

PARENTAL CARE IN AMPHIBIA

Amphibians include anurans, urodela and apodans. In all these groups of amphibians a great deal of parental care is seen. Amphibians show several mechanisms to protect their eggs and developing young ones because they lay few eggs.

Parents protect the eggs and early developmental stages in two ways.

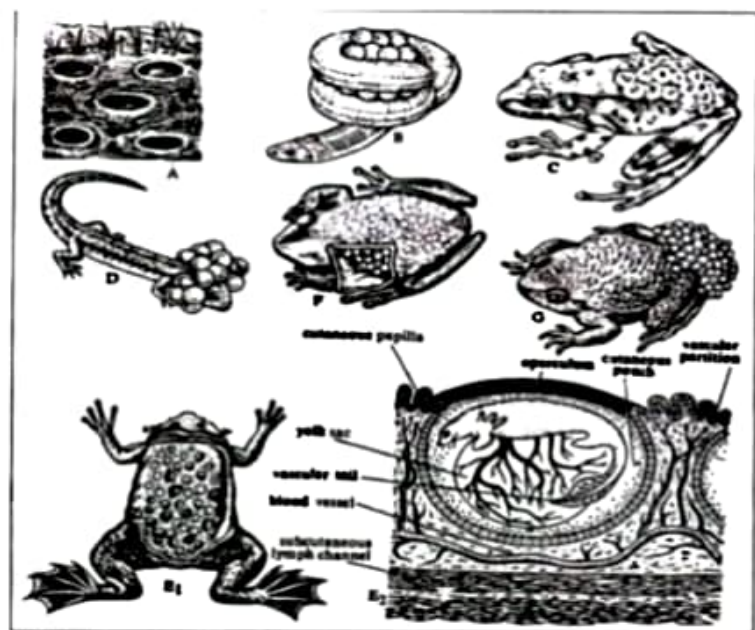
- 1) They construct nests
- 2) Direct Nursing.

The female *Ichthyophis gluinosa* will dig a hole in the moist soil near a pond. It will deposit eggs in it. Around this egg mass the mother will coil and protect the egg mass from the enemies.

2. PARENTAL CARE IN URODELA:

In some urodela amphibians the eggs are very small. They hatch and directly develop into larvae. In those organisms parental care is not required.

- a) Protection by Nests :- *Salamandrella keyserlingi* will construct a gelatinous bag like structure. It is attached to an aquatic plant below the water. In this bag eggs are stored. Thus they are protected by the Nest. ii) *Autodax* will lay eggs in a dry hole on the soil or in a hole on a free. The parents also live in the hole and protect the egg and the larvae developed from them.



*47: Parental care in amphibians. A. Mud nests of *Hyla*. B. *Ichthyophis* coiling round the eggs. C. *Cryptotriton aeneus*. The brood pouches are opened to show the developing eggs. D. *Desmognathus fuscus*. E. *Pipa pipa*. E1. *Pseudisporocnema* in *Pipa divergens*. F. *Gastrotheca*. G. *Alytes*.

b) Direct Nursing by Parents

- i) *Amphiuma*, (Congoeel) The mother will coil around the eggs and protect them. *Amphiuma-congoeel-eggs* ii) *Desmognathus fuscus*, (the dusky Salamander) The mother will carry the eggs. They are attached around its neck.

L *Salamandra salandra*, (the European fire salamander) :- The mother will retain few eggs in its body. It liberates the larvae into water. They complete their development in the water.

iv) *Salamandra atra*, (the European alpine salamander) : The mother keeps the eggs in its uterus. It liberates only the young ones which are completed their metamorphosis.

3. PARENTAL CARE IN ANURA : In Anura amphibians the parental care is reached its peak. Many organisms will exhibit parental care.

a) Protection by Nests:

Many frogs and toads build nests in which the eggs are laid and developed. This is a primitive method of parental care. In these organisms the larva comes out in a very early embryonic stage which requires some kind of protection in the very early stages of development, hence the parent will build nests.

i) *Hyla Faber*:- It is Brazilian free frog. The female will construct the nest in the shallow waters of a pond. The female will dig a hole of 8 to 10cm depth. The mud which comes out of it is used by the female *Hyla* to construct a wall around the hole. This wall is raised above the level of water. Female *Hyla* will make the inner surface of this Nursery smooth and even the female will lay eggs in this nursery. The eggs and larval forms are protected inside this structure.

ii) *Rhacophorus malabaricus* It is called chunam frog. It lays eggs on the branches or leaves of a tree which will be hanging over a pond. These larvae after hatching from eggs will fall into the pond water and undergo metamorphosis.

iii) *Rhacophorus schlegeli* It is called Japan free frog. Both male and female frog will make a burrow in the moist soil near a pond edge. This hole is filled with foam by female. Then female lays eggs in this foam. The male and female animals will make an exit tunnel into the pond from the hole. The larvae developed from eggs will be carried by the liquid formed from the foam into the pond through these exit tunnels.

iv) *Hyla resinfectris* It is a free frog. It will make use of holes in the trees. It will line the hole of tree trunk with beewax brought from bee comb. Female animal lays eggs in this hole when filled with rain water.

v) *Leptodactylus mystacinus* It digs a hole in the moist mud near a pond. This hole is filled with foam which is secreted by the oviducts of the female. Female lays eggs in it. These eggs hatch into larvae then the pond will get good amount of water from rain. Then these holes are also surrounded by the pond water, Then the larvae will enter the pond and grow.

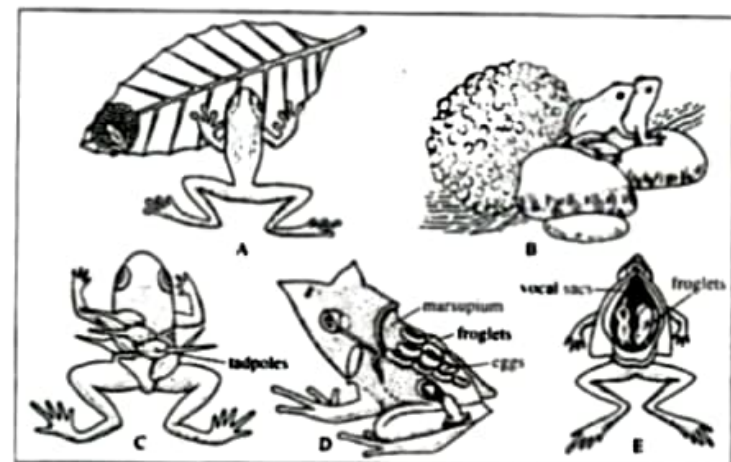
vi) *Hyla nebulosa* It lays its eggs in a nest. This nest is made by dry leaves. The eggs hatch and develop into small adults. Larval form is absent.

vii) *Hylodes* : It is an American frog. It deposits its eggs in moist places or under the stones. The eggs hatch and give tiny adults in perfect condition.

2) Direct Nursing by Parents:

This method is more advanced than protecting the eggs and larvae by constructing nests.

1) *Alytes*. It is called Mid-wife-toad. When the eggs are laid by the female frog, the male frog winds the strings of eggs round his back and thighs. This male frog lives in a shallow pit of the moist soil. It will come out of the pit now and then for feeding and to make the eggs moist. When the eggs are ready to hatch, the male frog moves to a nearby pond and the larvae are released.



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

2. *Gastrotheca* It is called New World brooding (or) Marsupial frog. It has a special pouch in its skin. It opens out through an opening near the cloaca. Fertilized eggs are transferred into this pouch. The eggs are stored in this pouch where they undergo development and tadpoles are liberated out.

3, *Pipa americana* It is called surinam toad. During breeding season the skin of the back of the female becomes soft and spongy. During copulation the oviducts will come out of the female. Because of the movements of male the eggs are forced out of the oviduct. Each egg sinks into a small pocket of the skin. It gets covered by an operculum. In the soft maternal tissue the young one can develop safely. The developing embryo has a tail and yolk sac. It has no gills. The tail may work like placental connection to draw nutrition from the mother. Nearly after 80 days small individuals may come out.

4. *Rhinoderma darwini* It is called little South American frog. The fertilized eggs are transferred into its vocal sacs the development takes place. Then the completely developed young individual will jump out from the mouth of the male frog.

Concluding Remarks:

Thus in Amphibians a good amount of parental care is seen.