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Chukar partridge in northern Iraq: A review article

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Abstract

Iraqi Sulaymaniyah is a treasure land of wildlife, especially avian species. Most of this treasure is not discovered, and even the guidance map is not completed yet. The geographical area of Sulaymaniyah is suitable for many types of wildlife animals, including Chukar partridges, locally known as Khasa Kaw. The Chukar partridge is present in many countries in the Middle East region, but there is a subspecies in the northern of Iraq. The Sulaymaniyah nature is a natural habitat for this fantastic bird, seen in the valleys and around water springs throughout the region. Also, Chukar partridges are used as game birds and raised as pets or for fighting between the males. Unfortunately, there is no detailed scientific study on this bird, even though it is one of the most common and beloved birds. This article provides information on the history of the bird, its life cycle, behavior, taxonomy, distribution, sex, and age determination of Chukar partridges. It also mentions the most common diseases of chukar partridge and its natural predators.

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Introduction

Chukar partridge (*Alectoris chukar*, Family Phasianidae, Order Galliformes) is the national bird of Pakistan and Iraq (1). It has a natural habitat ranging from Pakistan to Afghanistan in Asia. *Alectoris chukar* is remarkably similar to the red-legged partridge (*A. rufa*), which exists in western areas and was first introduced to North America in 1893 as a game bird. It is present in Palestine, Türkiye, Iraq, Iran, Lebanon, India, Central Nepal, the Middle East, Afghanistan, Pakistan, and Western Himalayas (2). The range extends from the Balkans to eastern Asia. *A. chukar* prefers such habitats as high mountain valleys, as in Sulaymaniyah, northern Iraq (3). Chukar partridges have been introduced worldwide, but there is limited information on their life characteristics (e.g., dispersal, habitat range, and survival). It is thought that Chukar partridges have a short lifespan, demographically offset by high reproductive rates (4). Chukar partridges are easy to breed in captivity and can be raised under intensive captive conditions with high productivity rates.

Chukars are considered more easily raised in captivity than other game bird species. There is special care for these birds in Iraqi Sulaymaniyah (5), exclusively as game birds. They are also used to fight and even kept as pets for their shiny and beautiful feather or vocalization and singing as ornamental birds. Partridge breeding for egg and meat production is increasing, which has resulted in reducing partridge populations in the wild in recent years. There are numerous species of partridges in Türkiye, but the number of wild birds has reduced drastically due to excessive hunting and the destruction of natural habitats (6). It is present in the mountains such as Safin, Mlakawa, and Hawraman (3).

Description of birds

Birds are vertebrate animals with feathers, have two legs, and are warm-blooded and egg-laying (7). All the birds today are bearded, have toothless beaks, lay eggs, have hard eggshells, have four-chambered hearts, are light in weight, have strong bones, and all have wings. The only bird without wings, the moa, remained in human hands until the end of the sixteenth century (8).

Most birds can fly, and some, such as penguins, can swim (9). Some other birds are brilliant, such as the parrot and mynah. They have high cleverness levels, and some can make simple things for themselves. Many of these birds live together in groups, have cultural knowledge of coexistence, and can pass on this knowledge to new generations. Several types of birds are migratory, whether short-distance or regional. Most birds are monogamous, at least for a year, and some live together until the mate dies. They understand each other through sound, reading, movement, and sight, and their ability to exchange information is a gift. They express happiness, fear, desire for mating, and emergency (10).

There is much talk about the origin of the birds. The latest scientific report indicates that birds evolved from the last species of dinosaurs, called theropod dinosaurs, which lived in the Jurassic Period, 165-150 million years ago. These dinosaurs appeared to have wings, teeth, claws, and a long tail like a lizard and the shapes of their wings and feathers were suitable for flight.

On the other hand, Alan Feduccia, an ornithologist at the University of North Carolina, says: No, the bird's ancestor was not a dinosaur, but a longisquama. However, the taxonomy of birds according to ornithology is based on physiological similarities and genetic makeup. Partridges belong to Kingdom Animalia, Phylum Chordata, Class Aves, Order Galliformes, and Family Phasianidae. Regarding the environment, location, and habitat of birds, they live in most parts of the earth, even in Antarctica's southern polar ice-covered lands (11). However, most bird species are in the regions of the earth's equator. Humans have unfortunately moved some of these birds from one place to another and changed the environment.

Local culture and birds

Chukar partridges are kept as pets in Sulaymaniyah, especially in the Koya district, as an estimated 20% of the houses keep this bird. People go out hunting which may last seven days and seven nights in the wild. Suppose we intend to examine better and understand the role of birds and avians on human life, thought, activity and innovation. In that case, we will conclude that their influence is more robust, more weighty, and deeper, compared to the influence of other animals, for two reasons: First, human looks at birds with the eyes of holiness because human nature has always been to look up to the sky. Since ancient times, the sky has been sacred and the earth corrupt. Because the bird has become part of the sky, it has received part of the holiness. Second, compared to other animals, birds are much safer and less dangerous. Most birds are beautiful, colorful, and good-natured and bring happiness, eggs, meat, chicks, soft feathers, and good companions as pets. Therefore, the status of birds has reached the rank of a God among some tribes and nations. For example, people worship black ravens in Alaska and eagles in Borneo (12).

According to peoples' mythology, Ashtar, the peacock, was the son of Ashtoreth, but when he became a man, he took over the powers of the time and lost all power. He takes away women, makes his statues, and replaces them with the statues of women goddesses. The Peacock Angel, called Satan by Yazidi opponents, was the God of nature and the universe, alive and dead. Because Ashtoreth was the first ancient power, her son Taus became the ancient goddess and chief of all the gods of Gath. Because the peacock was the God of all gods, most of his attributes are associated with agriculture, especially wheat. They believe that wheat has a soul, and because humans eat this soul, life is given to them. April, the beginning of vegetation, wheat, and grain in general, is the feast of the Peacock Angel. They believe the Peacock Angel will come down that day with his blessings raining on the earth. Creation is closely related to the existence and creation of the angelic peacock. The first day of creation in their mythology begins on Saturday because on this day, as they say, God created his first and most holy angel, the peacock, from his light and said to him, You are in heaven, the chief of my angels, on earth, the leader of the nation of the peafowl (13).

In Irani-Sulaymaniyah, the first arrival of the stork (Laqlaq) in early spring is celebrated with women and children going out into the countryside, singing, and celebrating. They even prepare a special meal on the day of the arrival of this bird, called Shiwa Hajila (14).

Birds have always been symbols. Even today, dozens of countries and hundreds of institutions have chosen the bird logo for their names, addresses, registrations, brands, and slogans. However, if we want to discuss the position of avian species in the culture, folklore, and literature of the world's nations, it will not be completed in a short article. Hence, we devote part of this review to the Chukar partridge.

Chukar partridge in Sulaymaniyah

If we look at the environment of Sulaymaniyah, in terms of clouds, rain, snow, the height of the land, and the abundance of forests and greenery, we see a beautiful natural environment, pleasant and suitable for the life of partridges. Therefore, the old traders say partridges existed in most parts of Sulaymaniyah. There have always been Chukar partridges in the mountains near the forest, snow-covered woodland, and mountain peaks. The partridge likes cool air; hence, it lives less in tropical areas. It can withstand sub-zero temperatures in winter but is tolerant of heavy snowfall. Some live in forests where the amount of rainfall per year reaches around 400 mm.

At the beginning of life, all animals were wild, each according to its instincts, weather, and behavior in its divinely created natural environment. Over time, the necessities of daily life have led man to domesticate and raise some of the animals he has destroyed. We must not forget that some animals are created by nature to be not domesticated, even if they live near us. Such as lizards, owls,

coyotes, and foxes. The partridge is one of the domesticated birds. After becoming domesticated, the caged partridges eat, drink, and fight but spend most of their life in a cage, and they will not be released back to the wild. Like chickens, fowls, ducks, geese, and peacocks, the partridges born at home lay eggs, hatch, and raise them. Because the chicks grow up and open their eyes in the home environment, like tamed chicks and chickens, they become pet birds and domesticated (Figure 1).

Figure 1: Chukar partridges during snowing.

Name and taxonomy of the Chukar partridge

There are seven types of red-legged partridge of the genus *Alectoris*. First, the rock partridge (*A. graeca*) has 22 subspecies, including the several Chukars presented to America and other areas. The Spanish and French red-legged partridge (*A. rufa*) has five subspecies. The Barbary partridge (*A. barbara*) has its main native range in North Africa and the Canary Islands. The monospecific Arabian red-legged partridge (*A. melanocephala*) has two subspecies. The genus *Alectoris* also includes the Chukar partridge (*A. chukar*). Philby's partridge, or Philby's rock partridge (*A. philbyi*), is a relative of the Chukar and is native to northern Yemen and Southwestern Saudi Arabia. Przevalski's partridge, or the rusty-necklaced partridge (*A. magna*), is found only in China.

As one might anticipate when dealing with a genus of birds with an extensive range across various habitats, frequently in far-flung corners of the globe, there have been many differing viewpoints on how to differentiate the many species or subspecies (15). According to the literature, the Arabian red-legged partridge is divided into two subspecies: *A. melanocephala melanocephala* and *A. melanocephala guichardi*.

Several experts in the past, including notable scientists, believed that the Indian subspecies of the rock partridge (most likely the subspecies that have been chiefly brought into America) should be designated a different species. Later, they elaborated on this idea, believing all rock partridge species east of Turkey (excluding *magna*) should be classified as a different species, *A. chukar* (1).

The Chukar Partridges are a kind of Chukar bird. *Alectoris chukar* is a common hunting bird with a range that stretches from the Balkans across eastern Asia. Human-mediated hybridization with congeneric species (*A. rufa* and *A. graeca*) from Europe or exotic conspecifics (from eastern Asia), primarily through importation, poses a threat to the Chukar (16). In order to gain crucial genetic information for managing this species, researchers looked into Chukar populations in the Middle East (Iraqi Sulaymaniyah, Cyprus, Türkiye, Lebanon, Armenia, Georgia, Iran, and Turkmenistan). Utilizing Mediterranean and Eastern Asian populations as intraspecific outgroups, studies sequenced the whole mitochondrial D.N.A. (mtDNA) Control Region. The Cypriot Chukars (wild and farmed birds) revealed a high level of diversity, solely local genotypes, and signs of demographic and geographical growth.

Cyprus has the Middle East's oldest *A. chukar* genotype (17). Given the potential of genetic contamination, scientists conclude that the current management of game species like the Chukar can no longer avoid using molecular techniques. Birds belongs to Kingdom Animalia, Phylum Chordata, Class Aves, Order Galliformes 21 in numbers, Family Phasianidae the class aves contaunes 248 families, Genus wich are 2057 genera and Species estimated more than 10,000 bird species. (18).

Fourteen geographical subspecies of partridges exist, ranging from Türkiye and the Mediterranean islands to India and Central Nepal in the east. Türkiye, Palestine, Iran, Lebanon, Iraq, India, Central Nepal, the Middle East, Pakistan, Afghanistan, and the Western Himalayas are all places where it may be found. It is available in the Sulaymaniyah in Sulaimani, Erbil, and Dhouk. Chukar partridge, rock partridge, red-legged partridge, and Indian hill partridge are common names for this bird, found at altitudes ranging from 2000 to 4000 m, and can adapt to dry, rocky and high mountainous areas (1).

The Chukar habitat is mountainous areas such as Sulaymaniyah, India, Pakistan, and Afghanistan. These regions are characterized geographically by massive peak chains such as the Himalayas, Karakorum, and the Hindu Kush, which contain the world's highest peaks and certainly present some of the hardiest mountainous terrains. Many valleys weave a pattern through the mountains, many with lovely streams and rivers, and the land is cultivated where conditions are adequate (19).

The term chukar has been pronounced in various ways, and while the above spelling is not used solely in scientific publications (20), it is the most prevalent. Chukar, Kabk, Kaw, Keklik, Kawg, Chikone, Khasa Kaw, Kaukau, Kawak, Chukru, Kakle, Zarkar, Chukor Chel (a particular name given to the female Chukar in the Hawrami dialect), Chickore, Zharazh or Chel (a particular name given to the Chukar in Hawrami dialect) and Nek-pa are some of the vernacular nicknames given to this bird across its natural habitat (Figure 2).

Figure 2: Male (upper left) and female (upper right) Chukar partridges (*Alectoris chukar*). Newly hatched baby chukar partridge (lower). Photos captured by the authors.

History of partridge domestication

Since man came to earth, he looked up for the first time and saw that he was not alone and that hundreds of other animals and creatures were within his boundaries. Some are on the ground, others in the water, and some fly in the sky (21). Forced or intentionally to continue and ensure life, man acquired a double acquaintance with the animals around him: friends and strangers. The beneficial, self-sufficient, and self-interested animals, such as sheep, goats, cows, goats, dogs, chickens, ducks, pigeons, and fish, were domesticated. On the other hand, animals that were a threat to his life, environment, land, and family, such as bears, leopards, wolves, lizards, snakes, scorpions, and hyenas, were his enemies. Humans learned how to make the first group their friends and plan to protect themselves and keep away from the second group (22).

Roughly, there are three main epochs during which partridge domestication was initiated. The first, during which the classical domesticated birds originated, dates back to ancient civilizations, i.e., 3000-1000 years B.C.B.C. for those developed in Europe and Asia, somewhat later for those in Central America. The second epoch began in the late Middle Ages at the time of the Renaissance, i.e., the fifteenth-century A.D. and after that. The last epoch is not much older than 100 years and is still in progress. Through the three epochs, bird breeders' aims and methods have changed substantially. In particular, the success in the deliberate creation of new breeds increased more and more following progress in biological science (23). Domestication of birds was done for economic uses such as food, pets, materials, clothing/fashion, sports or hobbies, and assisting hunters and gatherers. Partridges were used as symbols, inspirations, heraldry, mythology, and in the arts, such as poetry, prose, music, dance, painting, and sculpture (24).

Description

Partridges are medium-sized avians that range in length from 33 to 38 centimeters. The wings and back appear light greyish brown, while the belly, throat, and cheeks are pale; nevertheless, the throat is bordered by a black ring known as the gorget. It has pink or dark crimson eyelids, shanks, and toes. There are fourteen plumes on the tail. Regarding physical traits, both sexes appear to be identical (25,26). It only breeds yearly, depending on climatic circumstances, and the mating season generally falls between April and July. Chukars are primarily herbivores who consume leaves, seeds, grasses, nuts, and even fruits and insects if they are accessible (27). Partridges are a polytypic species having 14 subspecies worldwide. This bird has been widely reared in recent decades, with farm-reared partridges being raised regularly for discharge into the environment and for meat and egg production as a protein supplement and hunting.

The Chukar is a stout, upright, intermediate partridge with a striped head and throat, plain upper parts, a highly banded abdomen, and a rufous outer tail plum about 15 cm tall. A heavy black line contrasts the white throat from the grey head and breast over the brow, eyes, and neck. There is no seasonal change, and both sexes have the same plumage appearance (28). Males (490-600g) are more prominent in length and bulk than females 450-580g. The beak, eyelid borders, shanks, and toes are coral rosy to deep red or crimson. A tiny tarsal spur can be found in both sexes, but it is more common in males. The partridge is a powerful flier and a quick runner, although it still flies small distances, generally downhill (29).

Youngsters are slimmer than adults, with duller and less distinct markings on the head, neck, and abdomen and one black band on the head. Partridges are hunted in their natural environment and are primarily bred for natural reintroduction, game, flesh, and egg production as a new source of protein and hunting tourism (30).

The chukar partridge was once thought to be conspecific with the Rock Partridge (*A. graeca*), but it is now recognized as a separate species. There are no *Alectoris* species local to a particular nation. However, there are subspecies, such as the Chukar partridge of Sulaymaniyah, known as *Alectoris chukar* (31,32). The rock partridge (*A. graeca*) and the red-legged partridge (*A. rufa*) are similar to the chukar partridge. The red-legged partridge is distinguished from the chukar partridge by a light grey front and rear crown and a brown (not grey) neck. The dark collar below the red-legged bird's throat is also surrounded by white feathers, with just a black strip extending off the back rim of the collar, giving it a broader look, and the abdomen has more chestnut striping (33).

Alectoris graeca is a plump partridge with a bright brownish back, grey chest, and buff abdomen. The gorget is black, and the face is white, giving it a Chukar-like appearance, except it has a greyer rear and a white foreneck

instead of a yellowish one. This species may be distinguished from red-legged partridges by its finely defined gorget (34).

Gender and age determination

Efforts have been made to identify acceptable exterior sex parameters for Chukar partridges. Many references utilize the existence of the metatarsal spur to identify males from females, and this trait has likely been one of the key yardsticks for differentiation in future years (35). Observations in the wild revealed that the metatarsal bony spur was not limited to male birds, with several females possessing well-developed spurs, so this trait might not be utilized through complete assurance. Many investigators agree on the overall physical variance among the sexes, with the mature male bird being greater and bulkier than the female, but this is a relative matter. Based on visual findings, males tend to be more stalling than females. The males' beak and tarsus are a clearer orange than the females'. The males' beak and tarsus looked to be bigger and heavier. Male Chukars appeared to have a more pronounced metatarsal spur structure. As in males, the neck patch surrounded by the black mask seemed buffier. The gray superciliary stripe seems lighter and extends upward to the crown with males (36).

Older age groups are more straightforward to differentiate than younger generations, and the accuracy of sexing Chukar partridges in hand would likely rise in the spring when the Chukars are in the breeding state. Even during mating season, the accuracy of sexing birds physically and in a space in the field has not been routinely verified. When a pair of birds are together, and it is feasible to see them closely enough, there are visible variations in their physical appearance and behavior, and the maximum accuracy of sexing by visual observation is likely achieved at this time (37,38).

Juvenile birds' ages can be determined by the presence of speckled secondary plumage on their backs. By the time the bird reaches the age of one month, these feathers have all been molted, and the Chukar has acquired its complete adult coloring. As a result, this trait cannot be relied upon to detect aged birds effectively throughout the hunting session. According to the pattern followed by most Galliformes, young Chukar partridges do not molt their outer two primaries during their first year of life. This characteristic, together with the shape, quality, and coloration of the outer two primaries, can be used to determine the age of a bird (39).

Male and female adults have a black forehead and lines through the eye as a gorget among the throat and topmost chest; grayish for the forehead, which runs back as a distinctive supercilium, often shading posteriorly (40). The crown is red on the dorsal neck, ashy on behind and scapulars, and then ashy on the lower back, hindquarters, and top tail coverts. Muffs are dull in color; middle tail feathers are ashy and drab, and the outer feathers are the same but pale chestnut at the end. The outer scapulars have true pale grey centers, tinier and median coverts, innermost secondaries such as the back, and more minor and median coverts and innermost second ashy outer wing-coverts. Primary and secondary webs are brown with a yellowish-buff spot in the center (41).

General behavior

Chukar stays in its natural environment from March through October at 5,000-6,000 feet altitudes. It prefers rounded grassy slopes with few plants and no forest. Flocks of Chukar are guaranteed to be found in such places, especially near patches of agriculture and on sections of rocky land. The natural habitat of Chukars in Sulaymaniyah is favorable for providing more than enough shelter. Also, Tallus hills, rocky outcrops, scattered bushes, and patches of grass across an uneven landscape provide enough hiding places for the Chukar. Chukars like an open, unobstructed view over their realm, and they are frequently found sitting atop a high rock overlooking it. When disturbed, they will flee uphill, which is an effective strategy for evading a dedicated hunter (42). Chukars have already been observed roosting beneath sagebrush, trees, rock outcrops, and open rocky regions in Sulaymaniyah. For roosting, they do not prefer deep cover. Dusting is a crucial aspect of Chukar's daily routine. Dusting bowls can be found beside pathways, under the shade of bushes and trees, along the foot of rocky outcrops, and especially around sprinkling holes, where the Chukar partridge loves the moist dust. They are oblong oval despairs in the ground with a few feathers and droppings in and around them (43).

Annual and elevational movements are common, and the water seems to be the decisive element in Chukar partridge distribution and migrations during the spring, summertime, and early autumn. Chukars have been spotted in regions where water is accessible, from the valley bottom to high mountain basins. Subsequently, during the main fall rains, when lawns begin to germinate and delicious food becomes available, the Chukar partridges, in coveys, migrate freely across their variety and occupy previously abandoned dry areas. After much snow, the Chukars will relocate to lower altitudes when more food is available, and then they will reappear in higher altitudes when the snow melts. When the Chukars couple in March, there is a general migration throughout their range. During the day, the Chukar traverses over a mile radius for grazing, watering, and resting (35).

When a covey is flushed, these birds erupt into the air and rise by whipping their wings fast several times and then flying downhill, a flying pattern that changes only in extreme circumstances. They swing uphill at the end of the glide, narrowly clearing the ends of the plants and terrestrial. The design depicted is usually hemispherical. The average flying length appears to be between 40 and 300 meters; nonetheless, it is not unusual to witness a partridge soar over a canyon and terrestrial half a mile distant on a mountain

slope. They may go further if they are very eager. Chukars frequently hold tight at the end of a flight, making them difficult to detect even if the observer is several feet far from them. Short flying of only several feet occurs in cliff-like regions, where they must use their wings to get from one pinnacle to the next (44,45).

Chukar partridges have been seen near water in the early morning and evening times of early summer whenever the temperature increases. Clockers, massive feces of incubating females, are frequent in watering holes at this time of year. Following the hatch, the Chukars are seen more regularly at the water as the climate gets warmer than at other times. Considering the Chukars' preference for being near water for most of the day in the summer heat, rare broods with chicks and attending adults have been discovered on hill borders over a mile from the nearest identified groundwater in the early morning. The distribution and availability of water in the Chukars' habitat significantly impact their summer dispersion. Chukars use many types of water, from rivers to tiny streams, springs, and practically stagnant seeps that barely dampen the ground (46). Birds were seen drinking in mine shafts at which the river was almost ten feet below the ground's level and in mine tunnels where a weak light illuminated the water on other occasions.

The eating activity appears to be highest in the mid-morning and afternoon. While eating, the Chukars move around a lot and cover much ground. During the hot summer months, they are frequently seen foraging near water. Their movements are careful during the nesting season, and when they must cross an exposed area of ground, they sneak over, dropping their crowns and dashing. They regularly stop in place with their heads upright to study the environment. Large flocks of birds might be seen grazing on preferred slopes or benches throughout the summer and autumn. Small farming pockets in canyon or valley locations are usually widely used, although uncommon in most parts of Sulaymaniyah (47).

Chukar partridges are diurnal, meaning they feed on the ground in the morning and afternoon. They eat various seeds, bugs, lawn blades, base shoots, cloves, stems, branches, and vegetation buds. Grains make up the majority of the food in Sulaymaniyah. Insects make up a significant component of the diet of young partridges, such as termites, larvae of caterpillars, cricket, ant, and bug eggs but insects make up less than 15% of the mature diet (Figure 3) (48).

Social behavior and groupings

Chukar partridges do not migrate, and their seasonal movements are altitudinal. When flushed, the flight is usually confined to short lengths downhill. When negotiating uneven terrain, they hop instead of flying and prefer running rather than flying. A covey is the primary social group consisting of numerous adults from 5 to 40 and their youngsters. The size of a covey is determined by various factors, including the period of the year, humidity, and climate. When it is dry, the birds concentrate around water sources, although they can fly up to 3-4 kilometers away. They will spread after rain, and the coveys will be reduced to family groupings (37,49). As bigger, unconnected groups converge and interact, enormous coveys arise.

Figure 3: Juvenile Chukars in a cage.

Alarm, social connection, agonistic sexual interactions, and fighting calls are among the vocalizations used by Chukar partridges. The most common call is a low chuck-chuck, which transforms into a Chukar-Chukar over time and may be heard from a considerable distance, earning the name Chukar (50). Visual signals are likely to be used in communication (51).

The Chukar is a monogamous bird that exits as coveys and begins breeding in mid-March. Light exposure, temperature, and feeding circumstances play a role in whether pairing occurs sooner in February in certain places. Chukars do not mate or only pair for a short time before regrouping into coveys, which indicates a lousy nesting season (49).

When it comes to matching, there is much dispersion. During the cold, the population remains relatively stable. The dispersion that comes with partnering is a crucial step in hastening the Chukars' distribution and subsequent settlement in vacant habitats after their release. Pairing occurs from mid-February to the end of March (41), and birds older than a year are the first to mate. Also, males' testicular recrudescence starts in late January, reaching peak

breeding capability in late March and lasting for about three months. Recrudescence begins around February 1 and ends with laying eggs between mid-March and mid-April (Figure 4). Once Chukars are coupled, territorial behavior emerges, with the male becoming aggressive and fighting with other males entering the broad nesting territory. This territorial defense's scope is debatable (1).

Rather than defending a specific nesting place, the male partridge merely repels other male partridges from the female's locality. Courtship cries are particularly abundant throughout the coupling process, and both sexes utilize various specialized calls that only occur during the breeding season. The male performs in front of the female. He charges at her with his head down, neck elongated and bloated, and one of his wings stretched, descending till the edge fixes the ground. The actual mating of the couple is the conclusion of this courting behavior (52-54).

Figure 4: Female Chukar partridge is sitting on its eggs.

Natural predator and conservation status

The Chukar partridge is not endangered internationally. Populations are constant or growing in most locations, while habitat degradation and aggressive hunting may impact some native populations in their natural range. The International Union for Conservation of Nature (I.U.C.N.) lists the Chukar partridge as a species of minor concern (55). The species has a vast range, a steady population trend, and an enormous population size (56).

However, diverse opponents such as magpies, wolves, and various earth predators, notably snakes and even humans, have been documented as being involved in damaging the eggs in Chukar partridge nests, which is unfortunate. Range fires, carried mainly by cheatgrass, are widespread over vast expanses of Chukar habitat (57). Because cheatgrass usually turns tinder-dry by early June, an early fire might result in some nest damage and the loss of freshly fledged chicks. The Chukar partridge's enemies are the coyote, wildcat, hawk, falcon, and golden eagle. Predation is thought to be negligible when the birds are in good health. The Chukar partridge is a highly vigilant avian species, and a sentinel bird will generally sound the warning before the predator arrives. Cats, aggressive hedgehogs, rodents, and hunting dogs are among the Chukars' other predators, entirely of which do most of the damage during the breeding time of year or the days following hatching when the youngsters are unable to take wing (56). Road fatalities do occur, although they are rare, especially when solid highways cross suitable Chukar habitats. Some Chukars also fall into wires, but this is a minor problem. Drowning of together mature and young birds in animal watering holders, big open-top water loading tanks, and exposed holes or shafts that the Chukar partridge cannot escape or fly out of is perhaps the most common cause of unexpected fatality. Baby birds suffer the most losses and are susceptible to the animal watering holder, which is sometimes the only accessible water source aside from the weather. All Chukars are in excellent shape and have adequate fat reserves (35). There is no evidence that the snow harms Chukars in Sulaymaniyah, but they may have died due to a lack of food.

Most common diseases of Chukar partridge

Like any other creature, Chukar Partridge faces many diseases and conditions like accidents, trauma, and predator injuries. Diseases can be divided into congenital and acquired diseases, including infectious and non-infectious ones. Infectious diseases may be contagious (e.g., avian pox) or non-contagious (e.g., avian tuberculosis). On the other hand, non-infectious diseases include degenerative diseases, deficiencies, allergies, and tumors). The most common and notable transmitted diseases are listed in Table 1.

Despite the Chukar partridge's environmental and socio-economic importance as a prey species and a game bird, as well as the documented effect of infections on other galliform bird populations, research on illnesses of the Chukar partridge is still limited. The relevance of illnesses in the dynamics of free-living Chukar partridge populations is little understood. In particular natural populations, however, enzootic avian poxvirus may be responsible for the mortality of partridge chicks. More data, on the other hand, suggests that intensive partridge management (through the release of farm-reared partridges, extra feeding, or predator control) encourages the spread of infectious and parasitic diseases.

In Chukar partridge rearing facilities, infectious and protozoan agents and monoxenous helminths common in farmed galliforms are exceptionally usual. The occurrence of such helminths in wild Chukar partridges and other disease outbreaks may be linked to the release of farm-reared Chukar partridges. The gathering of Chukar partridges and other birds near feeders and water sources, as well as the absence of predators that would remove ill Chukar partridges, may

favor other disease cases in the wild, such as avian tuberculosis. Intense supplemental feeding may cause physiological problems in juvenile wild Chukar partridges, such as improper development and eventual mass fatalities during summer.

Since many Chukars typically congregate at a tiny spring or leak, it would seem that these places would be the predominant route of disease transmission. Thousands or hundreds of wild Chukar partridge have been spotted in the area (58). We are unaware of any cases in which illness or parasitism has resulted in significant death (59). Chukars in game farms are prone to various common bird illnesses, and coccidiosis is the most frequent infection (60). However, most birds fight with each other, causing fractures, lacerations, and infectious diseases (61), among other clinical cases (62,63). So, we need to sedate the bird to diagnose the disease, and if surgical intervention is needed, we can do general anesthesia (Table 1).

Table 1: Common pathogens and diseases of partridge

Type of pathogen	Common diseases caused by them
Viruses	Highlands J Virus, Newcastle disease, avian influenza, avian pox, infectious bronchitis disease
Bacteria	Salmonellosis, mycoplasmas, pasteurellosis, tuberculosis, avian botulism,
Fungi	Aspergillosis, candidiasis, mycotoxins
Internal parasites	Protozoan e.g., coccidiosis, trichomoniasis
	Trematodes e.g., *Dicrocoelium* sp.
	Cestodes e.g., *Cotugnia latiproglottina*
	Nematodes e.g., *Ascaridia numidae*
External parasites	Mites, lice, ticks, and myiases

Life history and history as a pet

The greylag goose (*Anser anser*) was possibly the first avian species to be domesticated, preceded by the rock dove (*Columba livia*). Domestication happened at least three thousand years ago in southwest Asia, as the eastern subspecies of graylag geese and the Near-East and Indian subspecies of the rock dove appear to have been engaged. Several centuries later, the red junglefowl (*Gallus gallus*) and, maybe even afterward, the mallard (*Anas platyrhynchos*) were domesticated near Mesopotamia. Intelligent civilizations domesticated these animals with an extraordinary cultural level that had previously tamed mammals, such as small ruminants in southeastern Asia since 10,000 or 8,000 years B.C. and canines since 9,000 BC (64).

Most ancient domesticated breeds remained through the Middle Ages and into today. They were frequently raised in extremely tiny and isolated groups, resulting in a more or less rapid diversification of breeds inside the species. Recurrent genetic interchanges with wild populations occurred in certain species, such as mallards and graylag geese. One domesticated avian species, the Guineafowl, very certainly got extinct in captivity, at least in The western world, and was only recently domesticated in the 16th century by the Portuguese, who discovered it in west Africa. However, it was not until the 17th century that it became a widely domesticated species throughout Europe (65).

The last epoch of avian captivity began in full flow two centuries ago. Pet bird fanciers assisted in raising the number of new domesticated avian species and, in certain circumstances, to the nearly inconceivable number of various breeds within the same species. Breeding species as an avocation has several motivations: Lonely individuals get pets, fanciers' objectives are met in raising high-standard birds for displays, and fans enjoy cockfighting and similar activities.

The Chukar partridge is used exclusively in commercial enterprises in Australia, and Chukars are considered more easily raised in captivity than other game bird species. There is special care for these birds in Iraqi Sulaymaniyah (5).

Chukar partridges are supposed to have a short life expectancy, compensated by their high fertility rates. They are easy to breed in captivity and may be reared in intense captivity with high productivity rates. The Indian Chukar partridge (*A. chukar*) is the only partridge breed utilized commercially in Australia. They are one of the easier hunting bird species to raise in captivity among the hunting bird species.

Conclusion

Competition, predators, parasites, infections, hunting, accidents, and habitat degradation are just a few issues that wild chukars suffer, limiting their activity, development, and life. Many common avian parasites, such as protozoa, helminths, lice, ticks, and mites, are vulnerable to Chukars. The study of Chukar is essential and significant to reduce the impact on national wealth, improve efficiency, and increase the possibility of breeding or adapting this bird in new locations. It also plays a vital role in spreading diseases and parasites to domesticated birds and even humans. In terms of environmental science, all these measures we mentioned earlier to protect biodiversity are the foundation of maintaining the environmental balance. Accordingly, bringing foreign animals into the domestic environment is not allowed, as the introduction of rabbits to Australia caused

the destruction of the farmers' lands and the death of many other animals. Mass extermination of a particular animal is not permissible because the extermination of 125,000 American eagles within a year and a half resulted in increased rat populations and caused significant damage to farms and households that distribute balance. Also, using chemical agents without proper information is not permitted, As national, religious, and humanitarian partners, we must be aware of the rights of animals that share life and a safe environment and be compassionate and respectful of their feelings to maintain the environmental balance. It should be noted that incidental killing of animals, torture, exhaustion, imprisonment or use outside their field of work is prohibited. We wish this work of review article to be well regarded in the direction of protecting animals and maintaining the ecological balance in the Sulaymaniyah and the world.

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Conflict of interest

The authors declare no conflict of interest.

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حجل تشوكار في شمال العراق: بحث مراجعة

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الخلاصة

مدينة السليمانية في شمال العراق هي أرض الكنوز للحياة البرية، وخاصة أنواع الطيور، ولكن لم يتم اكتشاف معظم هذا الكنز، وحتى الخريطة الإرشادية لم تكتمل بعد. المنطقة الجغرافية في السليمانية مناسبة للعديد من أنواع الحيوانات البرية، بما في ذلك حجل تشوكار، والمعروفة محليا بالعربية: القبج الشمالي، الحجل الجبلي. حجل تشوكار موجود في العديد من البلدان في منطقة الشرق الأوسط، ولكن هناك نوع فرعي في شمال العراق. تعد طبيعة مدينة السليمانية موطنًا طبيعيا لهذا الطائر الرائع، الذي يرى في الوديان وحول ينابيع المياه في جميع أنحاء المنطقة. أيضا تستخدم حجل تشوكار كطيور الصيد وتربى كحيوانات اليفة أو للقتال بين الذكور. للأسف، لا توجد دراسة علمية مفصلة عن هذا الطائر، رغم أنه من أكثر الطيور المحبوبة في شمال العراق. يوفر البحث الحالي معلومات عن تاريخ الطيور ودورة حياتها وسلوكها وتصنيفها وتوزيعها وجنسها وتحديد عمر حجل تشوكار. كما يذكر أكثر أمراض حجل شوكار شيوعا والحيوانات المفترسة الطبيعية.