EFFECTS OF ANTHROPOGENIC FACTORS ON DRAGONFLY SPECIES

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Abstract: *This article describes information about the spread of some species of dragonflies in artificial and natural landscapes, anthropogenic influence on the population of some species and its consequences.*

Keywords: *dragonflies, anthropogenic factors, urbanisation, artificial landscapes*

Аннотация: *В данной статье изложены сведения о распространении некоторых видов стрекоз в искусственных и природных ландшафтах, антропогенном влиянии на популяцию некоторых видов и его последствиях.*

Ключевые слова: *стрекозы, антропогенные факторы, урбанизация, искусственные ландшафты*

Dragonflies are amphibious insects, and their distribution mainly depends on the living conditions of their pre-imago stage - larvae. Currently, the main part of the Kashkadarya plains is occupied by the desert areas, including urbanized areas. Even the water and aquatic ecosystems in the hilly and mountainous regions of Kashkadarya have undergone significant changes over historical periods due to human economic activity and are currently under the pressure of a large-scale growing human factor. In addition, it is also a very important issue to determine the patterns of formation of the dragonfly community living in different ecological environments and habitats under human influence. The anthropogenic impact on the odonotofauna of Kashkadarya region was mainly a significant change or complete loss of the water regime in the first biotopes of dragonfly larvae, pollution, and the creation of new artificial habitats. As we know, our region is one of the main producers of agricultural crops on the scale of the republic. These processes are directly related to the development and improvement of the irrigation system. Of course, these changes have not left their impact on our object. In some cases, especially in urbocenoses, the activity of recreation zones plays a major role. In the course of our research, we witnessed that the local residents have organized recreational areas near the banks of the Kyzildarya River. In July-August, family vacationers from the reclaimed desert zone constantly come

to the recreation areas near the river. We found that there are about 50 of these artificial resting places (clay platforms or iron beds) along the coast of Kyzyldarya, 2-2.5 km long. The operation of these artificial habitats coincides with the time when dragonflies live an active life. This causes dragonflies to fly away from these places. That is why we met 1-2 individuals alone in such places. In addition, urbanization processes have a negative or positive effect on dragonfly species. For example, around big cities such as Karshi, Koson, Guzor, Tallimarjon, Beshkent, Kitab, Shahrisabz, Yakkabog, dragonflies practically live only in artificial ponds, so many species of dragonflies are increasing in these places. Dragonfly larvae are a protein-rich natural feed for fish in ponds. A major factor influencing the spread and increase of dragonflies in these urbanized areas is artificial reservoirs in the irrigation system, irrigation facilities such as sewage reservoirs, ponds, canals, collectors, lakes, and fisheries. Table 1 analyzes the influence of the anthropogenic factor on dragonfly species distributed in the study area. According to him, the human factor had 48 percent positive, 42 percent satisfactory, 5 percent insignificant, and 5 percent negative impact on dragonfly species (Table 1).

Irrigated land is one of the ancient ways of human economic activity that fundamentally changes the environment. The hydrographic river system of these mountain ranges covers the highlands, where the main water supply is collected. We know that Kashkadarya and Jindarya, which are the main rivers of the mountainous area, starting from the Hazratsultan, Aksuv Darya, Karasuv Darya, Yakkabogdarya, Kyzildarya, and 3 lakes: Sechankol, Alankol, Achinkol form natural water reserves. The extent of anthropogenic change of the hydrographic system can be seen on the basis of the following data. In order to develop irrigated agriculture in the region, 14 reservoirs totaling 173,357 square kilometers - Tallimarjon, Chimkurgan, Pachkamar, Toshloksoy, Hisorak reservoirs are the largest water reserves. 100 million canals, ditches, and collectors were dug in the occupied desert areas, and the foundation for the development of agriculture was laid there. If we take into account the numerous local irrigation and drainage ditches and canals in cultivated fields, this number increases several times. Kashkadarya is also the main source of water supply for the developed desert areas. On its banks are very large irrigated areas that were previously without water. Smaller but more important irrigation canals in terms of irrigated area pass through the cultivated Karshi desert. Agricultural-related agro-landscapes can include agro-irrigation landscapes and anthropogenic water-landscapes include reservoirs, ponds and irrigation

systems. Strong changes of current landscapes under the influence of anthropogenic factors, i.e., anthropogenic modification, have been noted. **Construction of artificial water bodies in our research area has fundamentally changed the ecosystem of areas without natural water. There, new habitats emerged for hydrobionts, including dragonflies and aquatic organisms. Due to their hydrological regime, they are partly unique and cannot be found among natural basins. On the other hand, the control and management of the water source used for irrigation of the fields has led to the change of all natural water bodies, which in turn has led to a change in the composition and structure of the world of organisms living in them.** This process of changing nature had a strong impact on the odontofauna of Kashkadarya.

Analysis of the scope of antropogenic impact on dragonflies 5.1-table

№	Types of dragonflies	Scope of anthropogenic impact
1	*Ophiogomphus reductus*	satisfactory
2	*Anax imperator*	positive
3	*Anax parthenope*	satisfactory
4	*Libellula quadrimaculata*	satisfactory
5	*Orthetrum albistylum*	satisfactory
6	*Orthetrum brunneum*	satisfactory
7	*Orthetrum cancelatum*	positive
8	*Orthetrum sabina*	positive
9	*Crocothemis erythraea*	positive
10	*Sympetrum flaveolum*	Insignificant
11	*Sympetrum meridionale*	positive
12	*Sympetrum pedemontanum*	positive
13	*Sympetrum striolatum*	positive
14	*Calopteryx splendens*	satisfactory
15	*Calopteryx virgo*	negative
16	*Sympecma fusca*	positive
17	*Ischnura elegans*	satisfactory
18	*Ischnura pumilio*	satisfactory
19	*Coenagrion pulchellum*	positive

It is the ability of many species of insects to choose a new habitat and their wide ecological adaptability, which determines the possibility of moving to and living in vast and diverse natural-climatic and high-altitude areas or anthropogenic landscapes in developed desert areas. It is known that the area of the habitat depends on the speed of migration there, and this process is very high in dragonflies. According to the research results, 48 percent positive, 42 percent satisfactory, 5 percent insignificant, and 5 percent negative impact of the anthropogenic factor on the spread and increase in the number of dragonflies in urbanized areas were found.

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