

**Respiratory System of *Calotes*
*versicolor***

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Respiration in Reptiles

- Reptilian lungs are better developed than amphibians
- Reptiles use two efficient lungs (except snakes – they only have one long one that fits their bodies)
- Muscular ribs help them expand the chest cavity as we do to draw in the air
- Nostrils allow them to bring in air while their mouth is closed
- Few reptiles can also exchange gasses through skin eg. sea snakes, soft shelled turtles
- Lungs, trachea are respiratory organ.
- Also, aquatic turtles can “breath” through their mouth

Respiratory passage

The respiratory tract includes the external nares, nasal chambers, internal nares, glottis, larynx, trachea and bronchi.

External Nostrils:

1. Paired external nostrils are small and oval apertures situated dorsally at the tip of the snout.
2. External nostrils are uncovered and are not connected to the mouth.
3. External nostrils possess valves.

The external nares, present on snout open through nasal chambers and internal nares into the buccal cavity.

Nasal chambers

- Nasal chambers are small and do not have the conchae.
- Nasal chambers remain separate throughout as there are two internal nostrils.

Internal nostrils

- Paired internal nostrils open into the anterior part of the buccal cavity.

Glottis & Larynx

- Glottis is without epiglottis.
- A median longitudinal slit on the floor of pharyngeal cavity, called glottis, leads into a small box like chamber, called larynx. Its wall is supported by two arytenoids' and one cricoids cartilage.
- Larynx is a voice-box by possessing paired vocal cards which are functional
- Larynx has two paired 12 muscles innermusculus compressor laryngis and outer musculusdilaterlaryngis. It opens into the trachea.

Trachea

- The larynx leads into a long ,cylindrical tube, the trachea, which turns posteriorly through the neck, ventral to esophagus. The tracheal wall is supported by complete cartilaginous rings throughout its length to prevent it from collapsing.
- In the thoracic cavity, the posterior end of trachea bifurcates into two very small narrow tubes, the right and left bronchi, which are also supported by complete cartilaginous rings. Each bronchus enters the lung of its side through its anterior end.
- Bronchi have complete cartilagenous rings.
- Bronchides are not formed.
- Syrinx is absent.

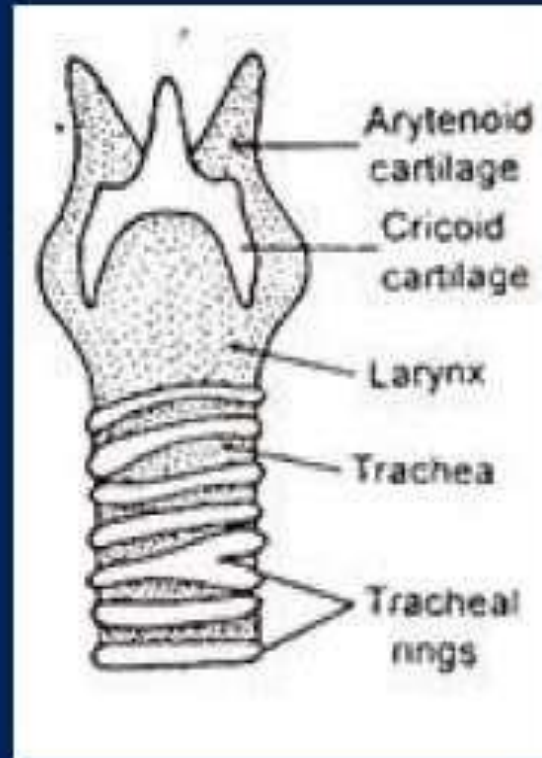
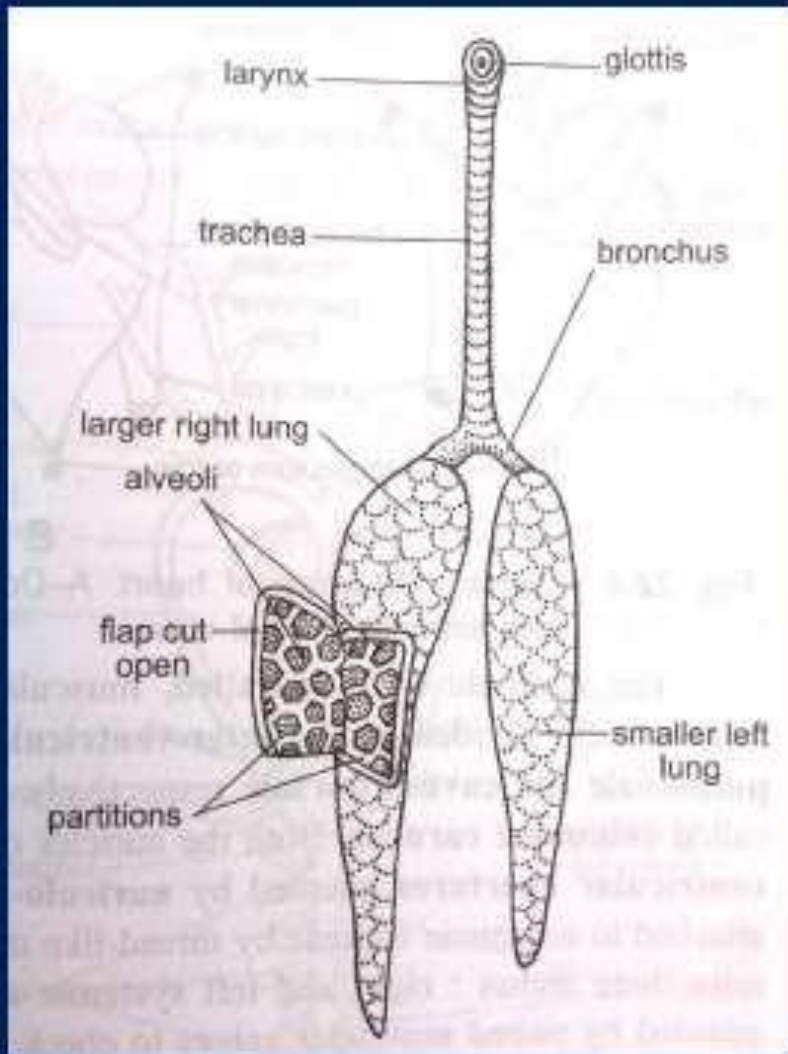


Fig: *Calotes* Respiratory System

Lungs, Larynx, trachea and other associated parts

Respiratory organs

- Unlike frogs, lizards have no auxiliary means of respiration.
- Lungs of Garden Lizard (*Calotes*) are little more elaborate than those of anurans .
- There is a pair of elongated, fusiform, thin-walled, elastic sac-like lungs.
- Lungs have orange colour. These are elongated bodies of fairly large size.
- Lungs are hollow sacs with thin elastic wall. These are having low septa and shallow alveoli on the inner surface.

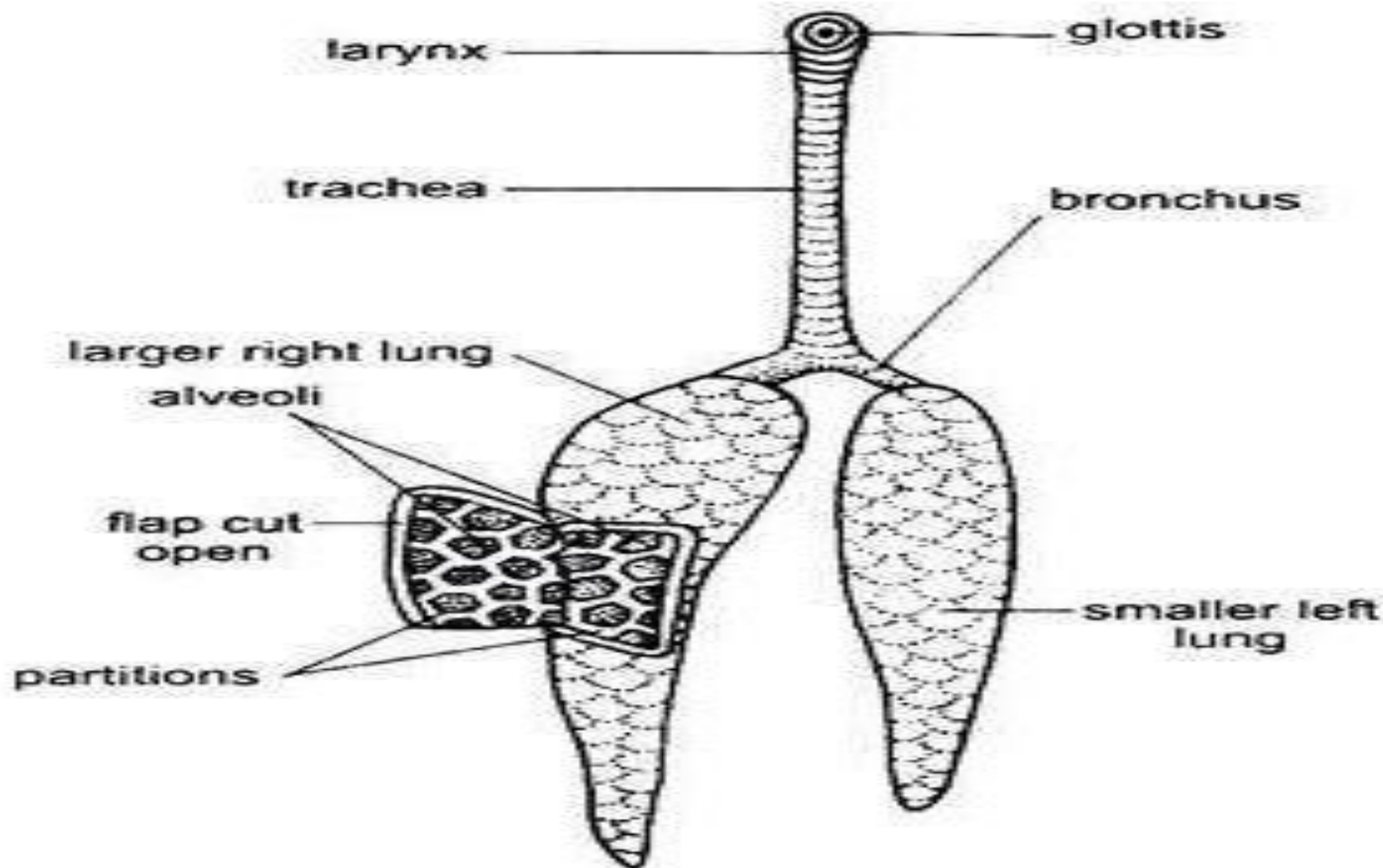


Fig. 22.3. *Calotes*. Respiratory system. A portion of the right lung is cut open to show the internal partitions and alveoli.

- Lungs are not differentiated into lobes.
- These lie in the thoracic cavity one on either side of the heart.
- Right lung is a little larger than the left one. Inner surface of each lung is folded into a network of incomplete ridges or *septa* giving the appearance of a honeycomb.
- Lungs are enclosed by peritoneum.
- Air sacs are absent.

[III] Respiratory mechanism

- In most reptiles including the garden lizard (Calotes) the pleural and peritoneal cavities communicate.
- The respiratory movements are performed by the intercostal muscles attached to the ribs.
- Inspiration is caused by the movement of intercostal muscles, raising the ribs that increases the volume of the thorax and reduces the lung pressure causing the inflow of air into the lung.

- The mechanism of respiration in lizard is different from that in a frog and also more effective. It is provided by the ribs and their intercostal muscles.
- During inspiration, the muscles pull the ribs outwards, enlarging the body cavity. As a result the lungs expand the fresh air rushes into them from outside through nostrils.
- During expiration, the ribs are pulled back to their original position. Consequently, the body cavity is reduced, the lungs are pressed and their foul air goes out through the same passage.
- Oxygen of the air enters the blood of the blood capillaries and CO_2 of the blood enters the alveoli. Expiration is done by lowering the ribs that decreases the volume of the thoracic cavity, flows back to the exterior.

(A) Exchange of Gases in Lungs:

(B) Exchange of Gases in Tissues:

Transport of Gases in Blood:

Blood carries oxygen from the lungs to the heart and from the heart to various body parts. The blood also brings carbon dioxide from the body parts to the heart and then to the lungs.

A. Transport of Oxygen:

(i) **As dissolved gas:** About 3 per cent of oxygen in the blood is dissolved in the plasma which carries oxygen to the body cells.

(ii) As oxyhaemoglobin:

About 97% of oxygen is carried in combination with haemoglobin of the erythrocytes. Oxygen and haemoglobin combine in an easily reversible reaction to form oxyhaemoglobin.

