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دراسة الحجل البري (*Alectoris Barbara*) من حيث النباتات التي يتغذى عليها والوصف المرفولوجي والتشريحي في منطقة الجبل الاخضر

هشام عبدالرحمن علي الرابطي [1]* هشام محمد السنوسي ابراهيم بن عامر [2]

[1] قسم الحياة البرية والاتجاه العام ، كلية الموارد الطبيعية ، جامعة درنة ، مدينة درنة، ليبيا
[2] قسم علم حيوان، كلية الموارد الطبيعية ، جامعة عمر المختار ، مدينة البيضاء، ليبيا
h.alrabty@uod.edu.ly

Study of the wild partridge (*Alectoris Barbara*) in terms of the plants it feeds on and the morphological and anatomical description in AL Jabal Al Akhdar region

Hesham abdalrhman ali alrabty [1] - Hesham Mohamad alsanusy ibrahem benamer [2]

[1]Department of Wildlife and General Trend, Faculty of Natural Resources, University of Derna, Derna, Libya

[2]Department of Zoology, Faculty of Natural Resources, Omar Al-Mukhtar University, Al-Bayda City, Libya

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الملخص:

الحجل البري *Alesetros barbara* هو احد الانواع الاربعة من جنس Alesetros وهو طائر مستديرة متوسطة الحجم يكون ما بين حجم طائر الدراج (الكروان) وطائر السلوى (السمان) ذو ظهر رمادي – بني وصدر رمادي وبطن مصفرة الوجه رمادي فاتح مع شريط عريض بني محمر لها جوانب بيضاء ذات خطوط حمراء وارجل حمراء . عند ازعاجه فأنه يفضل الجري بدلاً من الطيران ولكن اذا لزم الامر فأنه يطير لمسافة قصيرة بأجنحة مستديرة. ينتشر طائر الحجل البربري *Alectoris barbara* على نطاق واسع وخصوصاً في شمال أفريقيا، على طول الساحل والمناطق الجبلية من مصر الى المغرب حيث يتواجد في موائل كثيفة مختلفة من الأراضي المنخفضة حتى ارتفاع حوالي 3300 متر. حيث سجل تواجده من شمال الصحراء الغربية وشمال موريتانيا شرقاً مروراً بالمغرب وشمال الجزائر وتونس إلى شمال غرب ليبيا، وبشكل منفصل في شمال شرق ليبيا وذلك في منطقة برقة والجبل الغربي، ومنطقة تيبستي في أقصى شمال تشاد ،والجبل الغربي وفي الحدود الجنوبية مع الجزائر تهدف هذه الدراسة على القاء الضوء على الحجل البري *Alesetros barbara* في ليبيا من حيث الوصف المورفولوجي الدقيق وقياس الاطوال والاوزان البيومترية المحلية للحجل البري المحلي ومقارنته بالأطوال والاوزان العالمية ويتم تثبيتها كمعلومات احصائية محلية ثابتة ويتم ايضاً القاء الضوء على سلوكيات هذا الطائر والنبتات التي يتغذى عليها في جميع المواسم.

الكلمات الدالة: الحجل البري Alesetros barbara الطوال البيومترية ، الوصف المورفولوجي.

Abstract:

The wild partridge, Alesetros barbara, is one of the four species of the genus Alesetros. It is a medium-sized round bird, between the size of a pheasant (curlew) and a quail. It has a gray-

brown back, a gray chest, and a yellowish belly. Its face is light gray with a wide reddish-brown stripe. It has white sides with Red lines and red legs. When disturbed, it prefers to run rather than fly, but if necessary, it flies a short distance with rounded wings. The Barbary partridge, Alectoris barbara, is widespread, especially in North Africa, along the coast and mountainous areas from Egypt to Morocco, where it is found in various dense habitats from the lowlands to an altitude of about 3,300 meters. Its presence was recorded from northern Western Sahara and northern Mauritania in the east, through Morocco, northern Algeria, and Tunisia to northwestern Libya, and separately in northeastern Libya, in the region of Cyrenaica and the Western Mountain. And the Tibesti region in the far north of Chad, the Western Mountain and the southern border with Algeria. . This study aims to shed light on the wild partridge Alesetros barbara in Libya in terms of accurate morphological description and measurement of the local biometric lengths and weights of the local wild partridge and its comparison with international lengths and weights and they are fixed as fixed local statistical information. Light is also shed on the behavior of this bird and the plants it feeds on in all seasons

Keywords: wild partridge *Alesetros barbara*, biometric analysis , morphological and anatomical description.

INTRODUCTION

he wild partridge (*Alesetros barbara*) is one of the four species of the genus Alesetros. It is a medium-sized, round bird, between the size of a pheasant and a quail, with a grey-brown back, grey breast, and yellowish belly. The face is light grey with a broad reddish-brown stripe. It has white sides with red stripes and red legs. When disturbed, it prefers to run rather than scurry, but if necessary, it flies a short distance with rounded wings (Akil M. & Boudedja S., 2001). These birds are classified as endemic old world birds. The partridge lays about 20 eggs and builds its nest on the ground among bushes and shrubs. It is characterized by its lack of flight. The length of this bird ranges between 32-35 cm, depending on the type of breed. This species lives in dry and open lands, rocky areas, coastal dunes and shrubs (Scandura et al. 2010). The partridge belongs to the Galliformes family, which includes 48 genera, of which 221 species are known (Akil M. and Boudedja S. 2001). The subspecies of barbary partridge Alsetroris Barbara confined to north-east Libya and adjacent Egypt,A.b.barbarahas recently been postid to merit species rank,with the additional suggestion that itmight be among the Western palearcitics most threatened avian taxa.(Nigel J at al 2024) They inhabit all regions of the world. Among the common species in the family are the domestic chicken and the guinea fowl known as the turkey fowl, as well as the quail, pheasant, chinnar, quail, partridge, and water fowl. There are other similar birds spread throughout the world, the most important of which for the hunter is the bustard (Alaoui M. 2001). The partridge is a beautiful bird, one of the favorite hunting birds for hunters. Like other birds, the males are more beautiful than the females. There are several types of partridges, including: the sand partridge, the rock partridge, the Moroccan and Nubian partridge, the Tihama or Palestinian partridge, and the Egyptian partridge. Partridges build their nests on the ground, and the eggs vary in number, and the females incubate them until they hatch (Ashton K.G., 2002). The partridge is a plump bird with an average length of about 30 cm. It prefers to run rather than fly, but when it feels danger, it flies away. It has a great ability to hide and camouflage itself among rocks and bushes, and its gray color helps in this (Spano, S.Pellegrino, I, and Borgo, E. 2013). The female lays her eggs in March of each year, which are white in color with brown spots for camouflage and to mimic the environment. She lays up to 15

eggs, and the female alone incubates the eggs for 21 days. It is a fast-breeding bird, and it is one of the resident birds that do not migrate. The partridge belongs to the Galliformes family, which includes 48 genera, of which 221 species are known (Akil M. & Boudedja S., 2001) that inhabit all regions of the world. Among the common species in the family are the domestic chicken and the guinea fowl known as the turkey fowl, as well as the quail, pheasant, chinnar, quail, partridge and water fowl. (Marcello Grussu et al 2023) There are other similar birds spread throughout the world, the most important of which for hunters is the bustard. (Alaoui M., 2001) The partridge is a beautiful bird and one of the favorite hunting birds for hunters. There are several types of partridge, including: Sand partridge, rock partridge, Moroccan partridge, Nubian partridge, Tihama or Palestinian partridge and Egyptian partridge. Partridges nest on the ground, and eggs of varying numbers are incubated by the female until hatching. (Ashton K.G., 2002) The partridge is a stocky bird with an average length of about 30 cm. It prefers running rather than flying, but when it feels danger, it flies away. It has a great ability to hide and camouflage itself among rocks and forests, aided by its grey colour (Spanò, S., Pellegrino, I., & Borgo, E. 2013). The wild partridge is considered an endangered animal due to overhunting and the degradation of the habitats in which the wild partridge lives (Akil M and Boudedja S. 2010).

1.2 Geographical distribution

Like many bird species, climate change is negatively impacting Barbary partridge's (Alectoris barbara) development and conservation in its natural environment.(Kamal el fallah et al 2024) It is difficult to see the wild partridge easily due to the camouflage that mimics the environment in which it lives. (Ageela Ali et al 2024) The Barbary partridge *Alectoris barbara* is widely distributed, especially in North Africa, along the coast and mountainous areas from Egypt to Morocco, where it occurs in various dense habitats from lowlands to an altitude of about 3,300 meters. Its presence was recorded from the north of Western Sahara and northern Mauritania in the east, passing through Morocco, northern Algeria and Tunisia to northwestern Libya, and separately in northeastern Libya in the Barqa region and the Western Mountains, the Tibesti region in the far north of Chad, the Western Mountains and on the southern border with Algeria, as shown in Map (1). Four Alectoris species inhabit the Mediterranean area, where they represent important gamebirds subject to human manipulations. The Sardinian partridge is peculiar in Europe, in that it belongs to the African species Alectoris Barbara (Massimo Scandura et al 2010)

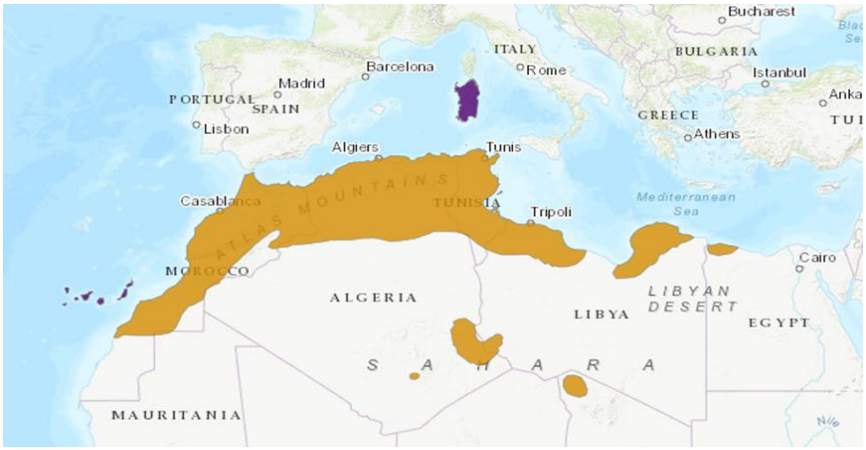


Figure (1) shows the geographical distribution of wild partridge. © BirdLife International 2016

- **EXTANT (RESIDENT) ■ EXTANT & INTRODUCED (RESIDENT)**

1. Materials and method

• Wild partridges were collected, where 5 pairs of wild partridges were collected for the study.
• Dissection kit for the anatomical and morphological examination of wild partridges.
• Gaimsa stain, slides and microscope for blood smear procedure.
• Cages for breeding and keeping wild partridges to study their behaviour and conduct experiments on them.
• To measure and analyze the biometric lengths of wild partridges, vernier rulers and calipers were used. To make the measurement more accurate, the ImageJ computer program was used for accurate analysis of the lengths.
• To study the variation in feather coloration, the computer program G morph was used for color analysis.
• Using the Featherbase protocol to study the characteristics, types and shape of feathers in wild partridges.

2. RESEARCH OBJECTIVES

The research aims to provide a preliminary study of the wild partridge in the Green Mountain region, so that it will be a cornerstone for more advanced research and will be considered a reference for researchers when conducting other research in terms of:
. • Accurate morphological description and knowledge of the biometric lengths of the Libyan partridge and comparing them with global lengths.
• Featharbase formation of wild partridge
• Knowing the differences between males and females from a morphological and anatomical perspective.
• Conducting a blood smear protocol to identify the different types of blood cells.
• Perform a complete CBC test on a wild partridge blood sample.
• Blood examination by performing blood smears using Gaimsa stain to identify the different shapes of blood cells and count them.
• Conducting a CBC blood test for wild partridges.

4. Results

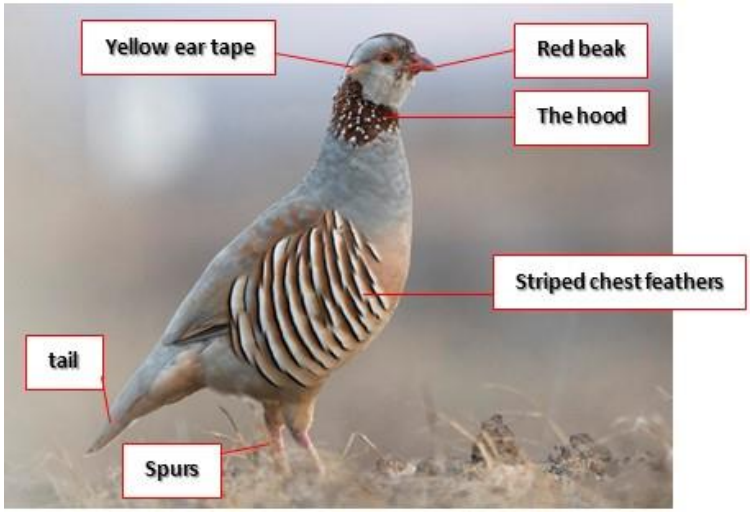
4.1 Morphology

4.1.1 General characteristic

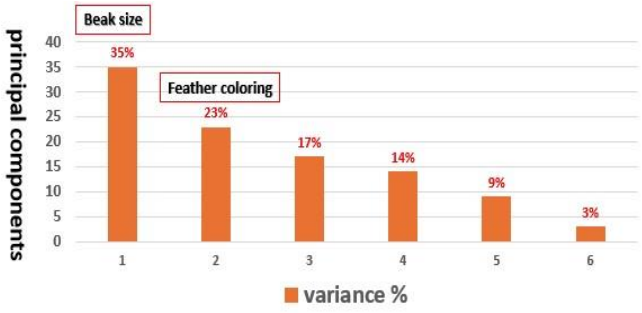
The partridge is yellow and grey with a scaly or striped pattern on its sides, a red bill, an orange eye, a yellow ear band, a rusty brown crown, and a rusty brown partial collar spotted with white. It called the hood and the The upper parts are mostly grey and the under parts are mostly yellowish. the upper parts are mostly grey and the under parts are mostly yellowish. When the tail is spread it shows shiny rusty brown corners, and is mainly visible in flight. The male is generally more colorful than the female and larger in size. The breast feathers are larger and

denser in males and the male partridge has trigger spurs which he uses to fight with other males during the mating season. Due to the difficulty of differentiating between the colors of the male and female in the wild partridge using traditional methods, due to the similarity of their colors to the external appearance, the G morph program was used to provide more accurate differences. It provides accurate color measurements and distinguishes between the colors of the male and female. The program depends on measuring the twisting network and the difference between the colors. (Jerez V and Briones R and vidal M and Benitez H . 2010)

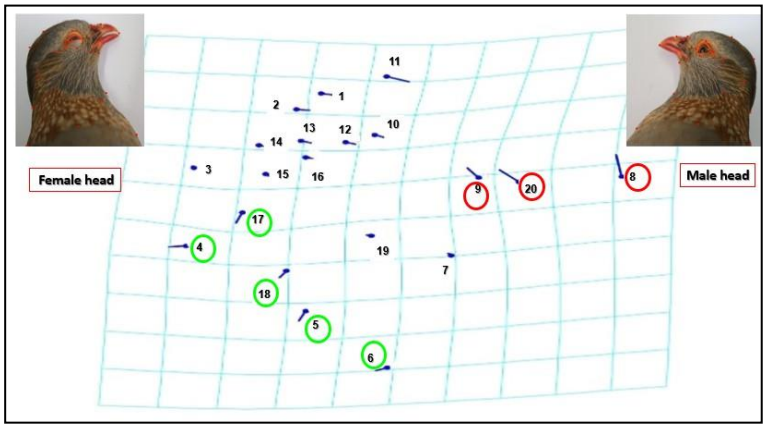
4.1.2 Reading the G morph program that shows the color differences between males and females in the head area



- The difference in beak size between males and females reached 35%.
- While the highest percentage of difference in feather color between males and females according to the second column was about 23%.
- The remaining differences in the color of the feathers on the neck were varied in columns 3-4-5-6.



. **Percentage of variation in the external shape of the head, beaks and feather coloration of the neck of the partridge**



3.1.3 Types and shapes of feathers

Feathers were studied in terms of their types, shapes and location on the bird's body using the Feather base protocol. It is noted that the wild partridge flies little and prefers running to flying. Its wings are classified as oval wings and consist of the following:

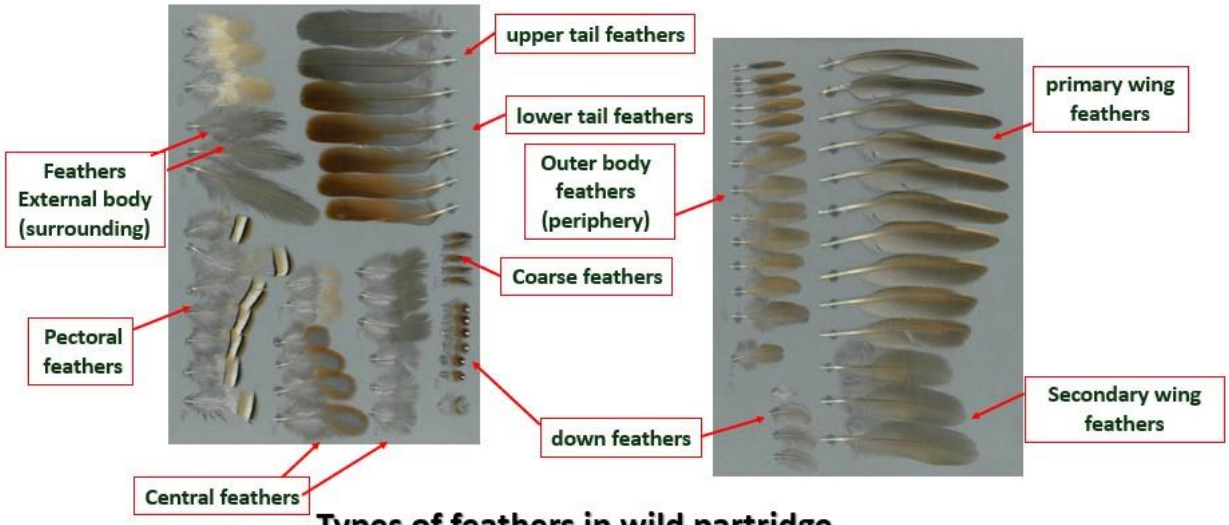


Figure No. (2) shows the types and shapes of feathers.

4.1.4 Biometrical analysis of *Alectoris Barbara* of Libya

Biometric lengths	Male	female
Medium size	39 cm	35.5 Cm
Average wing length	24 cm	22.5 cm
Average length of feet	12.5 cm	12.5 cm
Average tail length	8.5 cm	8 cm
Average beak length	2 cm	1.25cm
Average length of spurs	0.8 cm	0

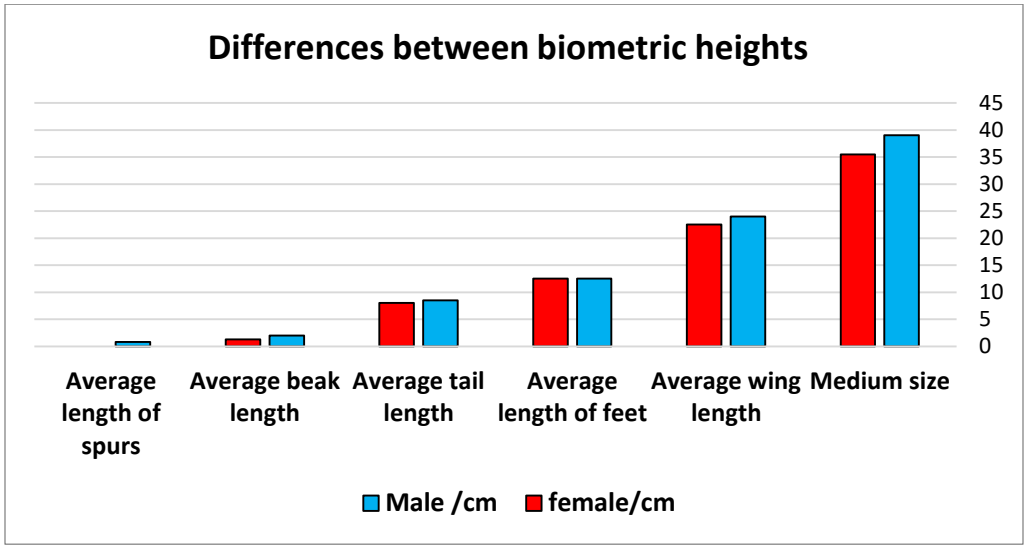
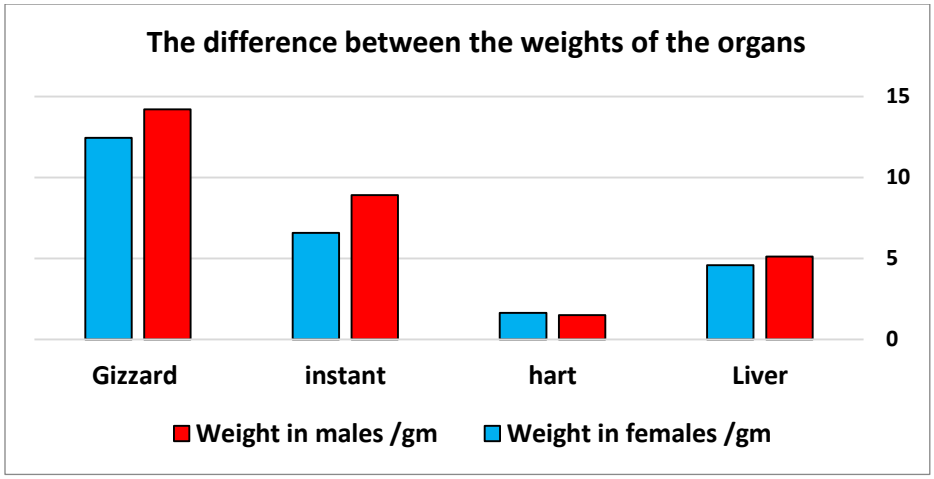


Chart (2) Comparison of biometric lengths between female and male wild partridges

4.1.5 Anatomical description of *Alectoris Barbara*

Ten samples of wild partridge were dissected, their anatomical organs were identified, and the weights of the organs were compared.

Name of the organs	Weight in males /g	Weight in females /g
Liver	5.12	4.57
hart	1.5	1.63
instant	8.9	6.57
Gizzard	14.2	12.45



The differences between the weights of organs in male and female

When conducting an anatomical examination, the feeding behaviors and the food material that the wild shy one feeds on in Libya were identified, and they were as follows:

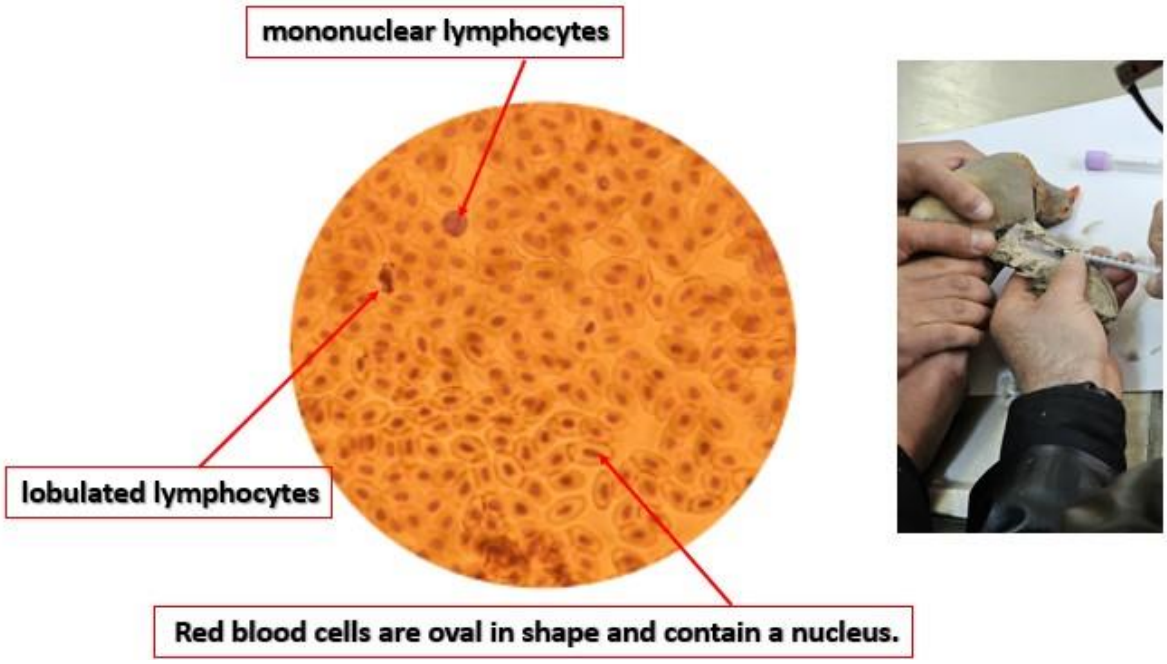
Type of food	Favorite parts	food in the crop	Food in the gizzard
Arum cyrenaicum	The *Arum cyrenaicum* plant is one of the plants that the wild partridge feeds on, whether the fruits or tubers that it digs for underground.	It is present in the crop	There is no in the gizzard
Pistacia atlantica Desf	Fruits when ripe	It is present in the crop	The gizzard contains the scales of the seed coat.
Sinapis alba.L	plant seeds	Present in the crop	There is no in the gizzard
Some insects and worms	all	It is present in the crop	It contains the chitinous scales of some insects.
Wheat and barley grains	grains	present	Doesn't exist
Gravel and solid materials	The wild partridge uses some pebbles that remain in the gizzard to grind its food.	present	present
Some green herbs, mosses and lichens	all	present	Doesn't exist
Gundelia tournefortii	Seeds	present	The gizzard contains the scales of the seed coat.

4.1.6 Blood test

- To perform the blood smear, a blood sample was taken from the flank vein and placed in a tube containing ADTH to perform the blood test. The test was performed on the basis of:

- **Microscopic examination of blood**

The sample was stained by Gaimsa stain to determine the blood morphology.



- **HEMATOLOGY PROFILEN**

HEMATOLOGY PROFILEN	
WBC	98.3 g/dl
Neutrophil	70.00 %
Monocyte	0.60 %

Eosinophil	0.10l0 %
Basophil	3.00 %
RBC	121.1fL
HEMOGLOBIN	6.6g/dl
HEMATOCRIT	31.00 %
MCV	121.1fL
MCH	25.8 Pg
MCHC	21.3 g/dl
RDW-CV	RDW-CV
PLATELETS	21.3 g/dl
MPV	7.7fL
PDW	3.9

4 DISCUSSION

The importance of studying the wild partridge lies in the fact that it is one of the components of biodiversity in the Green Mountain, and due to the beauty of its shape and the quality of its meat, it is vulnerable to hunting. This study was conducted due to the lack of studies that shed light on some of the biological, morphological and anatomical aspects of the Libyan wild partridge. It is one of the animals with a noticeable decline in its global presence, and in Libya it has become an endangered animal. In the Red List it is considered one of the deficient animals.

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