

PARENTAL CARE:

One of the most fascinating features in animal kingdom is parental wherein the adult male and female take care of the eggs or young ones until they mature and become independent.

Therefore, looking after the eggs or the young until they are independent to defend themselves from the predators is known as Parental care.

In other words, parental care is any action or behaviour performed by the parents towards its offsprings that increases its chance of survival. Parental care is performed after breeding by one or both parents.

Various animal groups have adopted different means by which they care their eggs and young ones.

I. PARENTAL CARE IN FISHES:

- ✓ Parental care behaviour is universal among fishes.
- ✓ Of some 250 families described over fish reproduction, about 77 per cent fish show no parental care, another 17 percent include fish species that care for the egg only and less than 6 percent contain species that are known to care for eggs and newly hatched young.
- ✓ Fish show all grades of parental care behaviour from random spawning and from deposition of large number of uncared eggs to the protection of young.
- ✓ The lack of parental care behaviour is correlated with the production of great number of eggs and sperms.
- ✓ Two general types of variation in parental care behaviour exist among fishes.
- ✓ First either both parents, or one alone care for the offspring. Thus, there are paternal, maternal and biparental species.
- ✓ Second, the eggs and newly hatched young are either maintained on the substrate that is, on plants, under stones, in excavated pits and so on (these are called substrate-brooders or guarders) or carried about in the parent's mouth (these are called mouth brooders or incubators).
- ✓ Fishes have evolved many means of affording care to fertilized eggs and young ones by one or both sexes.

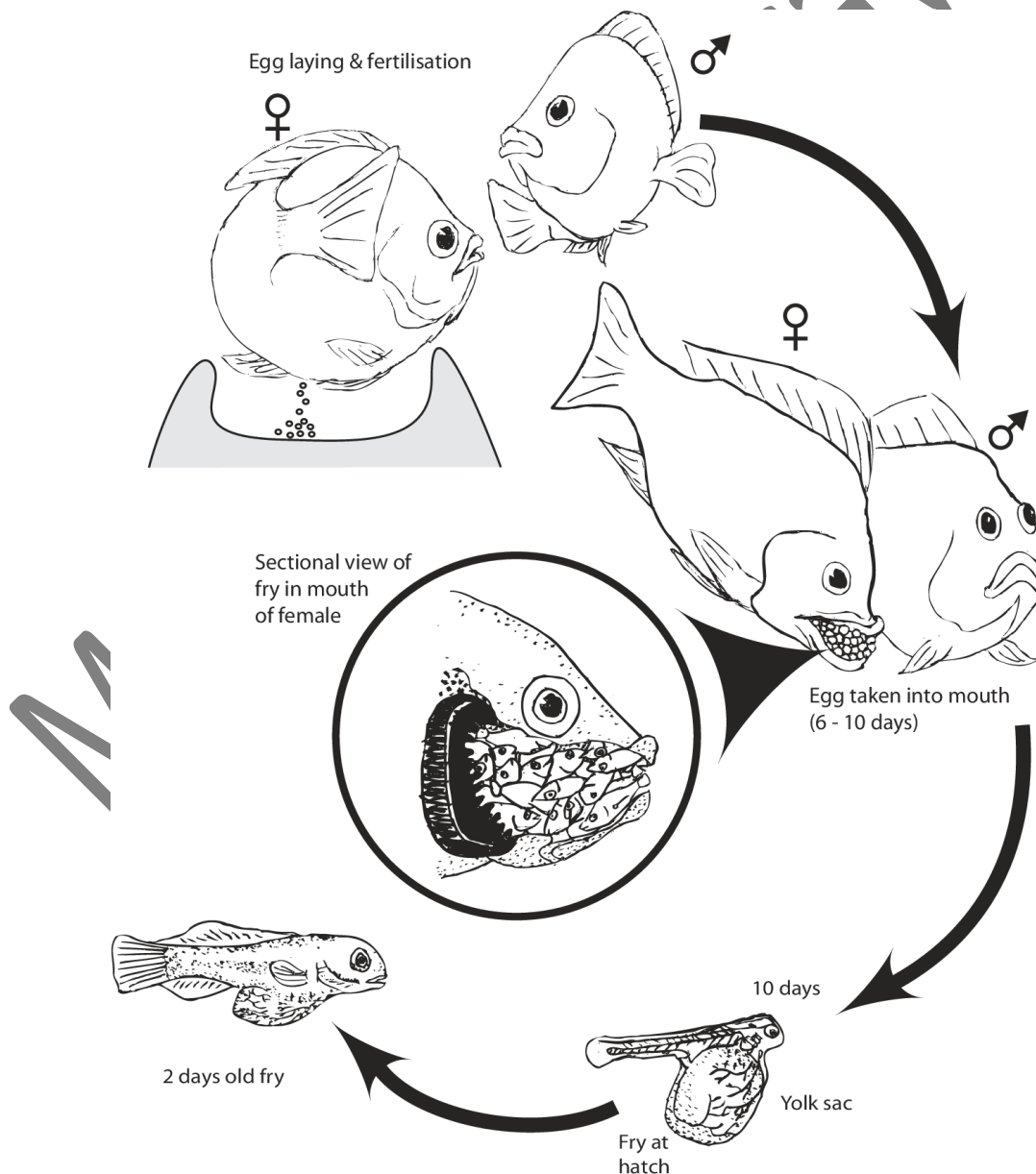
DIFFERENT TYPES OF PARENTAL CARE IN FISHES INCLUDE:

- 1) Scattering eggs over aquatic plants
- 2) Depositing eggs in sticky covering
- 3) Laying of eggs at suitable places
- 4) Nest building
- 5) Coiling round the eggs

- 6) Egg brooding in mouth and intestine
- 7) Brood pouches
- 8) By the formation of egg capsules
- 9) Attachment of eggs to the body
- 10) Viviparity

EXAMPLE 01: EGG BROODING IN MOUTH:

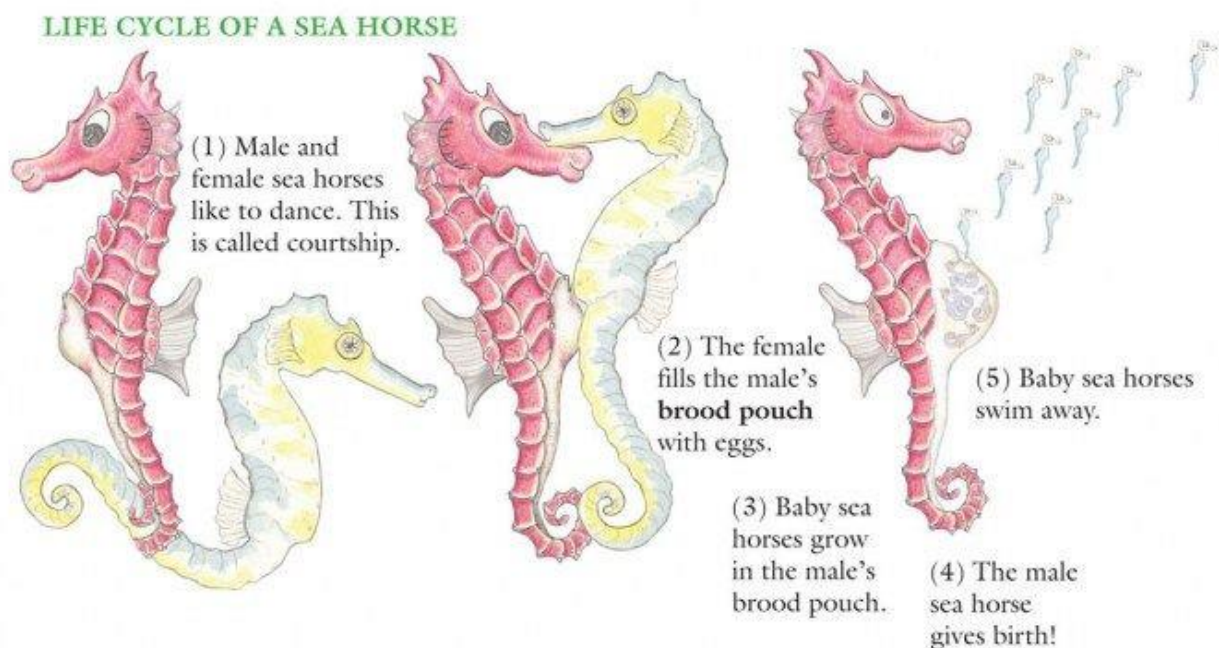
- ✓ Brooding is type of behaviour where the fish stock the eggs or young ones in their body for calculated period of time.
- ✓ Oral brooding or mouth brooding is observed commonly in few species of fishes.
- ✓ The female *Tilapia mossambica* broods the fertilized eggs in her mouth.



- ✓ Initially the female deposits eggs in a safe place and invites the male to fertilize them.
- ✓ The males do fertilize them and move away from the place.
- ✓ Once the eggs are fertilized by the sperm of males, the female fish swallows the eggs and traps them in buccal cavity.
- ✓ Once she takes in the eggs into her buccal cavity, she stops feeding the food and just care for the eggs.
- ✓ The female tilapia occasionally opens her mouth for the fresh air and water to pass in for rejuvenation of eggs.
- ✓ She allows the young to take refuge in her buccal cavity in times of danger for some days after hatching.

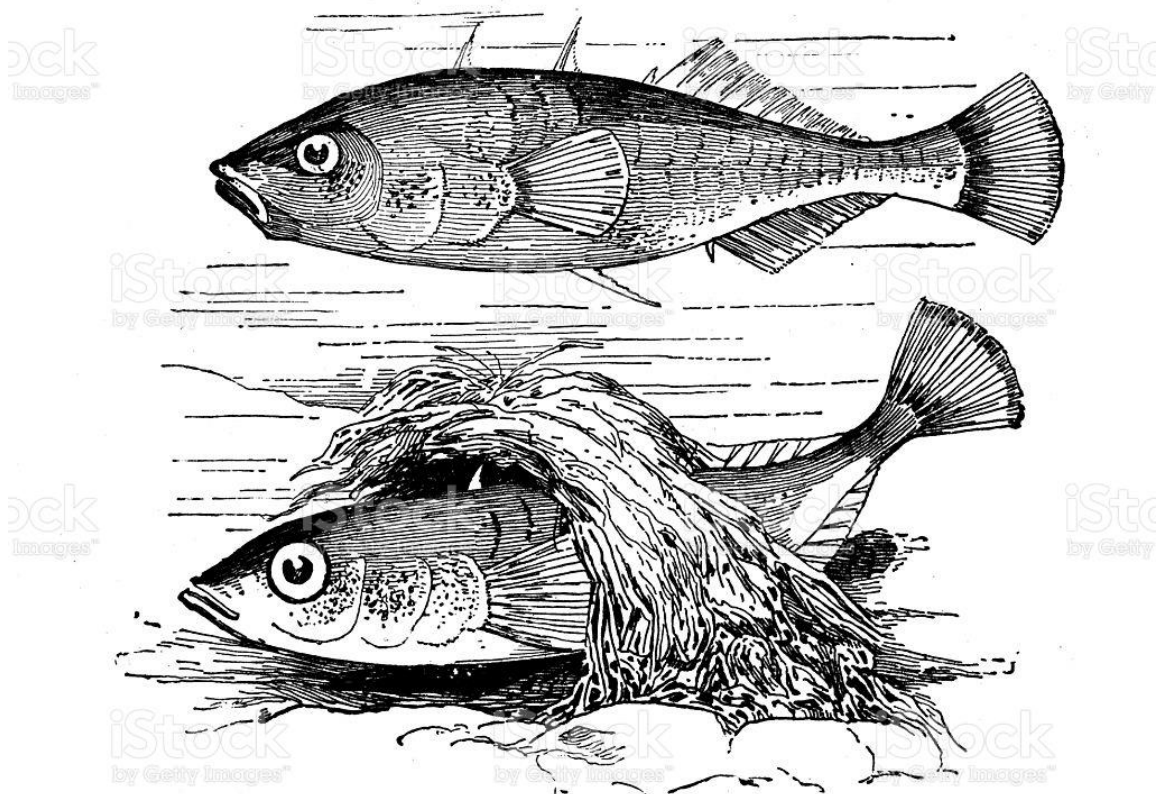
EXAMPLE 02: BROOD POUCHES

- ✓ Brood pouch are special bag like structure formed on the body of fishes where they store the fertilized eggs or young ones.
- ✓ Examples include sea horse (***Hippocampus***).
- ✓ The male sea horse carry eggs in a brood pouch on the abdomen.
- ✓ The eggs are initially fertilized in the brood sack of female by males. Once the fertilization is complete, the females transfer the eggs into brood pouch of male sea horse.
- ✓ These eggs are carried by males until their hatching.
- ✓ Eggs become embedded in the folds of the brood pouch and for the exchange of respiratory gases a sort of placenta is formed.



EXAMPLE 03: NEST BUILDING

- ✓ Nest building is a unique type of behaviour which is exhibited by very few fishes.
- ✓ Usually, males build nest with the aid of plant materials and decorate the nest with stones, sand and plant source.
- ✓ Once the nest is ready, the male invites the female to inspect the nest and deposit the eggs.
- ✓ Ex: Spined stickle back fish.
- ✓ Before the onset of its courtship, stickleback builds a quite elaborate spherical or elongate nest.
- ✓ The nest is built by collecting plant fragments, rootlets and then binding them together with adhesive kidney secretions.
- ✓ The various activities of male such as probing, boring, sucking and gluing, result in the formation of a compact nest with an internal chamber (tunnel) to receive the eggs.
- ✓ Male drives and induces the female into the nest for laying eggs, then chases her away, enters the nest, fertilizes the eggs and guard them from intruders.
- ✓ The male stays back in the nest till all the eggs are hatched.



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II. PARENTAL CARE IN AMPHIBIANS:

In amphibians there are many ways for the protection of the eggs during the early stages of the development.

Among amphibians, parental care includes

- ✓ attendance of the eggs,
- ✓ transportation of eggs or larvae, and
- ✓ feeding of larvae.

Parental care is associated only with those species that place their eggs in single clusters, never with those that scatter their eggs in aquatic situations.

VARIOUS STEPS INVOLVED IN AMPHIBIAN PARENTAL CARE ARE:

- 1) Selection of Site
- 2) Frothing of Water
- 3) Defending Eggs
- 4) Formation of Nests
- 5) Direct development
- 6) Carrying eggs over the body
 - a) Coiling around the eggs
 - b) Transferring tadpoles to water
 - c) Eggs glued to the body
 - d) Eggs in back pouches
- 7) Carrying eggs over the body
- 8) Organs as brooding pouches
- 9) Vivi parity

EXAMPLE 01: DIRECT CARE BY PARENTS

- ✓ The apodans (limbless amphibians) such as *Ichthyophis* form the example of direct parental care in amphibians.
- ✓ The female lays eggs in shallow water.
- ✓ The female *Ichthyophis* coils around the gelatinous eggs.
- ✓ Female provides required protection, temperature for the eggs to develop.
- ✓ If the temperature exceeds the desired level, she baths the eggs with her saliva or with water.
- ✓ Regularly she keeps in check with the eggs and take count of it.
- ✓ If any infection is observed in any individual egg, it eaten up by the female to stop spread of infection.
- ✓ Female defends the eggs and fights against predator if need.
- ✓ Males certainly play no role in the parental care in case of limbless amphibians.

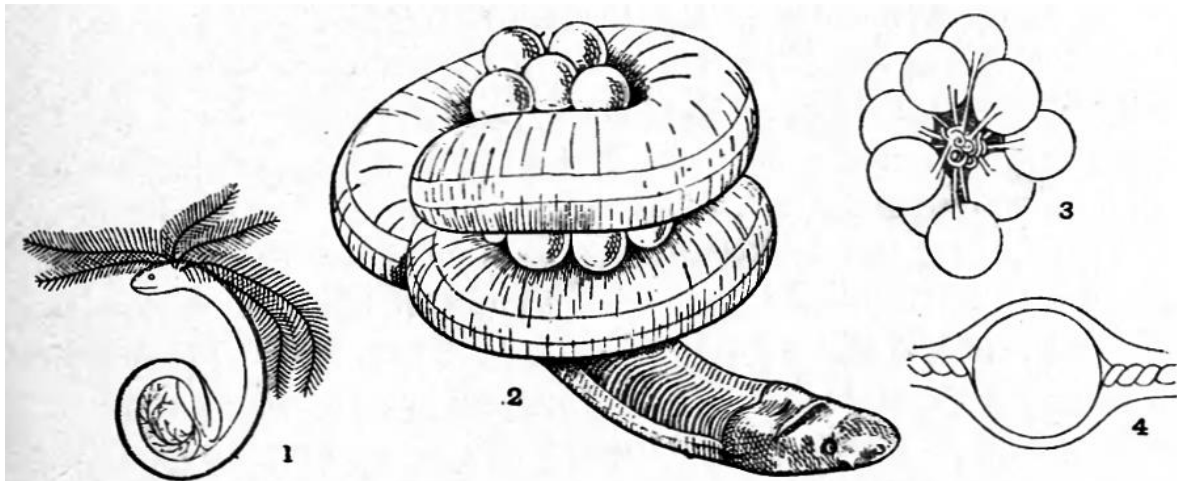


FIG. 15.—*Ichthyophis glutinosa* × 1. (After P. and F. Sarasin.) 1, A nearly ripe embryo, with gills, tail-fin, and still with a considerable amount of yolk ; 2, female guarding her eggs, coiled up in a hole underground ; 3, a bunch of newly laid eggs ; 4, a single egg, enlarged, schematised to show the twisted albuminous strings or chalazae within the outer membrane, which surrounds the white of the egg.

EXAMPLE 02: NEST BUILDING

Some amphibians build nests for deposition of eggs. The nests are built which provides protection for eggs from predators, harsh temperature etc.

- **Mud Nest:** *Hyla faber* digs small holes in the mud for deposition and development of the eggs. The holes are made in moist soil which act as temporary nest for developing eggs.
- **Leaf Nest:** In a South American tree frog *Phyllomedusa hypochondralis*, margin of the leaves is folded and glued together which acts as nest for the eggs.
- **Shoot Nest:** *Triton* construct the nest by fixing the shoots with a gelatinous secretion.

EXAMPLE 03: EGGS GLUED TO BODY

- ✓ Many amphibians carry eggs glued to their body. Ex: **Salamander**
- ✓ Females carry a string of eggs coiled around her neck until they are hatched.
- ✓ The females place her chin on the egg clutch thereby subjecting the egg to slight vibrations caused by pulsations of the throat.
- ✓ The females aggressively defend the eggs.
- ✓ The infectious eggs are removed from the clutch and they are swallowed by her as its rich in protein content.