

Reproductive strategies in fishes

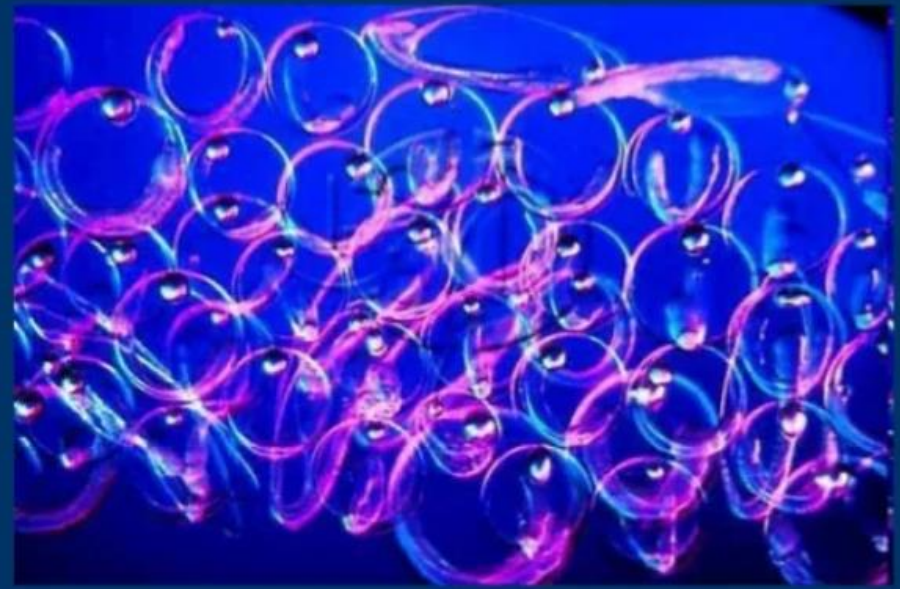
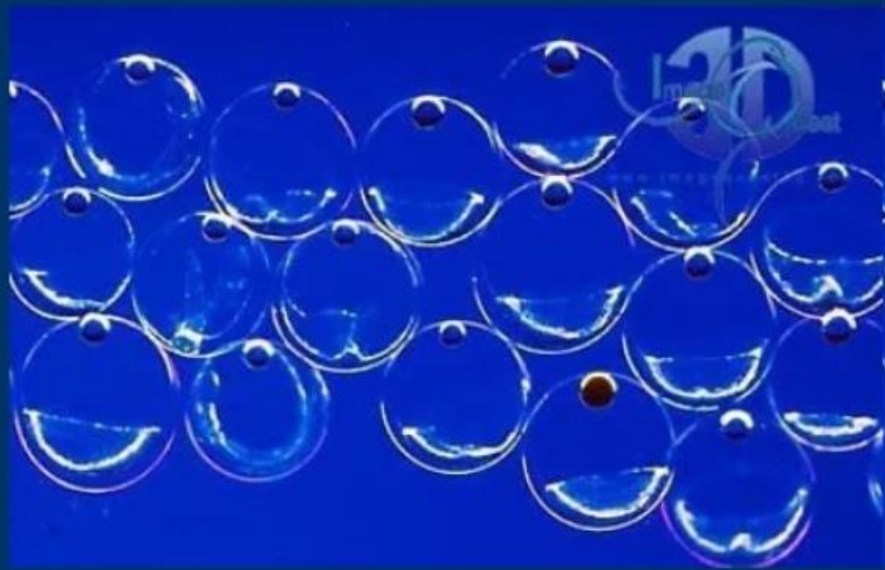
OVIPARITY: EGG LAYERS AND EXTERNAL FERTILIZATION

- By far the vast majority of fishes are **oviparous**, that is they produce eggs that are fertilized after they have been laid
- About 96 percent of all living fishes are egg-layers. Fishes exhibit a great variety of **egg types and adaptations**. Morphologically and physiologically they are tremendously diverse

OVIPARITY IN MARINE FISHES

- Very generally speaking eggs come in two kinds:
- **1. Pelagic eggs: eggs that float**
- **2. Demersal eggs: eggs that sink**
- By far the majority of marine fishes start out life as **pelagic eggs**.
This includes:
 - **1. Most all fishes that live over the continental slope**
 - **2. Nearly all those that range over surface waters of the open ocean**
 - **3. All pelagic deep-sea fishes**

- The eggs of these kinds of fishes are made **buoyant by low-density fluids acquired from the follicle cells of the ovary** or they develop an oil droplet independent of ovarian tissue.
- The kinds of fishes that develop floating eggs must be able to produce **large numbers of small eggs**. A fair-sized hake (*Merluccius productus*) lays about 1 million eggs; fecundity in cod (*Gadus morhua*) ranges from 2–9 million eggs;



- **High numbers of eggs are necessary for successful recruitment because thousands of eggs and larvae are dispersed into areas far beyond the optimal conditions for survival, and thousands die long before hatching or metamorphosis to juvenile stages**

Demersaleggs

- Some marine fishes lay demersale eggs, that is, eggs that are heavier than water and thus sink to the bottom after being laid, or they are laid directly on the bottom, or placed in nests, or fastened to rocks, shells, seaweed, sponges, and a whole host of other objects

OVIPARITY IN FRESHWATER FISHES

- While most marine species lay **pelagic eggs**, **demersal or non-floating eggs are the rule in freshwater—they sink to the bottom. There are several reasons for this:**
 - 1. It is **physiologically more difficult to produce an egg with a specific gravity less than freshwater.**
 - 2. **Freshwater does not provide the rich food resource in its upper layers as does the marine environment.**
 - 3. **Fast moving rivers and streams would remove nearly all eggs and larvae from a local population preventing recruitment**

OVOVIVIPARITY AND VIVIPARITY: INTERNAL FERTILIZATION

Ovoviviparous and viviparous fishes are similar in that both are live-bearing forms that require internal fertilization. However, they differ fundamentally with regard to the source of nutrition for the developing young.

In ovoviviparous forms the eggs are retained and fertilized within the body, but the young receive no nutrients from the mother—they must rely solely on what is provided in the yolk. In viviparous forms, the young are nourished by some kind of placental connection with the mother.

Ovoviviparity and viviparity are relatively rare among fishes—they include only about 4 percent of all living fishes, but they are among the most interesting when it comes to reproduction.

- . Representatives are found among the following taxa: Chondrichthyes (sharks and their allies), live-bearers(i.e., guppies and their allies, family Poeciliidae and the coelacanth(*genus Latimeria*).**
- . Internal fertilization involves the use of some kind of organ, a structure used to pass sperm to the female. Most live-bearing fishes have males with such an organ. They are usually modified analog pelvic fins.**