

# Parental care in Amphibia

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## **Parental Care in Amphibia**

Looking after the eggs or the young until they are independent, to defend from predators, is known as *parental care*. It is a very important factor for survival. Animals exhibit a great diversity in caring for their eggs and young during their development. Perhaps no group shows more diversity than do the amphibians, especially those living in tropical regions. Anurans show much greater diversity than urodeles and apodans. The methods of caring by Amphibia generally fall under two broad categories: (1) Protection by nests, nurseries or shelters and (2) Direct caring by parents.

### **[I] Protection by nests, nurseries or shelters**

Amphibians have evolved countless interesting methods to give protection to their defenceless eggs and larvae from predators.

**1. Selection of site.** Many amphibians lay eggs in protected, moist microhabitats on land. Many tropical frogs and toads lay eggs on land near water. Many tree frogs lay their eggs not on land but on leaves and branches overhanging water. Species of *Phyllomedusa*, *Rhachophorus*, *Hylodes*, etc. glue their eggs to foliage hanging over water. *Rhachophorus malabaricus* in India and *Chiromantis* of Africa also deposit their spawn on trees. Many tree frogs deposit eggs in water that accumulates in epiphytic tropical plants. Free from reach of aquatic egg predators in their microhabitats, the tadpoles on hatching drop into water beneath to complete metamorphosis.

**2. Defending eggs or territories.** Males of green frog *Rana clamitans* and other species maintain territories and attack small intruders to defend eggs. Male or female even guards the eggs. In *Mantophryne robusta*, the male actually sits over and holds with hands the elastic gelatinous envelope containing eggs numbering 17. Some tree frogs laying eggs above water may sit beside the eggs or rest on top of them. Removal of guarding frogs may result in desiccation or death of eggs.

**3. Direct development.** In some terrestrial or tree frogs, such as *Eleutherodactylus*, *Arthroleptis*, *Hylodes* and *Hyla nebulosa*, the eggs hatch directly into little frogs thus avoiding larval mortality. In the red backed salamander *Plethodon cinereus*, the hatchlings are miniatures of the adults.

4. **Foam nests.** Many amphibians convert copious mucous secretions into nests for their young. In the Japanese tree frog *Rhacophorus schlegeli*, the mating couple digs a hole or tunnel into which eggs are left in a frothy mass to avoid desiccation. During rains, hatching tadpoles are washed down the sloping tunnel into pond or river water for further development. The female of South American tree frog, *Leptodactylus mystacinus*, stirs up a frothy

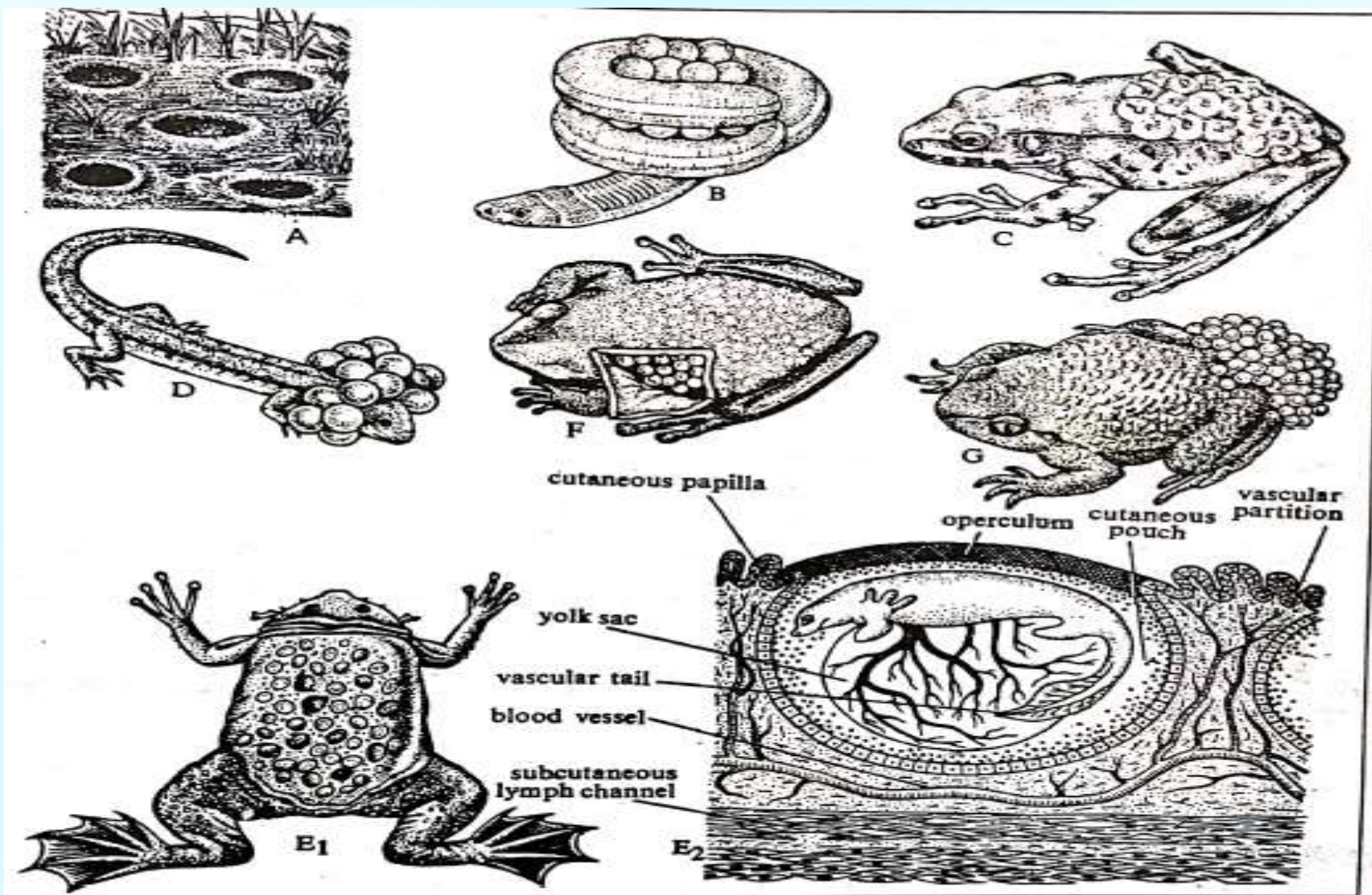
mass of mucus, fills it in holes near water and lays eggs in them. The tadpoles developing in these improvised nests can readily enter water. Some anurans lay eggs in nests of foam floating on water. The female emits huge mucus that she beats into a foam with her hindlegs to lay eggs. When tadpoles hatch they drop from foam into water.

## [II] Direct caring by parents

1. **Coiling around eggs.** In congo eel *Amphuima* and certain caecilians like *Ichthyophis* and *Hypogeophis*, the female lays large eggs in burrows in damp soil and carefully guards them by coiling her body around them until they hatch. The female of Salamander *Plethodon* also coils round the eggs which are laid in small packages in the hollow of a rotten log or beneath a rock. In *Megalobatrachus maximus*, it is the male who coils around the eggs.

2. **Transferring tadpoles to water.** Some species of small frogs (e.g. *Phyllobates*, *Arthroleptis*, *Pelobates*, *Dendrobates*) in both tropical Africa and South America, deposit their eggs on ground. The tadpoles hatching out fasten themselves to the back of one of the parents with their sucker-like mouth and transported to water.

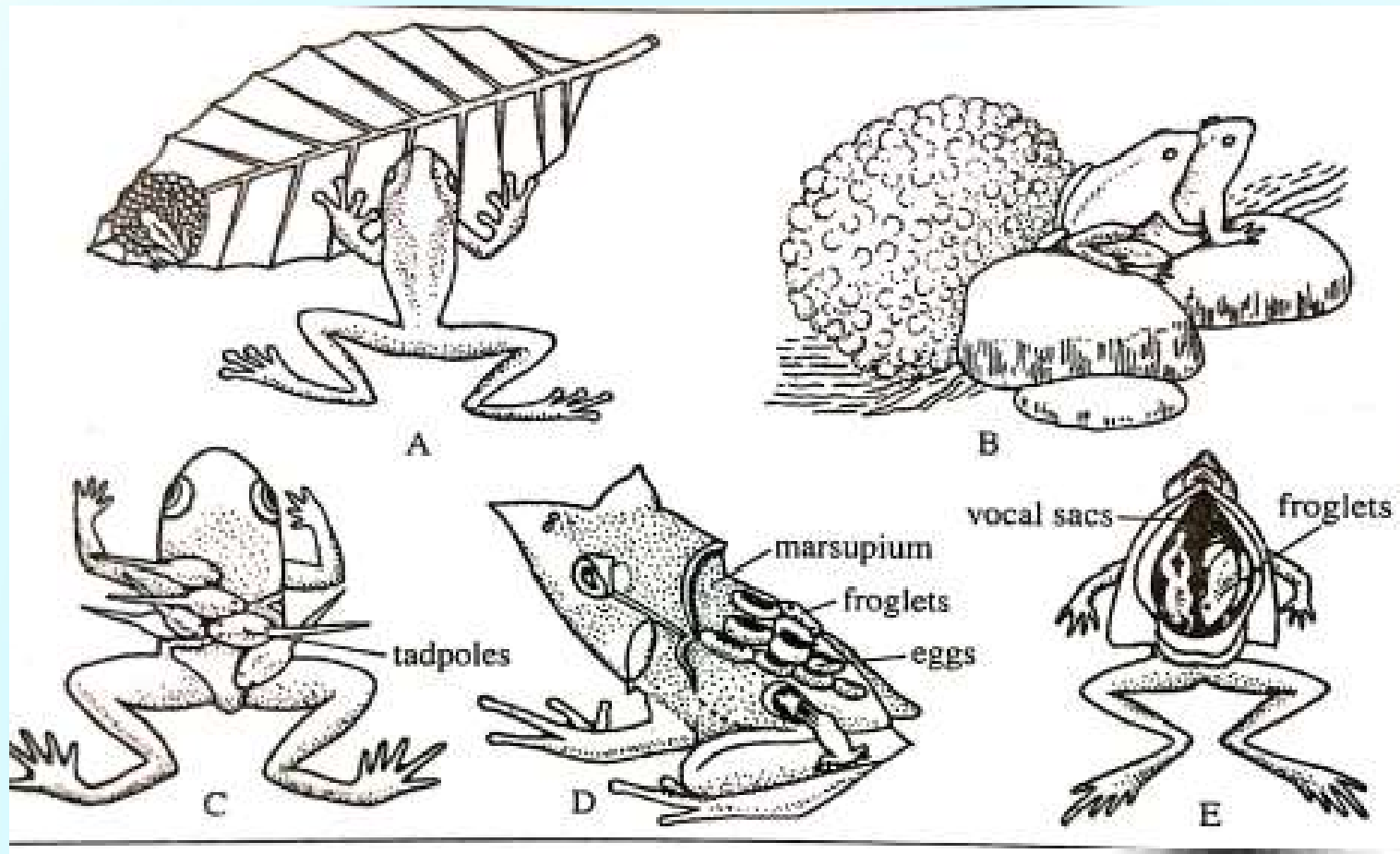
3. **Eggs glued to body.** Many amphibians, instead of remaining with the eggs, carry the eggs glued to their body. In the dusky salamander, *Desmognathus fuscus*, female carries the string of eggs coiled around her neck, until they have hatched. In Sri Lankan tree frog, *Rhacophorus reticulatus*, the eggs are glued to the belly of female. An interesting case is that of the European midwife toad, *Alytes obstetricans*. When the female lays eggs, the male entangles them around his hindlegs. He carries them with him until they are ready to hatch. At that time he releases the tadpoles into nearest water.



47 : Parental care in amphibians. A. Mud nests of *Hyla*. B. *Ichthyophis* coiling round the eggs. C. *Cryptobatrachus evansi*. The brood pouches are opened to show the developing eggs. D. *Desmognathus fuscus* with eggs. E<sub>1</sub>. *Pipa pipa*. E<sub>2</sub>. Pseudoplacentation in *Pipa dorsigera*. F. *Gastrotheca*. G. *Alytes*.

the developing larva attains a vascular tail (Fig





A-E, Parental care of some amphibians. A. Leaf nest of *Phyllomedusa*, B. Eggs (*Rhacophorus schlegli*) are laid in a hole near the bank of the river or pond and are protected by foamy mucus, C. Tadpoles (*Phyllobates*) are carried by the back of females to the water body, D. Eggs (*Hyla goeldii*) are carried on the back of females in their broad pouches, E. Males (*Rhinoderma darwini*) carry the eggs in their inflated vocal sacs.