Quadrant II- Transcript and Related Material

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Notes

INTRODUCTION: Parental care is a post-spawning care of the offsprings by the parents and can be defined as an association between the parents and the offsprings, so as to increase the chances of the survival of the young ones. One or both the sexes may participate in the process. There are many fishes where definite parental care has been evolved and it varies greatly from fish species to fish species. Eggs of many species possess various mechanisms for attachment to stones, pebbles or aquatic vegetation, so that they are prevented from being washed away with the current of water.

Most fishes do not care for their eggs or young ones and leave the spawning grounds soon after fertilisation. The lack of parental behaviour compensated by the production of great numbers of eggs to increase the chances of survival. It has been estimated that about 77 percent fishes show no parental care, another 17 percent of the fish species care for the eggs only, while less than 6 per cent care for eggs and newly hatched young.

METHODS OF PARENTAL CARE IN FISHES: Fishes that produce limited number of eggs developed various strategies to ensure proper development of the eggs into adults. This includes:

- Selection of a suitable site,
- Nest building and
- Various other methods of protection of the egg or young ones.
 - Mouth Cavity as Shelter
 - Coiling Round Eggs
 - o Attachment to Body
 - Formation of Integumentary Cups
 - Development of Brood Pouches
 - o Mermaid's Purses
 - o Viviparity

Nest Building:

Fishes prepare crude nests for egg laying. Males of many species like the Darters (*Etheostoma*), Sunfishes and Cichlids, prepare a shallow basin- like nest for laying eggs by females, first suitable place is selected for preparing the nest. The stones and pebbles are removed from such nest and male keeps close watch over the eggs till hatching.

Many freshwater fishes prepare crude nest with aquatic vegetation where eggs are laid. *Protopterus* and *Lepidosiren* prepare deep hole into which the females lay eggs, hiding eggs is a simplest form of fish parental care. *Amia calva* (Bowfin) prepare a crude circular nest among aquatic vegetation. Male and female of some Cat fishes of North America prepare a crude nest in the mud for egg-laying. The nest is sometimes provided with protective cover of logs, stones, etc. Male Stickleback (*Gasterosteus aculeatus*), a small freshwater fish of North American lakes and ponds. The male fish builds a nest of dead aquatic weeds which are joined together by a sticky secretion produced from the kidneys. When the nest assumes a considerable size, the male makes a small tunnel. After the formation of tunnel and an elaborate courtship ritual, the male drags a mature female into the tunnel for laying eggs. After laying eggs, the female swims away and the male keeps watch over the fertilised eggs till development is over.

Foamy nest prepared by blowing of bubbles of air and sticky mucus are also encountered in many fishes. The eggs are collected by the male in his mouth cavity and he throws them in such a way that the eggs can adhere to the lower surface of foamy nest.

Mouth Cavity as Shelter:

In some species (Cichlids, *Tilapia mossambica*), eggs develop within the mouth of the parent. In many cichlids, the female carries the eggs in her oral cavity. After hatching, the young fry do not leave the shelter for some time, and swim about in water very near the mouth, so that they can return to it in case of danger.

In the cat fish, Arius the male carries the eggs and young ones in his mouth, and does not take food during this period.

Coiling Round Eggs:

In Butter fish, *Pholis* rolls the eggs into a rounded ball and then one of the parents remains on guard, possibly male, guards the egg-ball by coiling round it.

Attachment to Body:

In *Kurtus indicus* (Perciformes) the male develops a bony hook projecting from the forehead and is supported by a special process of skull bone. The eggs are grouped in two bunches and are attached to the hook of the forehead with the help of filamentous processes of the egg membrane.

Formation of Integumentary Cups:

In a cat fish, *Platystacus* of Brazil, during breeding season, the skin of lower surface of the body of the female fish becomes soft and spongy. Immediately after fertilisation of the eggs, the female presses her body against the eggs in such a way that each egg lodges in a small integumentary depression. Each egg is attached inside the cup by an inconspicuous stalk. The eggs remain in this position till hatching.

Development of Brood Pouches:

In the pipe fish, *Syngnathus* and the Sea Horse, *Hippocampus* the eggs develop within the broad pouch of the male. The eggs are transferred into the broad pouch by the female and development takes place within the broad pouch.

Mermaid's Purses:

Oviparous sharks (e.g., *Scylium*) lay fertilised eggs inside the protective horny egg capsules or mermaid's purses, which remain anchored to the sea weeds by their long tendrils. The young hatch out after rupturing the egg case.

Viviparity:

In viviparous fishes young one develop within the oviduct of the female e.g., in Dog-fish (*Scoliodon*) and the Surf Fish (*Cymatogaster aggregates*). Both fertilisation and development are internal. Viviparity provides maximum protection and represents the highest degree of parental care.