

**Winter frosts and late frosts as the reason of karakurt
(Black Widow Spider, *Latrodectus tredecimguttatus*)
depression in Kazakhstan.**

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In the northern part of the area, in the territory of Kazakhstan, *Latrodectus tredecimguttatus* undergoes considerable fluctuations of quantity. Periods of quantity flashes when one specimen per 1 m² is met in the permanent location give place to the periods of depression when it's impossible to find out even a specimen of the species.

Change of karakurt quantity in different years

Years of mass reproduction	Duration of mass reproduction	Duration of previous depression	Sources of data
1838-1840	?	?	Mochulski (1849), Beker (1855)
1863-1869	7 years	20-25 years	Lebedev (1896), Uke (Chensnovich, 1870), Shatilov (1869), Koppen (1881), Brily (1866)
1895-1904	10 years	20-25 years	Lebedev (1896), Rossikov (1904), Sherbina (1903), Konstantinov (1907)
1914-1917	4 years	10-12 years	Shnitnikov (1943), Morits (1922), oral data
1928-1930	3 years	10-12 years	Dukenbaev (1935), Dubinin, oral data
1940-1944	4-5 years	10-12 years	Oral data, own observations

It's stated flashes of mass reproduction are unequal in value and can be divided into great and small ones. To the former of them undoubtedly the flash of 1895-1904 years belong to the last one - the flash of 1914-17, 1928-30, 1940-44 years (Marikovskij, 1956).

Beginning with 1985, we were carrying out monitoring investigations on karakurt in the places of its permanent locations in Djambul district (the province of Alma-Ata area), Krasnogorsk district (the province of Djambul) as well as in Zaaminsky district (the province of Dzhizak, Uz.SSR). The beginning of our observations in 1985 coincided with the depression of the species in the northern searching part of area. Practically we failed to find a single specimen on the territory perspective for its populations along the route of raid in Ilijsk and Djambul regions of the province of Alma-Ata, Krasnogorsk region in the province of Djambul area. In the southern part of its area on the territory of Uz.SSR its quantity in separate points was one specimen per 1 m² in average.

In the season of 1986 in the places of monitoring observations in the northern part of the area, the karakurt population was present by singular specimens. The index of finding was constant enough, the index of abundance was on a low level. In the southern part of the area in Uz.SSR the quantity continued to stay constantly high.

During the seasons of 1987-1989, the sufficient increase in the number of karakurt in northern part of its area was observed : in some parts of locations the number was about to 1 individual per 1 m². In these seasons karakurt was found in some places along the northern border of its area. In Aktyubinsk area some occasions of bites of the people were observed. In the more southern parts of its area (Uzbekistan), as previously, the number of karakurt remained standardly high.

An analysis of the depression causes of karakurt in the northern part of its area.

Explaining the causes of karakurt depression during a number of years, P.I. Marikovskij (1956) presumably picked out the influence of natural enemies, but this aspect was never studied specially.

Analysing the depressions of karakurt in 1985 in the northern part of its area, we must notice that this depression didn't concern the populations in the more southern parts of karakurt's area. The winter of 1984-1985 in the south-eastern Kazakhstan (northern part of area) was characterized by non typical sufficient decreases of temperature (lower than -30°C). Besides, the abnormal drop of temperature with the snow-fall was happened in the middle of May. This drop destroyed the apple-crop within the whole territory of the south-eastern part of Kazakhstan.

During the winter periods 1986-87 and 1987-88 there were also repeated decreases of temperature observed below -30°C ; besides, in November 1987, such decrease of temperature in the desert zone of Alma-Ata and Dzhambul areas was happened without any precipitations. Meanwhile, with the help of minimum thermometers we found that the snow layer of 10 cm provides the warming of the earth surface up to 18-20°C. Thus, overwintering spiderlings of the first age sitting in the cocoons situated in the holes of rodents or under stones were subjected to extreme conditions under the influence of low temperatures without the warming effect of snow layer. Taking this into consideration, we have studied the state of overwintering karakurt spiderlings in the end of November - immediately after frosts - near Malai-Sary pass, and in Krasnogorka district. In both cases spiderlings were alive in all cocoons found, and overlive such severe conditions just normally. Thus, low winter temperatures cannot be the cause of mass death and depression of karakurt. As, besides winter frosts, in 1985 there were frosts with snow-fall

in the middle of May, when karakurt was in its II-III age living freely, without protective effect of friable web cocoon, we decided to test the cold-resistance of the first freely living ages of karakurt experimentally.

The study of influence of negative temperatures on the free-living larvae of younger ages in karakurt.

An experiment was provided in the laboratory conditions using domestic refrigerator. Spiderlings releasing from overwintering cocoons were placed in glass tubes, each individual separately. In all variants of temperatures tested there were a hundred trials - each individual was a trial.

There were three experiences provided with free-living spiderlings of the second age : the first variant -8°C , the second -5°C and the third one -3°C .

In the case of -8°C under exposure of 24 hours only 8% of spiderlings were alive ; in the case of -5°C , 55%. In the case of -3°C during the first 2-3 days only small part of spiderlings was died - about 10%. Up to the sixth day slightly above 40% remained alive.

Comparing the data obtained to the meteorological scale of temperatures in May 1985 when the temperature, being lower than -5°C , in some places was dropped up to -18°C , we can affirm certainly that the 1985 depression of karakurt in the south-eastern part of Kazakhstan was caused by mass death of spiderlings during the frosts in May. Unfortunately, we can't compare the periods of karakurt depressions in the past with corresponding spring temperatures because of absence of meteorological data.

Bibliography

Marikovskij P.I., 1956. - Tarentul and Karakurt. - *Publication Kirgisian SSR Since Academy, Phrunze* : 1-280.
