



THE FAUNA OF MOSQUITES (DIPTERA: PHLEBOTOMINA) AND ITS EPIDEMIOLOGICAL IMPORTANCE IN THE SKIN LEISHMANIOSIS OF UZBEKISTAN

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Annotation

Some regions of Uzbekistan are endemic for cutaneous leishmaniasis. Research was carried out in Jizzakh, Kashkadarya and Surkhandarya regions to determine the current state of the mosquito population in areas where outbreaks of ACL and ZCL are considered. In the studied foci of leishmaniasis, 7 species of mosquitoes belonging to 2 genera were identified: Phlebotomus (6 species) and Sergentomyia 1 species.

Keywords: leishmaniasis, ATL, ZTL, endemic foci, mosquito, Foral fluid, Phlebotomus, Sergentomyia.

Аннотация

Ўзбекистоннинг айрим вилоятлари тери лейшманиози бўйича эндемик ҳудуд ҳисобланади. АТЛ ва ЗТЛ ўчоқлари ҳисобланган ҳудудларда москитлар популяциясининг ҳозирги ҳолатини аниқлаш учун Жиззах, Қашқадарё ва Сурхондарё вилоятларида тадқиқотлар ўтказилди. Тадқиқот ўтказилган лейшманиоз ўчоқларида 2 уруғга мансуб 7 тур москитлар: Phlebotomus (6 тур) ва Sergentomyia 1 тури аниқланди.





Аннотация

Некоторые регионы Узбекистана эндемичны по кожному лейшманиозу. Исследования проводились в Джизакской, Кашкадарьинской и Сурхандарьинской областях для определения текущего состояния популяции moskitov в районах, где рассматриваются вспышки АКЛ и ЗКЛ. В исследованных очагах лейшманиоза выявлено 7 видов moskitov, относящихся к 2 родам: *Phlebotomus* (6 видов) и *Sergentomyia* 1 вида.

Dosage

Different manifestations of leishmaniasis are common in 82 countries around the world, including Dosage. Various forms of leishmaniasis are common in 82 countries around the world, with about 350 million people living in high-risk areas. [1,2,] The World Health Organization has included the disease in a special program to study tropical diseases. Zoonotic and anthropanose leishmaniasis are common in Asia and Africa. Some regions of Uzbekistan are endemic for skin leishmaniasis [1,3,6].

Currently, there is an increase in the incidence of skin leishmaniasis in Uzbekistan in Surkhandarya, Kashkadarya and Jizzakh regions. About 1.5 million people in Uzbekistan live in endemic areas. According to the official data of the Republican Center for Sanitary and Epidemiological Surveillance in 2018, the incidence of TL (skin leishmaniasis) in the country increased by 37% (from 503 to 766, from 1.6% to 2.4% per 100 thousand population). In Surkhandarya region, this figure increased by 40% (from 149 to 248 cases), in Samarkand - by 3.3 times (from 27 to 88 cases), in Bukhara - by 35% (from 66 to 102 cases), in Jizzakh - by 19% (from 42 to 52 cases).) was noted.

In the endemic areas of leishmaniasis in Uzbekistan identified 17 species of mosquitoes belonging to 2 generations: 12 species of *Phlebotomus* and 5 species of *Sergentomyia* [2, 3, 4, 5, 6, 7, 8, 9, 11, 15, 16], of which the main carriers of leishmaniasis - mosquitoes Type 3: *P. papatasi*, *P. longiductus*, and *P. sergenti* .. s.

Due to the complexity of the situation with leishmaniasis, it is important to study the species composition of leishmaniasis carriers mosquitoes in populated areas and to monitor the number of carriers. To determine the current state of the mosquito population in the ATL and ZTL hotspots in Uzbekistan, surveys were conducted in Jizzakh, Kashkadarya and Surkhandarya regions.

Materials and Methods

Catching mosquitoes in these areas was carried out during 2019 and 2021. Mosquitoes (A4) were captured using adhesive papers prepared by lubricating size papers with





castor oil. Adhesive papers were installed in residential buildings, animal shelters, basements, and large sand dunes 1 hour before sunset.

During the observation period, a total of 1241 specimens of mosquitoes were captured from settlements, barns, and large sand colony. The captured mosquitoes were soaked in 96% ethyl alcohol. To identify the species of mosquitoes, permanent preparations were prepared using a mixture of gummy arabica (Fora liquid). Species identification was performed according to appropriate identifiersm.

Research Results

In the examined leishmaniasis foci, 6 species of mosquitoes belonging to the genus *Phlebotomus* and 1 species belonging to the genus *Sergentomy* were identified, *P. papatas*, *P. caucasicus*, *P. alexandri*, *P. mongolensis*, *P. sergenti*, *P. andrejevi* and *S. clydei*.

Five species of mosquitoes have been identified in ZTL natural foci in Surkhandarya and Kashkadarya regions. *P. papaya* predominated in residential and animal buildings (59.0 - 67.9%). Species such as *P. caucasicus*, *P. alexandri*, *P. mongolensis*, *P. sergenti*, were also caught.

The highest incidence of ZTL in Kashkadarya region was recorded in Mubarek. It should be noted that in the desert zone near the city of Mubarak, *P. Caucasicus* - 62.2% and *P. papaya* - 25.8%. As we approached the settlements, the number of *P. caucasicus* decreased, and the type of *P. papaya* increased. In populated areas (villages), mosquitoes were found to have a large number of *P. papaya* species (from 1.7 to 4.87 per sheet of sticky paper at night, mainly due to *P. papaya* type). *P. caucasicus* predominated in the desert zone where large sandpiper nests were located. The number of mosquitoes of all other species was much lower than in the villages (0.005 to 1.1 mosquitoes). Studies have shown that zoonotic skin leishmaniasis is prevalent in the desert zone in Mubarak because of the natural foci of ZTL.

To determine the role of mosquito breeding grounds in the studied areas, we compared the number of mosquitoes caught in different types of shelters. It is known that most mosquitoes are caught in wooden buildings and livestock barns, as the main breeding grounds for mosquitoes are barns and wooden buildings.

The following carriers of leishmaniasis have been identified in Mubarak, the natural foci of ZTL in the fauna of mosquitoes: *P. papata* and *P. sergenti*. It can be seen that not only zoonotic but also anthroponotic skin leishmaniasis carriers are prevalent in this region. These species that carry leishmaniasis have been identified in all biatopes examined.



5 species of mosquitoes were caught in the basements of ATL centers in Jizzakh region, houses and buildings for animals. *P. sergenti* (50.0-89.0%), which is a carrier of anthropanotic skin leishmaniasis, predominated in the studied settlements. The dominance of this species indicates a high incidence of ATL.

The main areas where mosquitoes breed in the studied settlements are cattle ranches, the most common species among the captured mosquitoes: *P. Sergenti*. In this regard, the Sanitary Epidemiological Surveillance and Public Health Service requires the Departments of Kashkadarya and Jizzakh regions to pay more attention not only to ZTL, but also to ATL.

Conclusion

1. While 17 species of mosquitoes were identified in Uzbekistan, 7 types of mosquitoes belonging to 2 genera were detected in leishmaniasis outbreaks in Surkhandarya, Kashkadarya and Jizzakh regions: *Phlebotomus* (6 species) and *Sergentomyia* 1 species. *P. sergenti*, and *P. papatas*, *P. caucasicus* predominate in rodent colonies in populated areas.
2. In areas with rodent nests that are considered resuscitated for zoonotic leishmaniasis, the number of mosquito species was very low compared to the settlements, but leishmaniasis carriers *P. caucasicus* and *P. papata* species, which pose a threat to humans, were found to be abundant among rodents.
3. In populated areas, the main breeding grounds for mosquitoes are basements and buildings for animals, while in the wild, large sand colony colonies are conducive to their reproduction.
4. The presence of the main carriers of cutaneous leishmaniasis in almost all of the studied areas means that the risk of disease remains high in these areas.
5. The predominance of *P. sergenti* type over other types of leishmaniasis carriers in Jizzakh regions may lead to an increase in ATL incidence in this region in recent years.

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