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Title:

Morpho- Histological and Immunohistochemical Study of Some Organs of the Respiratory System in Male European starling (*Sturnus Vulgaris*)

Abstract:

The study aims to demonstrate the morphological, histological and immunohistochemical of some organs of respiratory system including the larynx, trachea, syrinx, primary bronchi and lung of the male European Starling (Sturnus Vulgaris). In Basra city.

The study consists of thirty clinical healthy, mature male birds which were collected from Al- Basra market in the histological labratory at the College of Veterinary Medicine / University of Basra at the beginning of winter (November to February).They have been divided into three groups; ten birds for the anatomical,histological, and immunohistochemical study respectively.

The anatomical results show that the larynx appeared as a triangular-shaped mound, made up of single cartilage (cricoid, procricoid) and paired arytenoid cartilages, while the epiglottis cartilages are absent in the larynx. The trachea appeared as a long, flexible tube which lies in the midline, and tends to the right side of neck and composed of overlapping complete circular cartilaginous rings, and was divided into right and left bronchi after broncho-syringeal cartilage. The primary bronchi (extrapulmonary) consists of incomplete C-shaped cartilage rings. The syrinx located on the base of the heart, ventrally to the esophagus and the skeleton structure of the syrinx was composed of three different cartilages: tracheosyringeal cartilage, the tympanum (intermediate cartilage and bronchosyringeal cartilage). The lungs lie in the craniodorsally part of the thorax, located on each side of the heart, extended from the first to the sixth ribs, each lung is small, with bright pink color, and pyramidal in shape, they are conical in shape with a narrowly rounded apex at the top and a broad base.

The histological examination revealed that the laryngeal cavity, trachea composed of mucosa, sub-mucosa, and adventitia. The epithelium of mucosa which was pseudostratified columnar epithelium, lamina propria-sub mucosa which consists of connective tissue contain mucous gland and goblet cells. While the syrinx revealed that the tympanum showed that the cranial syringeal cartilage represented by bulla tympanum lined by the pseudostratifed ciliated columnar epithelial with few goblet cells. The lamina properia-submucosa contained loose connective tissue with blood vessels. The lamina properia-submucosa is composed of a number of elastic fibers. The mucosa lining of the tertiary bronchi and atria are squamous epithelium or cuboid does not have mucous cells and glands. The lungs showed the presence of a central area of the parabronchi which lead into the atria, and this led into air capillaries, the major part of

parabronchial wall consist of smooth muscle, while with Von Kossa Stain the laryngeal cavity, glottis and laryngeal cartilages of the larynx showed calcification scattered inside the hyaline cartilage, but in the trachea the calcification appeared as a dark brown color in the cervical and thoracic part.

The immunohistochemical study of the laryngeal cavity of the larynx show the presence of lymphocyte cells which appeared as a brown color in the respiratory mucosa epithelium layer as aresults expression of Ki-67 protein, were as, the expression of the Ki-67 protein in the trachea appeared as a brown color in the mucosa epithelial cells with accumulation of lymphocytes and macrophage cells. The upper part of the lung detects the presence of macrophages and lymphocytes in the alveolar septum and around the bronchiole and blood vessels which appeared as a brown color due to deposition of IL-β1 around the bronchiole and blood vessels that explain the presence of macrophages and lymphocytes.