

**HISTORY OF THE STUDY OF DIPTERA (INSECTA)**

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**Abstract:** The article provides information on the history of the study of the Diptera order, their role in human life and nature, as well as their importance in the livestock industry.

**Keywords:** Diptera, Muscidae, Culicidae, Central Asia, Uzbekistan, livestock, Molecular genetics.

Diptera (Diptera) is one of the largest and most diverse orders of insects, with more than 160,000 species known to science. According to recent data, their species are even higher. Representatives of this order are found in all regions of the globe, from the Arctic tundra to tropical rainforests. Since ancient times, humanity has experienced both positive and negative effects of insects belonging to this order. On the one hand, they contribute to the stability of ecosystems by decomposing organic matter, as pollinators or natural enemies, and on the other hand, their harmful aspects are manifested. For example, they cause significant economic damage to humans and animals by transmitting many infectious diseases, as well as as pests of livestock.

Ancient written sources around the world record the direct impact of mosquitoes and flies on human life. For example, ancient Egyptian papyri emphasize the connection of mosquitoes with human diseases. Aristotle, in his work "Historia Animalium", gave the first scientific observations about the stages of development of dipterans. Later, in the works of Hippocrates and Galen, there are also ideas about the spread of diseases by flies. These sources show that dipterans have long been of great importance in human life, and also provide brief information about the composition of some species of the order.

The Central Asian region, including Uzbekistan, with its climatic and geographical conditions is a favorable environment for the fauna of the Diptera order. Representatives of such families as Muscidae, Calliphoridae, Tabanidae, Culicidae, Sarcophagidae found here are not only an important link in the ecological system, but also have a significant impact on livestock and agricultural activities.

Especially in the Fergana and Zarafshan valleys, Kashkadarya and Surkhandarya regions, where livestock farming is developed, mosquitoes and flies harm animals by sucking their blood,

causing them discomfort, and are also important as mechanical carriers of various infectious diseases.

Scientific study of Diptera in Uzbekistan began to take shape at the beginning of the 20th century. During this period, local entomologists focused on identifying species that harm livestock farming, studying their biology and distribution. Later, through research conducted in the veterinary and medical fields, the impact of the Muscidae, Calliphoridae and Culicidae families on animal and human health was determined, as well as individual and general measures to combat them were developed. Currently, Diptera species found in Uzbekistan are studied not only using classical morphological methods, but also using molecular-genetic methods, and their bioecological characteristics and importance in the national economy are being analyzed in depth. Systematic and medical-entomological research on the Diptera order has been widespread worldwide since the beginning of the 20th century. German, English, and Russian scientists have described many families and species using classical morphological methods.

For example: JE Collin (Great Britain) - created the main monographs on the family Muscidae and conducted fundamental research on the morphology of mosquitoes and flies. Scientists such as BP Bezzi (Italy) and CH Curran (USA) - made an important contribution to the classification of new species of this family. In the second half of the 20th century, Kenneth Smith (England) and Zumpt (Germany) in the field of veterinary entomology deeply studied the impact of Diptera on animals. Since the end of the 20th century, methods such as molecular biology, DNA barcoding, electron microscopy and GIS (geographical information systems) have entered entomological research. In the 21st century, Hebert and his colleagues (Canada) developed the "DNA barcoding" technology, which allowed for the rapid and accurate identification of Diptera species. And through the GBIF (Global Biodiversity Information Facility) database, Diptera data from around the world are collected in electronic form. In Central Asia, the Diptera fauna of this region, especially the families Muscidae, Calliphoridae, and Tabanidae, was intensively studied in the Soviet era in the 20th century. The methods used during this period were:

morphological analysis (study of species characteristics using a microscope),

- entomological collectors (net, rotten meat traps, illuminated lamp traps),
- observing the development cycle in the laboratory.

AP Ogloblin, PP Sychevskaya, NG Khrustalev[1], scientists studied the entomofauna of Central Asia and published several monographs. Their work still serves as a scientific basis. In the 21st century, ecological monitoring and bioindication methods are widely used in the countries of Central Asia. For example, fly larvae are used as bioindicators to determine the level of pollution of water bodies. In Uzbekistan, the first scientific studies on dipterans in our country began in the first half of the 20th century at Tashkent State University (now the National University of Uzbekistan) and the Academy of Sciences of Uzbekistan. Research on pests of livestock and agriculture was carried out within the framework of veterinary and hygiene institutes.

AX Khojaev and RX Rakhmonov – studied the species of the Muscidae family found in Uzbekistan based on morphological characters. BA Umarov and colleagues – studied the species of the Calliphoridae family, their biology and veterinary significance. In the 1980s–1990s, entomologists from Tashkent and Samarkand used meat traps and pheromone methods in the field to identify the species of flies found in Uzbekistan. In the 21st century, the Diptera fauna is being studied using molecular genetic methods at the National University of Uzbekistan, Tashkent University of Veterinary Medicine and Samarkand State University. Work is being carried out to identify closely related species that are difficult to distinguish by morphological characters using DNA barcode technology. Experiments are being conducted to combat representatives of Muscidae using biological control methods - entomopathogenic fungi

(*Beauveria bassiana*, *Metarhizium anisopliae*) and parasitoids. Since 2020, work has been underway to include the Diptera fauna in Uzbekistan in the international GBIF database.

Thus, while in the 20th century Diptera were studied more on the basis of classical morphological and systematic methods, in the 21st century they have expanded further, based on molecular genetic, bioindicative, GIS, DNA barcoding and ecological monitoring methods. World scientists have been studying Diptera in depth at the international level, Central Asian researchers at the regional level, and Uzbek entomologists in solving local ecological and veterinary problems. Thus, dipterans have been in the focus of attention of mankind since ancient times and today occupy a special place in scientific research as an extremely important object for ecology, medicine, veterinary medicine and agriculture. In-depth study of their importance in the conditions of Uzbekistan, especially the development of innovative measures to combat species that harm livestock, is relevant for the national economy both theoretically and practically.

**References:**

1. Qodirov, T. M., Rasulov, Sh. R., & To'xtaboyev, A. T Hasharotlar zoologiyasi- Toshkent: O'zbekiston milliy universiteti nashriyoti, 2019- 456 bet.
2. Eshmatov, Sh. E., & Abdulazizov A. A. Qishloq xo'jalik entomologiyasi.- Toshkent: "Fan va texnologiya nashriyoti", 2016.-372 bet.
3. Abdullayev, A. M., & Rahmatov, I. S. Umumiy entomologiya : Samarqand: SamDu nashriyoti, 2020. – 288 bet.
4. Бей-Биенко, Г. Я. Общая энтомология. – Москва: Высшая школа, 1980 – 418 с.
5. Triplehorn, C. A., & Johnson , N. F. Borror and Delon's Introduction to the study of Insects.- Belmont, California: Cengage learning, 2005- 864 p.