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***Varroa destructor* MITE PREVALENCE IN BEEKEEPING FARMS IN LANKARAN-ASTARA ECONOMIC REGION OF AZERBAIJAN**

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**РАСПРОСТРАНЕННОСТЬ КЛЕЩА *Varroa destructor* В ПЧЕЛОВОДЧЕСКИХ ХОЗЯЙСТВАХ ЛЯНКЯРАН-АСТАРИНСКОГО ЭКОНОМИЧЕСКОГО РАЙОНА АЗЕРБАЙДЖАНА**

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*Abstract.* Beekeeping improvements and attention to this subject are considerable in Azerbaijan. It is not correct to indicate only the climate factor as the cause of low productivity and bee losses in honey bees. The presence of a number of pests in bees leads to a decrease in their ability to work, as well as to make them more susceptible to diseases and quickly infected. Among such pests, we can mention the *Varroa destructor* mite. In our research, the prevalence of the *Varroa* mite, which is a pest of honey bees, was studied in Jalilabad, Masallli, Yardimli, Lankaran, Lerik and Astara regions of Azerbaijan's Lankaran-Astara economic region. According to the results, the region with the highest infection rate was Astara and Lankaran, 80%, and the region with the lowest infection rate was 50% in Masalli district.

*Аннотация.* В Азербайджане значительное улучшение пчеловодства и внимание к этому вопросу. Неверно указывать только климатический фактор как причину низкой продуктивности и потерь медоносных пчел. Наличие ряда вредителей у пчел приводит к снижению их трудоспособности, а также к повышению восприимчивости к болезням и быстрому заражению. Среди таких вредителей можно упомянуть клеща Варроа-деструктор. В наших исследованиях изучена распространенность клеща Варроа, являющегося вредителем медоносных пчел, в Джалилабадском, Масаллинском, Ярдимлинском, Лянкяранском, Лерикском и Астаринском районах Ленкорано-Астаринского экономического района Азербайджана. Согласно результатам, регионом с самым высоким уровнем заражения стали Астаринский и Лянкяранский районы — 80%, а регионом с самым низким уровнем заражения — 50% в Масаллинском районе.

*Keywords:* *Varroa destructor*, mite, Azerbaijan, microscope.

*Ключевые слова:* деструктор Варроа, клещ, Азербайджан, микроскоп.

The honey bees are incredibly important to human life. Products made by bees are frequently used to prepare food, medications, and cosmetics. Large quantities of honey, wax, bee milk, and bee venom are sold on the domestic and international markets. As a result, Azerbaijani honey has become more and more valued in recent years in nations like Qatar, the United Arab Emirates, and Japan. High productivity is mostly dependent on the area's suitable climate.

According to the results of the statistical observation organized by the State Statistics Committee of the Republic of Azerbaijan, in 2022, 7445.9 tons of honey, 174.1 tons of wax, 19.1 tons of propolis and 379.1 kg of royal jelly were obtained from 656.1 thousand bee families in 32933 farms and in 2023, 4550.0 tons of honey, 172.7 tons of wax, 14.9 tons of tuber, 8.9 tons of royal jelly and 281.1 kg of royal jelly were obtained from 597.3 thousand bee colonies in 30802 farms [1, 2].

According to statistical data, when we look at the productivity of 2022 and 2023, unfavorable weather conditions in 2023, a lot of precipitation during the flowering period of trees in summer, and then drought due to high temperature, will not have enough nectar and pollen reserves for honey bees. However, it caused a 30% decrease in productivity in honey, 2% in wax, 22% in propolis and 26% in royal jelly.

It is not correct to indicate only the climate factor as the cause of low productivity and bee losses in honey bees. The presence of a number of pests in bees leads to a decrease in their ability to work, as well as to make them more susceptible to diseases and quickly infected. Among such pests, we can mention the *Varroa destructor* mite [3].

*Varroa destructor* parasitizes both *Apis mellifera* and *Apis cerena*. The female tick is 1.1-1.2 mm long and 1.6-1.7 mm wide, and its body is reddish-brown in color and flattened. *V. destructor* feeds on the adipose tissue and hemolymph under the chitin layer of honey bees, leading to a weakening of the immune system and infection of a number of viral diseases. It is also a dangerous parasite that plays the role of a vector in the spread of diseases (<https://kurl.ru/zrEhN>).

In our research, the prevalence of the Varroa mite, which is a pest of honey bees, was studied in Jalilabad, Masalli, Yardimli, Lankaran, Lerik and Astara regions of Azerbaijan's Lankaran-Astara economic region.

Honey bees samples were taken from bee farms located in Astara, Lerik, Lankaran, Yardimli, Masalli and Jalilabad regions as the research area. Determination of varroa mites in beehives was carried out by the powdered sugar method. In each apiary, about 100 adult bees were taken from 10 bee families, from the first and last hives of the boxes (special attention was paid to the absence of the queen bee) and placed in a round container with sugar powder inside, and the mouth was covered with a lid in the form of a filter. After that, powdered sugar was removed from the sieve with narrow meshes by moving it in a clockwise direction for 5 minutes. At this time, the honey bees stuck to the filter-shaped cover and remained inside the container, while the sugar powder passed through the sieve and poured into the container below. Ticks remained in the sieve with tight mesh. Then, the percentage of infection was determined by counting the varroa mites that appeared on the sieve. Then, the detected ticks were brought to the laboratory and determined to belong to the species using a stereomicroscope (Nikon SZM 800).

Samples were taken from apiaries located in both mountainous and lowland regions of the economic region in order to check the infection level of the Varroa destructor mite in Lankaran-Astara economic region. Varroa mite was found in 40 out of 60 bee families in total.

As a result of the study, the morphological characteristics of each of the ticks found as a result of the study were determined to belong to *Varroa destructor* (Figure 1).

In 8 out of 10 bee families taken from the apiary located in the Astara region of Lankaran-Astara economic district, in 7 out of 10 bee families in Lerik, in 8 out of 10 bee families in Lankaran, in 6 out of 10 bee families in Yardimli, in 5 out of 10 bee families in Masalli and finally ticks were found in 6 out of 10 bee families in Jalilabad.

According to the results, the region with the highest infection rate was Astara and Lankaran, 80%, and the region with the lowest infection rate was 50% in Masalli district (Figure 2).



A



B

Figure 1. *Varroa destructor* mite A-field determination, B-microscope determination and image

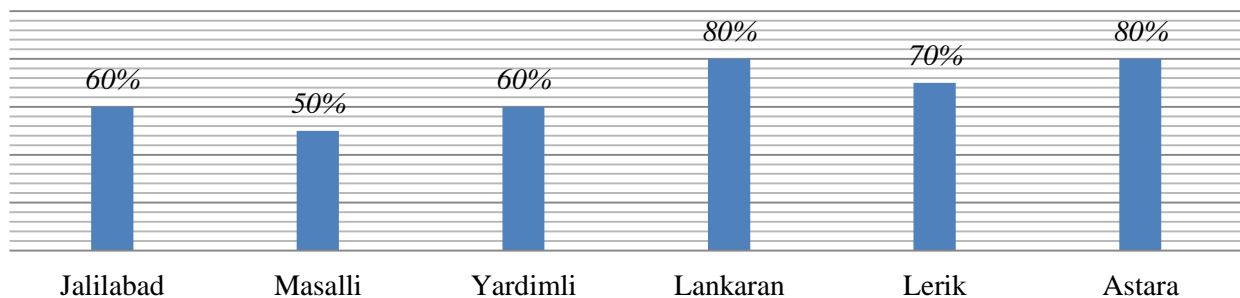


Figure 2. *Varroa* mite prevalence (percentage) by regions of Lankaran-Astara economic region

As mentioned in the given graph (Figure 2), the high level of rainfall and humidity in Astara and Lankaran regions, where the infection is high, is related to the presence of favorable conditions for the reproduction and spread of the *V. destructor* tick. In Masalli and Yardimli regions, where the infection is relatively low, it is due to low rainfall and humidity compared to other regions of Lankaran-Astara economic region. In general, as a result of research conducted in the Lankaran-Astara economic region, 66% of cases of varroa mite infection were recorded in beekeeping farms. This is quite a high indicator. The high level of varroa infection in the apiary creates conditions for the emergence of other diseases, especially viral diseases. This leads to a sharp drop in bee productivity and mass mortality.

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