



ANATOMICAL AND HISTOLOGICAL STUDY OF TRACHEA AND LUNG IN LOCAL BREED CATS *Felis Catus domesticus L.*

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ABSTRACT

A study was conducted on a total of (24) local Iraqi breed of cats (*feliscatus*) in both sexes (12 male + 12 female). Ages were ranged between (10 months – 3 years) and weight between (2600-5000 gm.). Result of the anatomical study revealed that the trachea of the cat was firm tube like structure composed of series of incomplete cartilaginous rings lined on the ventral surface of the neck its number roundabout (37 tracheal rings). The trachea had two parts according to the region. The first part was the cervical which was characterized by long wide lumen. The mean diameter was (8.15±0.040 mm) while the thoracic part was short and narrow diameter (7.34±0.26 mm). At the level of fourth rib the trachea included this primary bronchus (left and right). The right principal bronchi then continuous as the labor bronchi, the caudal lobe were as the left principal bronchi originates at slightly more acute angle from the trachea. The study explained that right lung larger in volume and weight from that in the left lung. The weight from the right lung (12±0.7 g), the volume (16±1.1 ml), the weight of left lung (9.4±0.6 g), the volume (14±0.9 ml). The right lung comprises four lobes which are named, apical, middle, and caudal in addition to the accessory lobe, while the left lung has two lobes, apical and caudal. The apical lobe is subdivided in to two parts, cranial apical and caudal apical lobe by deep notch.

KEYWORDS: Trachea, cat, *Catus domesticus L.*, anatomy, histology, lings etc.

INTRODUCTION

The Trachea is a tube like structure used as an air way to supply the lung with oxygen. It is attached to the caudal, border of the laryngeal cartilage; it lies on the ventral aspect of neck. Below the esophagus it is considered part of the lower respiratory tract^[1,2,3]. The Trachea is divided to two parts according to the position: Cervical Trachea: The Trachea extends from the cricoids cartilage to its bifurcation within the thorax and has 38-43 ring of Hyaline cartilage that form incomplete ring dorsally them. Tracheal is attaches externally to the cartilage and complete each ring shape. Annular ligaments joint the adjacent tracheal cartilage^[1,4]. The cervical Trachea was bounded ventrally and bi lateral by the stone-thyrohyoid muscle. The muscle was turned bounded laterally by longus muscle^[5]. After the glottis the Trachea in cat are around lumen and Trachea cartilage are c-shape ring connected dorsally by the tracheal membrane^[6]. Thoracic Trachea: The Trachea part of the trachea lies in the media stinum-dorsal to the right and left principle bronchi.^[1, 3, 7] who reported that the Trachea of syrain hamster contain 15-18, c-shape cartilage ring and cranial ring is composed of two semicircular segments which meet but don't fused ventrally, the ring is fused at the lateral aspect the diameter of a proximal of Trachea about 20 mm. The Rodent Africa Giant pouch rat (water house was made of c-shaped cartilaginous ring the ring were oval and increase cranial held together by a connective tissue. The range from 21-33 ring. The diameter of trachea ring is between (5.38-5.69 mm)^[5]. The trachea in dog using both in adult the diameter about (21 mm) and thickness of each trachea ring is 36-45 ring. The region of trachea is divided in to cranial cervical, middle, thoracic in inlet and intra thoracic trachea region.

Consist of 12 tracheal ring respectively fusion of the trachea ring is especially obvious in the cranial cervical and thoracic inlet regions as a result of neck movement. The trachea is semi-circular in shape in dog (the average length of trachea (10 cm))^[1,8]. The trachea extends from transverse plane through the middle of axis to plane between the fourth and fifth thoracic vertebrae^[8]. The trachea ring of the Angora goat is an elongated oral with gap dorsally which is occupied by Trachea crest. The trachea is composed of^[49] rings whose length is about 25 cm, the diameter of cervical region about 1.93 cm while in the thoracic region 1.65 cm^[9]. The trachea in camel (camelus dromedarius) composed of 82-84 cartilaginous rings. The trachea is cylindrical in shape in camel it is length 133-145 cm Trachea diameters 5-4.5 cm. The Trachea Tracheal lied in left side replaced in the subclavian artery and cephalobranial artery and different from the domestic animals^[10]. The Trachea in human is cartilaginous and fibro molar tube that extends forms inferior aspect of the cricoids cartilage to the main carina its length is (10-12 cm) in adult. The tracheal diameter was wide ranging from (13 to 15 mm) in men. In women variability is still noted, with range of (10-21) mm according to^[11,12]. The trachea of elephant cartilage ring the end of each incomplete end articulated with its other end and the opposite end of one of adjacent ring. The overlapped alternative attachment making a saw-tooth pattern (zipper line). The mammalian Lung is structurally a complex organ although many aspects of gross Lung anatomy have been studied in numerous species. Variation in location and in structure^[13, 14]. The Lung are a pair of Sponge like organs located inside the thoracic cavity. They are not directly attached to the ribs, enclosed by two layers

of pleura inside pleura cavity^[1, 15]. Each Lung roughly triangular in profile has an apex, costal, medial and diaphragmatic surface and dorsal, ventral and caudal (Basel) border^[1,16]. Anatomically there were differences, between the Lungs animal's species. In dog have apex, costal, medial, diaphragmatic surface and three borders. Each Lung is divided by deep fissures of the dogs Lungs correspond to the oblique of the human lungs^[1, 15,16,17]. Carnivorous Lungs are subdivided in Lobes by deep interlobar fissure. The right Lung is formed of four lobes; apical (cranial), middle (cardiac), caudal (diaphragmatic) and accessory (Intermediate) and it is larger than the left Lung, which has two lobes an apical (cranial) and diaphragmatic (Caudal)^[2,18] the feline Lungs had the same lobar division of carnivorous Lungs^[4]. Lungs of animals except the horse the left cranial lobes is further divided into cranial and caudal part, the right Lungs from the domestic animals, with the exception of the horse which have four lobes (Cranial, Middle, Caudal and accessory). The accessory lobe is located between the heart and diaphragm, bounded laterally by the folds of the venacava and medially by the mediastinum^[14,17]. Horse right and left Lungs are more nearly equal size than in other species. Left and right Lungs are divided into two lobes by Cardiac notch. Either side divided to (Cranial and Caudal)^[17,18,19]. The camels Lung like horse Lung which separated the lobes by connective tissue. The right Lung consists of three lobes (apical, diaphragmatic, accessory lobes), whereas the left Lung consists of two lobes (apical and diaphragmatic). These lobes are divided by cardiac notch.

Bovine Lung the right had four lobes are apical lobe is divided in to two parts (cranial and caudal parts, that receive a tracheal bronchus, cardiac lobe, diaphragmatic lobe and Intermediate lobe^[10]. The left Lung consists of two lobes the apical lobe is unlike but the right apical lobe is undivided and diaphragmatic lobe^[1,14,20,21]. The Lung of pig consists of right and left lungs, the right lung consist of (Cranial, Middle, Caudal and accessory lobes. While the left Lung consists of bilobed middle and caudal because a short left main bronchus^[17,22,23]. The Lung of guinea pig and Rabbit were divided into seven lobes—right have four lobes (Cranial, middle, caudal and accessory) and left two lobes^[14,24]. The elephant lungs, The left and right lungs having one lobe each were encapsulated with thick and highly elastic layer of dense connective tissue.^[12] The Formosan Reeve's muntjac (Taiwanese endemic deer) Lung and Japanese deer (Carves Nippon) Lungs are like most of the other domestic species are clearly subdivided into multiple lobes by inter lobar fissures it is deeper than most of domestic species the left lungs are subdivided into two lobes (Cranial and Caudal lobes). The cranial are composed of cranial and caudal parts shallow fissure are observed between two parts. The right lungs have four lobes^[17, 25]. The right Lung of the giraffe lung consists of bi-lobed upper middle, accessory and lower lobes- the middle and lower lobes are united to form one lobe, the left lung consists of upper bilobes, middle and lower lobes, the middle and lower are adhered.^[17] Macaca fascicularis (Monkey) Lungs were similar. In shape of that in human lung but had three lobes (upper, middle, and lower) in the left lung and four (an additional Infracardiac

lobes) in the right Lung. The right Lung had a larger volume than left^[26]. The Lungs of Bowhead whale are rectangular and of nearly uniform thickness throughout, without external or internal lobulation, invisible lobe in lung. The lung parenchyma including loci close to the pleura. This arrangement would seem to allow exchange of air in parts of the lung^[27].

Bronchial Tree

The conducting air ways of the bronchial tree is divided into smaller and smaller bronchi. When cartilaginous plates are absent in the walls of the smallest bronchi^[28,29]. The tracheobronchial tree had branching system that delivers air to the alveoli. The number of branches depends on the animal's size for instance mice have about^[10] and horse^[40] branches or more. Tracheobronchial tree lined by a secretary ciliated epithelium^[15,30]. The bronchial tree consists of a series of air way, an important difference between regular and irregular dichotomous modes become evident. This concerns the number of branching divisions between the trachea and terminal bronchioles dichotomous branching system may be regular in the former the parent divides into two daughters having essentially same diameter, length and branching angle.

In the irregular mode of division the daughter differ with respect to one or more dimension, usually diameter and angle^[13,31]. Relatively wider air ways and decline in air way resistance with decline body mass in small mammals as compared with large ones which result in height ventilatory dead space, which is compensated for by a higher breathing frequency.^[32,33] reported that the air way branching morphology of mature and immature rabbit Lung have variation in branching asymmetry and there are no evidence of systematic difference in structure between mature and immature Lung. Pulmonary air way are organized in a complex branching arrangement to facilitate gas exchange in the Lung. The branching air way in animals such as the mouse, rat, dog, pig, donkey and horse and are considered to exhibit monopodia branching pattern^[31,32,34,35] noted the terminal air way are separated from the surrounding pulmonary capillaries by a tissue Layer only few micro meters thick. The labor bronchi originated from the principal bronchi, in same order and in the same approximate anatomic location. In each lobar bronchus a series of segmental bronchi were observed. These segmental bronchi were directed dorsally and ventrally in all Lung Lobes, with the exception or the right middle Lung lobe in which the segmental bronchi were directed cranially and caudally. The first 2-3 segmental bronchi in each lobe usually originated at approximately the same location within the lobar bronchus^[1,9,10]. In dog noted that the bronchial runs down to branches of 0.5mm diameter [36]. The Horse Lung has four bronchioles system on either side, dorsal, lateral, ventral and medial. The cranial lobe is formed by the first bronchiole of the dorsal bronchiole system. The middle lobe is formed by the first bronchiole of the lateral bronchiole system. The accessory is formed by the first bronchiole of the ventral bronchiole system. The remaining bronchioles of the dorsal, lateral and ventral bronchiole system and all bronchioles of the medial bronchiole system constitute. The caudal lobe the term bronchiole corresponds to a labor bronchus arising from the right and left bronchi especially in ventral and

medial bronchiole system^[17]. The right cranial lobe bronchiole of the horse Lung doesn't correspond to the right cranial lobe bronchiole of cow, goat or pig Lung which arise from the right lateral side of the trachea of this bronchiole. In the fundamental structure of the bronchial ramification of the mammalian^[17,23]. The right middle lobe bronchiole of the horse Lung corresponds to the right middle lobe bronchiole of the cow, pig, goat or dog Lung^[93]. The pig Lung has dorsal, ventral, medial and lateral bronchiole system on the either side addition tracheal bronchiole (bronchus) arises from right side of the trachea^[17,22,23]. The bronchus arises from right side of the trachea in Japanese Deer, formason Reeves, Muntjac Lung (Taiwanese–endemic deer) and Giraffe Lung^[17, 25]. In primates (Monkey) the bronchioles are arranged like those of other mammalian Lung. The four bronchiole systems, dorsal, ventral, medial and lateral arise from both bronchi, respectively, although some bronchioles are lacking. In the right Lung, the bronchioles from upper middle, accessory and lower lobes were asin the left Lung the upper and accessory and lower lobes were as in the left Lung. The upper and accessory lobes are lacking and bi-lobed middle and lower lobes are formed^[15,17,25]. The dog Lung has four bronchiole system (dorsal), lateral, ventral and medial, on either side the right Lung bronchiole same the horse. The left Lung, all the cranial lobe bronchiole is absent. The left middle lobe bronchioles arise from the ventro-laterl side of the left bronchus. The remaining bronchioles of the lateral bronchioles system and all the bronchioles of the dorsal, ventral and medial bronchioles system constitute the left caudal lobe^[37]. The left principle bronchus of dog passes laterally and slightly caudally to enter the left Lung at the hillus and principal bronchus give off the apical lobe bronchus is short and terminates by divisions into two bronchi (apical and middle) lobes before it continues into

the diaphragmatic lobar bronchus^[1,16]. The bronchi tree in camel like that in the horse exclusively right cranial bronchus arises from the trachea before bifurcated to right bronchus^[10, 24].

MATERIALS AND METHODS

A total of Twenty four healthy adult of local Iraqi breed cats of sexed (male and female), were collected from the Diyala Governorate ranging weight between (2600-5000)g \pm 9 aging 10-mothes -5 year's determined by their dental formula. Cats were divided into three groups was allocated for anatomical study, Second group for histological study, Third group were used cast to study the blood vessels and bronchial tree. These groups had been euthanasia, including ability to induce loss of consciousness and death without pain [38]. The cats were anaesthetized with intra muscular does of xylazine (Rompum, the does 10mg/kg B.W. with Ketamin15 mg/kg. B.W.The chest was opened by midline thoracotomy to expose the trachea, lungs and thoracic contents.

The anatomical measurement taken as follows: The length of trachea from the cranial border of first tracheal ring to the bifurcation (carina). the diameter of trachea dorsal-ventra and latro-lateral diameter by digital vernier caliperto an accuracy of \pm 0.1 mm. External features of the ling the position, shape and color numerical of lobation of lung.

The anatomical measurements of lung are: as follows measuring the volume of Lung by displacement method each specimen was totally submerged into known volume of bi-distilled water at 2°C in a graduated cylinder. measured the total lung weight using electronic balance of sensitivity 0.01 gm. Weight of right and left lung and their lobes were measured separately using the above balance .

RESULTS & DISCUSSION

TABLE 2: shows a summary of Morphometric Parameters of the Trachea and Pleura in Cat n=8

parameters of the lower respiratory system	Minimum	Maximum	Mean \pm SE
1- Trachea diameter (mm)	7.2	9.67	8.5 \pm 0.39
2- Right principle bronchus diameter (mm)	6.39	8.9	7.34 \pm 0.36
3- Left principle bronchus diameter (mm)	4.24	8.3	6.07 \pm 0.36
4- Trachea cranial ring diameter (cost)	6.22	8.9	8.15 \pm 0.40
5- Trachea middle ring diameter (cost)	7.50	8.6	8.15 \pm 0.40
6- Trachea caudal ring diameter (cost)	6.13	8.0	7.34 \pm 0.26
7- Trachea length (mm)	119.79	135.97	127.88 \pm 0.52
8- Trachea ring number	36	38	37
9- Thickness of visceral pleura	0.018	0.021	0.0196 \pm 0.0004

TABLE 3: shows at the Morphometric pParameters of the Lung of the Cat n=8

Name of the parameter of the lung	Minimum	Maximum	Mean \pm SE
Body weight of the cat (g)	2775	5000	3875 \pm 0.04
Total body weight of lung (g)	16	27	21.9 \pm 1.2
B.W. of right lung (g)	9	16	12 \pm 0.7
B.W of left lung (g)	7	10.2	9.4 \pm 0.6

TABLE 4: Shows the the eight ofeach Lobe of the Cat n=8

Right lung	Apical lobe (g)	Middle lobe (g)	Accessory lobe (g)	Caudal lobe (g)
Weight of right lung mean	2.69 \pm 0.2	2.2 \pm 0.2	1.55 \pm 0.2	5.97 \pm 0.2
Minimum	1.63	1.5	0.89	4.98
Maximum	3.9	2.9	2.5	6.7

Left lung	Apical lobe		Caudal lobe
	Cranial part	Caudal part	
Weight left lung	2.28±0.14	1.43±0.15	5.66±0.32
Minimum	1.75	0.81	4.19
Maximum	3.1	1.8	6.78

TABLE 5 shows measurement of Volume of the Cat of Lung and lobes of lung n=8

Volumes	Minimum	Maximum	Mean
Volume of total lung ml	22	38	30±1.9
Volume of right lung ml	11	19.9	16±1.1
Volume of R. apical lobe (ml)	2.6	4.97	3.75±0.03
Volume R. middle lobe (ml)	1.8	3.43	2.51±0.2
Volume R. accessory lobe (ml)	1.2	2	1.64±0.1
Volume R. caudal lobe (ml)	5.6	9.7	7.6±0.5
Volume of left lung	10.2	18	14.0±0.9
Volume L. apical lobe (ml) crania part	3	5.1	3.97±0.24
Volume L. caudal part (ml)	1.28	2.6	2.01±0.16
Volume L. caudal lobe (ml)	5.8	10.2	7.97±0.5

TABLE 6: shows the Measurement of the diameter of the pulmonary trunk

	Min.	Max.	Mean ±SE
Right pulmonary artery mm	3.38	4.8	4.18±0.45
Left pulmonary artery mm	2.60	4.10	3.4±0.36

Trachea of cats is composed from a series incomplete ring is a firm tube like structure its passage through out all the cervical region on the ventral surface of the neck near the midline as given in fig [2]. The trachea is directed caudally from cricoidal cartilage of the larynx at the level of the second cervical vertebrae to the level of the fourth ribs in (thoracic vertebra) as shown in fig (4). These result agrees with [2, 29] in dog. At fourth rib the tracheal is divided to two principles bronchi. The right and left bronchi this bifurcation called carina. These results are similar to those mentioned [2] in dog and [6] in cat. Tracheal regions are divided to three area cranial region, middle region and thoracic region. The mean number of the ring about [38] rings in cat, this ring is present mostly in cranial region about (70%) which is located at the neck of cat and the thoracic region it has (30%) that means the tracheal rings of the cervical region is most affected by neck movement. These results are in agreed with that of [8] in dog, [7] in Syrian golden hamster. The Tracheal rings of cats are semi-circular as shown in (fig-1) in cross section and different from dogs which have elliptical shape. The measurements of diameters and length of trachea in cats obtained that the mean diameter of cat trachea about (8.5±0.39 mm) and the diameters of the tracheal region (cranial, middle, caudal) are 8.15±0.4, 8.15±0.4, 7.34±0.26mm respectively. There is no significant difference between tracheal regions as in Table [1]. The lumen of the trachea narrow in caudally region with relatively small and bounded by bone such as first pair of ribs, vertebra (thoracic vertebra) and sternum. The mean of the tracheal length about 127.88±0.52mm as illustrated in (fig 2). Other researchers reported the diameter and the length in domestic animals. [10] in camel; [9] in Angora goat [8] in dog [5] in African giant pouched rat. Boundaries of the Trachea in cat bilaterally the Trachea bounded by the sternothyrodeus muscle ventrally by the sternothyrodeus muscle but the esophagus was not visible

it lied on the dorsal surface of the trachea. The tracheal rings ends meeting of the right end with the left end between them trachea list muscles, the carotid sheath is dorsolateral to the trachea. These results are sameto those in Angora goat [9]. Lungs of cats were bright red in color which completely surrounding the heart as in (fig 1). The shape of the lung in situ was in conformity with the shape of the thoracic cavity which extends from second rib to thirteen ribs (fig. 4). The anatomical description of the lung in cats is con shape which had apex and three surfaces, costal, medial, diaphragmatic surface. Each lung is divided by deep fissure into distinct lobe. The lung borders have dorsal, ventral, caudal borders as in (fig 3). The dorsal border is rounded and thick, ventral border is flatten and rounded the caudal (basal) border sharp as in (fig. 3). The costal surface of lung is smooth and convex. The costal surface is neared with lateral thoracic wall and present of impression of ribs as in (fig. 5). Whereas, the medial surface or mediastinal surface is the narrowest surface consists of heart region and its pericardium and it contains the cardiac impression and passage of large blood vessels and nerve fibers entering or leaving lung through the hilus? (fig-3). The diaphragmatic surface which corresponds with the diaphragm as in as in (fig 3) by pulmonary ligament from this result is supported by the researches of [16] in dog and [1]. The right lung of cats has four lobes separated by complete fissures. Each of the lobes has an independent hilus. The hila of each these four lobes collectively from the main hilus of right lung (fig 6). The accessory lobe was fused with caudal part of the hilus (fig 6) those results is same to the anatomical description of the lungs by [2,16,18] in dog. Also the right lung of cats was large organ which occupy most the right thoracic cavity as in (fig 3). The right lung in cat had different description than that of large and small ruminant lungs according with the result of [9] in Angora goat. The right lung of the cat is different from the horse and camel.

They have three lobe lakes the middle lobe. Those results was reported by^[10,19] in camel. The left lung of cats is divided into two distinct lobes by deep fissure at the heart level. The left lung lobe including left apical lobe subdivided to two parts cranial apical part and caudal apical part, and caudal lobe (diaphragmatic lobe) as in (fig 7). The left lung of cats was smaller than right lung because position of heart which occupied the large part of

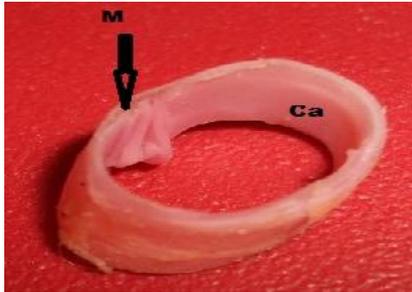


FIGURE 1: Shows Tracheal Ring of Cats, Semicircular Ring. MT=trachealis muscle. Ca=hyaline cartilage.

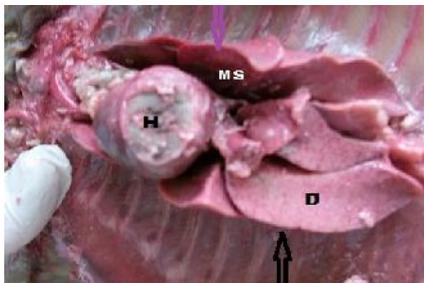


FIGURE 3: Shows Illustrates of Lungs of Cats (*Felis catus*) ventral aspect: DS=diaphragm surface. MS = medial surface. Arrow purple. Ventral border, black arrow caudal order

The left lung has two fissures a cranial and caudal corresponding to those of the right lung. The left lung of cat is different from that of the horse and camel. The cranial lobe of left lung undivided to parts^[1, 10, 19]. The camel and horse classical anatomical description from cats is different because required more oxygen and metabolic demand which can be attributed its habitat. The camel lives in desert need air flow in high speed to regulated temperature^[12]. stated that anatomical description of the elephant, lungs had only the right and left lung having one lobe in each. The left lung of cat is same as state by^[25] the left lung of Taiwanese endemic deer has two lobes; the cranial lobe is divided to two parts. The right of cat had four lobes apical lobe, middle lobe, caudal lobe and accessory lobes as in (fig 6) corresponded to the upper lobe, middle lobe, lower lobe and medial basal segment in the human. But in the human, the left lung consists of upper and lower the basal segments are absent this result is reported by^[11]. The total weight of lung about mean (21.9±1.2g), the mean of right and left lung (12.5±0.7g), the mean of left lung (9.4±0.6g) (table- 3). The weight of

caudal left thoracic cavity and from the cardiac notch. Those results is supported by researches of Light (1983) in cat,^[2,15,16] in dog but the left lung of cats is different from the rat reported by^[5] in Africa rat,^[7] in golden hamster have one lobe in left lung. This result of left lung of cat does not agree with^[16] which reported the left lung of dog have three lobes.



FIGURE 2: Shows Tracheal and Lungs of Cats Trachea Bifurcation (carina). Bi=bifurcation. RP=right principal. LP=left principal. RA=right apical lobe. RM=right middle lobe. RCa=right caudal lobe. S=right accessory lobe. LA=left apical lobe. LC=left caudal lobe.

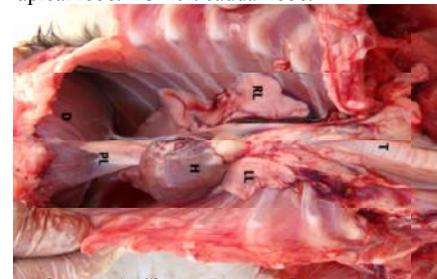


FIGURE 4: Shows Lungs of Cats (*Felis catus*) and related shape between Lungs and Heart in Thoracic cavity. T=Trachea. H=Heart. RL=right lung. LL=left lung. PL=pulmonary ligament. D=diaphragm

right apical, middle lobe, caudal lobe and mean weight of the accessory lobe were (2.69±0.2g 2.2±0.2g) and (1.55±0.2g) respectively. The mean weight of the left apical lobe cranial part (2.28±0.14g), caudal part mean (1.43±0.15g) and weight mean of caudal lobe (5.66±0.32g) as in Table 4. The weight of lungs and each lung reported by^[5] in Africa rat. The mean total volume of the lung of the cat, the mean volumes of the right lung and the left lung (30±1.9ml), (16±1.0ml), (14±0.9ml) respectively table^[5]. The mean volume of each lobes of each lungs of cats, the right lung apical, middle, caudal, accessory lobes (3.75±0.3ml), (2.51±0.2ml), (7.6±0.5ml) and (1.64±0.1ml) respectively as in (table-5). The mean volumes of left apical lobe cranial part (3.97±0.24ml) caudal apical part (2.01±0.16ml), caudal lobe (7.97±0.5ml) table as in (5). Each lung is separated by thin space and suspended by double layers of mesothelium layers called pleura. Inner layer called visceral pleura adherent with lungs parenchyma. Outer layer called parietal pleura attached with thoracic wall (fig 5, 8). Thoracic cavity contains the pleura the right and left

pleura cavities, the mediastinal as in (fig 7) with its contents and lung pleura end named for the structures that it covers mediastinal pleura diaphragmatic pleura, costal pleura as in (fig 5, 8). The caudal mediastinal pleura double layers of pleura extending from the lobes to the mediastinum and diaphragm called pulmonary ligament as in (fig 5). Those results supporting other results in cat. The lung consists of two layer outer parietal and visceral supporting by the [15] in dog, rat and monkey, [12] describe the pleura in elephant and description is different from the domestic animals it is very thick composed of thick and highly elastic layer of dense connective tissue. The measurement of thickness of cats used the digital caliper about 0.0195mm. The test of bronchial tree of the cats (*feliscatus*) Lung is done by using cold resin in order to prepare cast specimens. After preparing the cast injected the cold resin via trachea and maceration by 70% HCl and washing the specimen and cleaned to deliver the bronchial tree pattern which were relative size of the bronchi and bronchioles are clearly and faithfully. The trachea divided into right and left principal bronchi the right principal bronchi then continuous as the lobar bronchi the caudal lobe while the left principal bronchi originate at slightly more acute angle from the trachea. As in (fig 9, 10) those results agrees with the researcher [6] in cat and [2] in dog. The right and left principal bronchi arise the right lobar bronchi and left lobar bronchi and the last one divided into segmental bronchi for each side and sub segmental bronchi. That followed at regular branching to the bronchiole. The bronchiole tree in cat is composed of each the lobar bronchi give off bronchioles and classified the bronchioles into the dorsal and ventral bronchiole. The right apical lobe is formed by first bronchi of the dorsal bronchi (directed dorsally). The right middle lobe is formed by first bronchi of the lateral bronchi (directed ventrally). The caudal lobar bronchi is formed by medial bronchiole as in fig (11) In the left apical lobar bronchi is formed by the first bronchiole of the lateral bronchiole (directed laterally). The bronchioles of the dorsal, ventral and medial bronchiole constitute the left caudal lobe bronchi as in (fig 12). This result corresponds the to result [17] in dog in the right Lung but the result of bronchial tree of cat revealed that the left lung is different from that results reported by the [23]. In pig, [17] in dog because the left apical lobe bronchi are absent and also remind the middle lobar bronchi. The right principal bronchi are (first order) branches to three secondary bronchi (segmental bronchi) apical, middle, caudal bronchi which was the continuous of principal bronchi. The accessory bronchi arise from caudal bronchi as in (fig 11). This result agrees with the research by [24] in guinea pig but this result is different from the reported by the researches of [25]: in Taiwanese enemic deer, [37]. In Japanese deer; [9,23] in angora goat; [10]. In camel which reported arise tracheal bronchi from the trachea before the bifurcation. This situation was due to the distance between larynx and tracheal bifurcation is longer than other mammals. The left principal bronchi (first order) gives branches to the two secondary bronchi which the first branching to the cranial lobe which was subdivided in to two segmental bronchi supply the cranial part and caudal parts and the terminated into the left caudal lobe as in (fig 12). This result agrees

with the [2,6] in dog. The diameter of right and left principal bronchi in cats mean are (7.34 mm± 0.36) (6.07mm± 0.36) respectively. The right principal bronchi were larger than left principal. The air flows in right Lung faster than the left; these results were supported by the researcher [31].

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