

SOME ANATOMICAL STUDIES ON LUNGS OF THE FOX (ALAIPOS LAGOPUS)

El-Morsi, S. El-M. and Nosur, H. M.*

Department of Anatomy and Embryology, Fac. of Vet. Med. Mansoura University

**Department of Anatomy and Embryology, Fac. of Vet. Med. Zagazig University*

ABSTRACT

The morphological features, ramification of the bronchial tree and arborisation of the pulmonary vessels of the lungs of the fox were studied on eleven animals by dissection, roentgenography and cast preparation. The obtained result revealed that, the lungs were divided by deeper pulmonary fissures into lobes, four on right and two on left. The left apical lobe was divided into cranial and caudal parts while, the right did not and each lobar had its own hilus and received one lobe bronchus. The left and right apical and accessory lobar bronchi were divided into two segmental bronchi, but the middle one was behaved as segmental bronchus, while both of the right and left caudal bronchi were divided into a series of long ventral and short dorsal segmental bronchi. Each lobar vessel was ramified in a fashion like that of the corresponding bronchus. The ascendant and descendent arterial ram of the apical lobes were detached off on right by a common stem, but independently on left. The right cranial sinus received, the right apical and the middle lobar veins. The left cranial sinus received the ascendant and descendant segmental veins. The caudal sinus received both of the right and left lobar caudal and the accessory lobar veins. The result have been discussed with the available literature.

INTRODUCTION

The field of the pulmonary anatomy has been widely investigated and reported in the domestic and laboratory animals by many authors such as (9, 23, 16, 27, 8, 4 and 7). Recently the attention has been paid for the wild animal such as the fox to disclose the comparative relationship between them and the domestic animals. For this reason the present study was intended to describe the anatomy of the fox lungs aiming for adding some scientific information in a field which is merely still obscure up till now.

MATERIAL AND METHODS

The present study was made on eleven healthy fox (*Alopex lagopus*) of both sexes. The animals were sacrificed and prepared for the dissection and further investigations. The study was carried out by dissection, roentgenography and corrosive cast preparation techniques. Three formalin-fixed carcasses were utilized for the topographical and morphological studies of the lungs in situ and /or after excision from the body. Eight fresh carcasses were eviscerated for excision of attached hearts and lungs. The pulmonary vessels were thoroughly washed out with normal saline solution. The bronchography and vasography of the lungs were done by injection of 40 % barium sulphate suspension through the right ventricle into the pulmonary trunk and /or through the left atrium into the pulmonary veins and /or through the trachea into the bronchial tree. The corrosive trachobronchial casts were prepared by injection of coloured latex through the trachea into the bronchial tree. The corrosive casts were obtained by aid of concentrated hydrochloric acid. The obtained results were received and discussed with the available literature. The nomenclature used were those adopted by (19).

RESULTS

The morphological features of the lungs (*Pulmo dexter* and *sinister*). (Figs. 1, 2, 3 and 4). Each lung was a roughly elongated pyramid, having an apex, a base, two surfaces (costal and mediastinal) and three borders (dorsal, ventral and basal). The right lung was comparatively larger and heavier than the left one. The matrix of each lung was divided by a numbers of deep pulmonary fissures into well distinct lobes. The right lung (Figs 1 and 3) had three interlober fissures and four lobes. *Fissura cranialis pulmonis* between *Lobus cranialis pulmonis dexter* and *Lobus medius pulmonis*. *Fissura caudalis pulmonis* between *Lobus medius pulmonis* and *Lobus caudalis dexter* and *Fissura paras-agitalis pulmonis* between *Lobus accessorius pulmonis* and *Lobus caudalis pulmonis*. The left lung (Figs 2 and 3) had two fissures and two lobes. *Fissura cranialis pulmonis* between *Pars cranialis* and *Pars caudalis* of *Lobus apicalis cranialis pulmonis sinister* and *Fissura caudalis pulmonis* between *Pars caudalis* of *Lobus apicalis cranialis* and *Lobus caudalis pulmonis sinister*. All of these pulmonary fissures with the exception of the left cranial one were deeper and reached to the principal bronchi. The lobulation of the lungs was indistinct.

The apex of each lung (*Apex pulmonis*) was formed by the most cranial part of its cranial lobe. It was rounded in the right lung and pointed in the left one. The base or the diaphragmatic surface (*basis pulmonis* or *Facies diaphragmatica*) of the right lung was formed by the diaphragmatic surfaces of its caudal and accessory lobes, while that of the left lung, it was formed only by

the diaphragmatic surface of its caudal lobe. The costal surface (Facies costalis) of each lung was convex, attained the configuration of the internal surface of the thoracic wall and revealed superficial impressions of the ribs. The mediastinal surface (Facies mediastinalis) was less extensive than the costal one. It was irregular and moulded on the contained organs of the mediastinal space. The dorsal border (Margo dorsalis) of each lung was formed by that of the cranial and caudal lobes, it was thin and sharp cranially and thick rounded caudally. The ventral border (Margo ventralis) of each lung was sharp and thin and revealed a cardiac notch opposite to the heart. The ventral border of the right lung extended from its apex to the ventral end of the middle lobe, while that of the left one, it was extended from its apex to the ventral end of its caudal lobe. The right cardiac notch (Inclura cardiaca dexter) was bounded cranially by the right cranial lobe and caudally by the middle one. It was irregular rectangular in outline and extended from the level of 4th to 6th intercostal spaces. Meanwhile, the left one (Inclura cardiaca sinister) was inter-posed in between the cranial and caudal parts of the left cranial lobe. It was wider than the right one, semicircular in outline and extended from the level of the 4th to 7th intercostal spaces. The basal border (Margo basalis) of each lung was a thin, sharp and convex border.

The right lung (Pulmo dexter) (Figs 1, 3 and 4):-

- 1- The right Pulmonary apical lobe (Lobus apicalis Pulmonis dexter (Figs 1/1 and 3/10). It was triangular in outline, having a thin, cranioventrally directed apex and thick caudodorsally directed base that was partially overlaid the craniodorsal part of the costal surface of the middle lobe. Its hilus was located caudodorsally at the medial surface.
- 2- The pulmonary middle lobe (Lobus medius pulmonis) (Fig 1/2 and 3/11). It was wedge shaped, having caudoventrally and laterally directed apex and craniodorsally directed base. The craniodorsal portion of the lobe was concealed by the preceded lobe, while its caudodorsal portion was partially overlapped the cranio-dorsal portion of the right diaphragmatic lobe. The hilus was located dorsocranially at the medial surface.
- 3- The pulmonary accessory lobe (Lobus accessorius pulmonis) (Figs 3/12). It was a three-sided prismatic in outline, having a cranially directed apex lied at the root of the lung and a caudally directed base facing to the diaphragm. It was located on the mediastinal surface of the lung. Its lateral surface presented a deep longitudinal groove for lodging Vena cavae caudalis, while its medial one revealed an oval area related to the left pulmonary diaphragmatic lobe. The hilus was located cranially at the apex.
- 4- The right pulmonary diaphragmatic lobe (Lobus diaphragmaticus dexter pulmonis) (Fig 1/

3, 3/13 and 4/1). It was triangular in outline, its medial surface partially came in close contact with the accessory lobe and revealed impression of Vena caeve caudalis. Meanwhile, the caudal surface was lied against the diaphragm and constituted the majority of the diaphragmatic surface or base of the right lung. The hilus was located dorsocranially at the medial surface.

The left lung (Pulmo sinister) (Figs 2,3,4) :-

- 1- The left pulmonary apical lobe (Lobus apicalis pulmonis sinister) (Figs 2/1, 2,3/4, 5). It was divided into cranial and caudal parts by the left cranial pulmonary fissure. Each part was very thin cranially and comparatively thick caudally. The cranial part was triangular in outline, having a cranioventrally directed apex while, the caudal one was elongated and lancet-like with a caudoventrally directed rounded apex that was descended more distally beyond the level of the cranial part and that of the left pulmonary diaphragmatic lobe. The proximal portion of the caudal part was partially over-leaped the caudal portion of the cranial part as well as, the dorsocranial portion of the succeeding left pulmonary diaphragmatic lobe. the hilus was located dorsomedially at point of its division .
- 2- The left pulmonary diaphragmatic lobe (Lobus diaphragmatic pulmonis sinister) (Figs 2/3, 3/16, 3/4). It was similar to the right one with the exception that, its medial surface was landed on the accessory lobe and lacked the impression of Vena caeve caudalis and its diaphragmatic surface formed the whole base of the left lung .

Tracheobronchial tree (Fig 5 & 6)

The trachea was bifurcated at the level of the fifth thoracic vertebra into right and left principal bronchi (Bronchi principals dexter et sinister). Each bronchus proceeded caudolaterally to gain the hilus of the corresponding lung. The right principal bronchus was considerably larger and thicker than the left one and gave off four lobar bronchi, while the left one gave of two lobar bronchi. All of these lobar bronchi. Behaved a short extrapulmonary courses before entering the hilus of the corresponding lobe.

A- Bronchus principalis Dexter (Fig 5/2 , 6/2) :-

- 1- Bronchus lobaris apicalis dexter (Fig 5/3, 6/3). It erupted from the dorsolateral aspect of the right stem bronchus just at its origin, turned cranioventrally to gain the hilus of the right apical lobe and divided into larger ventral and smaller dorsal segmental bronchus.

The former supplied the ventral half of the lobe by a dorsal and ventral series of 5-7 subsegmental bronchi, while, the dorsal one supplied the craniodorsal segment of the lobe by 3-5 subsegmental bronchi. In addition to these segmental bronchi, it detached off close to its origin a dorsal supplementary segmental bronchus that was supplied the caudodorsal segment of the lobe.

- 2- Bronchus lobaris medius (Fig 5/2, 6/5). It detached from the ventrolateral aspect of its parent bronchus 0.5—1 cm caudal to the preceded lobar bronchus, proceeded caudovero-laterally to enter the hilus of the corresponding middle lobe. It extended in the axis of the lobe and behaved as a segmental bronchus where it gave off a cranioventral and caudodorsal series of subsegmental bronchi whose distributed in the corresponding areas of the lobe.
- 3- Bronchus lobaris accessorius (Fig 5/6, 6/6): It esupted caudal to the preceded lobar bronchus from the ventromedial aspect of the parent bronchus and just before origin of succeeding one and extended caudomedially to enter the hilus of accessory lobe. It was divided into a ventral and dorsal segmental bronchus of equal size, the former gave off a caudodorsal, while the later one gave off a cranioventral rows of subsegmental bronchi to the corresponding areas of the lobe.
- 4- Bronchus lobaris diaphragmaticus dexter (Fig 5/4, 4/7). It was the direct caudal continuation of the right principal bronchus. It proceeded caudolaterally to gain the hilus of its diaphragmatic lobe where, it continued caudodorsally and gave 5-6 ventral and 3-4 dorsal subsegmental bronchi. The formers were longer and larger and directed caudolaterally and ventrally, while, the later ones were smaller and directed caudodorsally, each supplied the corresponding areas of the lobe.

B- Bronchus principalis Sinister (Fig 5/3 , 6/3)

- 1- Bronchus lobaris apicalis sinister (Fig 5/8, 6/8). It emanated from the dorsolateral aspect of the parent bronchus 1 cm. from its origin and directed to the hilus of the left apical lobe where it was sooner divided into larger cranial and smaller caudal segmental bronchi for the corresponding parts of the lobe. The cranial bronchus turned cranially and gave off 5-6 large cranioventral and 3-4 small craniodorsal subsegmental bronchi for the corresponding areas of this part. Meanwhile, the caudal bronchus was coursed caudolaterally and ventrally in the caudal part of the lobe and gave off 5-7 long cranioventral and 3-5 caudodorsal subsegmental bronchi for the corresponding areas of this part.

- 2- Bronchus lobaris diaphragmaticus sinister (Fig 5/9, 6/9). It was the direct caudal continuation of the parent bronchus. It proceeded caudo-laterally to gain the hilus of left diaphragmatic lobe and behaved as the right one in its ramification.

Truncus Pulmonalis (Fig. 7) : It emanated from the conus arteriosus of the right ventricle, proceeded dorsocaudally between the right and left auricles and continued further caudad along the left ventral aspect of the trachea. It measured an average length of 11 cm and width of 0.8 cm, enveloped with the ascending aorta by common sheath of the visceral layer of the serous pericardium and connected with the aortic arch by Legamentum arteriosum. It was divided cranioventrally to the tracheal bifurcation into relatively larger right and large left pulmonary arteries.

A. The right pulmonary artery (A. pulmonalis Dexter) (Fig 7/2): It crossed under the ventral aspect the tracheal bifurcation to gain the ventrolateral aspect of the right stem bronchus, to continued further caudad on its dorsolateral aspect and detached off the following branches.

- 1- The right cranial lobar branch (Ramus lobi cranialis Dexter) (Fig.7/2): It was erupted from the dorsolateral aspect of the parent artery 1 cm from its origin, turned cranioventrally to gain the hilus of the right cranial lobe where it divided into larger ramus ascendens lobi cranialis dextri and smaller ramus descendens lobi cranialis dextri. These rami followed the dorsolateral aspect of the corresponding segmental bronchi and their subsegmental bronchi in their ramification within the cranial and caudal parts of the right apical lobe.
- 2- The middle lobar branch (Ramus lobi medii) (Fig 7/4): It was detached from the lateral aspect of the parent artery 0.8 cm caudal to the preceded branch, extended caudolaterally to gain the dorsolateral aspect of the middle lobar bronchus where it ramified with the corresponding subsegmental bronchi.
- 3- The accessory lobar branch (Ramus lobi accessarii) (Fig 7/5): It was detached from the ventromedial aspect of the parent artery 0.5 cm caudal to origin of the previous branch. It coursed caudomedially and crossing the ventral aspect of the right caudal lobar bronchus to gain the accessory bronchus and divided into dorsal and ventral branch that were entirely flow the ventrocaudal aspect of the corresponding segmental bronchi and their subdivisions within the lobe.
- 4- The right caudal lobar branch (Ramus lobi caudalis dextri) (Fig 7/6): It was the direct continuation of the parent artery which proceeded caudally along dorsolateral aspect of the right caudal lobar bronchus and gave off large long ventral and small short dorsal branches whose followed the corresponding segmental bronchi in their ramification.

B. The left pulmonary artery (A. Pulmonalis Sinister). (Fig 7/7) :

It was coursed laterally to gain the dorsolateral aspect of the left stem bronchus and detached off the following branches.

- 1- Ramus ascendens lobi cranialis sinistri (Fig 7/8). It was detached from the lateral aspect of the parent artery short distance 0.3cm from its origin for the cranial aspect of the left apical lobe. It proceeded cranioventrally to gain the dorsolateral aspect of the corresponding cranial segment bronchus.
- 2- Ramus descendens lobi cranialis sinistri (Fig 7/9): It was detached from the parent vessel 0.5 cm caudal to the previous one for the caudal part of the left apical lobe. It proceeded caudoventrally to gain the dorso-lateral aspect of the corresponding caudal segment bronchus. These rami entirely followed the corresponding segmental bronchi in their ramification.

3- Ramus lobi caudalis sinistri. (Fig 7/10):

It was similar to the right one in its origin, course and destination .

Venae Pulmonales (Figs. 8, 9):-

The pulmonary veins of the both lungs were emanated from the roof of the left atrium through three sinuses, right cranial, left cranial and caudal sinuses .

I. Sinus cranialis Dexter (Fig 8/1, 9/1) :

It detached off the veins of the right apical and middle lobes.

- (a) V. Pulmonalis lobi cranialis dextri (Fig 9/4) : It coursed laterally, then divided into ascendant and descendant segmental branches, these branches entirely followed the corresponding segmental bronchi in their ramification within the cranial and caudal parts of the right apical lobe.
- (b) V. Pulmonalis lobi medii (Fig 9/5): It proceeded caudolaterally to gain the cranio-medial aspect of the corresponding bronchus and behaved as segmental branch within the middle lobe.

II. Sinus cranialis sinister (Fig 8/2, 9/2) : It detached off the ascendant and descendent segmental branches, drained the cranial and caudal parts of the left apical lobe. Each branch

followed its corresponding segmental bronchus in its ramification.

III. Sinus caudalis (Fig 2/3, 9/3): It detached off the veins of the right caudal, left caudal and accessory lobes.

- (a) V. Pulmonalis lobi caudalis dextri (Fig 9/6). It coursed on the ventromedial aspect of the right caudal lobar bronchus and gave off large ventral and short dorsal segmental branches which accompanied the corresponding segmental bronchi in their distribution.
- (b) V. Pulmanalis lobi accessrii (Fig 9/7) : It detached from the previous one near the sinus and coursed along the cranial aspect of the corresponding lobar bronchus and divided into dorsal and ventral segmental branches distributed with the corresponding bronchi.
- (c) V. Pulmanalis Lobi caudalis Sintstri (9/8) : It was similar to the right one in its course and distribution.

DISCUSSION

The present study revealed that, the lungs of the fox were divided by deeper fissures into lobes. The right lung was consisted of four lobes while the left one was consisted of two lobes in agreement with that recorded in pig (28, 6, 12, 23, and 4), ruminants (6, 12, 23 and 4), dog (6, 12, 23, 16, 8 and 4), cat (1, 6 and 23), mink (25), rabbit (5 and 21) and ferret (24).

The left apical lobe of the fox was divided into cranial and caudal parts similar to that described in ruminants (6, 12, 23 and 4), pig (28, 6, 12, 23, and 4), dog (6, 12, 23, 16, 8 and 4), mink (25) and cat (1, 6 and 23). But dissimulated that recorded in horse (6, 12, 23 and 4), rabbit (5 and 21) and ferret (24). The left apical lobe of bovines had an accessory hilus. A condition did not observed in the fox.

In accord with that recorded in pig and horse (6, 12, 23 and 4), dog (6, 23, 8 and 4), cat (1, 6, 23 and 4), mink (25), the lobulation of fox lungs were indistinct. Percontra, the lobulation of lungs was distinct in bovines (6, 4, and 23) and camel (9 and 11).

In agreement with that reported in horse, dog, cat and pig (6, 12, 23 and 4) the right apical lobe of the fox was undivided. However, such lobe was divided in ruminants (6, 12, 23 and 4).

The right apical lobar bronchus was divided into two segmental bronchus in horse (23 and 4), dog (10, 6, 12, 23, 16, 8 and 4), cat (1, 6, 12, 23 and 4), sheep (13, 15, 6, 23 and 4); pig (28, 6, 12, 23 and 4); goat (6, 23, 26 and 4) and rabbit (5 and 21). Similar pattern was observed in the fox. Moreover, the present study revealed an additional dorsal supplementary segmental bron-

chus detached off from the parent bronchus prior to its division similar to that described in cat (1). However, the corresponding tracheal bronchus gave off four segmental bronchi in the pig (13 and 28) and camel (20).

The present study revealed that, each of the middle and accessory lobar bronchi were detached off from the right stem bronchus in an independent manner similar to that described in cat (1), rabbit (21) and ferret (24), but dissimilar with that recorded in sheep (15) and goat (18 and 26) whereas, these bronchi were erupted by a common stem from the parent bronchus. The middle lobar bronchus of the fox was coursed within the middle lobe along its axis and behaved as a segmental bronchus like that of dog (16), goat (18 and 26), rabbit (21) and ferret (24). However, such bronchus was divided into three segmental bronchi in bovines (13) and two segmental bronchi in cat (1). The accessory lobe bronchus of the fox was divided into dorsal and ventral segmental bronchi similar to that described in domestic animals (6, 23 and 4), cat (1) and mink (25).

The left apical lobar bronchus of the fox was divided into cranial and caudal segmental bronchi in agreement with that described in ruminants (6, 12 and 4), dog (6, 12, 8 and 4) and ferret (24). But disagreed with that recorded in pig (28) and camel (20) whereas, such lobar bronchus was divided into three segmental bronchi, as well as with that described in cattle, horse and sheep (12) and rabbit (21) whereas, such bronchus behaved as a segmental bronchus.

The present study revealed that, both right and left caudal lobar bronchi were divided into a dorsal and ventral rows of segmental bronchi of varying call-bers and lengths like that described in domestic animals (6, 23 and 4), mink (25) and rabbit (21).

The present study found that, each of the right and left apical lobe received two segmental arterial branches, ascendant and descendant branches. These rami were originated by a common trunk from the right pulmonary artery, but in an independent manner from the left one. This finding came in agreement with that recorded in dog (13), mink (17), buffalo (14) and sheep (27), but disagreed with that described in cat (1) whereas, these arterial rami of each lobe were emanated independently from the corresponding stem artery. As well, the present findings dissimulated that described in camel (20) and goat (26) in which the right apical lobe received two arterial rami while the left one received 2-3 rami, each ramus originated independently from the corresponding stem artery.

The present study revealed that, the middle and accessory lobar arteries were emanated from the right pulmonary artery in a separate sequential pattern like that of the rabbit (21), but conflicted to some extent with that described in the pig (13), goat (26) buffalo (14) and sheep (27) whereas, these arteries were emanated separately opposite each other.

In accord with that recorded in domestic animals (13), cat (1), mink (17), rabbit (20) and sheep (27), the present study revealed that the origin, course and distribution of the right and left caudal pulmonary arteries were similar but the differences were restricted only to the number of their segmental branches.

In agreement with that recorded in dog (10 and 22), mink (17), domestic animals (13 and 12), goat (26), buffalo (14) and sheep (27), the pulmonary veins of the fox were emanated from three sinuses located in roof of the left atrium. The summation of the pulmonary veins of the fox were seven in number in corresponding to 7- 8 veins in domestic animals (13 and 12), goat (26) and buffalo (14) and 11-13 veins in horse (3) and 6 veins in sheep (27). The ascendant and descendent veins of the left apical lobe of the dog were united to form V. lobi cranialis sinister (22). Mean-while, those of the both right and left apical lobes of the goat were emanated from the corresponding sinuses in an independent manner (26). These previous findings were conflicted with the present study to some extent. Such conditions might be assumed the variation in number of the pulmonary veins among the animals.

In accord with that observed in rabbit (21), mink (17), cat (1), goat (26), buffalo (14) and sheep (27), the lobar arteries and veins of the fox were coursed dorsally and ventrally in respect to the corresponding lobe bronchus respectively. The arborisation of these vessels was closely followed the ramification of the corresponding bronchi. Accordingly, it could be concluded that, the bronchopulmonary segments of the fox were of broncho-vascular type.

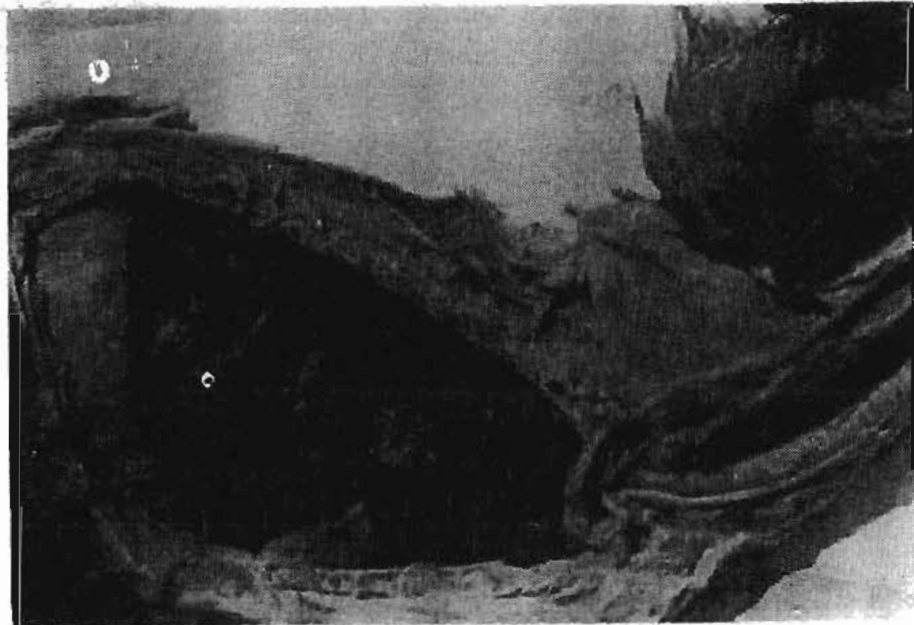


Fig. (1) : A photograph of pulmo dexter of fox in situ (lateral view) showing, 1- Lobus apicalis dexter, 2-Lobus medius, 3-Lobus diaphragmaticus dexter, 4-Incisure cardiaca, 5-Fissura cranialis pulmonis, 6-Fissura caudalis pulmonis.



Fig. (2) : A photograph of pulmo sinister of fox in situ (lateral view) showing, 1-Lobus apicalis cranialis pulmonis, 2-Lobus apicalis caudalis pulmonis, 3-Lobus diaphragmaticus sinister, 4 Incisure cardiaca, 5-Fissura cranialis pulmonis, 6-Fissura caudalis pulmonis.

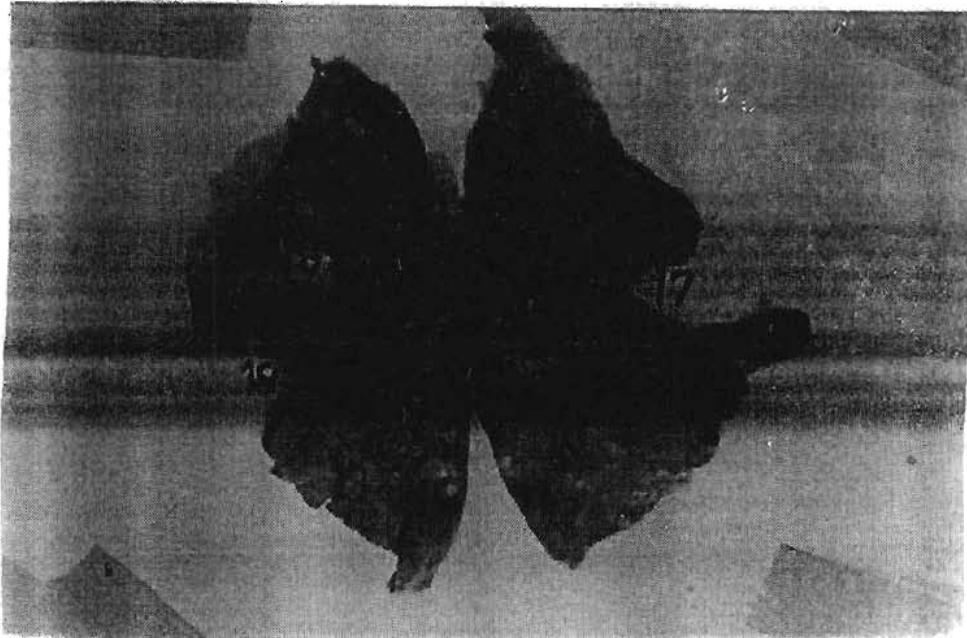


Fig. (3) : A photograph of pulmo dexter et sinister of fox (ventral view) showing, 1-Trachea, 2-Bronchus principalis dexter, 3-Bronchus principalis sinister, 4-Bronchus lobaris apicalis dexter, 5-Bronchus lobaris medius, 6-Bronchus lobaris accessorius, 7-Bronchus lobaris diaphragmaticus dexter, 8-Bronchus lobaris apicalis sinister, 9-Bronchus lobaris diaphragmaticus sinister, 10-Lobus apicalis pulmonis dexter, 11-Lobus pulmonis medius, 12- Lobus pulmonis accessorius, 13-Lobus diaphragmaticus pulmonis dexter, 14-Lobus apicalis cranialis sinister, 15-Lobus apicalis caudalis sinister, 16-Lobus diaphragmaticus pulmonis sinister, 17-Fissura cranialis pulmonis, 18- Fissura caudalis pulmonis.

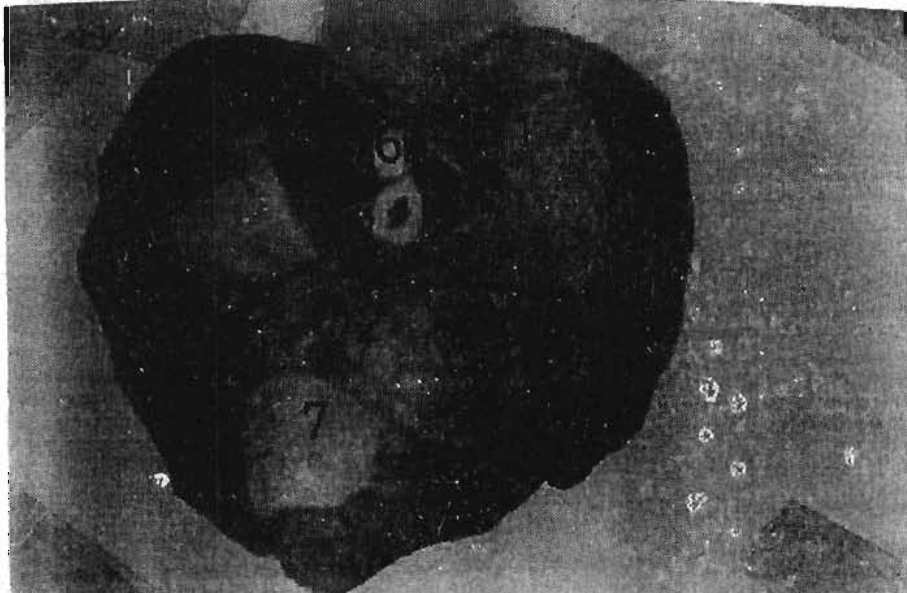


Fig. (4) : A photograph of lungs fox (Basis pulmonis) showing, 1-Lobus diaphragmatic pulmonis dexter, 2-Lobus pulmonis accessorius, 3-Lobus diaphragmatic pulmonis sinister, 4- Vena cavae caudalis, 5-Oesophagicus ,6- aorta thoracica, 7-Cardia.

Fig. (5) : A photograph of corrosion cast of tracheobronchial tree of fox (Dorsal view) showing, 1-trachea. 2-Bronchus principalis dexter. 3-Bronchus principalis sinister. 4-Bronchus apicalis dexter. 5-Bronchus medius, 6-Bronchus accessorius, 7-Bronchus diaphragmaticus dexter. 8-Bronchus apicalis sinister. 9-Bronchus diaphragmaticus sinister.

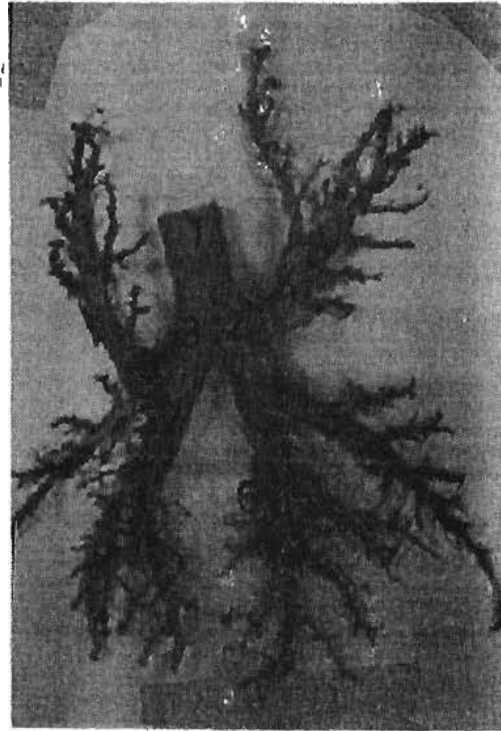


Fig. (6) : Roentgenogram of tracheobronchial tree of fox (Ventral view) showing 1-Trachea. 2-Bronchus principalis dexter. 3-Bronchus principalis sinister. 4- Bronchus apicalis dexter, 5-Bronchus medius, 6-Bronchus accessorius, 7- Bronchus diaphragmaticus dexter, 8-Bronchus apicalis sinister, 9-Bronchus diaphragmaticus sinister.



Fig. (7) : Roentgenogram of pulmonary artery system of fox (Ventral view) showing, 1-Truncus pulmonalis, 2-A. pulmonalis Dexter, 3-R.lobi cranalis dextri, 4-R.lobi medii, 5-R.lobi accessorii, 6-R.lobi caudalis dextri, 7-A. pulmonalis sinister, 8-R. as-c-endens lobi cranalis sinistri, 9-R.descendens lobi cranalis sinistri, 10-R.lobi caudalis sinistri .

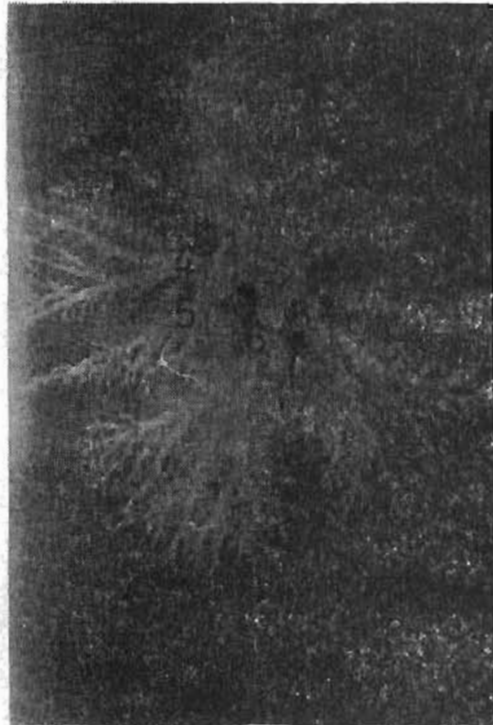
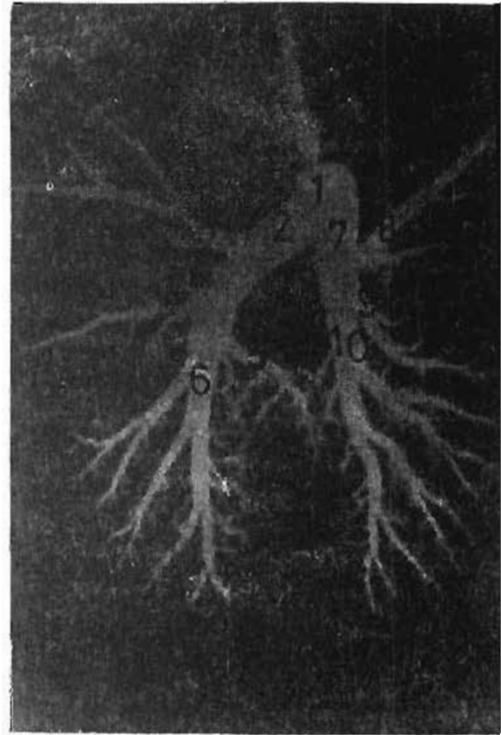


Fig. (8) : Photograph of opened left atrium of fox showing, 1-Sinus cranialis dexter, 2-Sinus cranialis sinister, 3-Sinus caudalis .



Fig. (9) : Roentgenogram of venae pulmonales of fox (Ventral view) showing, 1-Confluence cranialis dexter, 2-Confluence cranialis sinister, 3-Confluence caudalis, 4-V.pulmonalis lobi cranialis dextri, 5-V. pulmonalis lobi cranialis medii, 6-V.pulmonalis lobi caudalis dextri, 7-V. pulmonalis lobi accessori, 8-V. pulmonalis lobi caudalis sinister, 9-R.ascendens V. pulmonalis lobi cranialis sinister, 10-R.descendens V. pulmonalis lobi cranialis sinister.

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الملخص العربي

بعض الدراسات التشريحية على رئتي الثعلب

صلاح المرسى المرسى - حامد محمود نصير*

قسم التشريح وعلم الأجنة - كلية الطب البيطري - جامعة المنصورة

قسم التشريح وعلم الأجنة - كلية الطب البيطري - جامعة الزقازيق*

لقد أجريت هذه الدراسة على عدد أحد عشرة ثعلب مستخدماً في ذلك التشريح الوصفي والصور الإشعاعية والقوالب الماصية لدراسة مورفولوجية الرئتين وتفرعات شعبتا القصبة الهوائية والأوعية الدموية الرئوية وبينت النتائج الآتى :

إن كلاً من الرئتين ظهرت منقسمة بواسطة صدوع عميقة إلى فصوص رئوية وتكونت الرئة اليمنى من أربع فصوص بينما تكونت اليسرى من فصين وظهر بها الفص القمى منقسم إلى جزئين، كما ظهر كلاً من الشعبى القمى الأيمن والأيسر والثانوى متفلق إلى فلقين بينما ظهر الشعبى الوسطى غير متفلق وامتد كما لو كان شعبية فلقية، كذلك ظهر كلاً من الشعبى الخلفى الأيمن والأيسر متفلقين إلى فلقات بطنية طويلة وأخرى ظهرية قصيرة، كذلك ظهرت الشرايين الرئوية للفصوص مقلقة إلى فلق مناظرة لتفرعات مثيلاتها من الشعب الفلقية كما ظهر الوريد الفصى القمى الأيمن والوريد الفصى الوسطى مندمجان بالجيب الوريدى الأمامى الأيمن بينما ظهر كلاً من الوريد الفصى الخلفى الأيمن والأيسر وكذلك الثانوى مندمجان بالجيب الوريدى الخلفى بينما ظهر كلاً من الوريد الفلقى الصاعد والنازل الأيسران مندمجان بصورة منفردة بالجيب الدموى الأمامى الأيسر.