of *Z. azsheganovae* on the East European Plain.

Material and methods

Within the East European Plain, the material was collected in 59 localities of 10 administrative regions of Russia and 4 regions of Ukraine (map, fig. 1). Only one locality was listed from the literature sources; in the others, the material was collected and/or identified by the authors. The photographs of copulatory organs of the specimens from Chernihiv and Sumy Regions were taken by means of a microscope Leica PN MOG 35/10 in the Department of Acarology of the Schmalhausen Institute of Zoology NAS of Ukraine; four photos were processed in the Corel DRAW 11. SEM micrographs of the male palp were made using Hitachi TM3000 SEM

microscope with BSE (back-scattered electrons) at the Perm State University. Geographic coordinates of collecting localities were determined using the Google Earth program.

A list of material is provided with a name of locality and its geographic coordinates, number of male and female individuals, date of collecting, habitat, collector name and literature references, if any. For the conservation areas, we give the name of Nature Reserve or National Park, name and coordinates of the centre of its segment or department, and the nearest village. For the material from Gubkin and Cherniavka Districts of Belgorod Region we use local names of forest stands and their coordinates. Russian and Ukrainian names are given in corresponding transliteration.

The following abbreviations are used for the material depositories: KVE — collection of K. V. Evtushenko (Schmalhausen Institute of Zoology NAS of Ukraine, Kyiv); NYP — collection of N. Y. Polchaninova (V. N. Karazin Kharkiv National University, Ukraine); AVP — collection of A. V. Ponomarev (Institute of Arid Zones, Southern Scientific Centre RAS, Rostov-on-Don, Russia); ANS — collection of A. N. Sozontov (Udmurt State University, Izhevsk, Russia), and PSU — collection of Zoological Museum of the department of Invertebrate Zoology and Aquatic Ecology of the Perm State University, curator S. L. Esyunin. Part of the material was sent to the National Arachnological Collection of V. I. Vernadsky Taurida National University, Simferopol (TNUS), curator M. M. Kovblyuk; a specimen from Krasnodar Province is deposited in the collection of Zoological Museum of Moscow State University (ZMUM), curator K. G. Mikhailov.

For the comparison of *Z. azsheganovae* abundance in the forest and open grassland habitats, we choose 7 localities, where systematic pitfall trap collecting had been performed: Sumy Region, Vakalivshchyna Vil.; Penza Region, Kuncherovskaya Lesostep; Lipetsk Region, Lipovskaya Gora; Lipetsk Region, Morozova Gora; Kursk Region, Zorinskie Bolota; Belgorod Region, Les-na-Vorskla; Belgorod Region, Gubkin and Cherniavka Districts. In the last case, individual numbers were pulled together because of the localities close proximity and similar habitat type. Furthermore, such a locality arrangement made it possible to estimate species relative occurrence within the two districts. The occurrence index adopted from A. S. Utochkin (1977) is equal to the number of individuals of a given species multiplied by the number of localities where the species was found, and means 1–9 — rare species, 10–99 — common, 100–999 — frequent, 1000 and more — abundant species.

Material. Southern Taiga Belt. Russia. Kirov Region. Svecha Distr., Shmelevo Vil., 58°15'38" N 47°48'47" E: 2 ♂ (PSU-5661), 13–30.05.2007, 'woodside' (Yuferev) (Esyunin et al., 2011). **Udmurt Republic.** Igrinsk Distr., Chutyry Vil., 57°22'42" N, 53°15'12" E (the coordinates are specified by A. N. Sozontov): 2 ♂ (ANS), 29.05–14.06.2001, 1 ♂, 1 ♀ (ANS), 7–26.08.2011, meadow; 1 ♂ (ANS), 14–25.06.2011, *Picea* forest on slope; 1 ♂, 1 ♀ (ANS), 29.05–14.06.2011, mixed forest (Sozontov) (Sozontov, Shirobokova, 2014). Alnash Distr., Golyushurma gully, 56°00'18" N 52°42'06" E (the coordinates are specified by A. N. Sozontov): 1 ♂ (ANS), 4–29.06.2013, 1 ♀ (ANS), 22.06–6.07.2014, dry meadow (Sozontov). Yakshur-Bod'insk Distr., Selychka Vil., 57°4'36" N 53°12'19" E (the coordinates are specified by A. N. Sozontov): 1 ♂ (ANS), 25.06–14.07.2014, in meadow vegetation on the *Pinus* forest edges (Sozontov). Izhevsk, Oktyabr'skiy Vil., 56°49'56" N 53°20'57" E (the coordinates are specified by A. N. Sozontov): 1 ♂ (ANS), 14–31.07.2014, meadow (Sozontov). Votkinsk Distr., Perevozhnoe Vil., "Siva" biological state, 56°49'44" N 53°54'14" E (the coordinates are specified by A. N. Sozontov): 2 ♀ (ANS), 9.07.2014, *Quercus* forest (Uskova). **Perm Province.** Dobryanka Distr., "Lunezhskie Gory" Preserve, 58°19'43" N, 56°24'18" E: 1 ♂, 1 ♀ (PSU-2025), 2.06–13.07.2001, meadow and in meadow vegetation on the *Pinus* forest edges, (Kozminykh) (Esyunin, Farzaliyeva, 2002; Tuneva, Esyunin, 2008). Perm City, 58°00'32" N, 56°01'14" E: 1 ♂, 1 ♀ (PSU-1488), 1–31.05.1992, meadow bog, (Kozminykh) (Esyunin, Efimik, 1995; Tuneva, Esyunin, 2008). Perm Distr., Kachka Vil., 57°59'08" N 55°46'26" E, 4 ♂ (PSU-2548), 2–13.06.2001, meadow with young *Betula* trees (Esyunin). Perm Distr., Overyata Vil., 58°06'19" N 55°49'49" E, 1 ♂ (PSU), 24.05–15.06.2008, meadow (Esyunin). Kungur Distr., "Spasskaya Gora" protected spot, 57°28'26" N, 56°55'09" E: 1 ♂ (PSU-6457), 2.10.1988, 1 ♀ (PSU-6457), 17.06.1989, steppe (Kozminykh) (Esyunin, Efimik, 1995; Esyunin, 2006; Tuneva,



Fig. 1. Map of collecting localities of *Z. azsheganovae* on the East European Plain. Circles — authors' material; squares — literature data.

Esyunin, 2008). Kishert Dist., "Preduralie" Preserve, 57°21'26" N, 57°09'48" E: 1 ♂ (PSU-6141), 28.06.1990, meadow (Gridina) (Esyunin et al., 2011). Suksun Distr., Chekarda Vil., 57°02'05" N 57°43'43" E, 1 ♂, 1 ♀ (PSU-1336), 8.2000, *Betula-Pinus* forest (Tuneva). **Ukraine. Chernihiv Region.** Novhorod-Siverskiy, 52°00'25" N 33°18'08" E: 1 ♂ (KVE), 5.06.1989, birch forest on the sloping right bank of the Desna River. Novhorod-Siverskiy, 52°00'58" N 33°18'39" E: 2 ♂ (KVE), 15.06.1989, lichen pine forest on the Desna River left bank (Evtushenko) (Polchaninova, Prokopenko, 2013 (as Novhorod-Siverske Polissia); Evtushenko, 2013).

Wood-and-Steppe Belt. Penza Region. Lunino Distr., "Solontsovaya Steppe" nature monument, Ferlyudinka Vil., 53°36'54" N 45°00'43" E: 1 ♀ (TNUS), 13.07.2004, saline steppe (Lebiazhinskaya). "Privolzhskaya Lesostep" Reserve (PLR), "Verkhovya Sury" segment, Kuznetsk Distr., Tikhmenevo Vil., 53°19'30" N 46°48'30" E: 2 ♂ (NYP), 10.08.2005, clear cutting in *Pinus* forest; 1 ♂, 2 ♀ (NYP), 6.07.2005, clear cutting in *Pinus* forest on a brook bank; 1 ♂ (NYP), 17.07.2004, 1 ♂ (NYP), 26.07.2007, *Betula* forest (Lebiazhinskaya). PLR, "Borok" segment, Kuznetsk Distr., Shatkinovo Vil., 52°55'57" N 46°17'49" E: 1 ♂ (NYP), 18.07.2004, *Pinus-Quercus* forest (Polchaninova). PLR, "Kuncherovskaya Lesostep" segment, Kameshkir Distr., Krasnoye Pole Vil., 52°50'04" N 46°21'23" E: 4 ♂, 2 ♀ (NYP), 26.06.2005, meadow steppe; 5 ♂ (NYP), 26.07.2005, 1 ♂ (NYP), 14.10.2005, meadow on a brook bank (Lebiazhinskaya); 1 ♂ (NYP), 29.07.2004, open *Quercus* stand in steppe (Polchaninova). PLR, "Ostrovtsovskaya Steppe" segment, Kolyshlei Distr., Berezovka Vil., 52°49'34" N 44°26'06" E: 3 ♂ (NYP), 28.06.2005, meadow steppe; 1 ♂ (NYP), 28.06.2005, meadow on a brook bank (Polchaninova) (Polchaninova, 2008). **Lipetsk Region.** "Lipovskaya Gora" spot, Zadonsk Distr., Bekhteevka Vil., 52°33'01" N 38°53'24" E: 7 ♂ (NYP), 21.06.2011, 2 ♂ (NYP), 31.07.2011, 3 ♂, 2 ♀ (NYP), 28.05.2012, 3 ♂, 1 ♀ (NYP), 1.07.2012, 1 ♂ (NYP), 8.08.2012, edge of *Quercus* forest (Polchaninova). "Galichya Gora" Reserve (GGR), "Galichya Gora" segment, Donskoye Distr., Donskoye Vil., 52°36'07" N 38°55'08" E: 1 ♂ (NYP), 21.06.2011, 1 ♂ (NYP), 29.05.2012, shrub-steppe, GGR, "Morozova Gora" segment, Donskoye Vil., 52°35'47" N 38°55'40" E: 1 ♀ (NYP), 29.07.2011, meadow steppe; 4 ♂ (NYP), 24.06.2011, 1 ♂ (NYP), 09.07.2011, 4 ♂, 1 ♀ (NYP), 28.05.2012, 1 ♀ (NYP), 26.06.2012, 4 ♂ (NYP), 4.08.2012, edge of oak forest; 1 ♂ (NYP), 29.07.2011, 1 ♂ (NYP), 24.06.2011, 3 ♂ (NYP), 28.05.2012, burnt *Quercus* forest; 1 ♂ (NYP), 28.05.2012, *Quercus* forest; GGR, "Plyushchan" segment, Krasnino Distr., Yablonovo Vil., 52°49'52" N 38°59'16" E: 6 ♀ (NYP), 22.06.2011, edge of *Quercus* forest (Polchaninova et Tsurikov), **Kursk Region.** Kursk Distr., Stepnoi Vil., 51°35'N 36°23'E: 3 ♂ (NYP), 15.06.2011, meadow vegetation in a gully (Polchaninova) (Polchaninova, 2012). Central Black Earth State Biosphere Reserve (CBESBR), "Streletskaya Steppe" segment, Kursk Distr., Selikhovy Dvory Vil., 51°34'38" N 36°06'51" E: 2 ♂ (NYP), 20.06.1999, 7 ♂ (NYP), 13.09.1999, 4 ♂ (NYP), 18.06.2000, 1 ♂ (NYP), 14.09.2006, 7 ♂ (NYP), 14.06.2011, meadow steppe on the upper interfluvies; 10 ♂ (NYP), 14.06.2011, 1 ♂ (NYP), 8.07.2011, meadow in a gully; 1 ♂ (NYP), 27.05.1999, edge of *Quercus* forest in a gully; 1 ♂ (NYP), 20.06.1999, oak forest in a gully; 1 ♂ (NYP), 27.05.1999, 5 ♂ (NYP), 20.06.1999, 1 ♀ (NYP), 8.07.1999, 1 ♂ (NYP), 26.05.2000, glades in plain *Quercus* forest; 1 ♀ (TNUS), 8.07.1999, *Quercus* forest (Polchaninova) (Polchaninova, 2004: as *Z. apricorum*; Polchaninova, 2009 b). The record of *Z. apricorum* in Pichka (1984 a, b) needs verification. Presumably, it may refer to *Z. azsheganovae*. CBESBR, Medvenka Distr. "Kazatskaya Steppe" segment, 51°31'53" N 36°18'09" E: 4 ♂ (TNUS), 2.07.2006, 46 ♂, 8 ♀ (NYP), 16.06.2011, meadow steppe; 3 ♀ (TNUS), 6 ♂, 2.07.2006, edge of oak forest (Polchaninova). CBESBR, "Zorinskiye Bolota" segment, Oboyan, 51°11'45" N 36°23'40" E: 8 ♂ (NYP), 13.09.1999, abandoned field (Polchaninova) (Polchaninova, 2001: as *Z. apricorum*). **Belgorod Region.** Belogorye Nature Reserve (BNR), "Les-na-Vorskla" segment, Borisovka, 50°36'38" N 35°58'47" E: 1 ♀ (AVP), 19.08.1996, south facing steppe slope; 1 ♀ (AVP), 28.08.1996, old apple orchard; 1 ♂ (AVP), 19.09.1997, open *Pinus* forest; 1 ♂ (AVP), 1.09.1997, mixed forest (Ponomarev); 1 ♂, 5 ♀ (TNUS), 28.06.2003, 2 ♂, 2 ♀ (NYP), 8.07.2003, abandoned field; 5 ♂ (NYP), 18.07.2002, 5 ♂ (NYP), 28.05.2003, 2 ♂ (NYP), 25.06.2003, edge of plain oak forest; 1 ♂, 1 ♀ (NYP), 9.08.2002, 4 ♂ (NYP), 28.05.2003, 2 ♂ (NYP), 25.06.2003, glade in *Quercus* forest; 1 ♂ (NYP), 28.05.2003, young *Fraxinus* plantation; 1 ♂, 9.08.2002, plain *Quercus* forest (Polchaninova et Nemchenko) (Ponomarev, Polchaninova, 2006: as *Z. apricorum*; Polchaninova, 2011). BNR, "Ostrasiyevy Yary" segment, Borisovka, 50°34'18" N 36°03'00" E: 1 ♂ (AVP) 19.05.1997, shrubs in steppe gully (Davidian) (Ponomarev, Polchaninova, 2009: as *Z. apricorum*). BNR, "Yamskaya Steppe" segment, Gubkin Distr., Dubravka Vil., 51°11'28" N 37°38'46" E: 1 ♂ (NYP), 25.05.2001, 3 ♂, 1 ♀ (NYP), 17.07.2001, meadow steppe (Polchaninova); 2 ♂ (NYP), 20.07.2011, 1 ♂ (NYP), 19.09.2011, 6 ♂, 1 ♀ (NYP), 23.07.2012, 1 ♂ (NYP), 20.10.2012, 1 ♂, 10 ♀ (NYP), 7.06.2013, 5 ♂ (NYP), 19.07.2013, meadow steppe (Sychev); 2 ♂ (NYP), 23.07.2012, ♀ (NYP), 20.10.2012, 2 ♂, 3 ♀ (NYP), 07.06.2013, 7 ♂, 2 ♀ (NYP), 15.08.2013, ditch on the reserve edge (Sychev); 1 ♂ (NYP), 17.07.2001, 2 ♂ (NYP), 17.07.2002, edge of *Quercus* forest in a gully (Polchaninova); 1 ♀ (NYP), 10.2012, 2 ♀ (NYP), 6.2013, 1 ♂ (NYP), 19.07.2013, same habitat (Sychev) (Polchaninova, 2002; Polchaninova, 2004; Ponomarev, Polchaninova, 2006: all as *Z. apricorum*). Gubkin Distr. Saprykino, 51°07'19" N 37°39'51" E: 3 ♀ (NYP), 13.09.2011, 4 ♂ (NYP), 9.06.2013, 4 ♂, 1 ♀ (NYP), 21.07.2013. Dolzhik, 51°09'08" N 37°33'15" E: 1 ♂ (NYP), 21.07.2011, 1 ♀ (NYP), 24.07.2012, 1 ♂ (NYP), 12.06.2013, 5 ♂, 1 ♀ (NYP), 19.07.2013. Khmelevatoye, 51°06'43" N 37°26'37" E, 1 ♀ (NYP), 17.08.2011, 3 ♀ (NYP), 28.07.2012, ♂ (NYP), 12.06.2013, 1 ♂, 1 ♀ (NYP), 19.07.2013. Vodianoye, 51°04'57" N 37°31'17" E: 1 ♂ (NYP), 17.08.2011, 1 ♂ (NYP), 28.07.2012, 1 ♂ (NYP), 28.07.2012. Visloye, 51°02'12" N 37°24'35" E: 1 ♂, 1 ♀ (NYP), 13.08.2011, 1 ♂, 1 ♀ (NYP), 28.07.2012, 1 ♀ (NYP), 20.07.2013. Sennoye, 51°12'29" N 37°30'30" E, 2 ♂ (NYP), 23.07.2012. Lysye Gory, 51°14'01" N 37°28'00" E: 1 ♂ (NYP), 27.07.2011, 1 ♂, 2 ♀ (NYP), 26.07.2012, 3 ♂, 2 ♀ (NYP), 7.06.2013, 1 ♂ (NYP), 18.07.2013. Romanovo, 51°13'48" N 37°28'55" E: 1 ♀ (NYP), 19.09.2011. Panskoye, 51°06'51" N 37°33'00" E: 1 ♂, 1 ♀ (NYP), 19.10.2012. Barskoye, 51°06'38" N 37°35'56" E: 3 ♂, 1 ♀ (NYP), 27.07.2011, 1 ♂ (NYP), 23.09.2011, 1 ♂ (NYP), 24.07.2012, 1 ♀ (NYP), 2.06.2013, 3 ♂ 1 ♀ (NYP), 19.07.2013. Kleonovkoye, 51°11'03" N 37°28'20" E: 1 ♀ (NYP), 8.06.2013. Mikherevo, 51°10'11" N 37°36'02" E: 1 ♀, 18.08.2013. Galichi, 51°10' N 37°28' E: 1 ♂ (NYP), 14.06.2013. In all localities in meadow vegetation on the forest edges. Barskoye, 3 ♂ (NYP), 18.08.2011; Perelesok, 2 ♀, 2 ♂ (NYP), 9.06.2013. In both localities under the canopy on the



Fig. 2. Copulatory organs of *Z. azsheganovae*: 1–3 — male palp, ventral (1), retrolateral (2, 3) view; 4 — palp tibia, lateral view; 5 — endogyne, ventral view; 6–9 — variation of epigyne, ventral view (1–2 — Chernihiv Region, Novhorod-Siverskyi; 3–4 — Chelyabinsk Region, Ilimenskiy Reserve; 5–9 — Sumy Region, Vakalivshchyna Vil.). Scale 0.5 mm.

forest edges (Sychev). Cherniavka Distr. Albiny, 51°03'49" N 37°37'05" E: 5 ♂ (NYP), 20.07.2011, 1 ♂ (NYP), 24.07.2012, 1 ♀ (NYP), 19.07.2013. Perelesok, 50°59'35" N 37°35'25" E: 6 ♂, 1 ♀ (NYP), 2011, 7 ♂, 4 ♀ (NYP), 28.07.2012, 6 ♂, 5 ♀ (NYP), 20.07.2013. Prostoye, 51°05'16" N 37°41'53" E: 1 ♂ (NYP), 12.06.2013, 1 ♂ (NYP), 09.06.2013, 1 ♀ (NYP), 19.07.2013; Osinnik 51°03'01" N 37°39'15" E: 1 ♂ (NYP), 21.07.2011, 1 ♂ (NYP), 12.06.2013, 1 ♀ (NYP), 20.07.2013. Reznikov Yar, 51°01'01" N 37°39'41" E: 1 ♂ (NYP), 25.07.2012, 1 ♂ (NYP), 08.06.2013, 1 ♂ (NYP), 28.07.2013. In all localities in meadow vegetation on the forest edges (Sychev). **Ukraine. Sumy Region.** Trostianets, 50°28'59" N 34°54'40" E: 1 ♂ (NYP), 15.06.2013, edge of plain *Quercus* forest;

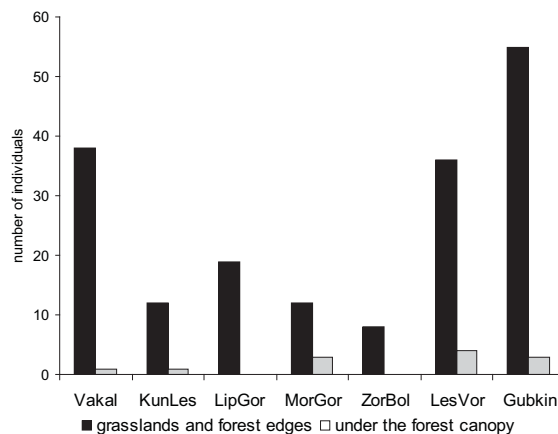


Fig. 3. *Z. azsheganovae* abundance in the forest and grassland habitats. Vakal — Vakalivshchyna Vil., KunLes — Kuncherovskaya Lecostep, LipGor — Lipovskaya Gora, MorGor — Morozova Gora, ZorBol — Zorinskie Bolota, LesVor — Les-na-Vorsklye, Gubkin — Gubkin and Cherniavka Districts (more detailed locality descriptions see in the list of material).

1 ♀ (NYP), 15.06.2013, open *Quercus* forest (Polchaninova) (Polchaninova, 2013). Sumy Distr., Vakalivshchyna Vil., 51°01'04" N 34°55'57" E: 14 ♂, 5 ♀ (NYP), 13.06.2013; 13 ♂, 4 ♀ (NYP), 14.07.2013, edge of plain *Quercus* forest; 1 ♂ (NYP), 13.06.2013, 1 ♂, 1 ♀ (NYP), 14.07.2013, edge of pine plantation; 1 ♀ (NYP), 14.07.2013, mild et *Quercus* forest in a gully (Polchaninova). **Kharkiv Region.** Vovchansk Distr., Starytsia Vil., 50°14'33" N 36°47'29" E: 1 ♂ (NYP), 3.07.2001, edge of plain *Quercus* forest; 1 ♂ (NYP), 3.07.2001, 1 ♂ (NYP), 6.06.2002, 4 ♂ (NYP), 10.07.2002, clear cuttings in plain *Quercus* forest (Polchaninova) (Polchaninova, 2009 a; Polchaninova, Prokopenko, 2013). Kharkiv Distr., Berezhivka Vil., 49°54'21" N 36°03'51" E: 1 ♂ (NYP), 11.07.2004, *Pinus* plantation (Polchaninova). "Homilshanski Lis" National Park, Zmiiv Distr., Haidary Vil., 49°38'13" N 36°18'46" E: 2 ♂ (NYP), 2.07.1997, 3 ♂ (NYP), 10.05.1998, open dry *Quercus* forest; 1 ♂ (NYP), 4.06.1997, mild wet *Quercus* forest (Polchaninova) (Polchaninova, 2003: as *Z. apricorum*; Polchaninova, 2009 a; Polchaninova, Prokopenko, 2013).

Steppe Belt. Russia. Bashkortostan. Meleuz Distr., Syrtlanovo Vil., 52°59' N 55°30' E: 1 ♂ (PSU-1385), 11.07.1990, forb-feather grass steppe (Efimik) (Esyunin, Efimik, 1982; 1995). **Orenburg Region.** Sol-Iletsk Distr., Chybynda gully, 50°36'28" N 54°43'10" E (the coordinates are specified by S. Esyunin) (Tuneva, Esyunin, 2002; 2008), 1 ♂ (PSU-1293), 6–13.06.2000, dry riverbed (Esyunin). **Krasnodar Province.** Kushchevskaya Distr., Kushchevskaya Vil., 46°32'39" N 39°41'13" E: 1 ♂ (ZMUM), 21.05.2004, shelter forest belt (Tsvetkov) (Ponomarev, Tsvetkov, 2006: as *Z. arzanovi*. Synonymy in Mikhailov, 2010). **Ukraine. Kherson Region.** Black Sea Biosphere Reserve, Potievskiy segment, Hola Prystan Distr., Novochnornomoria Vil., 46°09'28" N 32°14'15" E: 1 ♀ (TNUS), 20.06.1997, coastal steppe (Polchaninova leg., Kovblyuk det.).

Results and discussion

Morphological peculiarities. The characteristic feature of *Z. azsheganovae* is a rather high variability of size ratio and relative position of the male and female copulatory organ details. Meanwhile, the shape of main identification elements (male tibial apophysis and embolus, female spermatheca) is constant. We therefore present patterns of the male palp structure, female endogyne and variations of the epygine (fig. 2). The shape of epigynal fovea (fig. 2, 6–9) varies markedly even in the specimens caught in the same habitat (Sumy Region, Vakalivshchyna Vil., edge of a plain *Quercus* forest).

Geographic distribution. Based on available data, the geographic range of *Z. azsheganovae* can be characterized as East European-West Siberian subboreal. The species mainly occurs in the wood-and-steppe belt. In Udmurt Republic, all the records of *Z. azsheganovae* are associated with the transitional zone (changing from the forest to the wood-and-steppe belts), while in Perm Province, they are confined to the relict Kungur-Krasnoufimsk wood-and-steppe region. Single finds were registered in the southern taiga or steppe zones, quite far from the main Region. The marginal points of its distribution are: northernmost — Perm Region, "Lunezhskie Gory" Preserve, 58°19'43" N (Esyunin, Farzalieva, 2002), western- and southernmost — Kherson Region, Novochnornomoria Vil., 46°12' N 32°15' E (pers. data), easternmost — Altai Republic, 32 km SE of Iogach, Archa Mt., 87°25' E (Azarkina, Trilikaus).

Habitat distribution. *Z. azsheganovae* shows relatively high ecological plasticity. It occurs in both open and shadowy habitats as abandoned lands, steppes, meadows, forest edges and glades, deciduous, mixed and pine forests. However it avoids extremely wet or dry conditions. Quantitative analysis of its habitat preference shows that the species chooses open mild wet biotopes with herbaceous vegetation (fig. 3). The maximum number of specimens was recorded on the forest edges, glades, and in the meadow steppe. Adult individuals of *Z. azsheganovae* got into traps since May to September. In some cases, the species possessed dominant (5–10 % of collected individuals) or subdominant (2.5–4.9 %) position in the local ground-dwelling spider assemblages. For instance, it constituted 5 % of collected spiders on the edge of a plain *Quercus* forest (Vakalivshchyna); 7 % on the edge of a gully forest (Albiny); 3.7 % in the bottom of a steppe gully (Striletskaya Steppe); 6.5–8 % in the meadow steppe on the gully slopes and upper interfluves (Kazatskaya and Yamskaya Steppe). Frequent occurrence of the species (occurrence index ranged from 822 to 1222) was registered on the edges of patched forests in Gubkin and Cherniavka Districts of Belgorod Region.

The authors are thankful to A. Sozontov (Izhevsk), A. Ponomarev (Rostov-on-Don) and M. Kovblyuk (Simferopol) for providing detailed information on the specimens from their collections and databases.

References

Azarkina, G. N., Trilikauskas, L. A. 2013. Spider fauna (Aranei) of the Russian Altai, part II: families Gnaphosidae, Hahniidae, Linyphiidae, Liocranidae and Lycosidae. *Eurasian Entomol. J.*, **12** (1), 51–67.

- Esyunin, S. L. 2006. Spider fauna (Aranei) of xerophytic habitats. Antropogennaya dinamika prirodny sredy. *Mater. Mezhdunar. nauch.-prakt. konf. Perm'. Vol. 2–5. Osobo okhranyaemye prirodnye territorii. Ekologicheskii monitoring. Prirodookhrannye tekhnologii.* Perm, 31–35.
- Esyunin, S. L., Efimik, V. E. 1992. *Zelotes azsheganovae* sp. n. (Aranei, Gnaphosidae) from South Urals. *Zoologicheskii Zhurnal*, **71** (4), 139–141 [In Russian].
- Esyunin, S. L., Efimik, V. E. 1995. Remarks on the Ural spider fauna, 4. New records of spider species (excluding Linyphiidae) from the Urals (Arachnida Aranei). *Arthrop. Sel.*, **4** (1), 71–91.
- Esyunin, S. L., Farzalieva, G. Sh. 2002. Lunezhskie Gory as a unique natural reserve of invertebrates. *Geografiya i region. V. Biogeografiya i bioraznoobrazie Prikam'ya.* Perm, 80–83 [In Russian].
- Esyunin, S. L., Laetin, A. M., Tselishcheva, L. G. et al. 2011. On the spider fauna (Arachnida: Aranei) of Kirov Region, Russia. *Arthrop. Sel.*, **20** (4), 283–318.
- Esyunin, S. L., Polyenin, A. B., Vlasov, P. I., Shulaeva, E. A. 2011. Spider fauna of “Predural'e” Preserve (Perm Region): 40 years of researches. *Vestnik Permskogo Universiteta. Ser. Biologia*, **3/4**, 16–23 [In Russian].
- Evtushenko, K. V. 2013. On the distribution of *Zelotes azsheganovae* Esunin et Efimik, 1992 (Aranei, Gnaphosidae) in Ukraine. In: Marysova, I. V., ed. *II Vseukrainska nauk.-prakt. konf. “Suchasni problemy biol. nauk ta metodiky vykladannia”*. Nizhyn State University, Nizhyn, 51–52 [In Russian].
- Marusik, Y. M., Hippa, H., Koponen, S. 1996. Spiders (Araneae) from the Altai Region, southern Siberia. *Acta Zool. Fenn.*, **201**, 11–45.
- Mikhailov, K. G. 2010. New synonymy in the Genus *Zelotes* (Aranei, Gnaphosidae). *Vestnik Zoologii*, **44** (5), 420 [In Russian].
- Pichka, V. E. 1984 a. To the spider fauna of the Central-Chernozomyom Reserve. *Fauna i ekologiya paukoobrasnykh.* Perm University, Perm, 68–77 [In Russian].
- Pichka, V. E. 1984 b. On the fauna and ecology of spiders of the Central-Chernozomyom Reserve. *Ekologo-faunisticheskie issledovaniya tsentralnoi lesostepi Evropeiskoy chasti USSR.* TsNIL Glavokhoty RSFSR, Moscow, 65–75 [In Russian].
- Polchaninova, N. Yu. 2001. Spider fauna and assemblages (Aranei) of the Zorynskiy part of the Central Black Earth Reserve. *Prirodnye uslovia i ekologicheskoe raznoobrasie Zorinskogo zapovednogo uchastka Kurskoi Oblasti. Trudy Tsentralno-Chernozemnogo gosudarstvennogo zapovednika, is. 17*, 249–255 [In Russian].
- Polchaninova, N. Yu. 2002. Spider fauna and assemblages (Aranei) of the ‘Yamskaya Steppe’ Nature Reserve (Belgorod Region, Russia). *Kharkov Entomol. Soc. Gaz.*, **10** (1–2), 41–51 [In Russian].
- Polchaninova, N. Yu. 2003. Spiders of the oak forests of the Gomolshansky Nature Park. *Nauchnye issledovaniya na territorii prirodno-zapovednogo fonda Kharkovskoi oblast.* Kharkov National University, Kharkov, 62–67 [In Russian].
- Polchaninova, N. Yu. 2004. Effect of hay-mowing on spider communities of the meadow steppes of the Central wood-and-steppe (Russia and Ukraine). In: Logunov, D. V. Penney, D., eds. *European Arachnology 2003: Proc. 21st Europ. Colloq. Arachnol., St.-Petersb., 4–9 Aug. 2003.* KMK Sci. Press Ltd, Moscow, 261–273.
- Polchaninova, N. Yu. 2008. Materials to the spider fauna (Araneae) of the Ostrovtsovskiy part of the Privolzhskaya Lesostep Reserve (Penza Region). *Cauc. Entomol. Bull.*, **4** (2), 151–161 [In Russian].
- Polchaninova, N. Yu. 2009 a. A checklist of the spiders (Araneae) of Kharkov Region (Ukraine). *The Journal of V. N. Karazin Kharkiv National University. Ser. Biology*, **856** (9), 136–142 [In Russian].
- Polchaninova, N. Yu. 2009 b. Spiders (Araneae) of the Streletsky part of the Tsentralno-Chernozemny Nature Reserve (Kursk Region). *Cauc. Entomol. Bull.*, **5** (1) 13–27 [In Russian].
- Polchaninova, N. Yu. 2011. To the study of spider (Araneae) complexes of the plain oak forests of the Central Russian Upland on the example of the Nature Reserve ‘Les na Vorskle’. *Kharkov Entomol. Soc. Gaz.*, **19** (1), 67–76 [In Russian].
- Polchaninova, N. Yu. 2012. Spiders (Araneae) of the “Stepnoi” spot, a prospective protected area in Kursk Region. *Belgorod State Univ. Sci. Bull. Natural Sciences*, **15**(134), is. 20, 65–68 [In Russian].
- Polchaninova, N. Yu. 2013. To the study of araneofauna and spider communities (Aranei) of the Trostianets oak forests of Sumy Region, Ukraine. *The Kharkov Entomol. Soc. Gaz.*, **21** (2), 38–44 [In Russian].
- Polchaninova, N. Yu., Prokopenko, E. V. 2013. Catalogue of the spiders (Arachnida, Aranei) of Left-Bank Ukraine. *Arthrop. Sel. Supplement N 2.* KMK Scientific Press, Moscow, 1–268.
- Ponomarev, A. V. Polchaninova, N. Yu. 2006. The materials on the fauna of spiders (Aranei) of Belgorod Region. *Cauc. Entomol. Bull.*, **2** (2), 143–56 [In Russian].
- Ponomarev, A. V., Tsvetkov, A. S. 2006. New and rare spiders of the family Gnaphosidae (Aranei) from the southeast of Europe. *Cauc. Entomol. Bull.*, **2** (1), 5–13 [In Russian].
- Sozontov, A. N., Shirobokova, E. S. 2014. New species to the Udmurt Republic spider fauna from Igra District. *Vestnik Udmurtskogo Universiteta*, **3**, 43–147 [In Russian].
- Tuneva, T. K., Esyunin, S. L. 2002. A review of the Gnaphosidae fauna of the Urals (Aranei) 3. New species and new records, chiefly in the South Urals. *Arthrop. Sel.*, **11** (3), 223–234.
- Tuneva, T. K., Esyunin, S. L. 2008. The fauna diversity and geographical distribution of Gnaphosidae spiders (Aranei) in the Urals. *Zoologicheskii Zhurnal*, **87** (7), 779–789 [In Russian].
- Utochkin, A. S. 1977. Spiders of the Saralovo Forestry of the Volgo-Kama Reserve. *Voprosy arakhnoentomologii. Fauna i ekologiya paukov i krovososushchikh nasekomykh.* Perm University, Perm, 69–80 [In Russian].

Received 12 September 2014

Accepted 24 March 2015