FEATURES OF THE COMMON MYNA IN GREEN AREAS OF ALMATY

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Abstract

Background and Objective: This article aims to determine the current state of the localization of the common myna (*Acridotheres tristis* L.) in the city area. This bird quickly adapted to the new environment and became a real synanthropic species. A new member of the urban ornithofauna, due to its adaptive assimilation, the myna began to displace some of the old birds foundin the city. However, the number and location of *Acridotheres tristis* L. have not been specifically studied. The aim of the work is to determine the current state of *Acridotheres tristis* L, which inhabit the green areas of Almaty, and to determine the specifications of the localization of the species in addition to the significant causes of mortality for this species in urban settings. **Methodology:** Common mynas were studied in four green zones of Almaty city. The study was conducted in accordance with commonly accepted ornithological methods in classical ornithological methodologies, including visual observation with 30 minutes of observation in one location and a 5-minute census on certain routes. A total of 109 hours were spent in the abovementioned green zones. **Results:** Currently, common mynas are widespread in all areas of the city and in the areas where the research was conducted; the distribution of the common myna is unevenly distorted and quantitatively variable. In addition to the number of birds that reside with common mynas and life-threatening factors to common mynas, the impacts of the species on the environment, including competition with other bird species, were studied.

Keywords: common myna, acclimatization, biotope, range, urbanization

INTRODUCTION

The problem of conserving biodiversity is crucial in the world. Currently, in Kazakhstan, specific research is under way to study the populations of plants[2] and animals. One of the animals that requires population study is the common myna. There are many reports in the foreign[3,4,5,6] and domestic literature[8,9,10,11,12,14,15,16,17] about the common myna (*Acridotheres tristis* L., 1766). However, there are few data on this bird in Kazakhstan's inhabited localities, including the green areas in Almaty. In the twentieth century, the study of the processes affecting the naturalization of wild animals has been carried out, and ranges of some birds, including the common myna, and other animals have expanded. The common myna was observed in the early 1960s (more precisely, in 1961 in Shymkent). Two hundred birds were brought to Almaty in late March 1962[1].

In the early years of the city, the common myna do not slip, but at the end of summer and early autumn, Central zoo park often appear in young common myna, so it is supposed that they have grown in rural areas. In 1964, nests were found in the Central zoo park and hunting farms, and in 1965, mynas were found in the Botanical Gardens. In the 1970s and 1980s, ravine-style nests of the common myna were found in many parts of the city in 1964-1965, and the myna gradually became a commonplace bird[6,7,8].

A sharp increase in the number of common myna juveniles in Almaty was observed in 1990-1999. During these periods, massive settlements of the species were formed[9].

In 2000-2005, in the southern part of Almaty, in the "Kazakhfilm", "Orbita", and "Almagul" microdistricts and in Akademgorodok and Atakent, the common myna was one of the most prevalent birds in spring and summer, especially in private gardens. Such sightings were characteristic for many parts of the city and even in central locations[10,11].

In the summer months, along with the common myna, the *Parus major* and *Columba livia* var. *domestica* densities were relatively normal and relatively high[12].

In the Almaty districts, there are no data on the location of the common myna. The appearance of the city has changed dramatically in the twenty-first century. New buildings and roads were built. The common myna habitat has gradually become narrower. In this case, the study of the specifications of the bird's activities can be considered a scientific practice. The aim of this work is to determine the current state of the *Acridotheres tristis* L, which inhabits the green areas of Almaty, to determine the specifications of its location, and the significance of the contributing causes to the mortality of the myna in urban settings.

The dynamic processes of the bird belt of Kazakhstan and Central Asia have been affected by climatic and anthropogenic factors, especially in the last ten years of the twentieth century and the first decade of the current century. Many new species have been introduced to nonnative areas, resulting in the elimination of some native and important bird species. During the period from 1995 to 2005, birds in the fauna of Almaty were subjected to a great deal of change, and 223 species of birds were documented. In 2008, 235 bird species were observed[16]. The number of birds feeding them was 53 species. In 2009, with reference to the ornithological census conducted by the Institute of Zoology[16], researchers presented the frequency of different bird species observed by month in East, South-West, West and North-West of Almaty (according to the results of the survey conducted in 2009[17], the average daily frequency of encountering Acridotheres tristis in Almaty was approximately 63-209 per hour).

MATERIALS AND METHODS

Experimental site: The research was carried out in 2017-2018 in the green zones of Almaty — the General Botanical Garden, the Al-Farabi Kazakh National University campus, the Central Park of Culture and Recreation, the 28th -Panfilov Park, the boulevards of the city, and the yards of the micro districts (Figure 1).

Figure 1. View of the green zones of Almaty: 1 – Botanical Garden, 2 – Al-Farabi KazNU campus, 3 – General Botanical Garden, 4 – 28th -Panfilov Park

Materials and Research Tools: The common mynas were studied in four green zones of Almaty city (Figure 2). Binoculars (MINOX BV 10x42 BR and BERKUT-7 BPC 8x10 (USSR)), were used as tools to monitor the life of common mynas.

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Figure 2. Common myna photographs taken in the green areas of Almaty: 1 – Botanical Garden, 2 - Al-Farabi KazNU campus, 3- Central Park, 4-28th -Panfilov Park

Research Procedure: The study was conducted in accordance with commonly accepted ornithological methods in classical ornithological reports[13,14,15]: visual observation, consisting of 30 minutes of observation in one place and a 5-minute census on certain routes. A total of 109 hours were spent in the abovementioned green zones.

Parameters Measured: The five-minute interval accounting is one of the types of pedestrian observation. All birds, regardless of location, are taken into account. The results are recorded every five minutes; in this methodology, the observers record the birds they have seen during the first five minutes and then in the subsequent, five minutes (6-10 minutes) separately. This approach allows the production of an average score for every five minutes or one hour.

Statistical Analysis: Tables, graphic images and their statistical processing for the results obtained were executed in the Excel program of the MS Office 2010 package.

Experimental Design: Classifying the census results accurately based on the biotope and observation data for each person individually is vital to data analyses. In forests, there may be different biotopes, such as shrubs and birchy places. In this case, every five minutes, different landscapes were observed. In the first five-minute period, shrubs are observed, while in the second five-minute period, data from additional squares are recorded. Later, this approach yields good results. For example, in 60 minutes, 60 birds in woodlands including 23 squares and 15 shrubs can

be found. This method is especially effective in places where people are most likely spend 15 minutes each day while working or studying spent in 3-5 minute increments, and after a few observation periods, data collection durations may add up to five minutes.

For definitions to be complete, each group of identified birds must be separated by commas. For example, "Parus major 1,1,4". This allows the observer to define the group size and average size. Once the calculation has been completed, the definitions are written down one line. It is possible to determine how far it is (how many cannabis weigh 10 in 1 hour, 120 species of sparrows).

This type of monitoring is more effective when investigating a particular species. It gives good results when determining the number or decreases in the number and density of the species as well as the frequency with which the species is encountered. Even in an absolute census, an observer may use these definitions from which the length of the route can be retrieved, taking into account the census and recounting of the whole area.

RESULTS AND DISCUSSION

During the analysis of the frequency of bird watching, there was a relative deviation in the number of birds encountered in all the regions of Almaty and in the seasons. However, in our study, the average frequency of visits throughout the city was 121 per hour. Currently, the common myna is one of the major birds in the city, and the population is rapidly growing following introduction. A considerable number of common mynas are observed in summer and autumn, with an average of 107-209 sightings and a small number of occasions in the winter. In the winter months, the frequency of occurrence fluctuated between 63-109 individuals.

In some cases, the census revealed that their numbers were between 5 and 100. Common mynas are often found in smaller groups from 3-7 to 20 individuals (Fig. 3).

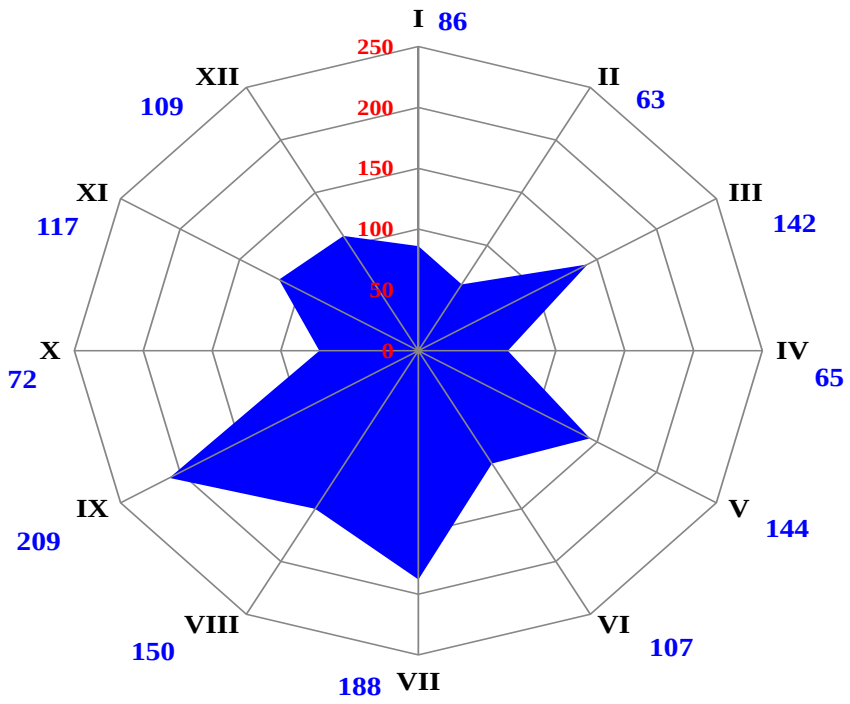

Figure 3. Frequency of encountering the common myna in the year 2009.

According to the results of the work carried out in green areas of Almaty — General Botanical Garden, Al-Farabi KazNU campus, Central Park, 28th -Panfilov Park, boulevards of the city, and courtyards in micro districts of Almaty city — the common myna are unevenly distributed in Almaty.

According to the results of the work, compared winter to summer and autumn, the number of common myna is about 2 times less than in the summer and autumn, which is depending on the climatic factors, in addition, it affects their activity, because they migrated from the south. So, as noted above, the fact that counting 1-20 individuals of their number during the census shows that our result is correct. In the years we spent conducted research, the number of common mynas was quite different from previous years. The numbers of common mynas are unstable in every year and that is depending on the climatic peculiarities of each year.

We found significant spread structuring across the common myna's Almaty city distribution, indicating limited levels of effective dispersal amongst the populations. In our article, 54 species were investigated in the green zones of Almaty. Among these species, there are birds that have dominant indices: House Sparrow - *Passer domesticus*, Common Myna - *Acridotheres tristis*, Rock Dove - *Columba livia*, Rook - *Corvus frugilegus*, Great Tit - *Parus major*. Collectively, these birds

accounted for 82.73% of the observed species. The percentage of House Sparrow in the census was 30.6%, the Common Myna - 8.9%, the Rock Dove - 26.7%, Rooks – 7.2%, and the Great Tit - 9.4% (Figure 4). According to the results of the survey, the number of poultry in the city was increased, the maximum number of poultry in the city was observed in winter months, up to February. The accumulation of birds in the city in winter is explained by the movement of birds of these species from the surrounding areas to the territory of the city, where it is easier for them to find food and winter. In March, their numbers fall when they start breeding and are distributed among the nesting sites. The increase in numbers in August and September is due to the appearance of young birds after the nesting period. In September, there will be a combination of poultry farming, which will take place in October. In November, most of the birds leave the city, and is distributed over farmland, where they feed on grapes, orchards and other crops. In December, they begin to return to the city again.

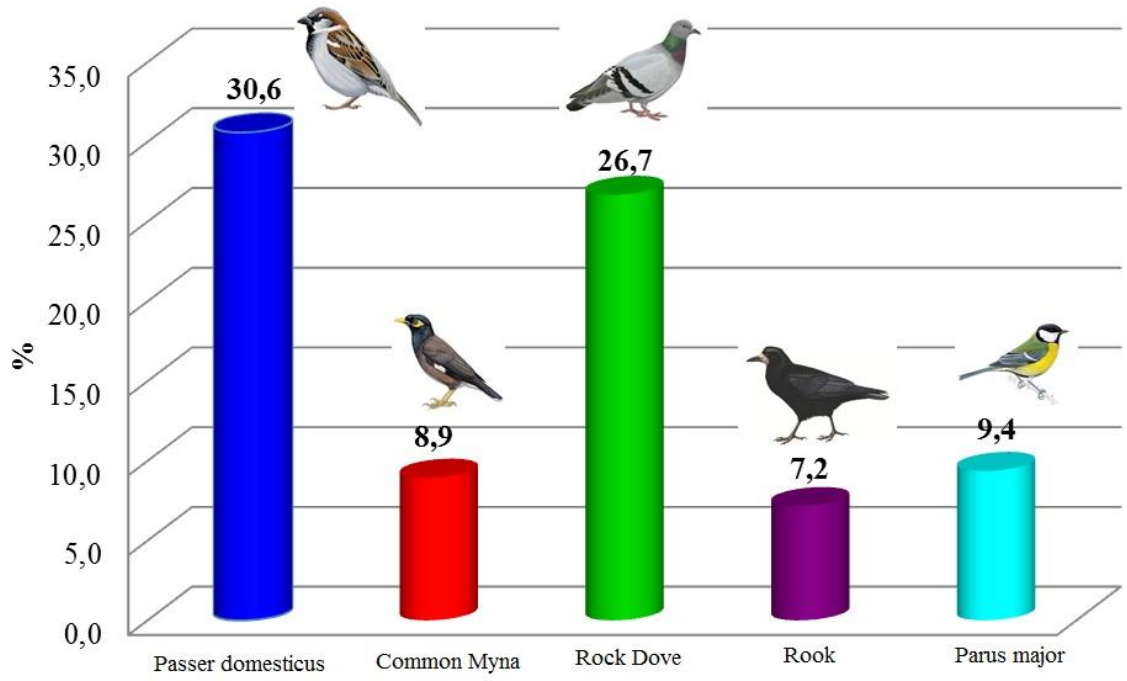

Figure 4. Abundance of birds found in all regions of Almaty

As shown in Figure 4, the reasons of great number of birds in the city area are that they are protedted by the city from wind, cold and the predatory birds. Also there is plenty of food available.

The reason of house sparrow and rock dove are the domination (30.6% and 26.7%) in the city is that they are not protected by the dangers from the people and shelter homes in building. There is low number of common myna, rooks, and great tit, that is because of their high protective capability.

The number of common mynas was recorded hourly, with an average of 12 birds per hour in the spring, 18 birds per hour in the summer, 9 birds per hour in the autumn, and in the winter, 6 birds per hour in the General Botanical Garden

In the Al-Farabi KazNU campus during the current year, the frequency of the common myna was 10 birds per hour in the spring, 15 birds per hour in the summer, 7 birds per hour in the autumn and 4 birds per hour in the winter.

According to the route census, in the 28th -Panfilov Park, the frequency of common myna in the spring was 4 birds per hour, in the summer – 8 birds per hour, in the autumn – 5 birds per hour, and in the winter – 3 birds per hour (Table 1).

Table 1. Frequency of encountering the common myna in the green zone of the city of Almaty, ha

№	Area	in the spring	in the summer	in the autumn	in the winter	Average
1.	General Botanical Garden	7-24 12	13-23 18	8-12 9	5-9 6	11
2.	Al-Farabi KazNU campus	8-13 10	7-19 15	4-10 7	2-6 4	9
3.	28th -Panfilov Park	1-6 4	2-12 8	2-6 5	1-4 3	5
4.	Central Park	2-22 10	8-28 16	7-9 7	2-6 4	9
5.	The streets of the	2-11	2-9	1-4	2-8	4

	city	5	3	2	5	
Notes: fractional deviation figures in the fractional fraction, and the mean value in the section.						

If we analyze the data in Table 1, we observe that common mynas are often found as synanthropic bird species but in relatively small numbers in areas where there is less human activity.

Birds live in the metropolitan area, including common mynas. the disturbing factors are main factor. Our research has shown that common mynas is synanthropic, although it is concentrated in areas where there are fewer people. For example, the general botanical garden is a specially protected area. Vacationers will only be available for a certain period of time. That's why the number of birds is much higher (Table 1). In Al-Farabi KazNU campus, there are many students in the campus, but the problem is not significant. Because students do not walk on green area. In the central park, there are enough security places. In the 28th -Panfilov Park, the disturbing factor is very high. There is a church, many restaurants and cafeterias, and there are many visitors. And the streets of the city, especially in the yards, have cats, dogs, and fewer vacancies. Therefore, the number of common mynas is lower than the three other places of the city (Table 1).

In this regard, the results of the census carried out about the number of common mynas in 2017-2018 have been largely reliable. In recent years, there has been a significantly decrease in the number of common mynas in the city. On the other hand, the numbers of house sparrow and Eurasian blackbird are growing. This requires regular monitoring of the number of birds in the Almaty city.

It has also been discovered that the number of birds in the Central Park is considerably variable. In the green zone, there were an average of 10 birds per hour in the spring, 16 birds per hour in the summer, 7 birds per hour in the autumn, and 4 birds per hour in the winter.

Control data collected in the streets and courtyards of the city have shown that this bird's frequency is different. In the spring months, the mean frequency of their frequency per hour is 5, and in the summer months, this number is between 4 and 6 (Fig. 5).

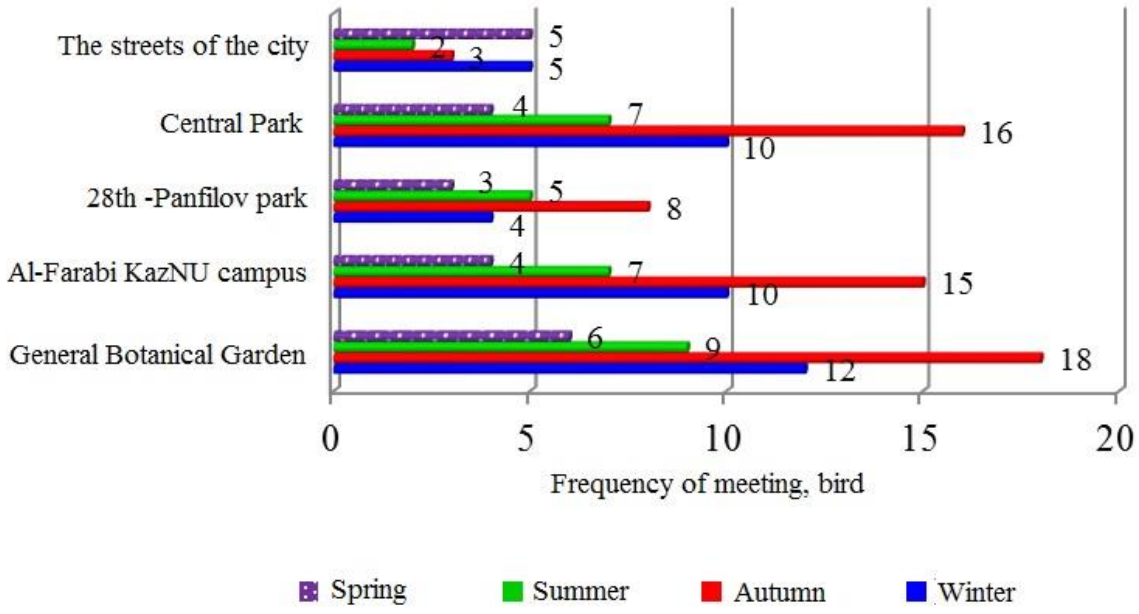

Figure 5. The average frequency of common myna cycles with season.

According to the above-mentioned observations, the moderate tendency of the common myna in all seasons remains moderate. The average frequency of common myna occurrence varied between 4-11 birds (Figure 6).

The continuation of the expansion of the range of the common myna in Kazakhstan, including the green areas of Almaty and surrounding settlements, remains a topic of debate among ornithologists, ecologists and the public.

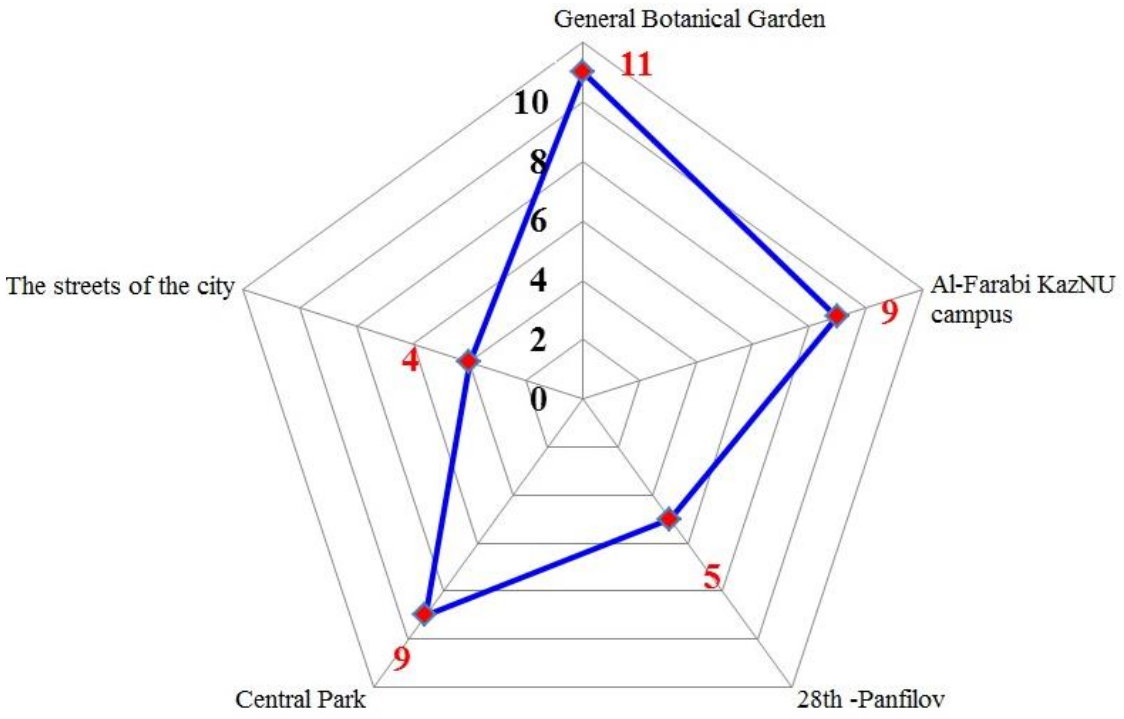

Figure 6. The average common myna frequency in the green spaces of the city (birds).

For many years, common mynas have extended the ranges of their native and localized areas, and their increase in density and overall population size may be associated with human activities. Under our monitoring scheme, the common myna was rarely found in natural areas that were far away from human settlement. However, there are no specific empirical data and statistical data available for this species.

Comparatively, the common mynas were significantly higher in the green sectors of the city, as well as in the courtyards of many multistory houses.

The results of the observations show that the common myna is now widely spread throughout the city, and in the regions where this research was carried out, the distribution of the species is uneven, and the number varies according to the month and annual seasons.

From a biogeographic point of view, urban areas are an interesting and current subject of research. We are convinced that this information will encourage future research on invasive species, including sarin.

Moreover, the number of common myna habitats living in a city like Almaty is devastating depending on the season, and it is concentrated in areas where it is less sensitive. There is no information about this bird's behavior of adaptation to new climatic zone. In this regard, in the future, it is necessary to conduct regular monitoring of the condition of its life and to monitor the behavioral characteristics.

CONCLUSION

Research carried out in 2017-2018 shows that the common myna is well adapted to survival in urban settings as a synanthropic species. In particular:

1. The results show that the common myna is now widely spread throughout the city.

2. In the case of a large metropolis such as Almaty, the location and quantity of birds in the various zones depends on the effects of various abiotic and anthropogenic factors, including seasonal effects.

3. In research areas, the distribution of the common myna is uneven, and the number varies from year to year. For example, in the territory of the Botanical Gardens, an average of 6-18 birds per hour per season was observed and in the 28th- Panfilov Gardens 3-8 birds per hour per season were observed. In the Central Park of Culture and Recreation, 4-16 birds per hour per season were observed, while 2-6 birds per hour per season were observed in city streets and yards.

4. The proportion of common myna is significantly higher in the green sectors of the city.

5. In recent years, large groups of common mynas have appeared. They are abundant and easily observable from long distances. In this regard, the common myna is one of the dominant species in the city and other localities.

In summary, common mynas are in good condition in Almaty, and they are quickly adapting to the moderate belt climate and gradually spreading to the north. In addition, they are displacing the local birds residing in the cities of Kazakhstan.

This study discovers the possibility that common mynas are adapting to a new environment that

can be beneficial for biodiversity assessment. This study will help researchers to explore the current state of new migratory species that many researchers were previously unable to explore. The condition of the common mynas in Kazakhstan cities is being studied for the first time. Thus, a new theory on these migrating new species and demonstrating competitiveness in other environments may appear in other points of view.

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