



# A descriptive study of the Female kestrel in northeast of Libya

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## ABSTRACT

This study aims to provide a preliminary description of some external phenotypical characteristics and some characteristics of the parts of the digestive tract of the kestrel bird, which inhabits the Green Mountain region in northeastern Libya, in order to create a database for all researchers and those interested in wildlife, especially in the African environment, which is believed to be the original home of the bird. The study was on 4 adult females of kestrels. The data includes body length, wingspan length and width, and the length and circumference of some parts of the body. The data also includes body weight, weights, and lengths of the parts of the digestive tract.

**Keywords:** kestrel, phenotypic traits, digestive tract

## 1. INTRODUCTION

The kestrel bird (Kestrel), whose scientific name is (*Falco tinnunculus*), is called locally in eastern Libya (Burgis), and it is a small predator bird. It is endemic (does not migrate) and belongs to the falcon's family (Falconidae). It has a clear activity in the Green Mountain region in northeastern -Libya due to the presence of mountains and forests. There are some migratory species that come from the far north of Europe to spend the winter in southern Europe and North Africa, and then return in the spring to their original home in northern Europe to breed (AL-Hrir, 2014).

The kestrel is small in size, and it is distinguished by the length of the wing and tail and the shortness of the toes. The body length from head to tail ranges between 32-39 cm, and the wingspan ranges between 65-82 cm. The average weight of an adult male is 155 g (136-252 g), while the average weight of an adult female is 184 g (154-314 g) (Orta, et al., 1994).

Both sexes reach puberty and can reproduce at the age of one year, and that the female incubates

mostly (3-7) eggs in the brood hatching after about 30 days, and the young remain in the nest for a period of about 5.5 weeks of age and are dependent on the parents for several months with their ability to hunt immediately after leaving the nest (AL-Hrir, 2014; Jones, 1987; Jones and Wahad, 1985 ; Village, 1990 and Groombridge, et al., 2002).The current taxonomy indicates that there is a link between the kestrel (*Tinnunculus*) and the falcons (*Disodectes*), and this is suggested by recent molecular studies (Olsen, et al., 1989 and (Seibold, et al., 1993).

In a study on the evolution and molecular evolution of the kestrel in Africa and its relationship to other regions, it was reported that the old world is the original home of the bird, and from there it moved to the New World, where it moved to Madagascar and then to Mauritius and then the Seychelles, (Groombridge, et al., 2002)

The studies suggest that the origin of the existing type of bird in Australia, goes back to Africa. And its group consists of 13 species, one of which is in the

New World and 12 species in the Old World. Africa alone includes 10 species, and this indicates the African origin of the kestrel (Boyce and White, 1987 and Village, 1990). Orta, et al., (1994) indicated that the species endemic to the Arab region is *F. t. rubicolaeformis*.

Jones and Wahad (1985) and Mikula, et al. (2013) stated that the kestrel's diet depends on many types of prey such as arthropods (insects and spiders), lizards, birds and small mammals (such as field mice), and it also has the ability to hunt hard-to-catch species such as bats and swifts. Most of the hunting cases of the kestrel bird are by attacking while flying and pounce on the prey (Dashing hunting technique), it is also characterized by the process of standing and waiting during the hunt (sit - and - wait) and the rate of hunting increases in the presence of the partner, and the hunting activity begins with sunrise and continues for about one hour after sunset.

These studies also indicated the reasons for the decline in bird numbers, which are; The significant decrease in forest areas led to a decrease in the numbers of small birds and insects, which negatively affected the number of kestrels ; the widespread use of agricultural and sanitary pesticides ; modern building styles led to the disappearance of cracks and openings in the ceilings, which negatively affected the number of prey from Small birds and rodents ; Destruction of nests by other animals and birds and consideration the kestrel as hated bird by most of the population as they believed that it attacks poultry (Jones and Wahad, 1985 and Mikula, et al., 2013).

The use of modern technologies heralds the possibility of increasing the number of kestrels, and that depends on taking the first brood of eggs a week after the incubation process and transferring them to artificial incubation, which forces the parents to put a new brood in the nest, and this requires careful monitoring of the nests, whether wild or in the reserve.

Duke, et al. (1997) recorded in American Kestrels receiving high fat diets that the intestine had numerous long thin villi and well-developed smooth muscle layers' characteristic of the ileum. The intestine distal to the cecum had short, lobular, less numerous villi and a thin smooth muscle layer characteristic of the colon. While the cecum was relatively small, its

lumen always had contents. The colon, like the duodenum, was quite long compared to other falconiformes and other avian species except Ostriches. At the junction between the colon and the cloaca, a small, dense structure, presumably the bursa of Fabricius, was found as in every species.

This study aims to provide a database of phenotypic characteristics and some characteristics of the digestive tract of the kestrel bird located in northeastern Libya that may benefit researchers and those interested in wildlife in order to preserve this bird and increase its numbers. It is considered the first descriptive study on the kestrel in northeastern Libya.

## 2. MATERIALS AND METHODS

A number of five adult females of kestrel birds were obtained from a hunter from the Asaad region in the far north-east of Libya in March 2022 AD, and then the birds were transferred to the Animal Physiology Laboratory in the Department of Animal Production - College of Agriculture - Omar Al-Mukhtar University, where external phenotypic measurements were taken from the weights Then, after slaughter the weights and lengths measurements of the parts of the digestive tract were taken.

## 3. RESULTS AND DISCUSSION

Table (1) shows some of the external phenotypic Parameters of the kestrel bird in northeastern Libya, which were taken from 4 adult females, where the average body weight was (172.45 g), and this was close to what was published by Orta, et al. (1994) while the body weight was more than what was reported by Duke, et al. (1997) about the adult males of the American kestrel (107.21 g). Our study provides that the average body length was (33.25 cm) and wing span (70 cm) which are slightly little than the range recorded by Orta, et al. (1994) and AL-Hrir (2014)

Table (2) shows some of the weights and measurements of the digestive tract of adult females of the endemic kestrel in northeastern Libya and when compared to what was published by (Duke, et al., 1997) in their study on adult males of the American kestrel It was found that the average weight of the liver in this study was higher (4.03 gm vs. 2.49 gm), and the weight of the gizzard was much higher (3.87 gm vs. 1.54 gm), and the weight of the glandular stomach was higher (1.34

gm vs. 0.52 gm), while the length of The alimentary canal without the esophagus was longer (60.0 cm vs. 42.6 cm) and the intestines were also longer (48.25 cm vs. 38.9 cm)

**Table 1. Average external phenotypic traits of kestrels in northeastern Libya.**

Adjective	Value	Standard deviation
Number of birds	4	----
Gender	Adult females	----
Body weight (g)	172.45	17.5
Body length (cm)	33.25	0.96
Wing length (cm)	31.5	3.11
Wingspan (cm)	70.0	5.66
Tail length (cm)	15.75	1.26
Beak length (cm)	1.52	0.09
Chest circumference (cm)	17.75	1.71
Leg length (cm)	3.88	0.25
Hip length (cm)	6.75	0.50
Thigh length (cm)	5.25	0.65
Leg diameter (mm)	4.33	0.25
Front paw length (cm)	0.92	0.12
Back paw length (cm)	1.3	0.22
Head width (cm)	3.09	0.14
Distance between eyes (cm)	2.14	0.093
Head circumference (cm)	10.9	0.63

**Table 2. Average weights and measurements of the digestive tract of kestrels in northeastern Libya**

Adjective	Value	Standard deviation
Number of birds	4	----
Gender	Adult females	----
Liver and gut weight (g)	14.32	6.08
Liver weight (g)	4.03	1.56
Heart weight (g)	1.79	0.57
Gizzard weight (g)	3.87	0.90
Glandular stomach weight (g)	1.34	0.73
Gut length (cm)	60.0	6.48
Esophageal length (cm)	9.5	1.47
Bowel length (cm)	48.25	7.68

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