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METHODS OF CAPTURING GNATS IN THE WORLD

Abstract

Leishmaniasis is one of the dangerous diseases that are widespread in the world. Its vectors are mosquitoes. One of the main reasons for the significant increase in the number of leishmaniasis is that the methods of combating vectors are not widely known. It is very important to prevent the disease and determine its species composition. The article shows various methods used to catch mosquitoes. These methods are widely used in research work. When applying the used methods, care should be taken not to disturb the chemical balance and not cause changes in species composition. In the future, steps should be taken to find safer methods.

Keywords: *leishmaniasis, causative, transmitter, gnats, catching methods*

Introduction

Leishmaniosis is a common disease in the world. It covers a lot of countries. It was also widespread in Azerbaijan as early as the last century. Subsequently, it was practically cancelled. Leishmaniosis belongs to a group of diseases caused by cellular internal protozoa belonging to the genus *Leishmania*. The perpetrators of the disease are parasites, revealed by Donovan in 1903 and named after Leysmania Donovan. There is a growing awareness in the references of the world that one of the main reasons for the considerable increase in the number of leishmaniasis infections in various regions of the world in recent years is that leishmaniasis is tolerable and perpetrators persist in the chemical drug, making it a little harder to reverse leishmaniasis.

Natural reservoirs of leishmania parasites include humans and about 70 species of animals, the predators included in this support include wolves, jackals, vultures, etc. About 21 species of leishmania parasites are known to be pathogenic to humans and spread through gnats. (Godverdiyev, Baghirov, 2023:13-15)

Epidemiological features of leishmaniosis depend on the ecology of parasites and moths, the prevalence of infection, and whether the population has been in contact with the pathogen at this time and in the past. The prevalence and severity of leishmaniasis are related to factors such as heat, humidity and economic development, and vegetation.

There are 3 clinical forms of the disease.

- Visceral leishmaniasis
- Cutaneous leishmaniasis
- Cutaneous and mucocutaneous leishmaniasis

The cause of cutaneous leishmaniasis is *Leishmania tropica*. Cutaneous leishmaniasis mainly damages the skin.

In Azerbaijan, the perpetrator of visceral leishmaniasis is *Leishmania infantum*. Visceral leishmaniasis is accompanied by damage to the internal organs and anemia. The reason for the widespread spread of these diseases is that the population in these areas is not marginalized about the disease, is not accurately diagnosed, is not properly treated, have poor disease control, etc. (Salehov, Vahabov, Huseynov, 2022: 30).

Leishmaniosis occurs when the blood clots of females are infected with *Leishmania* parasites. Gnats are small-sized insects belonging to the blood-sucking insect complex of Diptera, included in the subfamily Phlebotominae of the family Psychodidae. It is found mainly in tropical and subtropical zones, with rare mild climates. There are currently 800 species of gnats. More than 90 species of them are singled out as conductors of leishmaniasis. The length of the gnats reaches 1.5-2

mm, rarely 3 mm. They are covered with dense yellowish-brown hair and can be colored from white to gray.

Gnats feed larvae with natural sugars, plant saps, and decaying organic matter. However, the female body needs blood to develop her eggs. For this purpose, females attack people and animals. The development period of the egg, the absorption of blood, depends on the ambient temperature (Guliyev, 2014: 202-206).

The eggs, larvae, and pupa of hatchlings thrive in habitats-as basements, chickens, cattle-stained stalls, buildings of brick walls, and in nature--buildings, birds' nests, rodents' nests, that is, on a moist substrate rich in organic matter away from the rays of the day.

An adult's residence includes a daytime shelter- a stall, porch, basement, and wetlands. In nature, their refuge is the roost of a tree and the nest of rodents. Aliyev, Hajiyev, Hajibeyov, Safarova, Safarli, 2017;116-117).

Gnats are active during the twilight hours and late night, and they fly quietly. There are times when gnats are active. Annual activity is from the end of May to mid-September when temperatures haven't dropped below 20 degrees per day. Daily activity is from 7 am to 9 pm and from 4 pm to 5 pm in the morning. To complete the normal development of gnats, the summer season should not be less than 4 months per year and the average daily temperature should not fall below 18 degrees. Gnats don't like bright spots because the direct falling sun rays ruin their vision. In the evening and at night, sunshine attracts gnats. In areas where gnats are common, it is necessary to conduct regular observations to determine species composition, species dominance, and seasonality. Observations of gnats should be made both in residential areas and in nature. The gnats have different methods of withholding. Half perch paper or A4 sheets up to 20x30cm long are used. Both sides are lubricated with castor (*Ricinus*) plant oil. In living areas, greaseproof paper should be placed mostly in dark corners, under the ceiling, and on the balcony. The greaseproof papers should be nailed to the wall side by side. The surface of the greaseproof paper should be parallel to the wall and placed 3-5 cm away from it. Greaseproof paper is deposited in places that are considered gnats' shelters. Greaseproof paper can be stored for 1 day or more. Paper is collected from the places we put it. Each paper is labeled on the top. 1) Date and location of seizure 2) Location of the building

The gnats are removed from the greaseproof paper. The collected gnats are placed in small test tubes in 96 percent alcohol. Low-power alcohol does not dissolve *Ricinus* oil. The label is inserted into a test tube and the tubes are bonded to cotton and stored in a slightly larger container of alcohol. It is delivered to the laboratory and the preparations are prepared and authenticated.

In nature, gnats are found in mammals, birds' nests, treehouses, caves, and shrubs. Greaseproof paper is used to hold gnats. Oily diapers are placed 1 hour before sunset since the gnats are night hoppers. It is collected early in the morning to protect it from damage (Dergachova, 1986:100).

There are many different ways of capturing gnats in the world. Hatching gnats is a difficult task. So why do we need to keep the gnats? One reason is a scientific study and the other is to reduce the amount. Adult gnats can be held in two ways. Active or passive. In the first case, we will try to detect areas where there are gnats and capture them with special vacuum cleaners, and in the second case, very attractive devices are used for gnats. These devices are the ones that go above and beyond.

1. CDC light trap.
2. Ultraviolet and colored LED trap.
3. The magnetic trap of gnats.
4. The Shennon Trap.
- 1) CDC miniature light trap.



Figure 1.

Used by U.S. disease control centers for arbovirus and taxonomic research, locating stacks is a reliable and transportable sampling device on the fly. The battery-operated trap has become a widely used tool for fighting against gnats. The trap is turned on at twilight and extinguished early in the morning. There is an air-operated door system. With the air from the fans, the door opens and closes with counterbalancing weights. However, this trap causes difficulties for Africa due to procurement costs and transportation time. Traps made in Africa that are equally efficient in the CDC light trap, can be used in African settings, and are used to improve local vector control. This study is a solar-powered light trap (8).

The solar-powered SB trap was compared to the CDC light trap in the field. Since charging is difficult in remote settings, the SB trap is more promising.

2. Ultraviolet and colored LED trap.



Figure 2.

The 368 nm ultraviolet emits a wave of light and the trails automatically escape into the colored power grid. This appliance is primarily used in the home. With this device, we can basically protect our family from the bite of gnats (9).

3) Magnetic trap of gnats.



Figure 3.

This device is also called a wireless magnet trap. This machine is placed in locations where there are lots of gnats. It is placed 30-40 meters away from people. This device has a propane tank and this technology converts propane into CO₂. The released CO₂ is self-sufficient and increases the retention surge by up to 10 times. Trap blows gnats into the torches leaving them thirsty and they die in the torches (7).

4) The Shennon Trap.

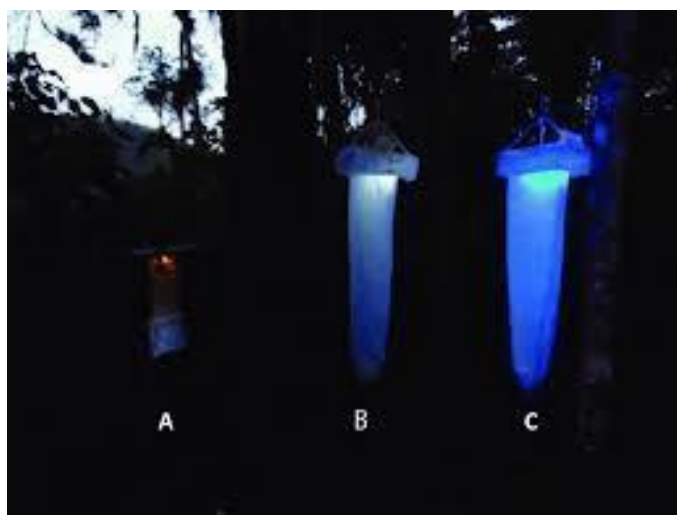


Figure 4.

It is made from a hanger and tent. White and black light is used. The light hangs upside down in the tent. The Shennon trap is set 1 metre from a tree branch. After each trap is set, a cumulative aspirator is used. From the top of the fabric cover, mugs attracted to light are collected and held to the top of the trap (6). There are other ways to capture the gnats. In 2016, researchers at Laurentian University released a cheap trap design called Ovillanta, which consists of water connected to an attractive part of a discarded rubber wheel. Water is filtered regularly to remove any eggs and larvae. Water, which then contains the egg-laying pheromone “egg-laying”, is used to attract more

people (10). Some new hatchery traps or known hatchery attractants spread a carbon dioxide feather along with other hatchery attractants such as sugar smells, lactic acid, octenol, heat, water vapor, and sounds. It can mimic the smell and output of mammals, pulling the trap female harnesses towards itself, and they are usually absorbed by the electric fan into the net and handler, where they are collected. They are useful in sampling studies to identify species to a common hatchery in an area but are usually very useful to reduce the population of the hatchery. Another method is the method of collecting gnats from any surface using an *exqauzer* (a special tool). Thus, as described above, the methods of seizure of gnats in nature or habitats are numerous and varied. The stacks explored by researchers have the option to select methods accordingly instead of withholding them. However, while existing traps offer temporary paths, they are often unsuccessful due to the limited duration of effectiveness and non-sequential effectiveness among different types of gnats. Future researchers need to develop a solution to more universally effective and sustainable gnats.

Conclusion

Eliminating the environmental impacts of widespread use of chemical attractants is also important. Careful assessment is required to ensure these methods do not harm non-target species or disrupt ecological balance. Using these concepts in pratic senators can change the way we manage our ambulance populations and reduce disease transmission. With ongoing technological advances and a deeper understanding of gnats ecology, we can ensure the development of new traps that are resilient and environmentally friendly (11, 12).

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