

# Amphibia

## General characters.

- 1- cold blooded vertebrates.
- 2- skin smooth or rough, rich in glands which keep it moist.
- 3- scales, if present are hidden in the skin.
- skull articulates with the atlas by two occipital condyles.
- vertebrae are acanthous, pseudocentrus and notocentrus.
- Limbs tetrapodus pentadactyle type.
- R.B.C. are biconvex, oval and nucleated.
- Heart is divided into two atria and one ventricle and it has 3 valves.
- Arcotic arches are symmetrical.
- gills are present at least during some early stages of development.
- Lateral sense organs are present during some stages of development.
- **vagus** is the last cranial nerve.
- **Eggs** with gelatinous covering, usually laid in water.
- The larva has to pass through an aquatic stage before **metamorphosis** into adult.

# Amphibia

order

**Apoda**

(Primitive burrowing forms)

Limbs and tail are absent.

Capellatory organs are present in male.

ex → Ichthyophis  
 → Siphonops

**Urodela**

(Head, trunk and tail)

→ limbs present  
 → outparony  
 → teeth present in jaws.

ex → Ambystoma

→ Axolotal larva

**Anura**

Body short and broad

Head and trunk fused.

→ Neck and tail absent.

ex → Alytes  
 - Pipa  
 - Bufo

80. *Ichthyophis*

<b>Classification :</b>		
Phylum	... Chordata	→ Dorsal tubular nerve cord, notochord, and paired gill-slits are present.
Group	... Vertebrata	→ Notochord is replaced by vertebral column; two pairs of appendages; circulatory system closed; hepatic portal system present; blood red containing R.B.C.
Subphylum	... Gnathostomata	→ Jaws and paired appendages are present.
Class	... Amphibia	→ Cold blooded; aquatic and terrestrial; skin moist, soft glandular and devoid of external scales; two occipital condyles; heart three chambered.
Order	... Apoda or Gymnophiona	→ Burrowing; vermiform; without limbs and girdles; skin with numerous grooves and wrinkles.
Genus	... <i>Ichthyophis</i>	
Species	... <i>glutinosa</i>	

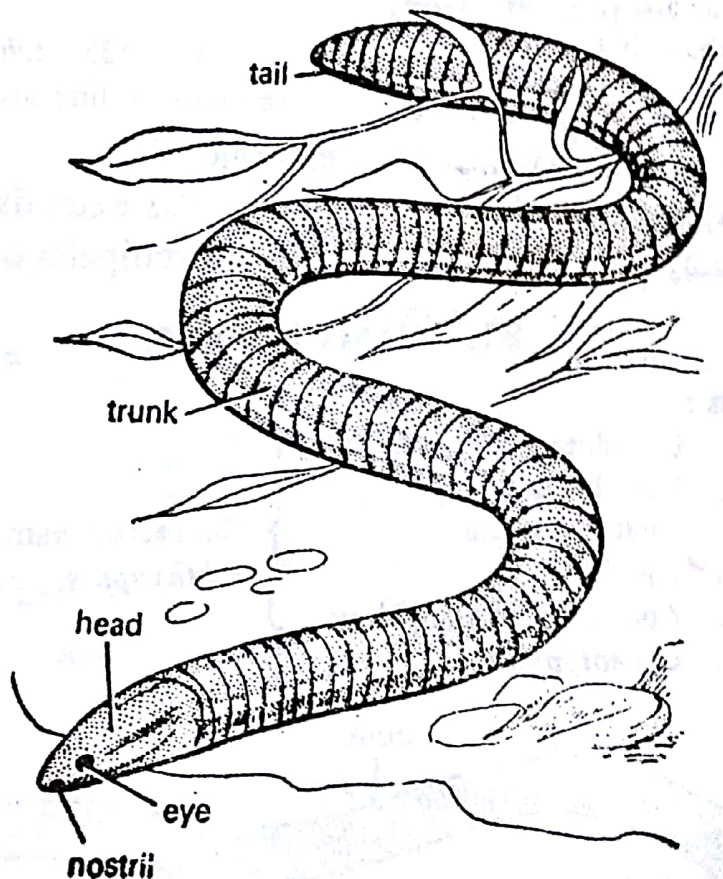


Fig. 134. *Ichthyophis* (Male).

**Characters :**

1. *Ichthyophis* is a burrowing elongated and eel-type animal.
2. It measures upto 30 cm in length.
3. The colour of the body is dark brown or bluish black with a yellow band along the side.

4. Skin is provided with numerous transverse grooves or wrinkles.

5. Minute scales are embedded in the grooves of skin.

6. Limbs and limb girdles are entirely absent.

7. Tail is short or vestigial.

8. Eyes are minute devoid of lids buried deep in the head.

9. A protrusible tentacle, present between the nostril and the eye, is a sensory organ.

10. Tympanic membrane and columella are absent.

11. Sexes separate, males possess large copulatory organ provided with hooks.

12. Parental care is very well developed. Female coils herself around the gelatinous egg mass to protect it from ground burrowing animals.

13. Larva possesses three pairs of very long finely branched external gills.

**Geographical distribution :** *Ichthyophis* extends from the foot hills of Himalayas to Ceylon, the Malay Archipelago and Siam.

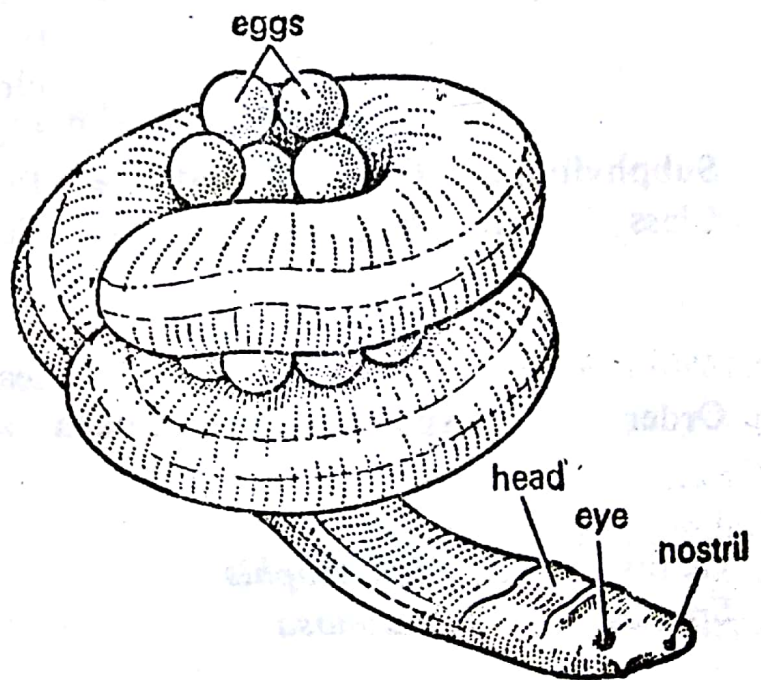


Fig. 135. *Ichthyophis*.

(Female coiling around the eggs.)

## 81. Uraeotyphlus

### Classification :

Phylum ... Chordata

**Geographical distribution:** *Ambystoma* is found in North America from Southern Alaska to Mexico. Neotenic forms occur in mountain region especially in Mexico.

**84. Axolotl Larva**

**Classification :**

Phylum	...	Chordata	}	Characters same as those of <i>Ichthyophis</i> .
Group	...	Vertebrata		
Subphylum	...	Gnathostomata		
Class	...	Amphibia		
Order	...	Urodela	}	Characters same as those of <i>Ambystoma</i> .
Suborder	...	Ambystomoidea		
Type	...	Axolotl larva		

**Characters :**

1. Axolotl is the larva of *Ambystoma tigrinum*.
2. It possesses three pairs of external gills and a tail having a caudal fin.
3. Axolotl larva exhibits the phenomena of neoteny. Failure to metamorphose because of environmental conditions is called neoteny.
4. When environmental conditions such as low temperature or lack of iodine in water inhibit the action of thyroid gland, the axolotl larva becomes sexually mature and reproduces in the larval state.
5. If the environmental conditions are changed, it is capable of metamorphose.
6. Metamorphosis in Axolotl is induced by injecting thyroid extract or by transferring to water with a higher iodine content.
7. During metamorphosis the gills and tail fin are lost.

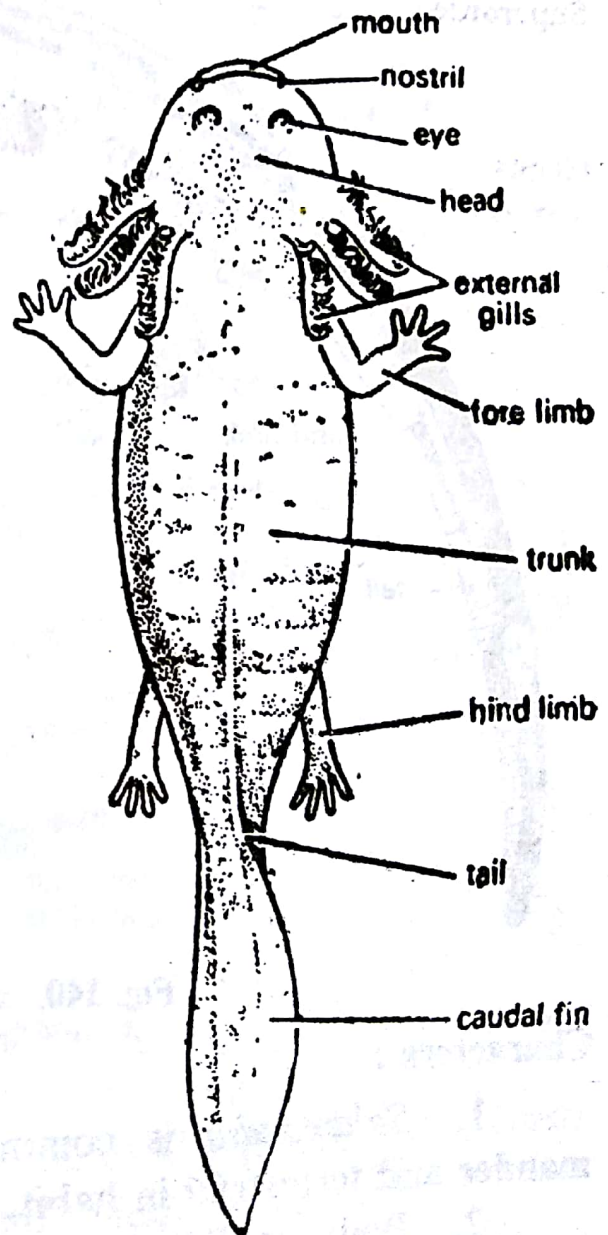


Fig. 139. Axolotl larva.

Geographical distribution : Axolotl larva is found in the mountain regions of Mexico.

### 85. Salamandra

#### Classification :

- Phylum ... Chordata
- Group ... Vertebrata
- Subphylum ... Gnathostomata
- Class ... Amphibia
- Order ... Urodela

Characters same as those of *Ichthyophis*.

→ Body with distinct head, trunk and tail; limbs two pairs and of equal size; with or without external gills; oviparous; larvae aquatic like adults.

- Suborder ... Salamandroidea

→ Eye-lids present or absent; either gills or lungs present; fertilization is internal; viviparous.

- Genus ... *Salamandra*
- Species ... *maculosa*

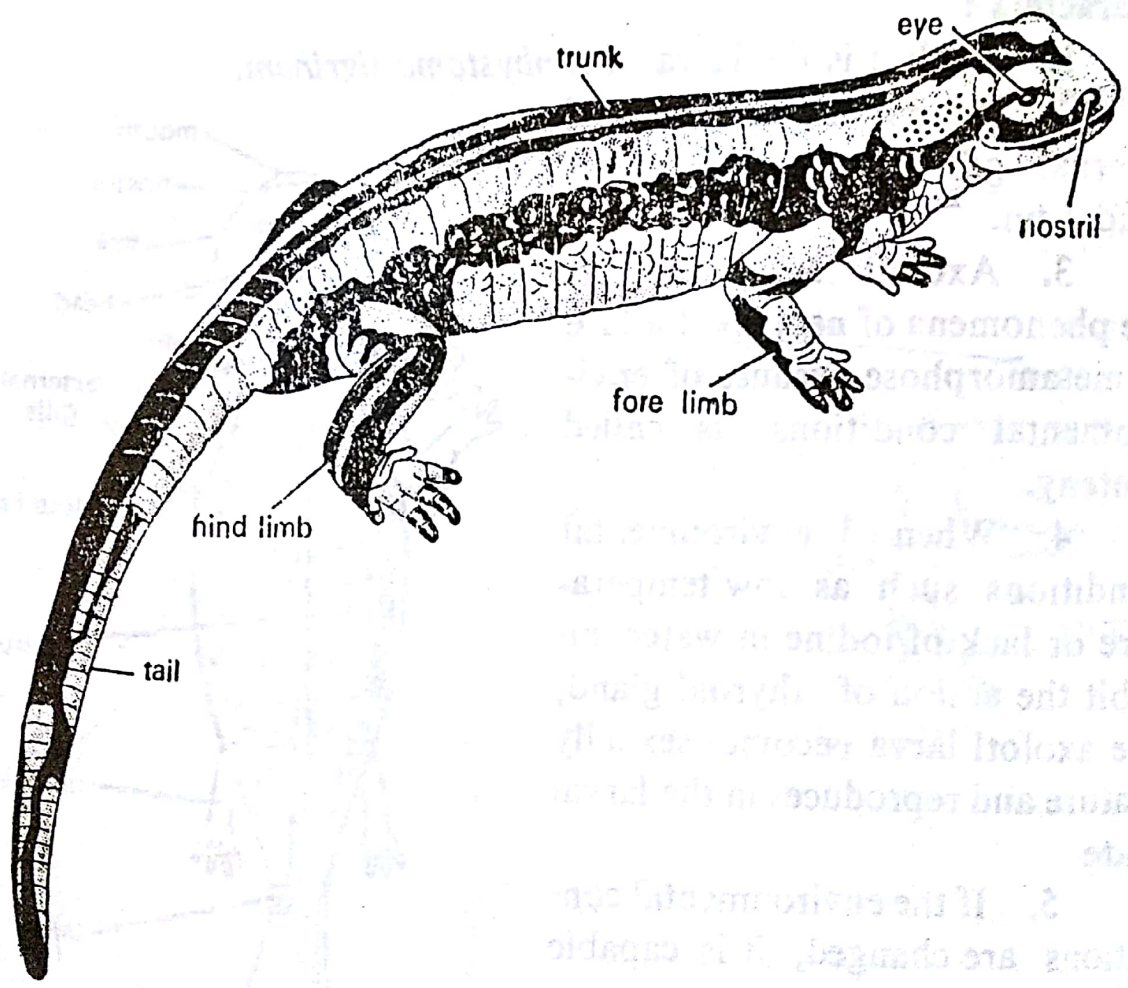


Fig. 140. *Salamandra maculosa*.

#### Characters :

1. *Salamandra* is commonly known as **European fire-salamander** and terrestrial in habit.
2. Body is lizard-like in appearance. The colour is black with yellow spots.

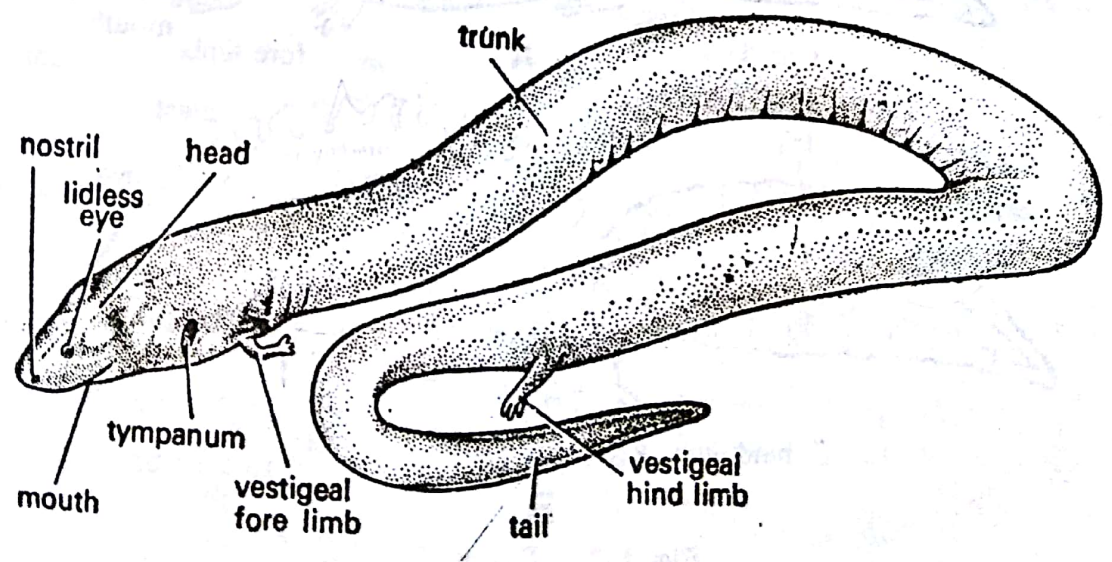
3. Limbs are well developed and strong.
4. Tail is cylindrical.
5. Gills are absent in adults.
6. Eye-lids are movable.
7. Tympanic membrane or middle ear is absent.
8. Paratoid glands are present behind the head.
9. Teeth are present on both the jaws.
10. Vomerine teeth are also present.
11. Vertebrae are opisthocoelous.
12. Inter-auricular septum is perforated.
13. Viviparous.
14. About 15 embryos develop in the oviducts.
15. Young-ones born having the external gills and metamorphosis takes place later.

**Geographical distribution :** *Salamandra* is found in Europe and Asia.

**86. Amphiuma**

**Classification :**

Phylum	...	Chordata	} Characters same as those of <i>Ichthyophis</i> .
Group	...	Vertebrata	
Subphylum	...	Gnathostomata	
Class	...	Amphibia	} Characters same as those of <i>Salamandra</i> .
Order	...	Urodela	
Suborder	...	Salamandroidea	
Genus	...	<i>Amphiuma</i>	



**Fig. 141. *Amphiuma*.**

**Characters :**

1. *Amphiuma* is commonly known as **Congo-eel**.
2. It is found in the swamps and muddy waters.
3. Body is very long and cylindrical, measuring about 90 cm in length.

4. The general colour is black.
5. It is a semi-larval form.
6. Fore-and hind-limbs are tiny and almost vestigial, which are of no value in locomotion.
7. Eyes are lidless and a small pair of open gill-slits are present and these are regarded as persistent larval characters.
8. Lungs with long trachea supported by cartilages.
9. Sternum is absent.
10. *Amphiuma* lays its eggs in water and the female coils around them for protection.

**Geographical distribution :** *Amphiuma* is found in South-Eastern U. S. A.



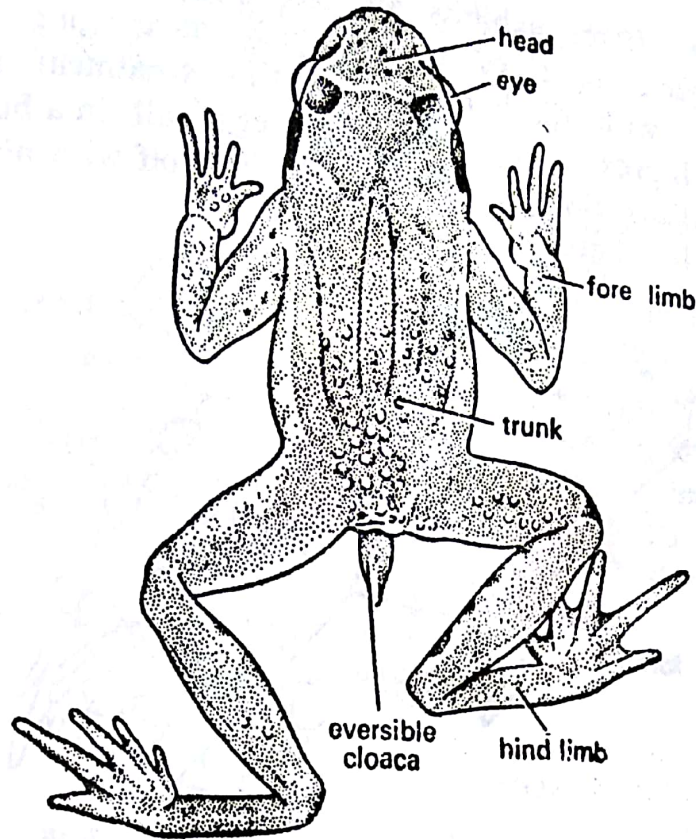


Fig. 146. *Ascaphus*.

92. **Alytes**

**Classification :**

Phylum	...	Chordata	} Characters same as those of <i>Ichthyophis</i> .
Group	...	Vertebrata	
Subphylum	...	Gnathostomata	
Class	...	Amphibia	
Order	...	Anura	→ Body short and broad ; head and trunk fused ; neck and tail absent ; fore-limbs short, hind-limbs long ; gills absent ; respiration by lungs ; fertilization usually external.
Suborder	...	Ophisthocoela	→ Vertebrae opisthocoelous ; free ribs either in larva or adult.
Genus	...	<i>Alytes</i>	

**Characters :**

1. *Alytes* is commonly known as mid-wife-toad.
2. Body surface bears papillae dorsally as well as ventrally.
3. It measures 5 to 7.5 cm in length.
4. Eyelids are movable.
5. Tympanum is large.
6. Vocal-sacs are absent.
7. Fore-limbs with four fingers and hind-limbs with five toes.
8. Vertebrae are opisthocoelous.

9. Male *Alytes* exhibits an extraordinary parental care of eggs. The male is described as assiduously massaging the cloaca of the female with its hand. After this treatment the female apparently with great effort, expels her eggs all in a bunch. The male then fertilizes the eggs and carries them off with him attached to its legs till they hatch into tadpoles.

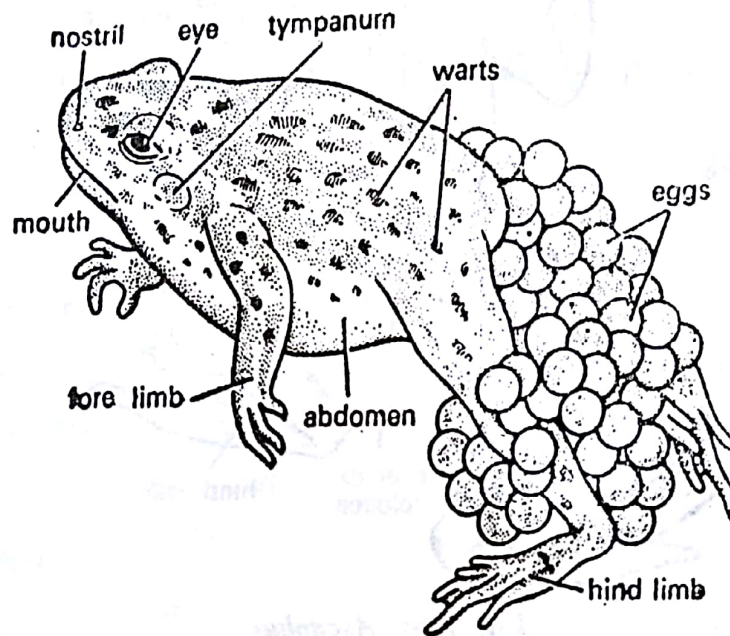


Fig. 147. *Alytes*.

**Geographical distribution :** *Alytes* is found in France and Italy.

### 93. *Pipa*

#### Classification :

Phylum	...	Chordata	}	Characters same as those of <i>Ichthyophis</i> .
Group	...	Vertebrata		
Subphylum	...	Gnathostomata		
Class	...	Amphibia	}	Characters same as those of <i>Alytes</i> .
Order	...	Anura		
Suborder	...	Opisthocoela		
Cenus	...	<i>Pipa</i>		
Species	....	<i>pipa</i>		

#### Characters :

1. *Pipa pipa* is commonly known as **Surinam toad**.
2. Body surface bears papillae throughout. Each papilla bears a horny spike at the tip and a poison gland at its base.
3. Head is very short and broad with a pair of small tentacles in front of eyes.
4. Eyes are small and eyelids immovable,
5. Tympanum is not distinct.
6. Tongue is absent.
7. Eustachian tubes open into the pharynx by a median opening.

8. Fore-limbs fingers are slender ending in star-shaped tips bearing sensory papillae.
9. Hind-limbs are exceedingly large and bear broadly webbed-toe.
10. Vertebrae are opisthocoelous.

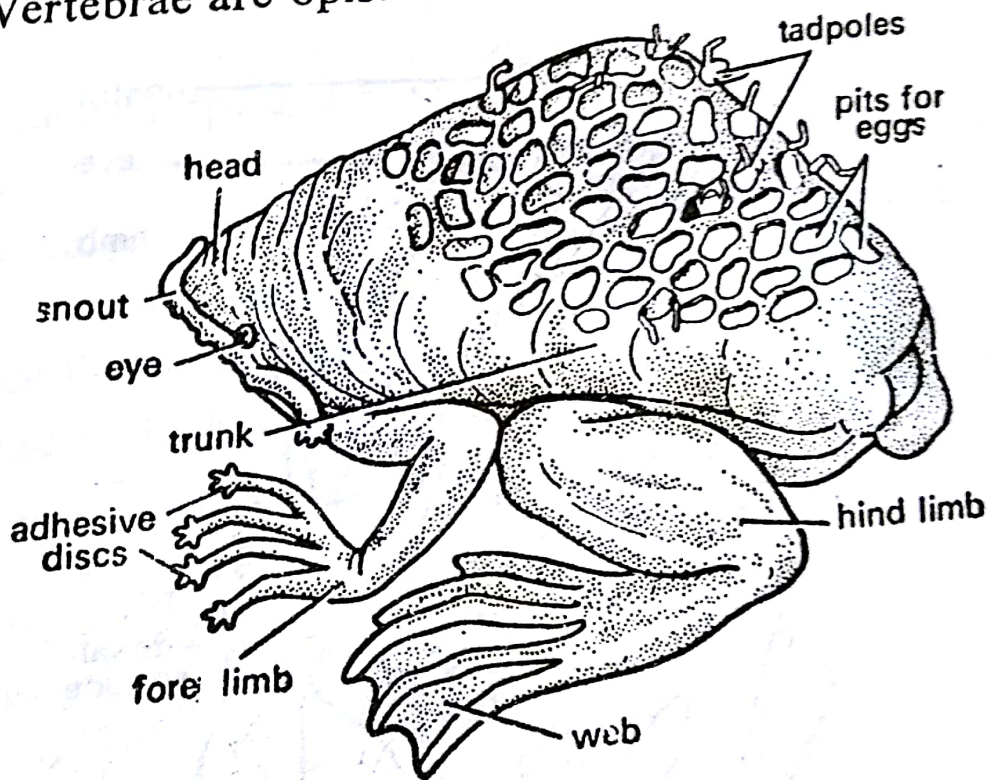


Fig. 148. *Pipa pipa* (Female).

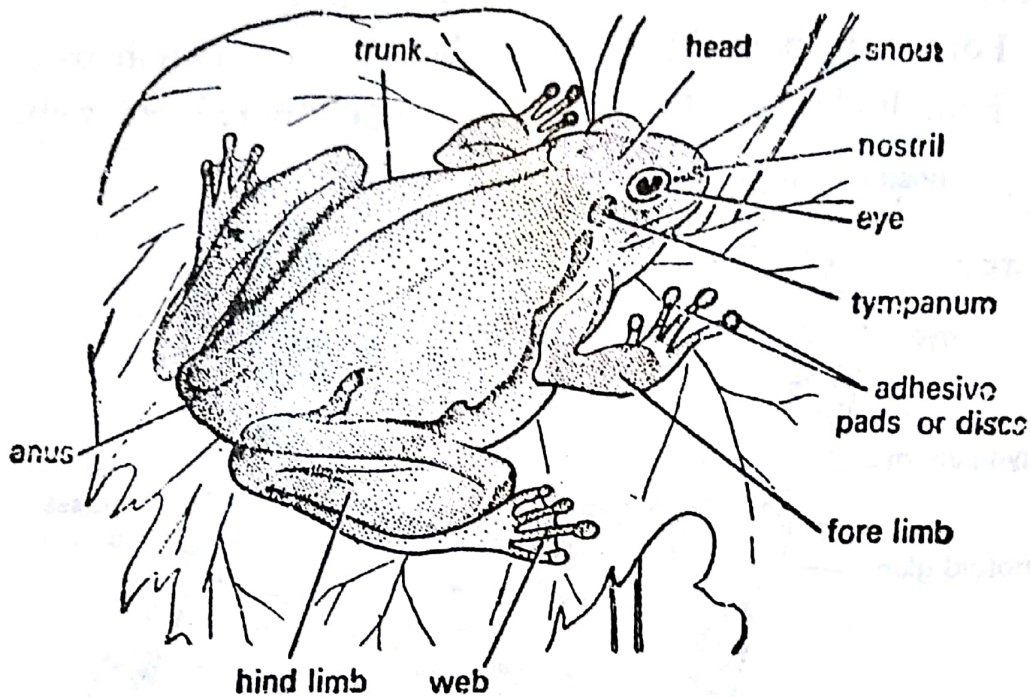
11. In the female, the skin of the back is soft and puffy and forms pockets or small pits with lids in which the eggs undergo their complete development.

**Geographical distribution :** *Pipa pipa* is found in Guiana and Brazil.

## 94. Bombinator

## Classification :

Phylum	...	Chordata	} Characters same as those of <i>Ichthyophis</i> .
Group	...	Vertebrata	
Subphylum	...	Gnathostomata	
Class	...	Amphibia	} Characters same as those of <i>Bufo</i> .
Order	...	Anura	
Suborder	...	Procoela	
Genus	...	<i>Hyla</i>	

Fig. 151. *Hyla*.

## Characters :

1. *Hyla* is commonly called as tree-frog due to its arboreal habits.
2. Skin is smooth on the dorsal surface but bears papillae on the ventral surface.
3. The animal measures from 2.5 to 7.5 cm in length.
4. Eyes, nostrils and tympanum are well-developed.
5. Fingers and toes have adhesive-pads or discs for sticking on the smooth surfaces.
6. Web is poorly developed.
7. Teeth are present only in the upper jaw and absent in the lower jaw.
8. Vocal sacs are greatly expanded and produce loud voice.
9. Vertebrae are procoelous.
10. They exhibit mimicry and are remarkably protectively coloured.
11. In *Hyla goeldii* the eggs are carried on the back of the female.

98. Rana

Classification :

Phylum	...	Chordata	}	Characters same as those of <i>Ichthyophis</i> .
Group	...	Vertebrata		
Subphylum	...	Gnathostomata		
Class	...	Amphibia	}	Characters same as those of <i>Rhacaphorus</i> .
Order	...	Anura		
Suborder	...	Diplasiocoela		
Genus	...	<i>Rana</i>		
Species	...	<i>tigrina</i>		

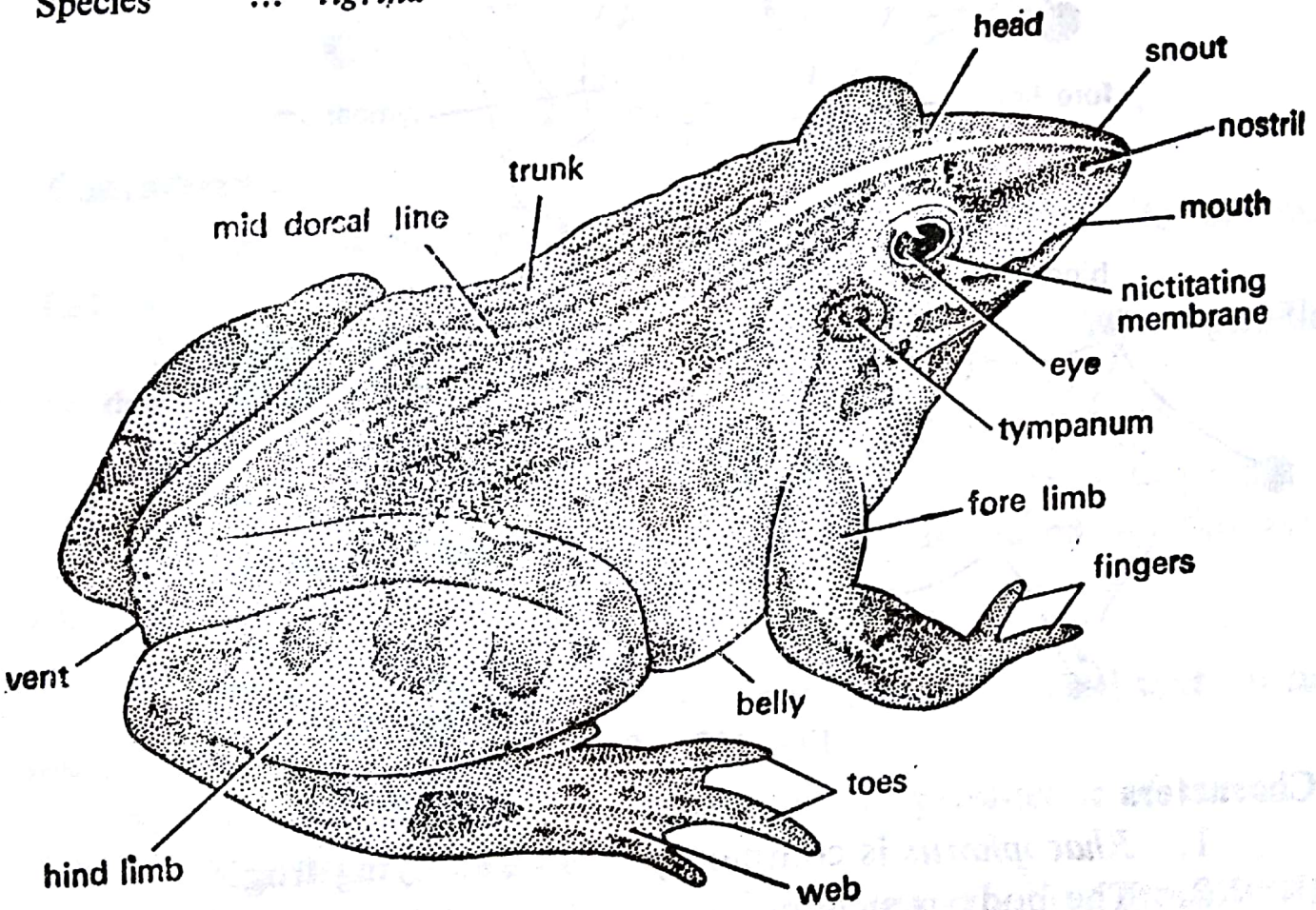


Fig. 153. *Rana tigrina*.

Characters :

1. *Rana tigrina* is commonly called **Indian bull-frog**.

2. Body is green with black patches along with a yellow mid-rib on the dorsal surface and pale yellow on the ventral surface.

3. Head is flat and more or less triangular.

4. **External nostrils** are on the dorsal surface of the snout, one on each side of the median line.

5. **Eyes** are large and placed behind the nostrils and provided with eyelids.

6. A pair of **tympanum** lie behind the eyes.

7. Limbs pentadactyle. Fore-limbs with four fingers and hind-limbs bear five toes which are webbed.

8. Lower jaw without teeth.

9. Tongue is large, muscular and forked, attached in front and free behind.

10. Vomerine teeth are present in two groups one on each side of the internal nostrils.

11. Vertebrae are procoelous.

12. Carnivorous, feeding on small worms, snails, slugs and aquatic insects.

13. It is found in moist places, freshwater ponds and streams.

**Geographical distribution :** *Rana* is world wide in distribution.