

Anatomical and Morphometric Study of the Trachea in Bee-eater Bird (*Merops orientalis*)

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Abstract: The present study included eight specimens of adult bee-eater bird (*Merops orientalis*) collected near the places of beekeeping of Al-Diwaniya city, open the birds and extracted the trachea for the purpose of anatomical study. The trachea in bee-eaters bird appear as long, cylindrical flexible tube and the principle basic unit consisting of the trachea are composed of series circular cartilages which takes - C - shape, The mean length of the trachea (5.087 ± 0.21 cm) and the mean total number of cartilage forming trachea (64.5 ± 4.5). The diameter of tracheal cartilage rings approximately unequal where the average of diameter of trachea near connection with larynx is (0.3 ± 0.0 cm) while the middle region and the area connection between trachea and syrinx (Voice box) is (0.25 ± 0.0 cm).

Keywords: Grossly, Trachea, Upper respiratory tract and Bee-eater bird (*Merops orientalis*).

1. Introduction

The bee-eaters birds live in colonies large numbers. They found near the places of beekeeping and may be visits parks and private gardens. It is well known to beekeepers as a predator of bees. It has a number of habits that make it useful in locating bees, and use of bee-eater birds in monitoring for the Asian honey bee (1 and 2). The respiratory system plays a vital role in thermo-regulation, the sense of smell, and voice are associated with it (3; 4 and 5). In birds the respiratory system differ from mammals due to specific structures includes nasal cavity, larynx, trachea, syrinx, bronchi, lungs and air sacs (6; 7 and 8), while in mammals the respiratory system consist of nostrils, nasal cavity, larynx, trachea, bronchi, lungs (9). In birds the trachea bifurcation at the syrinx to the right and left primary bronchi, both enter the target lungs via the hilus at septal surface as an primary bronchus (10; 11; 12; 13 and 14).

The aim of study: Design this study to providing anatomical information and data about Bee-eater bird (*Merops orientalis*).

II. Materials and Methods

In the present study used eight adult bee-eater bird (*Merops orientalis*) collected near the places of beekeeping of Al-Diwanyia city, After catching the bird by using fishing machine directly weighted and dissecting by fixed the birds on the table on the dorsal recumbency and make incision from the neck region up to the level of the pelvic region to show and photographs the respiratory system (Trachea) and record the relationship with the neighboring organs. Separate the trachea and remove the adipose to record morphological measuring. Used in this study some instruments such as (Vernier, electrical, digital camera Sony Ericsson and lens (X6 and X12)) to recorded the following:

1- Measured the length of the trachea (it measured from cranial border of the first tracheal cartilage ring into the caudal border of last tracheal cartilage ring which connect with syrinx).

2- Measured the diameter of the trachea in three regions:-

A-The connection between the trachea and the larynx (First tracheal cartilage ring).

B- The middle part of the trachea.

C-The connection between the trachea and syrinx (Last tracheal cartilage ring).

3- Calculate the number of cartilage rings in the trachea.

III. Results

The anatomical properties of the trachea in bee-eaters bird appear as long, cylindrical flexible tube and the principle basic unit consisting of the trachea are composed of overlapping complete circular cartilages which takes - C - shape, which will be open from the medial side and connected with each other by annular ligaments(Fig:1). The trachea observe extend along the ventral aspect of the neck and see the esophagus behind the dorsal aspect of the trachea(Fig: 2). it is extend from the caudal end of the cricoid cartilage of the larynx (rostrally) and the first trachea syringeal cartilage (caudally). The mean length of the trachea (5.087 ± 0.21 cm) and the mean total number of cartilage forming trachea (64.5 ± 4.5). Observe diameter of cartilage approximately unequal where the average of diameter of trachea near connection with larynx is (0.3 ± 0.0 cm) while the middle region and the area connection between trachea and syrinx (Voice box) is (0.25 ± 0.0 cm). it note that the distal part of the trachea after forming syrinx is bifurcates into two short tube are the left and right primary bronchi which enter the proximal third of the visceral surface of the lungs through the hilus(Fig:1).

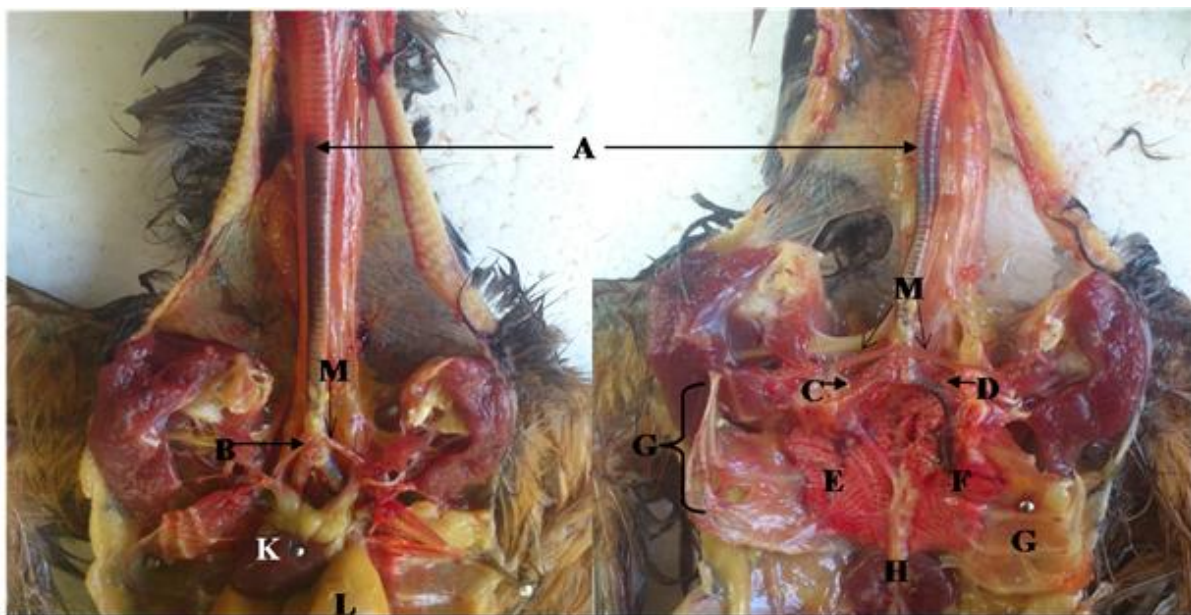


Figure (1) : Explain the trachea in Bee-eaters bird:-

A- Trachea. B- Syrinx. C- Right primary bronchus. D- Left primary bronchus. E- Right lung. F- Left lung. G- Ribs. H- Kidney (Right and Left). K- Heart. L- Liver. M- Sternotrachealis muscle.



Figure (2): Dorsal view of the trachea in Bee-eaters bird:

A- Trachea. B- Right Lung. C- Left lung. D- Larynx. E- Sternotrachealis muscle. F- Cartilage ring. G- Right primary bronchus. H- Left primary bronchus. K- Syrinx.

IV. Discussion

In the present study the trachea in Bee-eaters bird appear as long, cylindrical flexible tube and the principle basic unit consisting of the trachea are composed of overlapping complete circular cartilages which takes - C – shape, this result agreement with (4;7;13;14 and 15) due to the series of – C – shape rings of cartilage essential to kept the lumen of trachea open to prevent the trachea from collapsing when the thoracic presser falls and the incomplete rings allow food boluses to pass down the esophagus unimpeded by the tracheal cartilage (16).

The mean length of the trachea in Bee-eaters (5.087 ± 0.21 cm) and the mean total number of cartilage forming trachea (64.5 ± 4.5) this result disagreement with (14;15 and 17) explain the mean length of trachea in turkeys (26 ± 1.23 cm) ; in West african guinea fowl (26.363 ± 0.383 cm) and ostriches (78 cm) this difference due to species and body volume of birds.

The mean total number of cartilage forming trachea in Bee-eaters (64.5 ± 4.5) while (151 ± 12) in turkeys (14) also this difference due to species and body volume of birds. The mean diameter of tracheal cartilage rings in bee-eaters approximately between (0.3 ± 0.0 cm) to (0.25 ± 0.0 cm) this result differ in (14;15 and 17) the mean diameter in turkeys (1.01 ± 0.03 cm); in West African guinea fowl (0.0875 ± 0.0031 cm) and in ostriches (2 cm).

The distal part of the trachea after forming syrinx is bifurcates into two short tube are the left and right primary bronchi which enter the proximal third of the visceral surface of the lungs through the hilus, agreement with (14;15;18;19 and 20).

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