

Fishes are capable of effective production of eggs and sperms, but this alone is not sufficient for survival of fishes. Most fishes do not care for their eggs or young and leave the breeding grounds after laying eggs. But there are many fishes which exhibit definite parental care. Various methods have been evolved for affording care to fertilized eggs and young by one or both the sexes.

Formation of nests : — Different types of nests are formed by various species. The formation of nests is performed usually by male fishes. The following types of nests are formed : —

Basin like nests — The male Darters select suitable places in spawning season. This place is called domain. No any male invade the domain but female comes and constructs a basin like depression and releases the eggs which are fertilized by male. These fertilized eggs are covered by sticky substance adhere to stones. This sticky substance secreted by the kidney of males.

The fresh water Sun-fishes also scoop out a shallow basin-like nest at the bottom of river. The female lay eggs and male fertilized them. After this the male covered the eggs by small stones and sand. Male guide till hatching.

Similar kind of nest is also built by many chicklids but both parents take up the task of guarding the eggs.

Many fresh water fishes (Heterotris) make a nest by cleaning a space among aquatic vegetation. African lungfish (Protopterus) prepare a simple nest in the form of a deep hole in swampy places along river banks. This is prepared by male. Female lays eggs in deep hole. The eggs are guarded by the male. He also keeps the surrounding water

ated by lashing his tail vigorously.

- (1) Circular nest:— North American *Amia* (Bow fish) constructs a crude circular nest made out of aquatic vegetation. Both male & female live in nests. Female lays eggs and male care until the egg hatch.

(2)

Similarly north American Cat fishes (*Ameiuridae*) the male constructs a circular nest at the bottom of the river under logs or stones about 20" diameter. Female lays eggs and male fertilized them.

- (3) Burrow or hole like nests:— *Lepidosiren* excavates a burrow at the blind end of which the eggs are laid. The male guarded the eggs. The burrow is about one metre deep. The male develops highly vascularized filaments on the pelvic fins which probably serve to secrete oxygen into the burrow by water.

- (4) Barrel shaped nest:— The nest prepared by *Gastro-gasterosteus aculeatus* (Three spined stickleback fish) is much more elaborate. The male collects pieces of roots and stalks of aquatic plants which are joined together by a sticky secretion produced by the kidney of male. The nest is a hollow barrel shaped structure. When the nest is ready the male drags a mature female into the nest for laying eggs. After laying eggs the female swims away and male keeps guard over the fertilized eggs and young fries.

- (5) Pear-shaped nest:— Fifteen-spined stickleback fishes construct a nest on the bottom of a river by aquatic vegetation. The leafy stems are binded by sticky secretion and make pear shaped nest.

- (6) Floating nests:— *Gymnarchus* constructs a floating nest with the help of aquatic vegetation. The nest is up few cm above the water level by stick

which the fishes enter into nest. The nest stick is up into the water about 15 cm.

Foamy nest: — The male fighting fish (Betta) and many other Anabantid fishes prepare a nest by blowing bubbles of air and sticky mucus, which adhere together to form a floating mass of foam. The male collects the fertilized eggs in his mouth, gives them a coating of mucus and sticks them to the under surface of the foamy nest.

A similar foam nest is also prepared by the Paradise fish (Macropodus) and the eggs being lighter rise up to the foamy nest without being carried by the male.

Those fishes who do not build nest: — Some fishes do not make nest but take care of eggs and young by two methods —

- (A) Keep the eggs to safe places
- (B) Eggs are kept within the body.

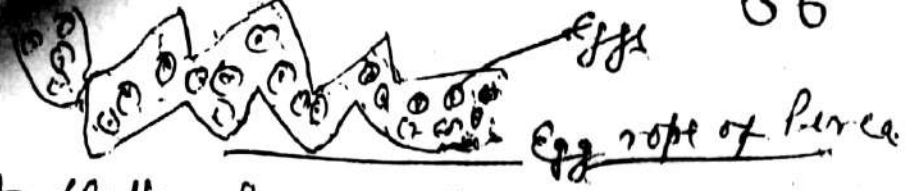
(A) Keep the eggs to safe places: — Some species of fishes do not make nest but their fertilized eggs are kept under safe places. These are of following types —

(1) Eggs kept in early prepared scooped hole: —

Dr. Semou seen that Cat fish (Arius) lay eggs in prepared scooped out hole at the bottom of river. Male covered the fertilized eggs with stones and then parents not care them again.

(2) Depositing eggs in masses of definite form: — yellow perch fishes (*Perca flavescens*) deposited their eggs in single masses. Such masses are held together by a membrane and form long floating bands, so that the eggs





are not scattered away, the eggs of the angler (*Lophius*) are invested by a gelatinous outer coat and joined together to form a transparent mass of enormous size.

(1) Mouth Cavity as shelter: — Many fishes protect fertilized eggs in their mouth cavities. In eel-like fish this is done by the mother. This ensures safety and also protect aeration. Even after hatching young fries do not leave the shelter of her mouth. In the Cat fish (*Arius*) the male carries the eggs in the oral cavity until hatching. Same case is also seen in male Cardinal fish, Male Brazilian Cat fish (*Loricaria tybus*), Paradise fish & Betta.

(2) Coiling round eggs: — The butter fish (*Photis* or *Gunnel*) rolls the eggs into a rounded ball. One of the parents, often male guards the egg-ball by coiling round it.



(3) Formation of integumentary cups: — An peculiar mode of parental care is seen in a Cat fish (*Platy-stacus*) of Brazil. The ventral face of the female become soft and spongy during breeding season. The female presses its ventral face of the body against the immediately fertilized eggs in a such a manner that each egg become attached to the spongy skin by a small, stalked cup and remains in this position till hatching.

(4) Placement of eggs in Brood pouch: — In pipe fish (*Syngnathus*) and sea-horse (*Hippocampus*) the males possess have brood pouch on the lower surface of abdomen. The female transfers the eggs in to the brood pouch of male after courtship. The male carrying the eggs till hatching. In the family *Solenostomidae* it is the female who keeps the eggs in a brood pouch.

depositing the eggs within the mantle cavity. The eggs are fertilized after laying. The fry leaves the host after hatching.

Conclusion: — usually All fishes lay eggs and fertilization is external. In case of external fertilization mostly eggs are lost at this time, so that parental care is essential in fishes, which helps in its survival. In most cases it is the male who takes up the burden of nest care and defend it. It is other things that cartilaginous sharks and two genus of bony fishes do not care the eggs & young but most probably parental care start from fishes in developed animal kingdom.