

Eggs and Types of eggs

Introduction:

- A cell that is produced by the female sexual organs and that combines with the male's sperm in reproduction
- The main form of **food reserve** present in an egg is the **yolk**. The yolk appears in the oocytes in the second phase of egg maturation i.e vitellogenesis period.
- As the main components of **proteins, Phospholipids** and lesser extent neutral **fats** are present in the yolk of the eggs.
- According to the predominance of these substances/components, can distinguish Yolk as **protein yolk or fatty yolk**.
- As the protein yolk is the main reserve in many invertebrates such as **Echinodermates** and lower chordates such as **protochordates** (Amphioxus, Tunicates), in these animals is having a small amount of the yolk.
- But in **Amphibians** the protein yolk is formed of **large granules** which termed as **yolk platelets**, it contains two main substances such as **Phosphovitin and Lipovitin**.
- The amount of yolk present in the egg is related to the nature of embryonic feeding. If the embryo starts feeding at once or takes food from the mother's body, the egg will have **less yolk**. **Examples:- Marine Invertebrates and Placental Mammals**.
- In higher invertebrates, unless the embryonic alimentary canal develops, the yolk nourishes /nitrifies the embryo.
- The amount of yolk is an important determining factor for the further pattern in embryological stages.
- Eggs are of various types according to the amount and distribution of yolk and by the pattern of their cleavage.

Classification of types of eggs

Types of eggs is divided based on the amount of yolk ,distribution of the yolk,on presence and absence of shell, and pattern of development.

1.Amount of yolk:- Eggs are grouped into two types. They are

A. Alecithal Eggs :- The egg contains little or no yolk, is called Lecithal egg.

Example:-Eutherian Mammals and Human egg.

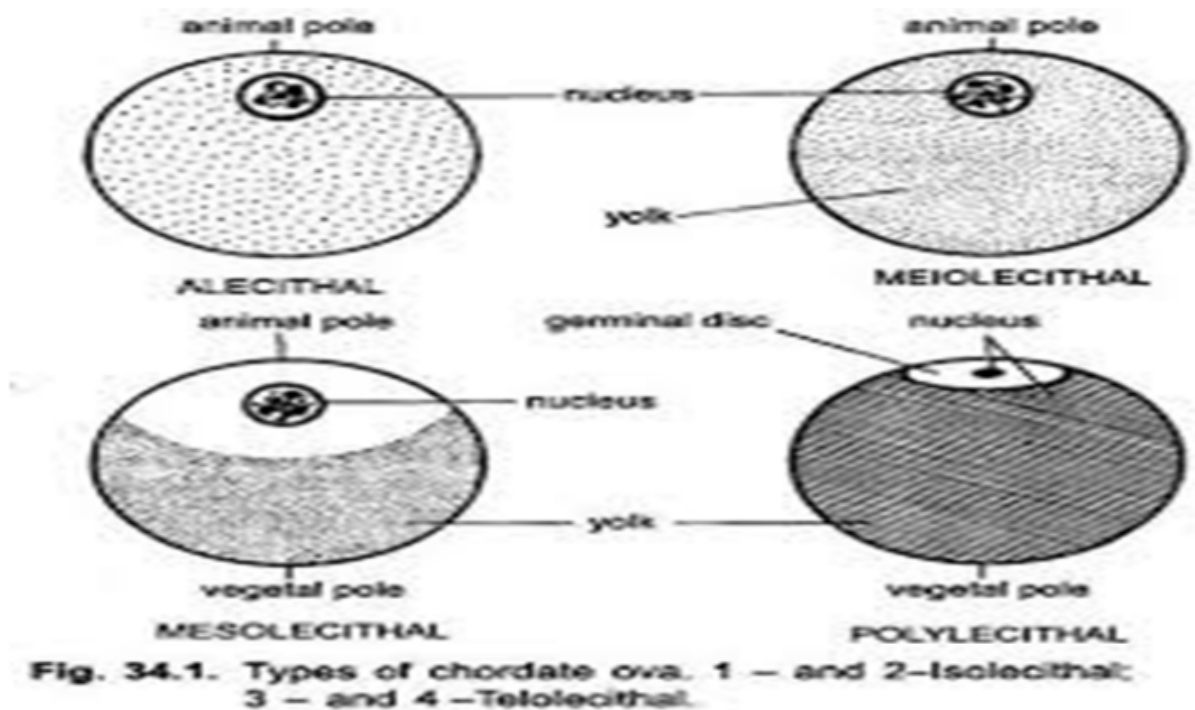
B. Lecithal Eggs :- The egg with distinct amount of yolk. Lecithal eggs are categorized as follows.

1. Microlecithal :- The eggs with small or little amount of yolk , are also referred to as Oligolecithal. **Examples : Echinoderms, Urochordates, Amphioxus.**

2. Meso /Media-lecithal:- The Eggs with moderate amount of yolk. **Examples:- Molluscs(Aplysia), Amphibians(Frog), Dipnoi and Petromyzon.**

3. Macro/ Megalecithal:-The eggs with large amount of yolk, is occupied almost the entire part of the eggs and the cytoplasm remains at the top. **Examples:- Bony fishes, Reptiles, Birds, Prototherians.**

Types of Alecithal and Lecithal eggs



2.Distribution of the yolk:- Eggs are classified into three types, they are

I. Homolecithal /Isolecithal eggs :- The yolk uniformly distributed in the cytoplasm (Vegetal pole, Animal pole, Equatorial region) . In such eggs cleavage is deeper. So all microlecithal eggs exhibit Isolecithal. **Examples : Echinoderms, Urochordates, Amphioxus**

2.Heterolecithal eggs:- Yolk is unevenly distributed in the cytoplasm of the eggs. They are divided on the pattern of yolk distribution such as

A. Telolecithal eggs:- The eggs yolk concentrated highly towards the vegetal pole, the concentration of yolk is smallest at the animal pole.(practically with out yolk / with smallest amount of yolk),The amount of yolk is so massive that it occupies almost all the vegetal pole and the active cytoplasm and germinal vesicle (nucleus)remain confined to a small cap at the animal pole. So, Mesolecithal and Macrolecithal eggs exhibit Telolecithal. **Examples:- Fishes, Amphibians, Reptiles and Birds.**

Telolecithal eggs may further classified into three types:

i.Slightly Telolecithal

This type of egg contains only a small quantity of yolk which is distributed unevenly. The vegetal pole has the highest concentration and the animal pole the lower (e.g. eggs of fishes).

ii.Moderately Telolecithal egg

This type of egg contains a moderate quantity of yolk which is distributed unevenly. Due to high concentration of yolk in the vegetal hemisphere, the nucleus is shifted more towards the animal hemisphere (eg. amphibian egg).

iii.Extremely Telolecithal Egg

In this type of egg, due to the heavy deposition of yolk, the entire vegetal hemisphere and a major portion of the animal hemisphere are occupied by yolk. Due to this extremely uneven distribution of yolk, the ooplasm and nucleus are displaced towards the animal pole (eg. reptilian and avian eggs).

B. Centrolecithal eggs:- The eggs has it yolk in the centre with the cytoplasm surrounding it. **Examples:-Insects eggs.**

3.Presence or Absence of the shell :- It is classified into two types, they are

1.Cleidoic eggs:- Cleidoic means Sealed Box (in Latin).

*The eggs are laid on dry land must be protected wall. Hence, they are leathery coats or hard shells covered by the calcareous shells.

*To certain accessory cells surrounding the ovum in the ovary secrete a membrane envelope and hard shell (in oviduct).

*To protect them from desiccation, i.e., to the danger of evaporation of water before the development of embryo.

*The shell membrane becomes water tight but has to do the gaseous changes. The eggs become a closed system and it is known as Box like egg. **Examples:- Reptiles and Birds.**

2. Non- cleidoic eggs:- In aquatic animals, are fishes and Amphibians lay their eggs in water. There are not having hard covering shell except jelly coat. This type of eggs is also laid by animals in whose the development is internal. **Example:- Mammals.**

4. Pattern of development :- Eggs is divided into two types. They are

1.Mosaic/Determinate Eggs :- Each of the cells formed by cleavage furrows in the blastula has a determined fate in adult organism.

- If a particular portion such as one or more cells of the egg is removed the developing embryo will be lacking in a particular organ.
- The cell fate in mosaic eggs are fixed or predetermined. **Examples:- Polyclads, Annelids, Molluscs, Ascidians.**

2. Regulative/Indeterminate Eggs:- In the majority of animals, there are not pre determined in the eggs, if a particular portion of eggs is removed, it can develop into normal embryo without any defect. **Examples:- Amphioxus, Mammals.**

Diagram of types of eggs

