

INFLUENCE OF ABIOTIC FACTORS ON INFECTION OF ROCK  
LIZARDS *DAREVSKIA RADDEI* BY GEOHELMINTH  
*SPAULIGODON SAXICOLAE*

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The infection of *Darevskia raddei* rock lizards by geonematoda *Spauligodon saxicolae* was examined. Comparative analysis shows prevalence dependence of infection on abiotic factors.

**Keywords:** *Spauligodon saxicolae*, geonematoda, abiotic factors.

**Introduction.** Recently in parasitology emerged direction of ecological parasitology, which examines the influence of environmental conditions to special consistence of animal parasitofauna and various factors in some way operating to host infestation. Known proceedings of Dogel [1], Kennedy [2], Kirillov [3], etc., which evaluated the role of such climatic factors as temperature and humidity of habitat in the formation of parasitic systems and the regulation of the number of certain type of parasites [4].

Advances in modern biology suggest that with the classical representation of the population, it is necessary to consider parallel a new representation: the population as a self-regulating "host-parasite" system. The components of this system are not only individual organisms that live in common, but also the whole complex, in which host and parasite interact with each other [5]. Consequently, the habitat of host promotes or, conversely, prevents the development and spread of the parasite, and abiotic factors of the host habitat have an impact on the extensity and other parameters of infestation.

The object of the study was the helminth *Spauligodon saxicolae*, which is monoxen geonematoda and infests almost all types of rock lizards of genus *Darevskia*. In life cycle this helminth has 3 stages: egg, larva and adult nematoda. The development of eggs takes place in the soil and it is in direct dependence on abiotic factors. The larval stage and adult nematoda parasitizes the organism of host and are less affected by environmental factors.

**Material and Methods.** Rock lizards *D. raddei* were collected in the territory of Armenia in 2010–2011. 55 mature individuals of *D. raddei* were studied by the method of complete helminthological autopsy [6, 7]. Invasion is

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characterized by parasitological indicators: prevalence ( $P$ , %), intensity ( $I$ , ind.) and abundance ( $A$ ) of infection. Studies were carried out in five populations: Kajaran, Ayrivank, Lchashen, Garni, Yerevan.

*Kajaran* (Syunik region). The altitude is 1950  $m$  a.s.l. The average temperature in winter is  $-4 \div -6^{\circ}C$ , in summer is  $14 \div 16^{\circ}C$ . The annual precipitation is 800  $mm$ .

*Ayrivank* (Gegharkunik region). The altitude is 1940  $m$  a.s.l. The average temperature in winter is  $-10 \div -12^{\circ}C$ , in summer is  $14 \div 16^{\circ}C$ . The annual precipitation is 600  $mm$ .

*Lchashen* (Gegharkunik region), is on the lakeshore of the Lake Sevan. The altitude is 1940  $m$  a.s.l. The average temperature in winter is  $-10 \div -12^{\circ}C$ , in summer is  $14 \div 16^{\circ}C$ . The annual precipitation is 600  $mm$ .

*Garni* (Kotayk region). The altitude is 1400  $m$  a.s.l. The average temperature in winter is  $-6 \div -8^{\circ}C$ , in summer is  $20 \div 22^{\circ}C$ . The annual precipitation is 400  $mm$ .

*Yerevan, Hrazdan Canyon*. The altitude is 950  $m$  a.s.l. The average temperature in winter is  $-4 \div -6^{\circ}C$ , in summer is  $24 \div 26^{\circ}C$ . The annual precipitation is 300  $mm$ .

The data about temperature, humidity and altitude of habitats were taken from the Atlas of Armenia [8].

The objective of this paper is to determine the influence of abiotic factors of habitat (temperature, humidity, altitude) on the infestation of the rock lizards *D. raddei* by geonematoda *Sp. saxicolae*.

**Results and Discussion.** Data about infestation of studied reptiles is given in Table.

Population	Number of studied reptiles	Number of infected reptiles	$P$ , %	$I$ , ind.	$A$
Kajaran	16	6	37.5	4.5	1.68
Ayrivank	15	5	33.3	1.6	0.53
Lchashen	7	2	28.5	2.5	0.7
Garni	7	2	28.5	2.5	0.7
Yerevan	10	1	10	1	0.1

In Fig. 1 are presented data about abiotic factors of studied populations. Populations are given in following order: Kajaran, Ayrivank, Lchashen, Garni, Yerevan.

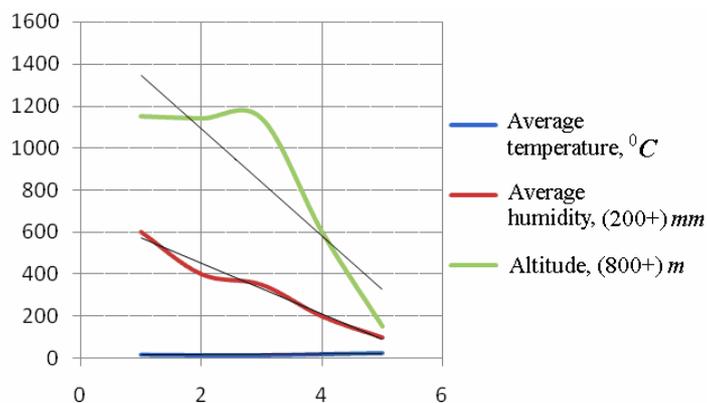


Fig. 1. Abiotic factors of studied populations.

In Fig. 1 we see, that in selected order the average humidity and altitude of populations are descending and the temperature is ascending.

In the study of infestation of populations (in the same order) by helminth *Sp. saxicolae* we also have a downward curve and infection of *D. raddei* by this nematode is reduced.

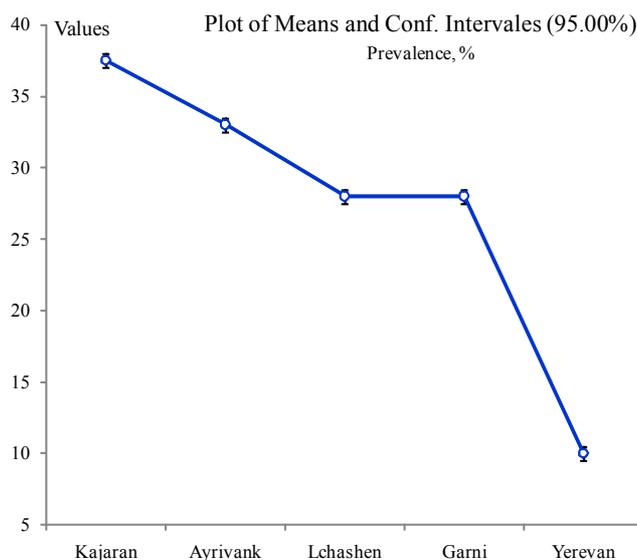


Fig. 2. Infestation of *D. raddei* by geonematoda *Sp. saxicolae*.

Thus, in our studies we didn't reveal dependence between the infestation of *D. raddei* by geonematoda *Sp. Saxicoale* and the average temperature of habitat. According to literature, temperature affects to this helminth, which eggs development takes place in the soil. On the other hand, the temperature changes the rate of biochemical processes in the cells, which affects the lifestyle of the host and can affect the infestation [1, 2]. Probably, the number of studied individuals is not sufficient to show patterns depending on the temperature. This result also can be explained by similarity of temperature of populations.

As can be seen in Fig. 1 and 2, infestation of *D. raddei* by examined helminth proportionally reduces with an average humidity of host habitat. In Kajaran population, where the average humidity is the highest (800 mm), we see the highest prevalence of infection (37.5%) and in Yerevan population, where the average humidity is the lowest (300 mm), prevalence is 10%.

Infestation of *D. raddei* by geonematoda *Sp. saxicolae* directly depended on the altitude of habitat. In Kajaran, where the infestation is the highest, the altitude is 1950 m a.s.l. and in the least infected population of Yerevan – 950 m.

Thus, our findings suggest, that infestation of *D. raddei* by helminth *Sp. saxicolae* proportionally increases with the average humidity of habitat and directly depends on the altitude of habitat.

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