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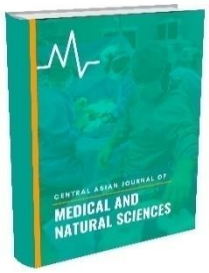

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# Analysis of Biological Harm Caused by Birds in the Bukhara Region

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**Abstract:** The main invasive species which cause biological harm and types of this process were studied in the article. In the Bukhara region, specific types of beekeeping, horticulture, viticulture, grain growing, the development of its branches, the biohazard which has borne fruit to birds, have been recorded. In order to reduce the biological damage produced by birds, the use of effective frightening agents, the management of the number of certain species and the involvement of beneficial species in pest control, the consequences of biological harm in various areas of the agriculture were identified and preliminary recommendations for their elimination were developed.

**Keywords:** Merops persicus, Acridotheres tristis, Passer indicus, Corvus frugilegus, biocenosis, chick, bird, ecology, biology, anthropogenic, biotope.

**Introduction.** The predominance of the participation of birds in biological harm when managing them in accordance with human interests is the reason for the formation of practical ornithology. According to the information, in Uzbekistan there are 24 bird species (5%) might cause damages in habitats that they are living, where the figure of global estimation includes 100 species (about 1%) in the world. In some regions of Uzbekistan, studies have been conducted on the participation of such species as megors persicus, Acridotheres tristis, Passer indicus, Corvus frugilegus in biological harm, its prevention, many of which are devoted to the issues of damage caused by birds to horticultural and viticultural farms, as well as its prevention, the effectiveness of various repellents in breeding birds [2;3;4].

The habitat of birds is often occupied or in other words destroyed by humans, and the degradation of their natural environment leads to the fact that some bird species accumulate in large numbers in public places, which brings along with numerous unwelcome results to people themselves. The analysis of the consequences and the development of the most convenient ways to prevent biological harm is one of the most urgent issues of today.

**Materials and methods**. The role of birds in devastation of nature in the years of 2012 and 2021 were investigated through the field studies conducted in various parts of the Bukhara region, namely in Bukhara city, Jondor, Alot, Karakul, Gijduvan, Vobkent and Kogon districts in the fields of

beekeeping and agricultural crops. When determining the number of species per unit area, their number was determined in stationary areas (feeding, breeding and resting places of birds) [5;6;7;8;9;10]. When studying the behavior of species, a visual method was used. Experiments were carried out in the form of transfers to expel them from the places where a lot of birds gather such as vineyards, cattle feeding places, places where birds gather at night, household waste by making them flutter. In this method drawing the wings of birds, which were captured in various places, rooks (n= 4), blue-cheeked bee-eaters (n = 8) and mynas (n= 10) holding their heads down, and their "distress signals" were recorded on a TASCAM DR-05 recorder as an acoustic repellent and used for transmission purposes [1;2;20] The modern model of A8-7: F600 and the TASCAM DR-05 were used to record the sound of Merops persicus, Acridotheres tristis, Corvus frugilegus.

Merops persicus is considered a migratory bird that flies to Uzbekistan for nesting. His flight to Bukhara region will take place on the first 20 days of April, and his return will take place at the end of October. There is practically no sufficient information in the sources about the relationship between the species and beekeeping farms, the seasonal nature of their harmful activities in beekeeping, the level, most importantly, its prevention, mitigation measures. Blue-cheeked bee-eaters gather around bee farms during spring and autumn migrations. During this period, they feed by catching worker bees from early morning until late at night. And during the nesting period, they feed mainly on pests. Even on cloudy days, they consume the worker bees, because at this time the number of flying insects decreases sharply, only bees become active. It is observed that one bird can catch several worker bees in one flight and eat 2-5 worker bees for 5 minutes, 20-30 per hour in average, the middle-sized pair of blue-cheeked bee-eaters eat about 150-200 worker bees per day. When analyzing hundreds of beetles found around bee farms, the remains of bees and other species of Apoidea were found in them. It was found that the acoustic sound systems of the birds vary depending on the different environmental situation, there is a warning, an alarm call or distress calls. The voices of the bee-eaters will also have different meanings. That is because, they sound the same in peacetime and differently when danger arises. Blue-cheeked bee-eaters turkeys, which eat around nesting colonies, communicate with each other through sound communication, transmitting certain information to each other, the repertoire of male or female bird voices, that come back to their nests with food, is completely different.

If there is a hazard occurring around the colony, they make alarm calls to warn others of the threat. The recorded sounds were translated by a bioacoustic device. The latent period of the bird's response to the alarm lasted 5-6 seconds, within 10-20 seconds all the bee-eaters flew to the side from which the sound came. The reaction of birds to distress calls ended with them flying to the source of the signal, turning over the source, and then quickly leaving the place. We observed that they flew 30-40 minutes when they were disturbed during the experiment which was conducted at the midnight in 10th and 12$^{th}$ Augusts in 2021. Thus, we have noticed that this bird has the ability to see well even at night. As a result of the increase in the number of bee-eaters in the last few years, beekeeping farms witnessed economic detriment. That is the reason, entrepreneurs engaged in beekeeping shoot the birds mainly with the use of hunting weapons. This way of hunting does not correspond to modern types of hunting. Such hunting can be characterized as illegal hunting, which is carried out for the purpose of controlling the number of species.

*Acridotheres tristis* participates in the formation of noise and causes unsanitary conditions as a factor of environmental pollution, damage to crops, damage to experimental facilities, being in a competitive form of relationship with other species and other unfavorable cases, which do not correspond to human needs.

Part of the adult bird population cannot participate in breeding due to the lack of nesting sites in Bukhara Province, and even during this period their feeding is sometimes observed in the status of a community. The fruit which begins to grow during the reproduction time of the bird, is far from the

area, that is because is hardly damaged. According to this, it is desirable to grow plants remote from the bird population, by making unfavorable situations in the adjacent territories of gardens in which myna can build nests (closing various cracks and holes, breaking old nests of common magpie and rook) [11;12;.13]. In our experiments in this direction, distress signal recorded from birds caught at different times of the year was used as an acoustic repellent. Signals were recorded in areas which were the mynas` gathering places, including an amusement park in the city of Kogon on 18th October 2020, in the farm in Bukhara on 17th December, 2020, in a vineyard in the Bukhara district on August 10, 2021, in a landfill site where waste materials and garbage were collected in the Bukhara district on December 22, 2021. The recording locations, the number of birds at those plays, for what reason birds stopped there, all of these factors had different advantages. In the first 10 seconds of recording, which was held at 6 p.m. at the area where birds stopped for sleeping, the noise of mynas stopped, and they did not fly away from the overnight places as well. In the next 30 seconds of recording, however, the process led some mynas to fly away, therefore, under 40% of them remained in the places. The next attempt lasted 1 minute, and as a result, 10% of mynas remained on the edges of their places, the rest flew away. There was a five-minute interval between attempts. After 30 minutes, the mynas came back to those places again, and this showed that the "distress signal", which was carried out in the form of 3 recordings, gave practically no results. The recording, conducted in the vineyard in the same way and with same instructions, also ended ineffectively. During this experiment, many of the birds 10-20 meters distant from the center of the recording flew away, while others hid in the thick foliage. Birds continued to eat grape fruits again after 10-20 minutes, as before. The population uses various methods against myna, due to its damage to grapes. These techniques include buckles, bells, various cans of canned food, handmade scarecrow buckles, [14; 15; 16]. Before ripening, in small vineyards, the grapes are wrapped in a paper bag. It was witnessed at some households that, birds caught by people were tied to the vines. It has been noted that other birds don't come here at all or watch around the site. The tied ones serve as both acoustic and optical repellent at the same time as a natural "distress signal". After the death of this bird, its acoustic function ends completely, the optical function slows down sharply due to the lack of movement, and as a result, the mynas reappear here again. In both of these cases also the percentage of mynas` escape and the distance of escape depend on the conditions of the area for example, noise, the size the vineyard, the number of mynas in the place, etc.) [17;18;19]. In 2018-2021, in the Vobkent district, for the prevention of Acridotheres tristis`s damage on grape and cherry fields, their branches were wrapped with a set of nylon mesh.

*Passer indicus* is an invasive species to a grain crop planted in the districts of the Bukhara region, which affects to the plant from late spring. At the beginning of May, when wheat grains begin becoming large, flocks of house sparrow and Indian sparrows attack wheat fields. Fields near the nest of sparrow colony have a high degree of damage, and in fields remote from the nest colony, there is low damage. In the Bukhara region, damage from sparrows is relatively high, firstly, due to the large number of Indian sparrows, and secondly, due to the fact that sparrows' nests are located among trees around fields.

*Corvus frugilegus* causes serious damage to seeds and young grass standing on the early germination in fields in the Bukhara region. Especially sharply reduces the germination of seeds by searching for seeds that have fallen into a niche in irrigated fields. Rooks brought a serious damage to the winter wheat fields which were sown in the first twenty days of November in 2019-2021. In the Vobkent district, 2 hectares of wheat sown in the first 10 days of November was destroyed by rooks when seeds was just beginning germination at the end of November. Yet the fields that were sown in the early October in 2019-2021, had not been damaged. We came to the conclusion that wheat should be planted in the first twenty days of October to prevent damage by Corvus frugilegus to seeds and young grass that stood on the germination in autumn fields.

**Conclusion.** In Buxoro region many species, such as Merops persicus – blue-cheeked bee-eater, Corvus frugilegus - rook, Acridotheres tristis - myna, Passer indicus - Indian sparrow participate in the process of biological harm. In agriculture, it participates in the destruction of seedlings and grains, in increasing the area of garbage distribution, in contaminating food in markets, in interfering the construction of nests of other species, including the destruction of eggs and chickens, in the formation of noise and other unsanitary situations. The use of acoustic repellents, optical repellents, biotechnical methods in preventing biological harm caused by birds works effectively. The use of optical and acoustic repellents simultaneously, in particular, reduced the chances of birds getting used to these repellents significantly. In general, it is important to control the number of species in nature.

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