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Research Article

Behavior of Domesticated Zebra Finches (*Taeniopygia guttata*) in Colony and in Individual Cage and Its Effect on Their Breeding

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Abstract: In the present study an investigational work was performed to find out the effect of population density on the breeding of domesticated zebra finch. For the present experiment three different types of cages were used namely: type A, type B and type C cages. Type A cage was utilized for colonial breeding of zebra finch. Ten adult compatible pairs of zebra finches were kept in type A cage. Five type B cages were built for the study; two adult compatible pairs were kept in each type B cage. Ten type C cages were constructed for the present study; one adult compatible pair was released in each type C cage. In type A cage 5 pair produced eggs and only one pair hatched and reared chicks successfully. In type B cages none of the pairs produced eggs. In type C cages all pairs produced eggs, hatched eggs properly and reared chicks successfully.

Keywords: *Taeniopygia guttata*, zebra finch, Breeding, population density, Behavior.

INTRODUCTION

The zebra finch Taenopygia guttata is the most common grass finch of Central Australia which has been kept and bred by aviculturists in many part of the world [1]. Zebra finches are not only beautiful but also easily adjustable to captive environment. These finches are prolific breeders [2]. These birds are social and exhibit comparatively low levels of aggression, but when we keep more birds in a cage they show high level of aggression [3]. Zebra finches are monogamous birds, in which each breeding adult mates with only one member of the opposite six and stay together for rest of their lives. These birds form pairs rapidly within few days, male and female form a permanent pair bond, they reform pair when their partners disappear or pass away. They always stay together except incubating and brooding [4].

Zebra finches are less aggressive during non breeding season, but during breeding season they show more aggressive behavior. During breeding season there are two reasons of aggression in zebra finch, first reason: they show aggression in order to protect their nesting sites, second reason: they show aggression in order to keep individual distance (each pair keeps distance from other members of the colony). In breeding season, males show more aggressive behavior than females. Females spend more time in nest during nesting period [5, 6]. Zebra finches commonly form dominance relationships, where dominant pairs have better access to resources compared to subordinate pairs and individuals. Dominant pairs are usually more aggressive than subordinate pairs and individuals [7]. In zebra finches aggressive behavior is fairly dimorphic. Males express most of their aggression at other males, whereas females direct most of their aggression at other females [8].

Zebra finches are being used in research laboratories for many years. These finches are derived from Taenopygia guttata castanotis. They have been domesticated for more than 100 years. At present, worldwide these domesticated zebra finches are being used in research. These domesticated zebra finches are genetically distinct from wild zebra finches. Domestication has changed number of behavioral and other characters of these finches [9]. Zebra finches are model birds for scientific study because they are tough birds, easy to breed, sexually dimorphic, matures rapidly, breed all year round [10].

MATERIALS AND METHODS

The experiment was conducted from February 2016 to July 2017. In the present study we used three different sizes of cages and namely: type A (numbers of cage=1), Type B (numbers of cages=5) and Type C cage (numbers of cages=10). Dimension of type A cage is 5*5*6 (L*B*H) feet. type A cage was used for the colony breeding of zebra finches. Type B cages (3*2*2 feet) were used for the breeding of two pairs; we kept only to pairs in each cage. Type C cages (2*1.5*1.5 Feet) were used for the breeding of single pair; we kept

only one pair in each cage. Healthy and disease free adult zebra finches more than 90 days of age were designed for this study. For pairing purpose, 40 male and 40 female were selected and marked using different marking colors and marking patterns and released in two big cages (6*3*6),40 birds (20 males and 20 females) in each cage and they were allowed to choose each other freely. We kept all birds in the cage for one month in order to make compatible pairs (well-matched pairs).

After pairing 10 pairs were released in type A cage, 10 pairs were released in type B cages (2 pairs in each cage), 10 pairs were released in type C cages (one pair in each cage).After releasing into the cages, the birds were left to acclimate for two weeks and then nesting material and nest boxes were provided to birds.

Same food was provided to all birds. A mixture of canary and millet seeds was given to them in bowls. Water was provided in water feeders. Cuttlefish bone and some green food, such as spinach leaves and coriander leaves, were also given to the birds from time to time. All the nest boxes in all cages were checked time to time.

OBSERVATIONS

In type A cage all birds showed territorial behavior, especially when they were breeding. Each pair protected the area around its nest against interlopers. Aggressive behavior was especially severe when the interlopers came near the nest. During the observation it was seen that most of the pairs who produced eggs could not hatch the eggs properly due to disturbance caused by other pairs.

In Type B cages, it was seen that pairs were disturbing to each other and defending their respective nests and respective areas around nests from each other, due to this none of the pairs could not produce eggs.

In Type C cages, there was no disturbance, each pair was so relaxed. Each pair produced eggs, hatched them properly and reared the chicks successfully.

Note: After one year in March 2017, 5 pairs which could not produce eggs in type A cage were released into Type C cages (1 pair in each cage), and five pairs from type B cage also released into type C cages (1 pair in each cage). Same food, nest boxes and nesting material was provided to each and every bird and they were observed for six months. During these six months all pairs produced eggs, hatched eggs properly and reared chicks successfully.

RESULTS AND DISCUSSION

In type A cage all pairs had chosen one of the nest boxes and started to build a nest in it within on to two weeks, but only five pairs produced eggs. Three pairs bred 4 times and each pair produced 3 to 4 eggs in each clutch and two pairs bred three times and each pair produce 3 to 4 eggs in each clutch. Out of 5 pairs only one pair got success, three chicks in first clutch and four chicks in second clutch hatched out and successfully reared by both parents. Remaining five pairs did not produce eggs.

In type B cage, all pairs had selected one of the nest boxes and started to construct a nest in it within few weeks, but none of the pairs produced eggs.

In type C cages, all pairs had chosen a nest in their respective cages. Out of ten pairs 6 pairs bred 4 times and each pair produced 3 to 4 eggs in each clutch. Three pairs bred 3 times and each pair produced 3 to 4 eggs in each clutch. Remaining one pair bred 2 times and produced 4 eggs in each clutch. All pairs got success.

Summary of the result is presented in the tables below:

Table 1: Type A cage and Type B cages

Cage Name	Total number of pairs	Number of pairs who did not produce eggs	Number of pairs who produce eggs	Number of pairs who properly hatched eggs	Number of pairs who did not properly hatched eggs	Number of pairs who reared chicks successfully	Total number of successfully reared chicks
Type A Cage	10	5	5	1	4	1	7
Type B cage	10	10	0	-	-	-	-

Table 2: Type C cages

Pairs	Number of successfully reared chicks in first clutch	Number of successfully reared chicks in second clutch	Number of successfully reared chicks in third clutch	Number of successfully reared chicks in fourth clutch	Total number of successfully reared chicks
Pair A	2	1	3	3	9
Pair B	0	1	2	3	6
Pair C	3	3	2	2	10
Pair D	2	0	2	3	7
Pair E	0	2	2	3	7
Pair F	1	3	0	2	6
Pair G	2	2	3	-	7
Pair H	2	2	0	-	7
Pair I	2	0	3	-	5
Pair J	2	3	-	-	5
					Total= 69

CONCLUSION

During observation in type A cage, it was seen that more dominant pairs were able to produce eggs and most dominant pair was able to hatch and rear chicks properly. Subordinate pairs could not produce eggs.

In type B cages, it was seen that both pairs in each cage were defending their respective nests and also disturbing each other.

It was found that these finches breed well when we keep each pair in separate cage. We get poor breeding results when we keep more than one pair in the same cage. When we keep more than one pair in the same cage each pair defends its nest and also disturbs other pair(s). This behavior of the birds shows negative effects on their breeding.

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