

## NEW SUBSPECIES OF MEADOW LIZARD, *Darevskia praticola loriensis* ssp. nov. (REPTILIA: SAURIA) FROM ARMENIA

S. B. Tuniyev,<sup>1</sup> I. V. Doronin,<sup>2</sup> B. S. Tuniyev,<sup>1</sup>  
A. L. Aghasyan,<sup>3</sup> A. A. Kidov,<sup>4</sup> and L. A. Aghasyan<sup>3</sup>

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Geographical variability of *Darevskia praticola* in the Caucasian Isthmus is analyzed. Description of the new subspecies *Darevskia praticola loriensis* ssp. nov. is given from the Lori Province of Northern Armenia. Possible ways of speciation and radiation of subspecies of *Darevskia praticola* within the North Caucasus and Transcaucasia are discussed.

**Keywords:** *Darevskia praticola*; geographical variability; the Caucasus; Armenia; *Darevskia praticola loriensis* ssp. nov.

### INTRODUCTION

In the course of the analysis of geographical variability of the members of *Darevskia (praticola)* complex within the Caucasian Isthmus the species distinct status of *D. pontica* (Lantz et Cyrén, 1919) and *D. praticola* sensu stricto was shown (Tuniyev et al., 2011). Within *D. praticola* (Eversmann, 1834) two subspecies were recognized: the nominative one and *D. p. hyrcanica* Tuniyev, Doronin, Kidov et Tuniyev 2011. At the same time the special characters of disjunctive populations were marked in Armenia and East Georgia. Absence of sufficient material from Armenia did not allow earlier discussing taxonomical status of these animals. New collections from Armenia (Permission of Ministry of Natural Resources of Republic Armenia No. 000016 from 05/31/2011), along with additional examination of collection material, allowed to revise variability of species and taxonomical status of population from Armenia and East Georgia.

### MATERIAL AND METHODS

**Morphological analysis.** A total 148 specimens were studied in morphological analysis. In statistical and

canonical analyses information is used for 132 adult and 16 juvenile specimens of meadow lizard from Armenia, East Georgia, and also Stavropol Territory, North Ossetia, Kabardino-Balkaria (Russia) and Azerbaijan. Material is stored in herpetological collection of the Sochi National Park (SNP) and Zoological Institute of Russian Academy of Sciences in St. Petersburg (ZISP) (Table 1). Material is combined according to geographical localities into 4 samples: 1. Talysh (including the Lenkoran Lowland and Alburz); 2. North Caucasus; 3. East Georgia; 4. Armenia. The diagnostic characters of the described subspecies (Tuniyev et al., 2011), and also morphological characters offered by A. G. Bannikov et al. (1977) were studied (Table 2). To eliminate influence of sexual variation, comparison of males and females were made separately (Tables 3 – 5). The results obtained were compared with the earlier published information (Orlova, 1978; Tuniyev et al., 2011).

Material was treated statistically using the standard methods of variation statistics (Lakin, 1990) and one of methods of multidimensional statistics — Canonical Discriminate Analysis (CDA), and also cluster analysis (Tyurin et al., 2003) by the package of STATISTICA 6.0 for Windows.

**GIS-analysis of distribution.** For the analysis of chorology of lizards the program Maxent 3.3.3e ([www.cs.princeton.edu/schapiro/maxent](http://www.cs.princeton.edu/schapiro/maxent)) was used. With its help, on the basis of 19 variable climatic indexes and information on heights, the cards of the most credible areas of distribution of lizards were constructed. Along with the analysis of literature sources, at drafting of cadastre of finds of lizards of the studied complex, material

<sup>1</sup> Federal State Institution Sochi National Park, Sochi, Russia; e-mail: tuniev1@mail.ru, btuniyev@mail.ru

<sup>2</sup> Zoological institute of Russian Academy of Sciences, St. Petersburg, Russia; e-mail: ivdoronin@mail.ru

<sup>3</sup> Scientific Center of Zoology and Hydroecology of National Academy of Sciences of Republic Armenia, Yerevan, Armenia; e-mail: agasaram@yahoo.com, agaslev@yahoo.com

<sup>4</sup> K. A. Timiryazev Moscow Agricultural academy, Moscow, Russia; e-mail: kidov\_a@mail.ru

was used from collections of the Zoological Institute of Russian Academy of Sciences in St. Petersburg, Zoological Museum of the Moscow State University, Zoological Museum of the National Natural Scientifically-History Museum of NAS of Ukraine, Museum of Nature of the Kharkov National University named after V. N. Karazin,

Scientific Center of Zoology and Hydroecology of NAS of Republic Armenia, Sochi National Park, Zoological Museum of the Stavropol State University, Stavropol State Historical-Cultural and Naturally-landscape Museum-Preserve named after G. N. Prozritelev and G. A. Prave. Part of literature information was not taken into

**TABLE 1.** Examined collection specimens of *Darevskia praticola*, stored in herpetological collections of Sochi National Park (SNP) and Zoological Institute Russian Academy of Sciences (ZISP)

Coll. No.	<i>n</i>	Sample	Collection locality	Date	Collector
NP 1473	20	1	Azerbaijan, Astara District, Talysh Ridge, natural boundary of Gada-Zyga-Khi	18.08.2009	Kidov A. A.
ZISP 12301	1	1	Azerbaijan, Lerik District, Lerik town.	14.05.1909	Kirichenko N. A.
ZISP 12630	1	1	Iran, Sharferud [= Sharif Rud], Enzeli Bay, Gilyan.	13.09.1913	Mlakosievich L.
ZISP 12632	1	1	Azerbaijan, Astara District, Kaladagna.	30.03.1912	Baldamus
ZISP 12633	1	1	Azerbaijan, Astara District, Kaladagna.	30.03.1912	Lantz L. A.
ZISP 12634	1	1	Iran, Kheyran, Astara-Ardebil.	05.04.1912	
ZISP 12635	1	1	Iran, Alburz Mountain [= Ridge] of near Ardebil.	05.04.1912	
ZISP 23562	10	2	Russia, Stavropol Territory, Budenovsk District, river Kuma, vicinity of village Orlovka.	30.06.2005	Lotiev K. Yu., Milto K.
SNP 1436	3	2	Russia, Stavropol Territory, Budenovsk District, river Kuma, vicinity of village Orlovka.	22.06.2008	Tuniyev B. S.
ZISP 22125	15	2	Russia, Stavropol Territory, river bad of river Kuma from Zelenokumsk town to Mineralnye Vody town	2000	Darevsky I. S.
ZISP 16307	50	2	Russia, Stavropol Territory, Pyatigorsk	1911	
ZISP 16054	1	2	Russia, North Ossetia, Terek River valley near Darg-Kokh	11.09.1947	
ZISP 16954	2	2	Russia, North Ossetia, vicinity of Vladikavkaz	12.09.1923	
ZISP 22126	2	2	Russia, Kabardino-Balkaria, Nalchik City	21.08.2000	Expedition of Institute of molecular biology RAS
ZISP 19503	6	3	Georgia, Kakhelia, Lagodekhi	14.07.1980	Darevsky I. S.
ZISP 17739	2	3	Georgia, Shida-Kartli, Surami Mountain Pass	07.06.1963	
ZISP 17075	10	4	Armenia, village Karakilis near Kirovakan (= Vanadzor)	23.06.1956	
ZISP 17837	1	3	Azerbaijan, Zakataly, Katekhchay Gorge	27.07.1961	Drozov N. N.
SNP 1568 – 1569	19	4	Armenia, Lori Marz, vicinity of Stepanovan, village Gyulagarak	22.05.2012	Tuniyev S. B., Tuniyev B. S., Aghasyan A. L., Timukhin I. N.
ZISP 12297	1	4	Armenia, Dzhalal-Ogly (= Stepanavan)	09.07.1922	Shelkovnikov A. B.
Total	148				

**TABLE 2.** The Scheme of Morphological Characters

No.	Abbreviation	Name	Notice
1	L.t.	Longitudo totalis	Distance from tip of muzzle to point of tail
2	L.	Longitudo corporis	Distance from point of muzzle to point of cloacae fissure
3	L.cd.	Longitudo caudalis	From point of cloacae fissure to point of tail
4	G.	Squamae gulares	Number of the gular scales along a middle line of gullet to middle of collar
5	Sq.	Squamae	Number of dorsal scales around the midbody
6	P.fm.	Pori femoralis	Number of femoral pores (right/left)
7	S.m.1	Submaxillaria	Number of chin shields
8	S.m.2	Submaxillaria contacts	Number of joint pears of chin shield
9	Gr	Granulae	Number of granules between superciliary shields and supraocular shields (left/right)
10	Pil.	Pileus	Distance from tip of muzzle to posterior end of parietal shield
11	Lt.c	Latitudo capitis	Maximum width of head
12	Al.c.	Altitudo capitis	Height of head near occipital shield
13	M	Massetericum	Massetericum shield (expressed/not expressed %)
14	Inter fm.	Squamae inter pori femoralis	Number of scales between pori femoralis

account, because it did not contain exact localization, or specific and subspecific identifications were doubtful. During authentication of old toponyms a reference book «The Caucasus: geographical names and objects» (2007) was used. Information was used for 147 localities of *D. praticola* records. As a test it was taken 25% information about localities. For a design the climatic base of WorldClim ([www.worldclim.org](http://www.worldclim.org)) (minimum resolution of 30 arc-sec or ~1 km on a pixel) was used which

allows to conduct interpolation of the looked after information from 1950 to 2000. GIS-maps obtained were imported and visualized in the program DIVA-GIS ([www.diva-gis.org](http://www.diva-gis.org)) (Hijmans et al., 2005).

**RESULTS**

It is shown that specimens from analyzed populations have for clear differences from each other in a number of morphological characters (Tables 3 and 4).

**TABLE 3.** Morphological Characteristic of Examined Samples of *Darevskia praticola*

No.	Character	Mean value of character, $\bar{x} \pm m_{\bar{x}}$							
		Talysh		North Caucasus		East Georgia		Armenia	
		♂♂ (n = 8)	♀♀ (n = 10)	♂♂ (n = 43)	♀♀ (n = 38)	♂♂ (n = 2 adult + + 2 juv.)	♀♀ (n = 5)	♂♂ (n = 16 adult + + 1 juv.)	♀♀ (n = 10 adult + 3 juv.)
1	L.t.	144 ± 3.3	145.7 ± 9.8	138.4 ± 2.3	146.2 ± 3.4	154.5 ± 6.5	134.5 ± 7.5	139.5 ± 3.1	148.6 ± 1.5
2	L.	50.8 ± 1.7	52.8 ± 1.5	47.4 ± 0.4	52.5 ± 0.7	52 ± 2	48.2 ± 3.2	48.3 ± 0.8	56.1 ± 1.7
3	L.cd.	93.5 ± 2.3	91.3 ± 7.8	91.3 ± 2.6	92 ± 3.03	102.5 ± 4.5	86.5 ± 1.5	91 ± 2.1	92.5 ± 0.5
4	G.	17.8 ± 0.6	17.6 ± 0.5	18.3 ± 0.1	18.2 ± 0.2	17.75 ± 0.5	17.6 ± 0.5	17.3 ± 0.2	17.3 ± 0.4
5	Sq.	37.1 ± 0.6	38.5 ± 0.6	37.02 ± 0.2	36.2 ± 0.3	36.75 ± 1.3	37.6 ± 0.6	37.1 ± 0.3	35.7 ± 0.4
6	P.fm.	10.9 ± 0.2	11.3 ± 0.3	11.1 ± 0.1	11.1 ± 0.15	10.4 ± 0.3	10.2 ± 0.6	11.5 ± 0.2	10.95 ± 0.2
7	S.m.1	5	5	5.1 ± 0.02	5	5.1 ± 0.1	5	5	5
8	S.m.2	2	2	2.1 ± 0.02	2	2.1 ± 0.1	2	2	2
9	Gr.	3 ± 0.3	4.7 ± 0.7	2.95 ± 0.15	2.8 ± 0.15	4 ± 0.35	3.6 ± 0.45	4.55 ± 0.4	4.1 ± 0.7
10	Pil.	11.4 ± 0.2	11.04 ± 0.2	10.5 ± 0.08	10.3 ± 0.1	11.9 ± 0.4	10.4 ± 0.2	11 ± 0.1	10.7 ± 0.2
11	Lt.c	7.2 ± 0.2	6.8 ± 0.2	6.3 ± 0.07	6 ± 0.1	6.7 ± 0.3	6.1 ± 0.2	6.3 ± 0.2	6.4 ± 0.2
12	Al.c.	5.6 ± 0.2	5.4 ± 0.2	5 ± 0.06	4.7 ± 0.1	6 ± 0.3	5.02 ± 0.2	4.8 ± 0.2	5 ± 0.2
13	M.	expressed 87.5%	expressed 100%	expressed 60%	expressed 44.7%	expressed 100%	expressed 100%	expressed 100%	expressed 100%
14	Inter fm.	2.4 ± 0.2	3.2 ± 0.2	2.9 ± 0.1	3.3 ± 0.1	3.25 ± 0.5	3.8 ± 0.4	3.3 ± 0.2	3.8 ± 0.2

**TABLE 4.** Comparison of Males and Females *Darevskia praticola* from Different Samples

No.	Character	♂♂	♂♂	♂♂	♂♂	♂♂	♂♂	♀♀	♀♀	♀♀	♀♀	♀♀	♀♀
		1/2	1/3	1/4	2/3	2/4	3/4	1/2	1/3	1/4	2/3	2/4	3/4
		n = 17	n = 13	n = 28	n = 47	n = 60	n = 21	n = 48	n = 20	n = 28	n = 43	n = 48	n = 18
1	L.t.	0	0	0	*	0	0	0	0	0	0	0	0
2	L.	0	0	0	*	0	0	0	0	0	0	*	*
3	L.cd.	0	0	0	0	0	*	0	0	0	0	0	**
4	G.	*	0	0	0	***	0	0	0	0	0	*	0
5	Sq.	0	0	0	0	0	0	***	0	**	0	0	**
6	P.fm.	0	0	**	**	*	**	0	0	0	0	0	0
7	S.m.1	0	0	0	0	0	0	0	0	0	0	0	0
8	S.m.2	0	0	0	0	0	0	0	0	0	0	0	0
9	Gr./P.f.	0	0	**	0	***	0	***	0	0	0	**	0
10	Pil.	*	0	0	***	***	**	***	0	0	0	*	0
11	Lt.c	***	0	**	0	0	0	***	*	0	0	**	0
12	Al.c.	*	0	**	**	**	*	***	0	0	0	0	0
13	M.	0	0	0	0	0	0	***	0	0	**	**	0
14	Inter fm.	0	0	*	0	0	0	0	*	*	0	**	0

**Notes.** Levels of meaningfulness: \**P* < 0.05, \*\**P* < 0.01, \*\*\**P* < 0.001); 0, there are not reliable differences. Samples: 1, Talysh; 2, North Caucasus; 3, East Georgia; 4, Armenia.



**Fig. 1.** Coloration of *Darevskia praticola*: a, female of *D. p. praticola* from riverbed of Kuma River in the Stavropol Territory; b, male of *D. p. hyrcanica* from Talysh; c, male of *D. p. loriensis* ssp. nov. from Gulagarak Village, North Armenia; d, female of *D. p. loriensis* ssp. nov. from Gulagarak Village, North Armenia.

Animals from riverbed of Kuma River in the Stavropol Kray (Fig. 1a) are differed the least by contrasting color pattern and homogenous coloration. A light band on each side of body is often seen only at the level of forelimbs. The high percent of specimens from territory of Central Precaucasus without color pattern was noted by Tertysnikov (2002).

In coloration of *D. p. hyrcanica* (Fig. 1b) we revealed (Tuniyev et al., 2011) predominance of chocolate-brown (not red) tone, poorly expressed white bar on each side of trunk, often it has the same tone as basic background of the back and brighter expressed above hind limbs. The live coloration of lateral ventral shields is goldish-pink, instead white, yellow, or greenish coloration in other parts of natural habitat.

Males of *D. praticola* ssp. from Armenia painted in pale yellow-gray tones with a contrasting blackly-brown spinal bar, with the brightly expressed white bar on each side of trunk, by the outlined black bar from below (Fig. 1c); females — in red-brown tones with a less contrasting red-brown spinal bar and less brightly expressed light lateral bar. For both sexes more intensive painting is

**TABLE 5.** Comparison of Adult Males and Females *Darevskia praticola*,  $n = 132$

Character	♂♂	♀♀	<i>t</i>	<i>P</i>
	( <i>n</i> = 69) min – max $\bar{x} \pm m$	( <i>n</i> = 63) min – max $\bar{x} \pm m$		
L.t.	121 – 161 141.4 ± 1.8	127 – 162 145.1 ± 2.5	1.3	>0.05
L.	42 – 61 48.2 ± 0.4	39 – 62.3 52.8 ± 0.6	6.2	<0.001
L.cd.	79 – 107 92.6 ± 1.3	78 – 105 91.3 ± 1.8	0.6	>0.05
G.	15 – 20 18 ± 0.1	15 – 21 17.9 ± 0.2	0.16	>0.05
Sq.	34 – 40 37.04 ± 0.2	33 – 41 36.6 ± 0.3	1.5	>0.05
P.fm.	9 – 13 11.1 ± 0.1	8 – 13 11.05 ± 0.2	1.6	>0.05
S.m.1	5(6)	5 (6)	—	—
S.m.2	2(3)	2 (3)	—	—
Gr	0 – 8 3.4 ± 0.15	0 – 8 3.35 ± 0.2	0.16	>0.05
Pil.	9.7 – 12.3 10.8 ± 0.1	9 – 12 10.5 ± 0.1	3.09	<0.01
Lt.c	5.3 – 7.7 6.4 ± 0.1	5.2 – 7.9 6.2 ± 0.1	2.37	<0.01
Al.c.	4 – 6.5 5.1 ± 0.1	3.8 – 6.5 4.9 ± 0.1	1.9	>0.05
Inter fm.	2 – 4 3 ± 0.1	2 – 5 3.4 ± 0.1	2.1	<0.05

**Note.** «—», data absent; in brackets, rare, as exception.



characteristic in red tones of overhead part of head and neck as compared to gray or hazel painting of the back (Fig. 1*d*). The same tendency in the contrast of painting is observed for juvenile specimens.

Lantz and Cyrén (1919) noted a little occipital, insignificantly wedged between parietals for a nominative subspecies. Animals from the Stavropol Territory have small triangular occipital shield. For lizards from Talysh the large triangle-shaped (35%) and trapezoid (40%) occipital is marked approximately in an equal proportion; about 1% of specimens have the occipital fragmented into small portions and 0.5% of specimens have the diamond-shaped, little rounded occipital, or an occipital absent (Tuniyev et al., 2011).

Lizards from Armenia are characterized in a large trapezoid occipital well wedged between parietals for 100% specimens.

**Males.** The smallest specimens are marked in Armenia and in North Caucasus, the largest — in East Georgia (Table 3). The maximal length of pileus and height of head is typical for animals from East Georgia, minimum values on these characters are marked for lizards from North Caucasus and Armenia. Animals from Armenia are characterized by comparatively large pileus at the most minimal height of head (4.8 mm). The most platycephalous specimens are marked from Talysh (7.1 mm), at identical values at North Caucasus and Armenia (6.3 mm). A central temporal (massetericum) is expressed in 100% cases for the Armenian and Georgian lizards, thus for lizards from Armenia this shield is very large; at Stavropol Territory — not expressed in 40% of specimens even from one side, while for males from Talysh — it is not expressed in 12.5% of specimens. The temporal area of lizards from Armenia is built from the large shields, sizes of postocular, massetericum, tympanum and post temporal shields often approximately equal, so that there are 4–5 large shields in a temporal area. The temporal area of lizards from the Stavropol Territory and Talysh never demonstrates such amount of equal on size large shields. Lizards from Armenia are characterized by maximal number of femoral pores (11.5), the minimal value is marked for lizards from East Georgia (10.4). The maximal amount of granules is recorded for specimens from Armenia (4.6) too, the minimal in specimens from the North Caucasus (2.95) and Talysh (3.0). The minimal number of scales between the rows of femoral pores is found in specimens from Talysh (2.4), the maximal — in lizards from Armenia (3.3). Amount of gulars in lizards from Talysh, East Georgia (17.8) and Armenia (17.3) is lesser than from North Caucasus (18.3).

**Females.** Unlike males, the maximal sizes of specimens are marked in sample from Armenia, minimal —

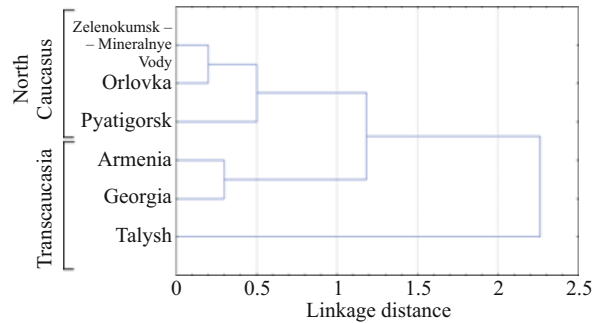


Fig. 2. Results of cluster analysis (UPGMA method) of males of *Darevskia praticola* based on pholidosis characters.

from East Georgia and North Caucasus. Length of pileus, width and height of head is maximal for specimens from Talysh. Number of gular shields of lizards from Talysh, to East Georgia (17.6) and Armenia (17.3) lesser than for lizards from the North Caucasus (18.2). The maximal number of Sq is marked for females from Talysh (38.5) and East Georgia (37.6), the minimal — from the North Caucasus (36.2) and Armenia (35.7). Amount of granules at Talysh (4.7) and Armenian specimens (4.1) is larger than at North Caucasus (2.9). Massetericum at Talysh, Armenian and Georgian lizards is expressed in 100% specimens, and in the North Caucasus — in 44.7% cases. As well as for males, the temporal area of females from Armenia is constructed from the large shields, sizes of postocular, massetericum, tympanum and post temporal shields approximately equal, so that there are 4–5 large shields in a temporal area. The temporal area of lizards from the Stavropol Territory and Talysh never has such amount of equal on size large shields. The number of scales between the rows of femoral pores at Talysh (3.2) and the North Caucasus (3.3) lesser than for lizards from East Georgia and Armenia (3.8).

The main patterns of sexual dimorphism in general do not differ from those described by Orlova (1978) and our information, published earlier (Tuniyev et al., 2011) (Table 5).

According to our data the sexual dimorphism for a meadow lizard is shown in greater length of body of females, and greater amount of scales between the rows of femoral pores. Males possess greater length of pileus, width and height of head.

In a cluster analysis dendrograms (Figs. 2 and 3) the males of *D. praticola* form three clades, thus *D. p. hyrcanica* is most distant from all of other samples. Animals from the Transcaucasia and the North Caucasus geographical clusters form a sister groups. Representatives of nominative subspecies entered in one of which, and in the second — *D. praticola* ssp. from Armenia and lizard

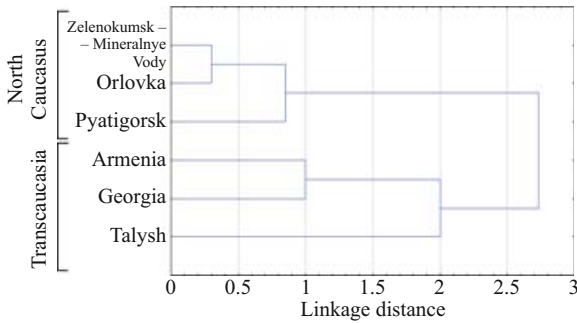


Fig. 3. Results of cluster analysis (UPGMA method) of females of *Darevskia praticola* based on pholidosis characters.

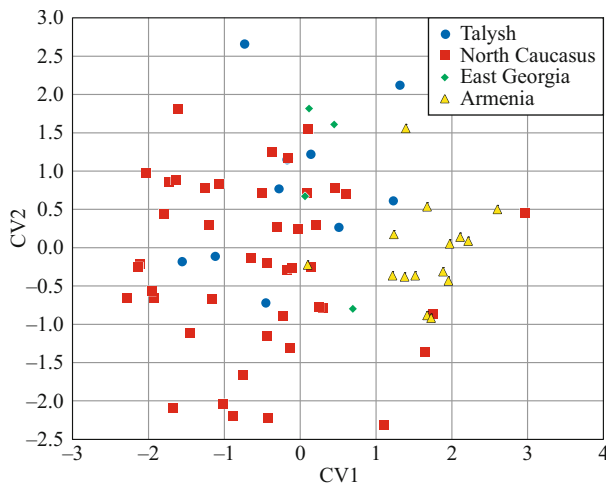


Fig. 4. Two-dimensional scatterplot of samples of *Darevskia praticola* in space of CDA function on the complex of morphometric characters. Adult males.

from East Georgia. Pattern of clusters of females slightly differs from males: *D. p. hyrcanica* is also most distant from others, but it is combined in one clade with other samples from Transcaucasia. It was shown that distances differ between samples.

Geographical variability of morphological characters of meadow lizard is considered also with the use of CDA, allowing making a comparison of the preliminary selected groups in the complex of characters (Tyurin et al., 2003). A complex from 6 meristic of characters (G., Sq., P. fm., Gr., M., Inter fm.) was used for which reliable distinctions were obtained in a statistical analysis. Lizards a priori were separated in eight groups according sexual and geographical principles.

The results of CDA showed relatively high accuracy of division of geographical groups. Accuracy for males is following: Talysh — 27.3%, Armenia — 88.2%, East Georgia — 25.0%, North Caucasus — 86.7%; for fe-

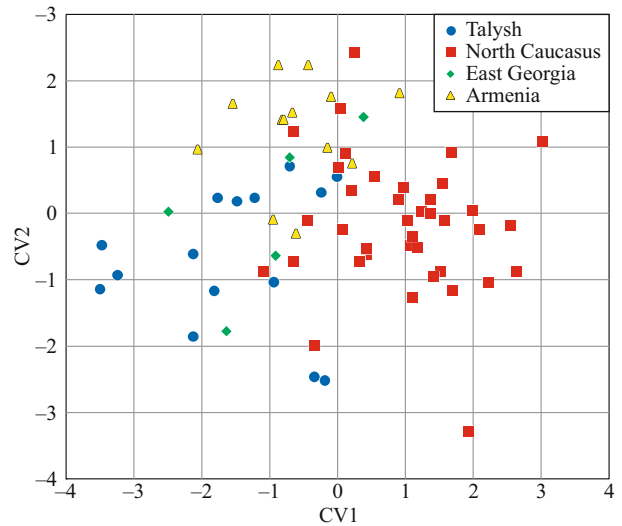


Fig. 5. Two-dimensional scatterplot of samples of *Darevskia praticola* in space of CDA function on the complex of morphometric characters. Adult females.

males: Talysh — 73.3%, Armenia — 61.5%, East Georgia — 40.0%, North Caucasus — 86.8%.

The results of CDA show that in space of discriminant functions males of lizards formed two groups (Fig. 4). The first group includes males from Talysh, the North Caucasus, East Georgia, the second group — lizards from Armenia, with the partial overlap with specimens from the North Caucasus.

Distributing in space of discriminant functions of females (Fig. 5) appeared more heterogeneous with formation of three groups in the first discriminant function. The isolated position was occupied by the groups of individuals from Talysh, Armenia and the North Caucasus, while animals from East Georgia practically dissolved within three previous groups. Females from the North Caucasus formed an independent group (Zelenokumsk – Mineral'nyye Vody), and other part (village Orlovka) is more similar in morphotype to the females from Talysh. Animals from Armenia are isolated from animals from Talysh on both functions. Females from Georgian population did not show considerable originality, that, presumably, it is related to the limited number of specimens in these samples (Lagodekhi-Zakataly, Suramskiy mountain pass).

The results obtained confirm the high degree of morphological apartness of the compared samples of meadow lizard. Degree of likeness between the selected samples in a CDA was estimated by the size of distance of Makhalonobis (Tyurin et al., 2003). The distances between the centers of samples of adult males of meadow lizard varied from 1.5 to 4.8. Minimum value was shown between males (1.5) from the North Caucasus and

Talysh, and maximal value (4.8, 4.1) — between males from Talysh and Armenia, and also to Armenia and East Georgia (Table 6). For the females this distance between the centers of samples varied from 3.6 to 6.98. Minimum (3.6) value was shown between females from East Georgia and Talysh, and maximal value (6.98) — between females from the North Caucasus and Talysh (Table 7).

The contribution of different morphological characters to discrimination of groups is different. Because the first discriminant function takes into account the maximal percent of dispersion and dividing of animals into basic groups occurs exactly along it, we describe the contribution of characters to the division of groups on the basis of values of this function (Tables 8 and 9).

A maximal contribution to discrimination of groups of males (Table 8) was brought by the followings characters: number of Sq, expressed/absence of central temporal shield, number of gulars, number of scales between the rows of femoral pores, number of granules.

A maximal contribution to discrimination of groups of females (Table 9) was brought by the followings characters: number of femoral pores, number of granules, number of gulars, number of scales between the rows of femoral pores, number of Sq, expressed/absence of central temporal shield.

During our study new information was obtained about the features of morphology and geographical variability of meadow lizard. Most important was to reveal substantial differences in the mean values in a number of metric and meristic characters of lizards from six regions (Tables 3 – 5), and also discrimination of three groups from four samples, selected on principle of geographical

**TABLE 6.** Mahalanobis Distances and Levels of Significance Among the Groups of Males *D. praticola* on CDA Results

Sample	Talysh	North Caucasus	East Georgia	Armenia
Talysh	—	1.5	1.96	4.1
North Caucasus	0.1	—	2.9	4.8
East Georgia	0.7	0.3	—	3.7
Armenia	0.001	0.0	0.2	—

**TABLE 7.** Mahalanobis Distances and Levels of Significance Among the Groups of Females *D. praticola* on CDA Results

Sample	Talysh	North Caucasus	East Georgia	Armenia
Talysh	—	6.98	3.6	4.8
North Caucasus	0.000000	—	6.5	4.7
East Georgia	0.12	0.003987	—	4.5
Armenia	0.000455	0.000023	0.07	—

identity using a cluster analysis (Figs. 2 and 3) and CDA (Figs. 4 and 5; Tables 6 and 7).

The results obtained allow to made a conclusion about taxonomic distinctivity of only three groups — from the North Caucasus, Talysh and Armenia, while position of specimens from East Georgia though and close to the Armenian animals on a cluster analysis, but remains indefinite on a CDA by virtue of insufficient amount of comparative material from this territory. Level of differences of animals from three groups (the North Caucasus, Talysh, Armenia) testify to subspecific independence of *D. p. praticola* — from the North Caucasus, *D. p. hyrcanica* — from Talysh, and *D. praticola* ssp. — from Armenia. That is possible that additional material from foothills of the South slope of the East Caucasus (Lagodekhi-Zakataly and South Ossetia) and from boundary with Armenia districts of Small Caucasus in East Georgia also will show the high level of distinctions.

**DESCRIPTION OF A NEW SUBSPECIES**

**Family Lacertidae Bonaparte, 1831**

**Genus *Darevskia* Arribas, 1997**

***Darevskia praticola loriensis* Tuniyev, Doronin, Tuniyev, Aghasyan, Kidov et Aghasyan ssp. nov.**

**Diagnosis.** Small lizard, different from other subspecies by a presence of 4 – 5 large shields in a temporal

**TABLE 8.** Value of Different Morphological Characters in Separation of Males Group *D. praticola* (on DCA Results)

Character	Standardized coefficient of first discriminant function	Character rank
G.	0.87	4
Sq.	0.98	1
P.fm.	0.82	5
Gr.	0.80	6
M.	0.91	3
Inter fm.	0.93	2

**Notes.** Conditional shortening given in Table 2.

**TABLE 9.** Value of Different Morphological Characters in Separation of Females Group *D. praticola* (on DCA Results)

Character	Standardized coefficient of first discriminant function	Character rank
G.	0.81	3
Sq.	0.75	5
P.fm.	0.91	1
Gr.	0.85	2
M	0.64	6
Inter fm.	0.79	4

**Note.** Conditional shortening given in Table 2.

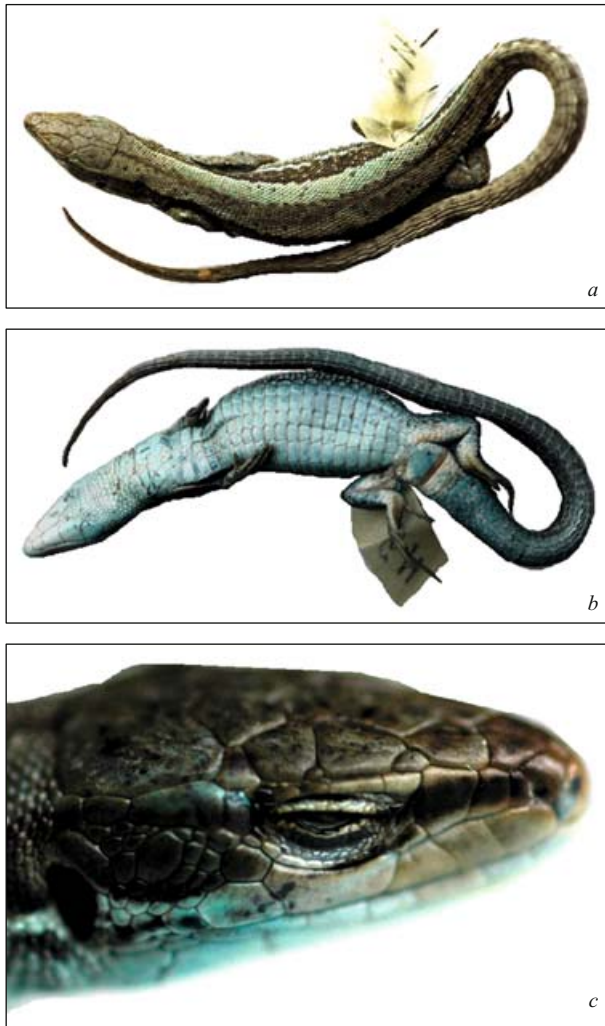


Fig. 6. Holotype of *Darevskia praticola loriensis* ssp. nov.: a, from above; b, from below; c, head from lateral side; d, head from below.

area, by a large trapezoid occipital shield, well wedged between parietal shields, maximal sizes of females in *Darevskia (praticola)* complex. At comparatively large pileus has the most flattened head. Also differs from other subspecies by maximal number of femoral pores, granules and scales between the rows of femoral pores. Males are colored in pale yellow-gray or coffee-milk tones with a contrasting dark-brown spinal bar, with the brightly expressed white bar on each side of body, by the outlined black strip from below; females — in red-brown tones with a less contrasting red-brown spinal bar and less brightly expressed light lateral bar. For both sexes more intensive color pattern is characteristic by red tones of overhead part of head and neck as compared to gray or hazel painting of the back. The same tendency in the con-

trast of color pattern is observed for juveniles. The color in life of lateral ventrals greenish-gray.

**Holotype.** Herpetological collection of the Sochi National Park, Sochi, SNP No. 1568, adult male, Armenia, Lori Marz (Province), vicinity of Stepanavan, village Gyulagarak (1438 m above sea level, 40°56'35.0" N 44°28'19.1" E), 22.05.2012, collector S. B. Tuniyev (Fig. 6).

**Paratypes.** 18 specimens, herpetological collection of SNP, Sochi; 10 specimens, ZISP, Saint Petersburg: SNP, No 1569 (1) adult female, (2) adult female, (3) adult female, (4) adult female, (5) adult female, (6) adult female, (7) adult female, (17) semiadult female, (18) semiadult female, (19) semiadult female, (8) adult male, (10) adult male, (11) adult male, (12) adult male, (13) adult male, (14) adult male, (15) adult male, (16) semiadult male, Armenia, Lori Marz, vicinity of Stepanavan, village Gyulagarak, 22.05.2012, collectors S. B. Tuniyev, B. S. Tuniyev, A. L. Aghasyan, I. N. Timukhin; ZISP, No. 17075, (1) adult female, (10) adult female, (2) adult male, (3) adult male, (4) adult male, (5) adult male, (6) adult male, (7) adult male, (8) adult male, (9) adult male, Armenia, vicinity of Kirovakan (= Vanadzor), 23.06.1956, collector I. S. Darevsky.

**Description of holotype.** Adult male, length of body from the snout to the anus (L.) 48.0 mm, length of tail (L.cd) 92.4 mm. Distance from the snout to the posterior edge of parietals (Pil.) 10.8 mm; maximal head width in the region of tympanic shield (Lt.c) 6.8 mm; head height in the region of occipital (Al.c) 4.9 mm. Width of frontonasal in 1.4 time more than its length. Rostral separated from frontonasal by nasals. Interparietal large; occipital trapezoid. Suture between prefrontal and frontal straight, not concave into frontal. Between supraciliaries and supraocularis, dividing them, an incomplete row of 5 granules (on the left) or 4 supraciliary granules (on the right). The first supratemporal long, wedge-shaped; behind it, on the edge of parietal, on the left side a one large post-temporal equal in its size with the size of second supratemporal, on the right side 2 supratemporals equal in their size. Masseteris is very large on both sides. One large shield between masseteris and tympanic. Five chin shields on each side, among them the first two pair contact each other along the middle line of throat; 5 sublabials on each side; 7 labials on each side; in front of suboculars three (left), and three (right) fronto-labial shields (Fronto-labialia). 17 scales from the middle line of throat to the collar (G). A collar includes 9 scales, central is not enlarged. Scale of body with the well expressed keels; 37 scales across a body (Sq.); 25 transversal rows of abdominal and pectoral shields. A row of 9 preanal pores of



approximately equal size in front of large anal shield. A row of femoral pores (10 on the left and 11 on the right) does not reach the knee; 3 scales between the rows of femoral pores.

**Description of paratypes.** All of paratypes correspond to holotype description with insignificant variations in metric and meristic characters (Table 10).

Coloration of males is more dark and contrasting than in females. The dorsum pale yellow-gray, either coffee-milk-colored, straight or with small wings cervical band of umber color passing to the dorsal surface of tail. Temporal bands wide umber color often with white small ocelli. Between the occipital and temporal stripes not numerous umber dots. A light band under temporal band clearly expressed. Below than light band on each side of

body there is a rather narrow dark stripe. Belly-greenish, rarer yellow, the lateral ventrals have greenish-gray spots (Fig. 7).

Females are painted in red-brown tones with a less contrasting red-brown occipital band and less brightly expressed light lateral bar, not outlined from below. Brown dots are present not only between occipital and by temporal bands but also along occipital band. Temporal bands well developed, darker than basic background of the back, but light ocelli absent. A belly is greenish-whitish. The color in life of lateral ventrals is greenish-gray (Fig. 8).

For both sexes more intensive red tones of overhead part of head and neck as compared to color of the dorsum.

**TABLE 10.** Morphological Characters of Paratypes *Darevskia praticola loriensis* ssp. nov.

No.	Coll. No.	n	Sex	Characters													
				L.t.	L.	L.cd.	G.	Sq.	P.fm.	S.m.1.	S.m.2.	Gr.	Pil.	Lt.c.	Al.c.	M.	Int.fm.
1	ZISP 17075	2	male	137	49	88	19	36	12/11	5	2	6/5	11.5	5.7	4.6	1	4
2	ZISP 17075	3	male	121	42	79	18	38	11/11	5	2	5/5	10.6	5.5	4	1	4
3	ZISP 17075	4	male	130	45	85	16	37	11/11	5	2	4/7	11	5.5	4.2	1	4
4	ZISP 17075	5	male	—	46	—	17	38	12/12	5	2	4/3	10.7	5.3	4.3	1	3
5	ZISP 17075	6	male	—	45	—	18	38	11/11	5	2	6/6	10.7	5.8	4.3	1	4
6	ZISP 17075	7	male	—	47	—	18	38	12/12	5	2	5/5	11.3	6	4.6	1	3
7	ZISP 17075	8	male	—	47	—	16	37	13/12	5	2	0/0	10.8	5.7	4.3	1	3
8	ZISP 17075	9	male	—	48	—	—	35	13/11	5	2	—	11.3	6	4.2	1	3
9	SNP 1569	8	male	147.3	51.7	95.6	17	39	12/13	5	2	4/4	11.4	7.3	5.6	1	3
10	SNP 1569	10	male	138.4	49.8	88.6	17	35	12/11	5	2	5/5	10.9	6.7	5	1	3
11	SNP 1569	11	male	144.7	50.6	94.1	17	36	12/12	5	2	5/6	11.1	6.6	5.3	1	2
12	SNP 1569	12	male	147.5	49.8	97.7	16	38	12/11	5	2	4/4	11	7.4	5.6	1	4
13	SNP 1569	13	male	—	54.3	—	18	37	11/11	5	2	5/5	11.3	6.9	5.5	1	4
14	SNP 1569	14	male	149.6	51.2	98.4	18	36	11/11	5	2	5/5	11.4	7	5.5	1	3
15	SNP 1569	15	male	—	49.1	—	17	38	11/11	5	2	6/5	10.9	7.3	5.4	1	3
16	SNP 1569	16	subadult male	79.3	31.6	47.7	19	38	13/12	4	2	2/3	7.3	4.5	3.6	1	2
17	SNP 1569	1	female	—	62.3	—	17	36	12/11	5	2	4/3	11.3	6.6	5.4	1	4
18	SNP 1569	2	female	150.2	58	92.2	18	36	11/10	5	2	3/3	10.3	6.4	5.1	1	3
19	SNP 1569	3	female	151.2	57.4	93.8	16	34	11/12	5	2	2/3	10.7	6.5	5	1	4
20	SNP 1569	4	female	—	62.1	—	15	35	11/11	5	2	0	11.3	6.9	5.4	1	3
21	SNP 1569	5	female	148.2	55.8	92.4	18	36	12/11	5	2	3/3	10.5	6.4	4.9	1	4
22	SNP 1569	6	female	144.63	53.03	91.6	19	36	12/10	5	2	4/3	10.2	6.2	4.8	1	4
23	SNP 1569	7	female	—	55.5	—	18	36	11/11	5	2	4/6	10.5	6.9	4.9	1	4
24	ZISP 17075	1	female	—	55	—	18	36	10/10	5	2	6/5	11	5.8	4.5	1	4
25	ZISP 17075	10	female	—	45	—	18	39	12/11	5	2	7/7	10	5.6	3.8	1	4
26	SNP 1569	17	subadult female	76.3	31.3	45	17	34	10/10	5	2	3/3	6.7	4.6	3.4	1	4
27	SNP 1569	18	subadult female	—	32.3	—	17	35	12/11	5	2	6/7	7.9	5.2	3.7	1	3
28	SNP 1569	19	subadult female	—	30.5	—	17	35	11/11	5	2	5/5	7.1	4.4	3.1	1	4

**Note.** «—», data absent; Gr. and P.fm. presented with considerable asymmetry (left/right sides).



Fig. 7. Coloration of male paratypes *Darevskia praticola loriensis* ssp. nov.: a, from above; b, from below.



Fig. 8. Coloration of female paratypes *Darevskia praticola loriensis* ssp. nov.: a, from above; b, from below.

The same tendency in the contrast of painting is observed for juveniles (Fig. 7a, 8a, 9).

**Etymology.** A subspecies is named after the ancient name of historical territory of north-western Armenia. Lori (= Lori Province) with village Gyulagarak is a type locality of new subspecies.

**Geographical distribution and biotopes.** The known natural habitat of subspecies covers the north slopes of the Small Caucasus within the limits of Armenia (Fig. 9). Recent distribution of this taxon in the contiguous districts of East Georgia requires clarification. Taxonomical position of animals is not clear from Lagodekhi-Zakataly, Tsiv-Gombor, Surami and Kartli Ridges in East Georgia and north-western Azerbaijan.

In Armenia *D. praticola* was recorded by Chernov (1939) for a peninsula Ada-Tapa on Sevan Lake at village Nadezhdino (= Shorzha, Gegarkuni Marz) (collections are not confirmed presently), vicinity of village Karakilis of Stepanovan district (= village Lernaovit, Lori Marz), a nomad summer-camp Karaketik of Allaverdi district (= village Karkop, Alaverdi town, Lori Marz), Vartatep park in Leninakan (= Gumri). Dal'(1954) noted the

meadow lizard for mountain steppes and meadow-steppes, meadows, subalpine and alpine areas, forests of Alaverdi, Kirovakan, Sevan and Stepanovan districts (presently all within Lori Marz) in the limits of elevation 1085 – 1920 m. Practically we find analogical information in the recently published monograph on herpetofauna of Armenia Republic (Arakelyan et al., 2011).

On the inventory book of reptiles of Institute of Zoology of NAS of Republic Armenia such collections of *D. praticola* are indicated from Armenia: No. 203 Krasnosel'skiy District (= Gegarkuni Marz), village Shorzha, 05.1930, collector A. B. Shelkovnikov (1 specimen); No. 854 Kirovakan botanical garden (= Vanadzor, Lori Marz), 18.07.1951, collector S. K. Dal'(4 sp.); No. 971 vicinity of Kirovakan, 27.07.1955, collector I. S. Darevsky (10 sp.); No. 972 vicinity of Stepanavan, 24.06.1956, collector I. S. Darevsky (10 sp.); No. 973 Semenovskiy mountain pass (Tavush Marz), 26.10.1956, collector I. S. Darevsky (1 sp.); No. 974 vicinity of Stepanavan, 06.05.1955, collector S. B. Papanyan (1 sp.);





Fig. 9. Coloration of juvenile paratypes *Darevskia praticola loriensis* ssp. nov.

No. 975 vicinity of Kirovakan, 23.09.1956, collector I. S. Darevsky (15 sp.); No. 1013 vicinity of Kirovakan, 21.05.1958, collector I. S. Darevsky (4 sp.); No. 1081 vicinity of Kirovakan, 06.1954, collector I. S. Darevsky (8 sp.).

In ZISP there are specimens from Kirovakan (= Vanadzor), Dzhelal-Ogly (= Stepanavan, Lori Marz) and a nomad summer-camp Karaketik (= village Karkop, Lori Marz).

The results of using of GIS-map (Fig. 11) confirm the presence of isolation of the Transcaucasian part of natural habitat of species from the North-Caucasian with the independent large centers of natural habitats in the indicated territories; they are located within the limits of Kabardino-Balkaria and contiguous districts of North Ossetia, related to the north slope of the Lesisty Ridge and Kabarda Inclined Plain, district of Caucasian Mineral Vody and valley of Kuma River; in Transcaucasia — central districts of Georgia and northlands of Armenia. We can expect the new finds of meadow lizard on territory of the Somkheto-Karabakh geographical Province of the Small Caucasus: favorable areas are exposed within the limits of Agdam, Kel'badzhar and Khodzhalala districts of Azerbaijan. We mark that recent distribution of species in the territory Leninakan City (= Gumri) by GIS-data was not confirmed; this locality was indicated by Chernov (1939), in reality here is not suitable for species biotopes. This locality is marked a question-mark and on a map in the monograph of Arakelyan et al. (2011).



Fig. 10. Distribution of *Darevskia praticola loriensis* ssp. nov. in Armenia: 1, Village Shorzha, Gegarkuni Province; 2, Village Semenovka, Gegarkuni Province; 3, Semenovskiy mountain pass, Tavush Province; 4, Vicinity of Dilizhan, Tavush Province; 5, Foothills of Mt, Kenac, Tavush Province; 6, Vicinity of Village Ajgedzor, Tavush Province; 7, Village Chinari, Tavush Province; 8, Vicinity of town Berd, Tavush Province; 9, Village Sevkar, Tavush Province; 10, Village Kiranc, Tavush Province; 11, Village Agarcin, Tavush Province; 12, Vicinity of town Vanadzor, Lori Province; 13, Village Pambak, Lori Province; 14, Village Vaagni, Lori Province; 15, Village Gulagarak, Lori Province; 16, Vicinity of town Stepanavan, Lori Province; 17, Vicinity of town Alaverdi, Lori Province; 18, Village Lernaovit, Lori Province; 19, Vicinity of Akhtala town, Lori Province; 20, Village Karakop, Lori Province; 21, Slopes of Mt. Lalvar, Lori Province; 22, Northern slope of Pushkinsky mountain pass, Lori Province; 23, Vicinity of Village Acharkut, Tavush Province.



Fig. 11. Potential distribution Maxent 3.3.3e-modeling of *Darevskia praticola* in the Caucasus. Colors in the map indicate different suitability values: red, high suitability; yellow, medium suitability; light green, low probability; white circles, known localities.



Fig. 12. Habitats of *Darevskia praticola loriensis* ssp. nov. in type locality near Gulagarak Village.

According to our data the records in Armenia are located in mountain-forest belt in the limit of elevation 600 – 2000 m a.s.l. Biotopes are presented by derivatives of the pine and oak forests, forest glades, shrub associations in place of the former forests. The type locality is situated in postforest glade with pine-tree (*Pinus hamata*) (Fig. 12). In this biotope meadow lizard is sympatric with *Lacerta agilis*, which is more than in 5 times lesser in its number. In nearby biotopes without wood-shrub vegetation the quantity of sand lizard increases sharply, and a meadow lizard absents completely.

According to I. S. Darevsky's data (1953) on the 29 August 1952 more than 70 specimens lizards were collected in a narrow belt along the edge of the mixed forest on an area, not exceeding a 1 square km in environs of Kirovakan (= Vanadzor). In the type locality 22.05.2012 we recorded over 40 specimens along 200 m of the route of excursion.

In the Red Data Book of Armenia (Danielyan, 2010), where *D. praticola* is included with status Vulnerable VU B1ab(iii) + 2a, it is indicated that information absent about density and number of population.

## DISCUSSION

Earlier Doronin (2012) have shown in GIS-Analysis in the Caucasus that areas of optimum (centers of natural habitats) of macropopulation of *D. praticola* of the studied forms are not overlapped, which testifies differences in the localization of centers of their formation.

Distribution range of *D. praticola* consists of many fragments which can be united in three large clusters: Talysh-Alburz from one side, north foot-hills of the Central — the East Caucasus — with other and, finally, foot-hill — middle-mountains of Transcaucasia from South Daghestan, through north-western Azerbaijan to East Georgia and north Armenia.

There are relatively large disjunctions of natural habitat of *D. praticola* in each of the indicated clusters. So, a nominative subspecies in the north foot-hills of the Central and the East Caucasus is presented by a number of isolated populations, since east part of the Stavropol Territory (Mineralnye Vody group of diaper mountains and valley of Kuma River northward up to village Orlovka), after in Kabardino-Balkaria, North Ossetia — Alania, to Ingush and Chechen Republics and in the north foot-hills



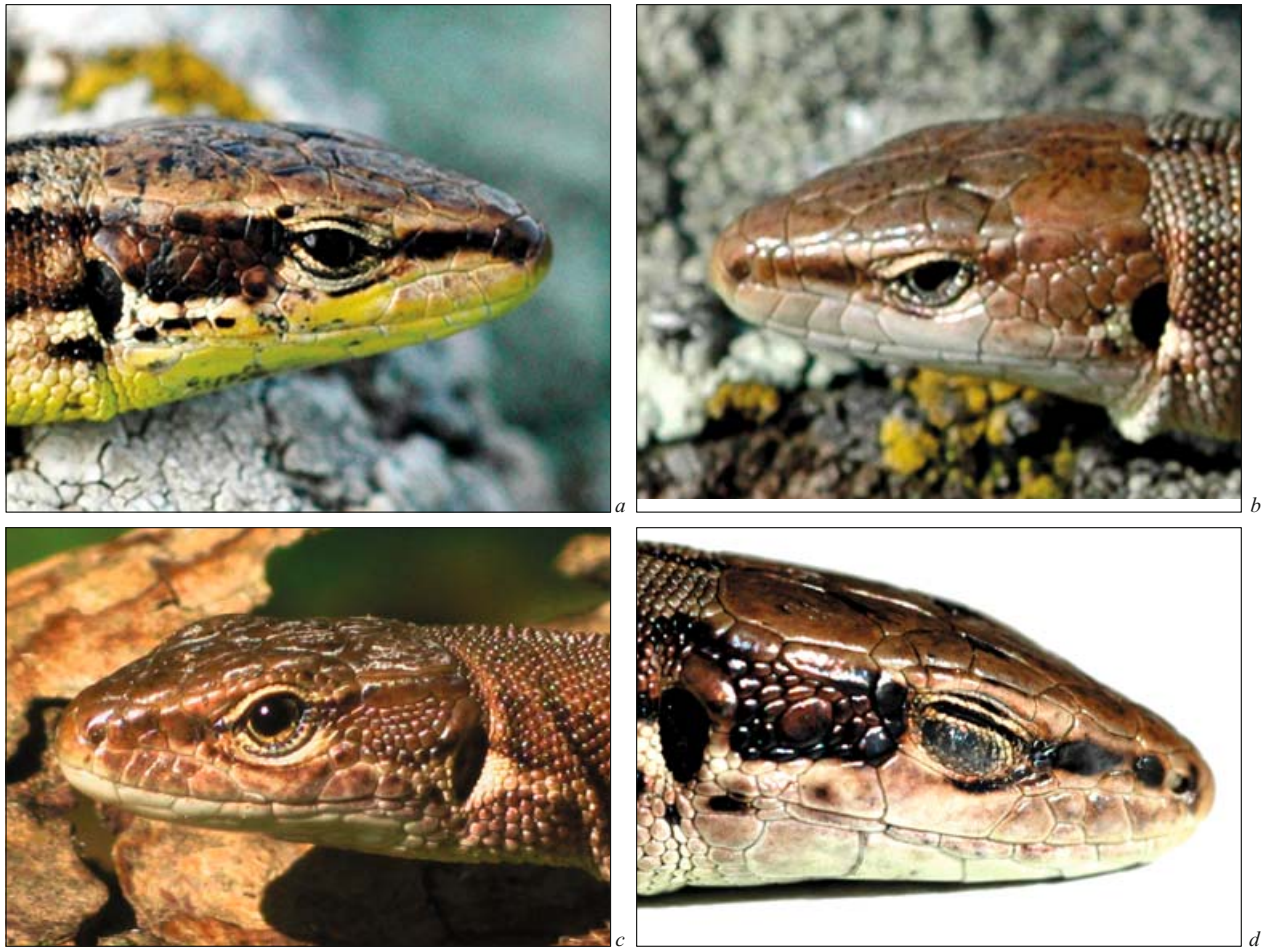


Fig. 13. Temporal area: a, male *D. p. loriensis* ssp. nov.; b, female *D. p. loriensis* ssp. nov.; c, male *D. p. praticola*; d, female *D. p. hyrcanica*.

of Daghestan (Khonyakina, 1964). The Hyrcan cluster is described in details earlier (Tuniyev et al., 2011). The isolated find of *D. praticola* in the valley of lower flow Samur River, village Akhty (Krassovskiy, 1932) joins to the Transcaucasian cluster which continue in north-western Azerbaijan in the district of Zakataly (Aleksperov, 1978), in contiguous East Georgia in Lagodekhi and further on Tsiv-Gombori Ridge (Muskhelishvili, 1964, 1969, 1970), yet more east on Surami and Kartli Ridges (Muskhelishvili, 1969, 1970) and, presumably, it is isolated in north Armenia.

Absence of material from South Daghestan and limited samples from far-located disjunctive populations in East Georgia still does not allow answering a question about variability of species along whole distribution range.

Our information on intraspecies structure of *D. praticola* is possible to present as follows:

#### IDENTIFICATION KEY FOR SUBSPECIES OF *Darevskia praticola*

- 1(2) — a massetericum is very large, the 4 – 5 large almost equal shields are often located in a temporal area (*D. praticola loriensis* ssp. nov.) (Fig. 13a, b)
- 2(1) — a massetericum is shallow, or not almost expressed, no more than 2 large shields locate in a temporal area (tympaanum and rarer massetericum)
- 3(4) — a massetericum often is not expressed (Fig. 13c), amount of scales between the rows of femoral pores more frequent only 3 – 4 (3.5); animals are painted in red-brown tones, on each side of body dark bands or spots absent below than light stripe; back of head and temporal bands are expressed poorly, or animals are solid; the live color of ventrals is white, yellow, or greenish (*D. praticola praticola*)
- 4(3) — a massetericum is expressed always (Fig. 13d), amount of scales between the rows of femoral pores more frequent only 2 – 3 (2.4); animals colored in chocolate-

brown tones, on each side of body below than light stripe there is the interrupted dark bar, or row of spots; a picture always contrasting; the live color of ventrals is goldish-rose (*D. praticola hyrcanica*).

Roitberg (1999) supposed that an ancestral species for *D. praticola* was *D. daghestanica*, from which a species was originated in a Postglacial period. Ljubislavljevic et al. (2005) associated speciation of *D. praticola* with the events of Pleistocene and considered species penetration to the North-Eastern Caucasus from the East Transcaucasia along the Caspian coast in Postglacial, or in Interglacial periods. Tertyshnikov and Gorovaya (1998) shared this opinion. Earlier we discussed the multiple origins of several lines of ancestral form of the *Darevskia (praticola)* complex in early Pliocene from the ancestor (not directly from *D. daghestanica*) round the Great Caucasus (Tuniyev et al., 2011).

Possible penetration of *D. praticola* in Pliocene in east part of the Caucasus along the coasts of Caspian sector of Pont (at first), and then Balakhan basin southward to Talysh and Alburz was supposed by us earlier (Tuniyev et al., 2011). Principal modifications of landscapes occurred in Pleistocene, with development of deserts, or steppes in practically whole Caspian Sea coast north of Talysh, resulted in disappearance of meadow lizard. Derivatives of the Hyrcan forests were saved only in a mouth of Samur River in Daghestan. Remarkable that from the valley of lower flows of Samur River the find of *D. praticola* was recorded by Krassovskiy (1932). Earlier (Doronin, 2012) the study of chorology of *D. praticola hyrcanica* exposed the center of its area within the limits of Talysh Mountains and contiguous districts of Alburz. Notably, that another territory with optimum for *D. praticola hyrcanica* bioclimatic terms was exposed in the district of delta Samur River and adjacent territories, where, as is well known, a relict subtropical liana forest is remained (L'vov, 1961). This information is especially interesting in the light of information about presence of a close to Hyrcan flora forest complex in Pliocene in the district of Samur – Devichi – Kayakent (Abramova, 1977). There is probability the destabilization of watercourse of Samur River after 1950, resulting in reduction and fragmentation of area of the forests with falling out of their composition of mesophilous hyrcan species (Novikova and Polyanskaya, 1994), resulting to the extinction of relict population of meadow lizard too. In 1985 E. S. Roytberg (personal communication, 2012) inspected a delta of Samur River in Khachmas District of Azerbaijan, and in 1991 — near village Primorsk of Margamakent District of Daghestan (Russia). In both places the meadow lizard was not found.

Already in Pliocene and later in Pleistocene the processes of aridization widely occur in Kura River valley, as a result the mezophylous landscapes were moved higher in mountains and fragmented. As to the southern edge of forests on the Lesser Caucasus, in the conditions of Armenia in an equal degree the area of the forests was decreased both from stormy volcanic activity and from anthropogenic elimination of the forests in a historical period. This processes resulted in modern frequent disjunctions of area of *D. praticola* and forming of geographical variability of specimens in isolated populations. Parallel processes were marked for the representatives of flora of vascular plants, with speciation of endemic and subendemic forms, for example, *Medicago hemicycla loriensis*, *Koeleria albovii loriensis* and many others.

Disconnection of populations of East Georgia between themselves and with populations of north-western Armenia, presumably, happened later than other disjunction — in a Xerothermic period (Holocene). With the same period the isolation of some separate populations of nominative subspecies took place in a valley of Kuma River. So, animals even from relatively close located populations of Mineralnye Vody, Zelenokumsk and village Orlovka show high morphological individuality. Similar information was obtained by using DNA markers (Ryabinina et al., 2002).

We will mark in conclusion that an originality of disjunctive populations from East Georgia and South Daghestan is the topic of additional study, which provide new light in the study of variability of *D. praticola* in the Transcaucasian cluster of area.

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