



Breeding biology of protected pheasants; a case study of Safari park Malakand Khyber Pakhtunkhwa

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Abstract

Reproduction is the main function of organisms to produce offspring. Pheasants are birds that breed from March to June every year. Most pheasants lay a clutch of 8 to 15 eggs, sometimes up to 18, but usually 10 to 12 eggs, and the eggs are olive in color. The incubation period for these eggs is approximately twenty-two to twenty-eight days, after which the eggs will hatch and the female will take care of the offspring. In this study, the breeding biology and population status of protected pheasants in Malakand Wildlife Park were examined. The pheasants are carefully cared and well-managed in this studied wildlife park. Information is collected each week from different field visits and questions from existing staff and experts. Data on clutch size and hatching success of different pheasant species were analyzed. The average number of broods for ring-necked pheasants is 15 and for white pheasants is 16. The average of green birds is 9. Likewise, the average of white birds is 7, the average of Indian peacocks is 7, and the average of black pheasants is 4. The growth rate of ring-necked pheasants is 26.6%, the rate of white pheasants is 7.89%, and the rate of black-shouldered pheasants is 16%. The proportion of green pheasants is 37.14%, and that of white pheasants and peacocks is 37.14%. This study aims to understand the brood size and hatching success of different pheasant species protected in Malakand Wildlife Safari Park.

Keywords: Breeding, Clutch size, Malakand, Pheasants, Safari Park.

Introduction

Pheasants belong to the family Phasianidae of order Galliformes and are among the most beautiful birds in the world due to their brightly colored plumage. They have medium to large size body,

body colors ranging from dark to light, blunt wings, and strong legs. Pheasants generally have beautiful feathers and necklaces on their heads and necks. Most species are sexually dimorphic. Galliformes is a large and diverse order with approximately 70 genera and more than 250 species (Mehmood et al., 2014). Pheasants have a single breeding season every year. The breeding season is from March to June every year. A female pheasant can lay up to ten eggs in 2-3 weeks. The eggs have an incubation period of up to 23 days, after which time the eggs hatch and the female takes care of the offspring. Male pheasants rarely care for their chicks, but they may still defend their territory if an animal or another male enters their territory (Delacour et al., 1973).

All pheasant species are either threatened or vulnerable due to habitat disturbances in most of their native range, according to the IUCN Red data book over one-third of the total species of pheasants are officially listed as endangered of extinction from their native habitat (Howman, 1993). Pheasants are precious and beautiful birds that are economically important to human beings, as their colorful feathers of some species are used for ornamentation and cloth manufacturing. Some species are important to the ecotourism industry. Some species have been domesticated and are reared for meat and eggs (Santamaria, 2000). Pheasants are prominent figures in conservation campaigns and their colorful plumages and charismatic breeding behavior have made them cultural icons (Kumar et al., 1997; Nawaz et al., 2000). According to the information provided by the Department of Forest and Wildlife Peshawar, the Hog deer, Chinkara, Blue bull, Cranes, Pheasants, and partridges are under captivity in different breeding centers of the Khyber Pakhtunkhwa department. In Khyber Pakhtunkhwa captive breeding program in Dhodial, district Mansehra was initiated in the early 1980s to maintain the pheasant population. This program is extended to the other districts of KPK. There has been great work done on these beautiful and threatened species (Sultan et al., 2014).

The main function of national parks and other protected areas is to protect wildlife. They provide habitat for many abandoned wildlife and protect threatened wildlife in their habitats. They provide environmental stability to the ecosystem (Alemu, 2016). According to the conservation director, there are currently eight national pheasant breed centers in the KPK province, covering an area of 5,169,585 hectares. The names of the pheasant breed centers are Dhodial Pheasantries, Bannu Pheasantry, Patanay mini Pheasantry, Fizagat Pheasantry, Kotal Pheasantry Enclosure, Zafar Park Pheasantry, Safari Park Pheasantry, and Kund Park Pheasantry. All these pheasantries are famous due to the captive breeding of the following species; white tro-pheasant, silver pheasant, golden pheasant, Yellow golden pheasant, Lady Amherst's pheasant, Reeves pheasant, Cheer pheasant,

Nepal Kalij pheasant, White Crested Kalij pheasant, Temminck's Tragopan pheasant, Satyr Tragopan, Edward's pheasant, Blue-eared Pheasant, Hume's bar-tailed Pheasant, Siamese fireback Pheasant, Vicillot fire back pheasant, Bornean fire-back Pheasant, Mikado Pheasant, Imperial Pheasant, Elliot's Pheasant, Monal Pheasant and Swinhoe's Pheasant (Ali et al., 2011; KPK Wildlife Department, 1995).

Material and methods

The pheasantries in the Malakand Safari Park were the study area for this research study. This park was established by and works under the Wildlife Department in 2010. The area of the park is 240 acres (97ha) and the whole area is protected (Yousufzai et al., 2023) (Fig. 1). A reconnaissance survey of the Malakand Safari Park study area indicated several cages. Several field visits were made to record the sign and survey different pheasant species (silver pheasant, ring-necked pheasant, wood green, Indian peacock, white true, black shoulder) and data on its breeding biology. The primary data was collected from different weekly field visits through observations and interviews with managerial experts and staff members, who were serving in Malakand Safari Park.

Secondary data was collected about pheasants (silver pheasant, ring-necked pheasant, wood green pheasant, Indian blue peafowl, black shoulder, and white true pheasant) from previous literature such as various research papers, books, and journals through internet sources.



Figure 1. Map of Malakand Safari Park (Courtesy of Google)

Results

Ring-necked pheasants (*Phasianus colchicus*)

Ring-necked pheasants are birds belonging to the Phasianidae family, also known as pheasants. The name of the genus is derived from the Latin word Phasianus, meaning "pheasant". The name Colchicus is derived from the Latin word "Colchis", a country on the Black Sea coast where Europeans were introduced to the pheasant.

Weight: 0.5 to 3 kg, males are larger, averaging 1.2 kg, females averaging 0.9 kg.

Egg production: Common pheasants lay about 8-15 eggs per clutch, sometimes up to 18, but usually 10 to 12; It is olive in color and harvest time is from April to June. Time 2-3. weekend.

Incubation Period: The incubation period of pheasants is approximately 22-27 days. The chicks will remain near the hen for several weeks, but will leave the nest when they are only a few hours old. After hatching, they grow very quickly and are ready to fly in 12-14 days as adults at 15 weeks of age.

Number of ring-necked pheasants in the Malakand Safari park: Total of 36 (Male=03; female=9;

Chicks=24).

Systematic position

Order: Galliformes

Family: Phasianidae

Genus: Phasianus

Species: *P. colchicus*



Figure 2. Ring-necked pheasant (*P. colchicus*).

The figure, 3 shows the total number of eggs laid by all the nine adult females of ring-necked pheasants (*P. colchicus*) were 162 in the breeding season from March-June, 2022. This graphic result show that the eggs of ring ring-necked pheasant in the monthof March were 45, in April ring necked pheasant have laid 35 eggs, 41 in May, while in June the ring necked pheasants have laid 41 eggs.

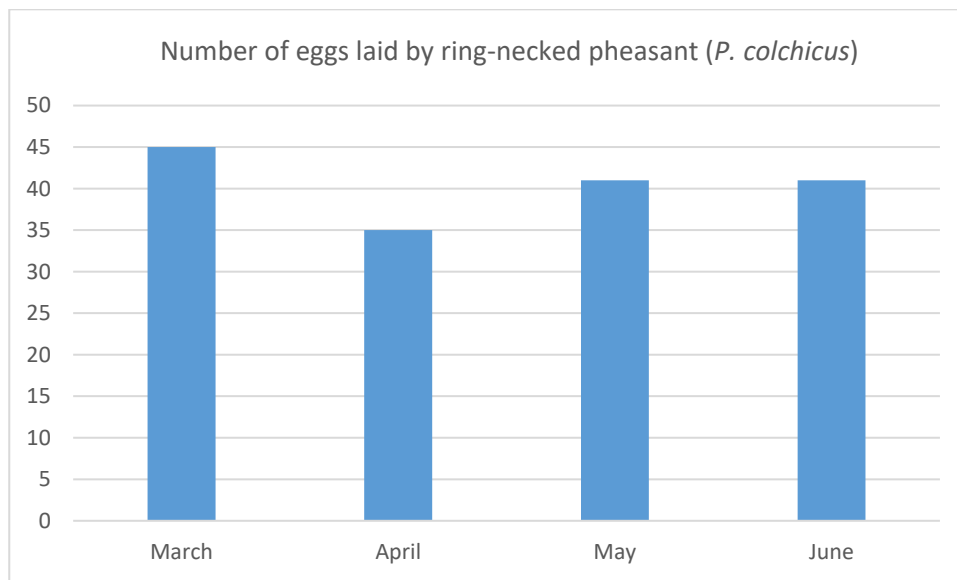


Figure 3. Number of eggs laid by ring-necked pheasant in breeding season.

Silver pheasant (*Lophura nycthemera*)

The silver pheasant is a species of forest-dwelling pheasant, distributed mostly in mainland Southeast Asia and the mountains of eastern and southern China. Males are black and white, females are mostly brown.

Systematic Position

Order: Galliformes

Family: Phasianidae

Genus: *Lophura*

Species: *L. nycthemera*

Number of silver pheasants in the Malakand Safari park: Total 14 (Males: 02, Females: 06, Chicks: 06)



Figure 4. silver pheasant.

The figure no. 5 below shows the total data of eggs, which were laid by all six female silver pheasants in the breeding season of the year of 2022 were 87. Out of 87 eggs 76 were used in broody and the rest of the eggs were sold. The figure shows the result of eggs of silver pheasant in the month of March were 39 eggs, in April silver pheasant laid 32 eggs while in May silver pheasant have laid 16 eggs.

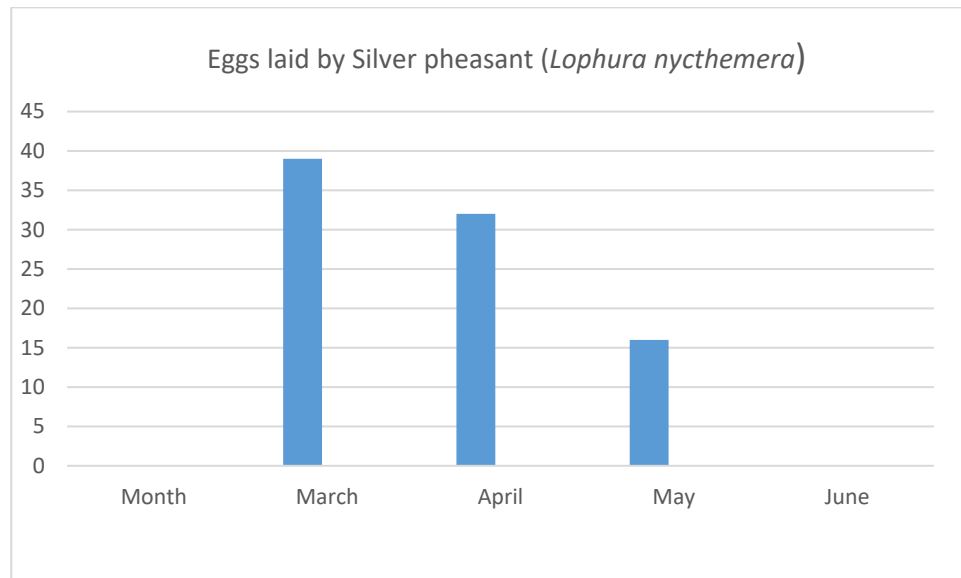


Figure 5. Number of eggs laid by Silver pheasant in breeding season.

Black Shoulder Peacock (*Pavo cristatus*)

The black-shouldered peacock is a variant of the Indian blue peacock. The main difference between the two peacocks is that the striped and black feathers of the Indian blue peacock are replaced by dark blue and green-tipped black feathers in the black-shouldered peacock.

Breeding season

The mating season begins in February, when peacocks' tail feathers grow. Eggs are laid 15-30 days after mating. Peach finches sometimes hatch as early as April or May and in late August.

Body Size

Peacocks are large birds, measuring 100 to 115 cm (39 to 45 inches) long from their beaks to their tips. Weight 4-6 kg (8.8-13.2 lbs). Female peacocks are small, around 95 cm (37 in) long and weigh 2.75–4 kg (6.1–8.8 lb (Wikipedia).

Systematic position

Order: Galliformes

Family: Phasianidae

Genus: *Pavo*

Species: *P. cristatus*

Number of black shoulder pheasant in the Malakand Safari park: Total 08 (Males: 02, Females: 04, Chicks: 02)



Figure 6. black shoulder

The graphical figure no. 7 below shows the total data of eggs that black shoulder pheasants lay in the year 2022 was only 12. All the eggs were used in broody.

In March silver pheasant have laid 04 eggs and in April 08 eggs

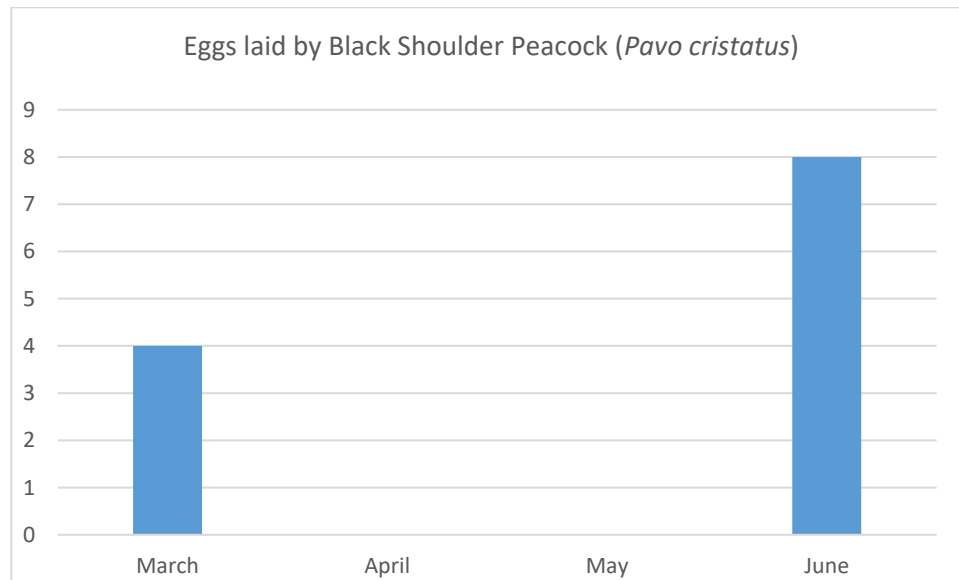


Figure: 7. Number of eggs laid by Black shoulder pheasant in breeding season.

Wood Green Pheasant (*Phasianus versicolor*)

The green pheasant, also known as the Japanese green pheasant, is a bird that lives in and is part of the Japanese archipelago. Some taxonomy authorities consider it a species of pheasant (*Phasianus colchicus*). It is the national bird of Japan.

Habitat and Distribution

Includes Honshu, Shikoku, Kyushu, and some small islands; It was also introduced (unsuccessfully) to Hawaii and North America as a game bird. It lives in forests and forest edges, shrubs, meadows, and park areas. The type is common throughout the race. He is actively involved in farming and living people. The population shown in Hawaii is constant. People in Western Europe have been breeding with pheasants for many years, and pure green pheasants are no longer found here. These species were hybridized with pheasants and released into some hunting grounds in North America. In their natural state, green pheasants outcompete ordinary pheasants. Although both species are related, they have different ecological needs and the pheasant is not well adapted to the ecology of the green pheasant habitat.

Diet: In the wild, green pheasants eat small animals such as worms and insects, as well as grains and plants. In captivity they are sometimes fed pellets, seeds, plants and live food.

Reproduction: The breeding season of green pheasants starts in March or April and ends in June. Green pheasants can breed for the first time when they are about a year old.

Size of each egg clutch: There are six to fifteen eggs in a clutch.

Incubation period: Eggs hatch for 23 to 25 days.

Systematic position

Order: Galliformes

Family: Phasianidae

Genus: *Phasianus*

Species: *P. versicolor*

Number of Green pheasant in the park: Total 08 (Males: 01, Females: 04, Chicks: 13)



Figure 8. Green pheasant.

The graph in Fig. 9 below shows the total data of eggs that green pheasants laid in the year 2022. The total number of eggs that came in this season was 44. Out of 44 eggs 35 were used in

broody and the rest of the eggs were sold. Figure 9 shows the result of eggs laid by Green pheasants in different months, 13 eggs were laid in March, 14 in April, 13 in May, and 4 in June.

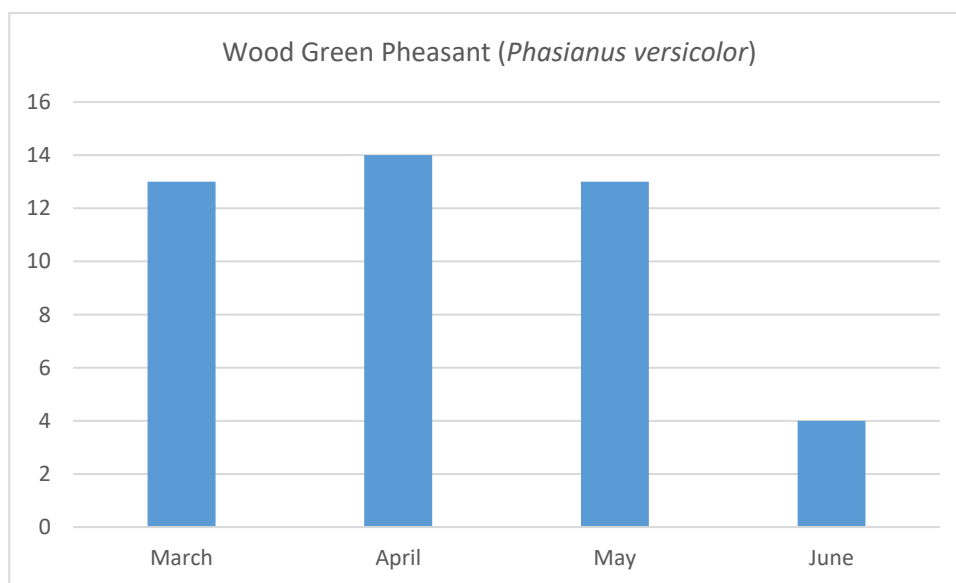


Figure 9. Number of eggs laid by Wood green pheasant in the breeding season.

White tro pheasants (*Crossoptilon crossoptilon*)

The White-Eared Pheasant (*Crossoptilon crossoptilon*), also known as the Dolan Pheasant or Bee Pheasant, is a "Crossoptilon" species. The natives of the Himalayas call it "shagga", which means "snowbird". These social birds live in large flocks and feed year-round in alpine meadows near or above the snow line.

Distribution

These pheasants are distributed in China, Qinghai, Sichuan, Yunnan and Tibet. > White-eared pheasants begin mating at the age of two and enter a serious breeding period in April. Breeding continues until June.

Clutch size: Pheasants usually produce four to seven eggs per clutch.

Incubation period: The incubation period for eggs is 24–25 days.

Body size: The cocks are considerably larger than the hens

(Wikipedia. They can reach a length of 86–96 cm

Male body weight: 2350–2750 g for males.

Systematic Position

Order: Galliformes

Family: Phasianidae

Genus: *Crossoptilon*

Species: *C. crossoptilon*

Number of White tro pheasant in the park: Total 02 (Males: 01, Females: 01)



Figur 10. White tro pheasant

The graphs (Fig. 11) below show the total data of eggs that white tro pheasants lay in the year 2022 were 7 and all of them were used in broody.

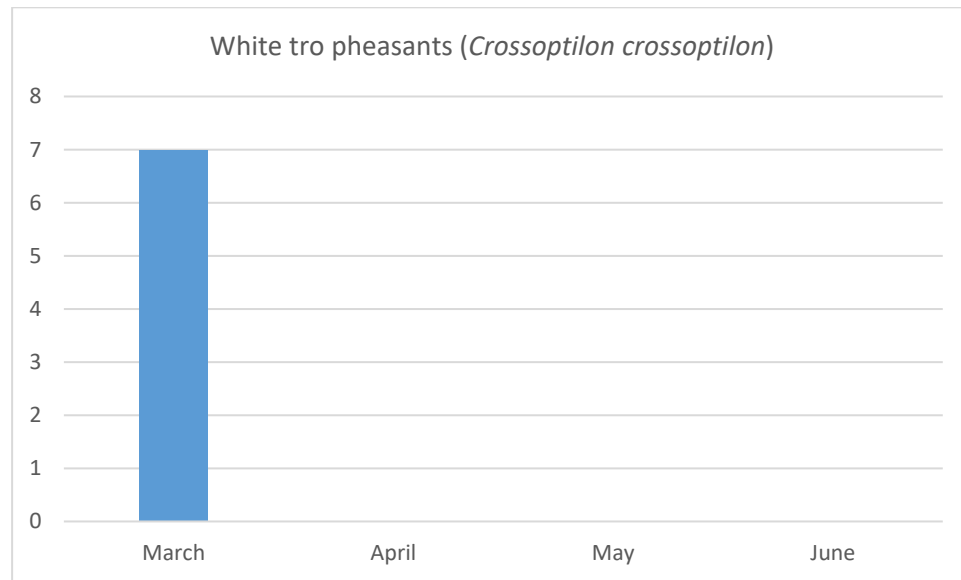


Figure 11. Number of eggs laid by White tro pheasant in breeding season.

Indian peafowl (*Pavo cristatus*)

The Indian peacock, also known as the common peacock and blue peacock, is a species of peacock found in the Indian subcontinent. It has been introduced to many countries.

The Indian peacock (*Pavo cristatus*), also known as the peacock and blue peacock, is a species of peacock native to the Indian subcontinent. It has been introduced to many countries. Male peacocks are called peacocks and female peacocks are called peacocks, but peacocks of both sexes are often called "peacocks".

Systematic position

Order: Galliformes

Family: Phasianidae Genus: *Pavo*

Species: *P. cristatus*

Number of Indian Peafowl pheasant in the park: Total 03 (Males: 01, Females: 02)



Figure 12. Indian peafowl

Figure no. 13 (Graph) below shows the total data of eggs which are laid by Indian peafowl pheasants in the year 2022. The total amount of eggs that came in this season was 12. All of them were used in broody.

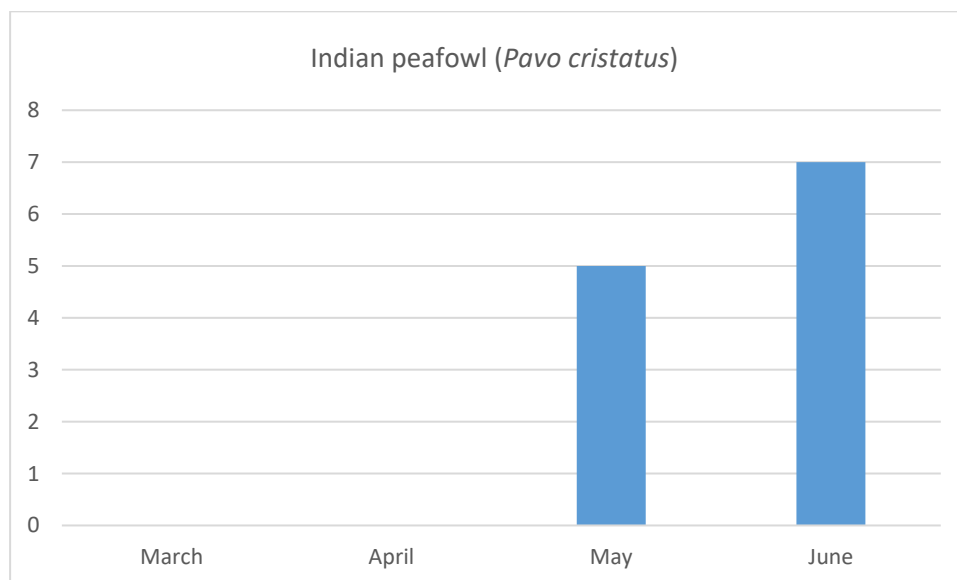


Figure: 13. Number of eggs laid by Indian Pea Fowl in the breeding season.

Discussion

In this study, we looked at breeding, hatching success, mortality rate and their effects on different pheasant species in Malakand Safari park in 2022 (January-June). In this study, we examined six pheasant species, namely ring-necked pheasant, white tro pheasant, green pheasant, white pheasant, Indian peacock and black-shouldered pheasant. A total of 4 hatching incubators were used in this study. The ring-necked pheasant lays 90 eggs, 24 hatched and 66 unhatched. The hatching rate was 26.6% compared to 49% of 52 nests hatched by female wild pheasants and only 22% of 30 nests hatched by farmed pheasants, according to Sage et al. (2003). This incubation ability and our result is about half of this result. Esen et al. (2010) examined the hatchability of ring-necked pheasants at different ages and found that there was a significant difference between the hatchability of 2-year-old pheasants (53.27%), total egg hatchability, fertilization rate and hatchability. Results of fertilized pheasant eggs of different ages showed that incubation time is related to hatching characteristics. This result supports our results. We also examined a total of 5 chicks in this study to examine White tro pheasant (Incubator, Chick 2, Chick 5, Chick 7, and Chick 8). 76 eggs were laid, of which 6 hatched and 70 did not hatched. The rate is 7.89%. Yamak et al., 2016, reported that there was a large difference in hatchability between white tro pheasant's eggs and ringed pheasant's eggs, with the hatchability of pheasant eggs being 41.54% and 96.7%, respectively. Factors affecting incubation efficiency include male-to-female ratio and nutritional status of the parents, as well as egg storage, temperature and habitat.

(Wu Yi et al., 1996), reported that the number of eggs laid per brood of white eggs was between 6 and 9. He oversaw the birth of the first chick that hatched at 7:00 in the morning. However, that died at 11:00. He then saw seven more hatches between 11:30 and 15:30. Since the pheasants have no natural habitat, the report cannot support our results. We also studied a total of 5 broods to test the name of the black-shouldered peacock (incubator, incubator, brood number 5). The black-shouldered pheasant lays 12 eggs, 2 hatched and 10 unhatched. The hatching rate is 16.66% and Indian peacocks name 3 nests. The number of Indian peacock eggs is 12, none of them hatched. The screening rate is 00%. (Tariq et al., 2019) previously revealed that the average hatching rate of peacocks was 33.5% in 2009, 61.5% in 2010, 54% in 2011, and 47.8% in 2012. Survival rates were 37.1% in 2009 and 47.8% in 2012. rates were 37.1% in 2009, 94.3% in 2010, 89.1% in 2011, and 81.6% in 2012, while the overall hatchability of black-shouldered eggs was 79.0%. (Yamak et al., 2016) recorded nest from The Trust in Ornithology (BTO) were analyzed according to (Robertson et al., 1991) Pheasant Nest Registration Scheme and Wildlife Conservation Society's Pheasant Nest Registration Scheme (PNRS). The average brood size was 11.4 and the hatchability of the eggs was 86% on average. The difference between these results is that the pheasants were not provided with a natural habitat. There are currently five incubator names in the study (incubator, incubator number 4, incubator number 9, incubator). The green pheasant laid 35 eggs, 13 hatched and 22 unhatched. The hatching rate is 37.14%. Similarly, Khan et al (2014) believe that women ovulate an average of 2 clutches, ranging from 1 to 4, and this is usually polyandry. Grip sizes range from 2 to 4, with the average clutch size being somewhere in the middle. One of the females laid a clutch of 5 eggs. The incubation period is 25 to 29 days. The hatching success rate is approximately 75%. The difference between these results is that the pheasants were not provided with a natural habitat.

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