

Distribution of *Vipera renardi renardi* (CHRISTOPH, 1861), in the Saratov region, Russian Federation

The Steppe Viper, *Vipera renardi renardi* (CHRISTOPH, 1861), is widespread in southeast European Russia (ANANJEVA et al. 2004). Distribution limits of the species are well known in general, whereas information on local populations scattered within marginal areas of the range is insufficient. This situation applies to the northern range area and the Saratov region in particular, on which the present note is focused.

The authors' analysis of confinement to certain biotopes and abundance of *V. r. renardi* was based on field data collected in the spring and summer months of 2002 – 2016. The population density of *V. r. renardi* was estimated by counts on trial plots and along routes (SHLYAKHTIN & GOLIKOVA 1986). In addition, collection materials of the Zoological Museum of the Saratov State University (ZM SSU) were examined.

In the 19th century, *V. r. renardi* inhabited most of the open steppe biotopes of today's Saratov region (Saratovskaja oblast – Саратовская область); at that time findings of the species in both the right bank area of the Volga River and the Trans-Volga region were quite common (NIKOLSKY 1916). This situation persisted until the first half of the 20th century. During the 1960s – 1980s, the *V. r. renardi* population of the Saratov region declined significantly. The viper disappeared from most administrative districts of the Saratov region and retreated to some isolated areas. However, it remained relatively common in the extreme south of the Saratov Trans-Volga region and in the extreme south-east of the Saratov right bank area of the Volga River. A similar decline took place in the adjacent Volgograd region, where the number of specimens was seven to 15 individuals/ha in the summer months of the 1960s, and one to two individuals/10 km along a line transect in 1986 (KUBANTSEV & KOLIAKIN 1989). The main causes of the drop in abundance of *V. r. renardi* were the plowing of vast pristine land areas and also the intense development of cattle breeding (SHLYAKHTIN et al. 2006).

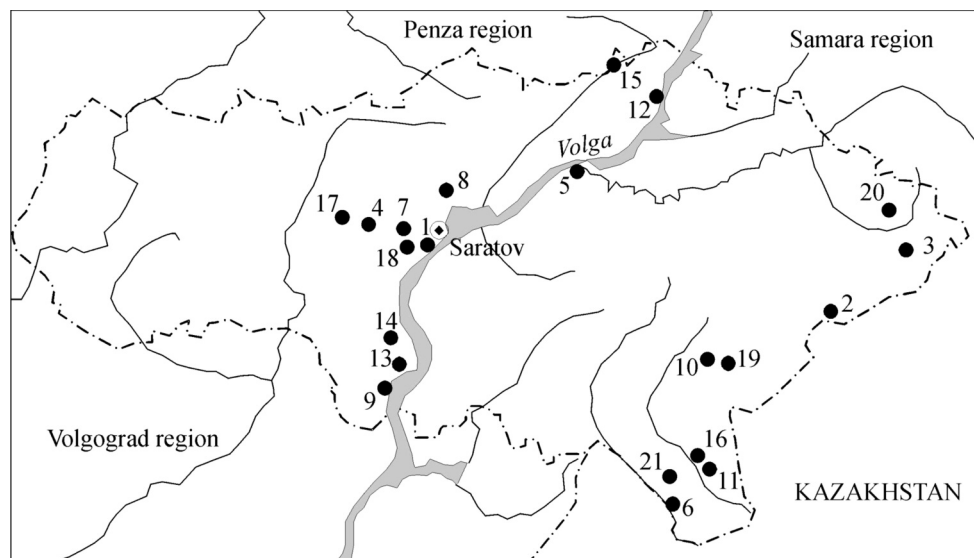


Fig. 1: Distribution of *Vipera renardi renardi* (CHRISTOPH, 1861), in the Saratov region (Russian Federation). Record localities 1-14 are taken from ZAVIALOV et al. (2006); 15-21 are new records by the authors.

1 – Near the city of Saratov; 2 – Ozinskiy district, near the town of Ozinki; 3 – Perelyubskiy district, near the village of Alekseevka; 4 – Tatishchevskiy district, near the town of Tatishchevo; 5 – Near the city of Balakovo; 6 – Alexandrovo-Gaiskiy district, near the village of Varfolomeevka; 7 – Tatishchevskiy district, near Kurdum train station; 8 – Novoburasskiy district, near the village of Radishchevo; 9 – Krasnoarmeysk district, near the village of Nizhnyaya Bannovka; 10 – Dergachevskiy district, near the village of Safarovka; 11 – Alexandrovo-Gaiskiy district, near the village of Monakhovo; 12 – Khvalynskiy district, near the village of Staraya Yablonka; 13 – Krasnoarmeysk district, near the village of Revino; 14 – Krasnoarmeysk district, near the village of Sado-voe; 15 – Khvalynskiy district, near the village of Staraya Lebezhayka; 16 – Alexandrovo-Gaiskiy district, Khar-lamov Sad natural boundary; 17 – Tatishchevskiy district, near Evdokimovskiy train station; 18 – Saratovskiy district, near the village of Konstantinovka; 19 – Dergachevskiy district, near the town of Stepnoe; 20 – Perel-yubskiy district, near the village of Kunakbayevo; 21 – Alexandrovo-Gaiskiy district, near the village of Sisoev.

Since the last decade of the 20th century, more and more arable land fell fallow and pasture land was overgrown with a relatively high projective vegetation cover because of minor warming and increase in humidity in the process of climate change (KOLOMYTS 2008; LEVITSKAYA et al. 2009; YERMOKHIN et al. 2017). Under the above conditions, a steady increase in the *V. r. renardi* numbers became apparent in the territory of the Saratov region. Along ravines and gullies, foothills of upland oak forests and floodplains of rivers, the species began to recolonize areas of its former range. New settlements of *V. r. renardi* in the northern Saratov right bank region of the Volga River and the southeastern Saratov Trans-Volga region were found (Fig. 1). For example, in the first ten-day period of May 2002 – 2006,

2010 and 2014, in the vicinity of the village of Staraya Yablonka (Khvalynskiy district) the abundance of *V. r. renardi* varied from 0.8 to 4.5 individuals/ha. Similar values of abundance (one to five individuals/ha) were typical for steppe sites with shrub vegetation in the valley of the Chardym river (near the village of Radishchevo, Novoburasskiy district), as well as the slopes and bottoms of ravines and gullies in the southeast of the Krasnoarmeyskiy district. In addition, a habitat of *V. r. renardi* was found in the area of a steppe slope with shrub vegetation near the Evdokimovskiy railway station (51° 44.404' N / 45° 21.931' E) in the Tatishchevskiy district on April 09, 2011, and also in the vicinity of the village of Konstantinovka (51° 27.057' N / 45° 35.788' E) in the Saratovskiy district on September 24, 2013.

In the Saratov Trans-Volga region, the maximum abundance indices of *V. r. renardi* (up to 11 individuals/ha) are typical for areas with mixed grass-shrub vegetation near open-water reservoirs (estuaries, canals, and storage reservoirs) and in the floodplains of the Bolshoy and Malyy Uzen rivers in the extreme south of the Alexandrovo-Gaiskiy district. A somewhat lower abundance was noted in the north of the Alexandrovo-Gaiskiy district and in the east of the districts Dergachevskiy, Pereyubskiy and Ozinskiy. For example, in the second third (ten-day period) of May 2006 – 2011, on plots of mixed-grass steppe with shrub thickets in the Kharlamov Sad natural boundary (the floodplain of the Bolshoy Uzen river in the vicinity of the village of Monakhovo, Alexandrovo-Gaiskiy district), the numbers of the specimens varied from 0.8 (2007) to 3.2 (2010) individuals/ha.

Thus, the available data indicates that *V. r. renardi* currently has a wide but patchy distribution in the vast territory of the Saratov region. Given a gradual increase in the average annual temperatures and somewhat stabilized humidity conditions within the study area, an increase in the species abundance and a slow expansion of the range boundaries in the region can be expected in the coming years. However, due to the limited distribution of the species, it is suggested to keep *V. r. renardi* included in the next (third) edition of the Red Book of the Saratov region (RED BOOK OF THE SARATOV REGION: MUSHROOMS. LICHENS. PLANTS. ANIMALS 2006).

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KEY WORDS: Reptilia: Squamata: Serpentes: Viperidae; *Vipera renardi*, ecology, distribution, Saratov region, Russia, Russian Federation

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