

# S.Y.B.Sc. Botany CBCS Pattern

BO 241: Plant Anatomy and Embryology

Credit-II Plant Embryology

Chap - 7. Introduction

Semester IV, Paper I- 2020-2021

By

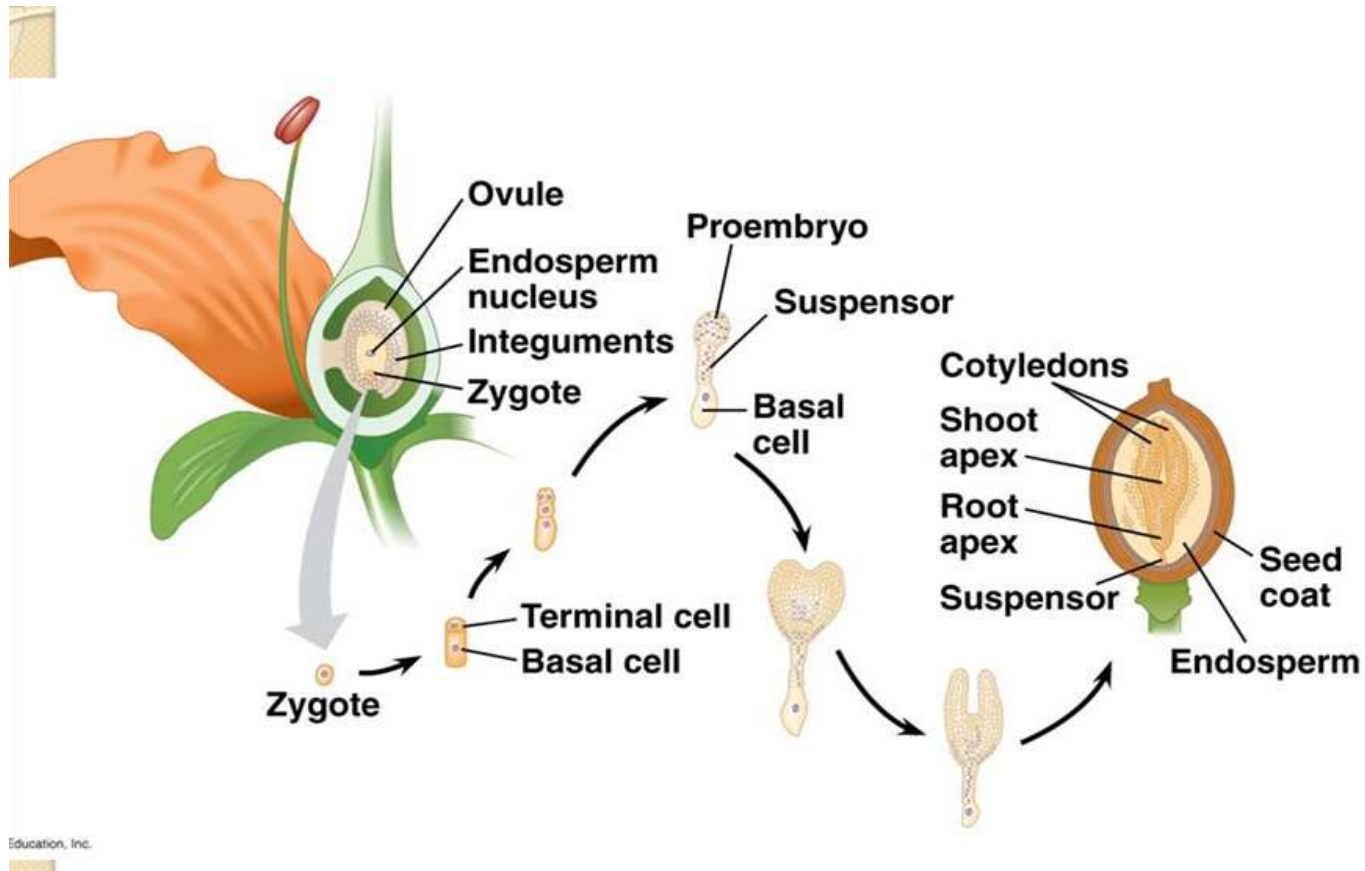
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# Learning Objects

- 7.1 Definition and scope of plant embryology

# Defination

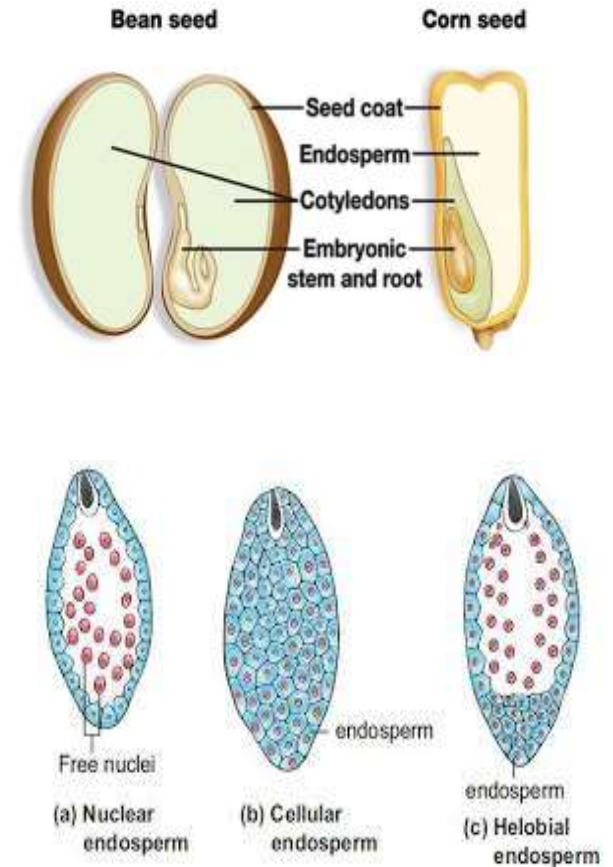
- **Defination:** Embryology is the study of micro and mega sporogenesis, gametophyte development, fertilization, development of endosperm, embryo and seed coats.



# Scope of Embryology

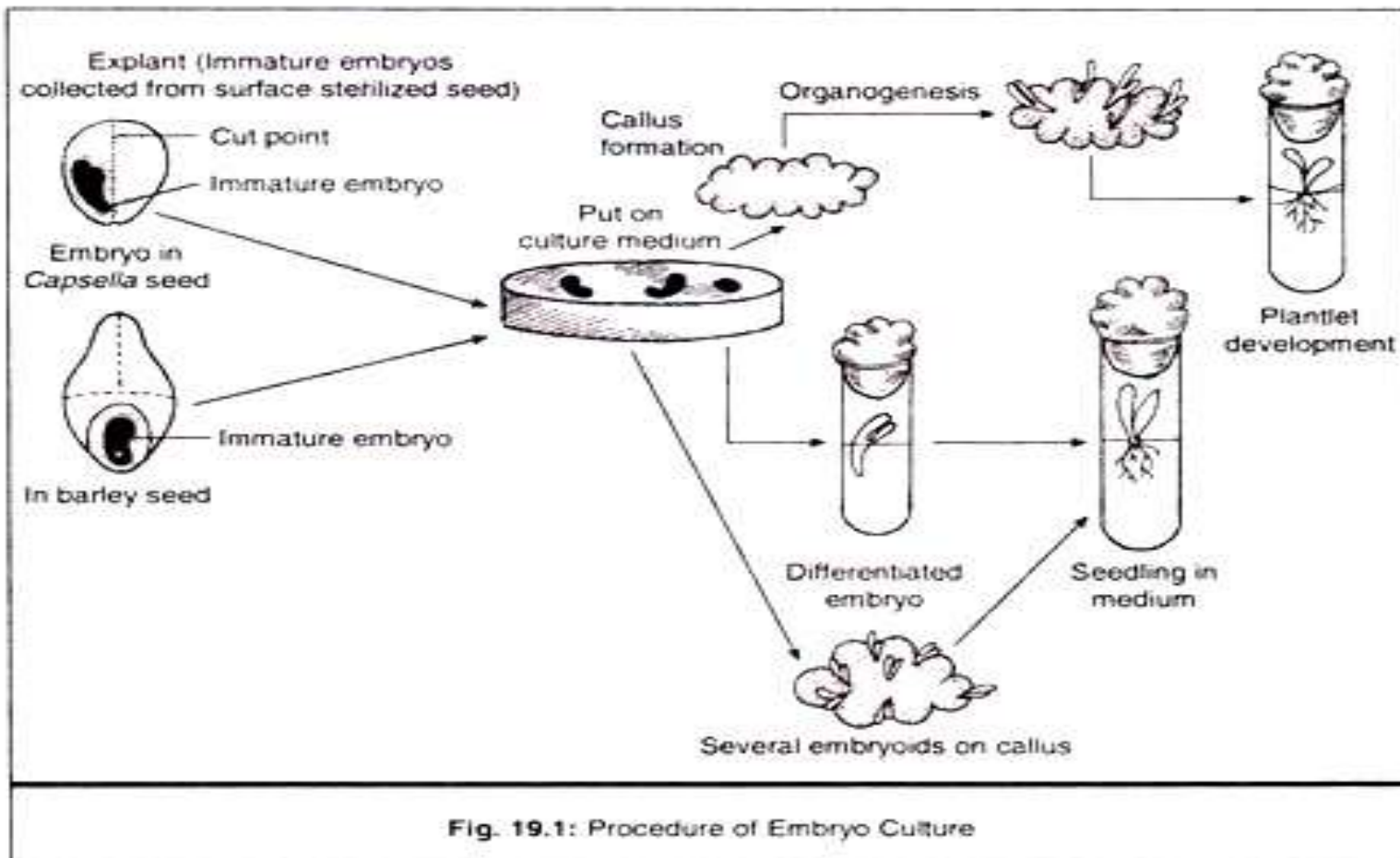
- **Scope of Embryology in Taxonomy:** embryological evidences have been used in solving taxonomical problems at almost all levels, and have helped resolve the doubtful systematic positions of several taxa.
- However, according to Jones and Luchsinger, the embryological characters have proved to be of significant help in determining relationships within families, genera and species, but less useful at the rank of order, subclass, or class.
- Embryological characters, being less prone to adaptive stress, are relatively stable and have acquired great significance in plant taxonomy, especially when external morphological characters are inconclusive and misleading as a result of convergence.

- Scope of Embryology in Taxonomy :
- (1) Dicots and Monocots: Angiosperms are universally divided into dicotyledons and Monocotyledons. The primary classification of angiosperm is based on one major embryological character I.e; the number of cotyledons.
- (2) Helobiae: This monocotyledonous order, treated as a subclass in some recent system of classification, is characterized by the presence of a helobial type of endosperm.
- (3) Orchidales: The distinguishing embryological character of the members of this order is the presence of undifferentiated embryo and very little or no endosperm
- All the above-mentioned examples confirm that embryology plays a definite and significant role in solving taxonomic problems



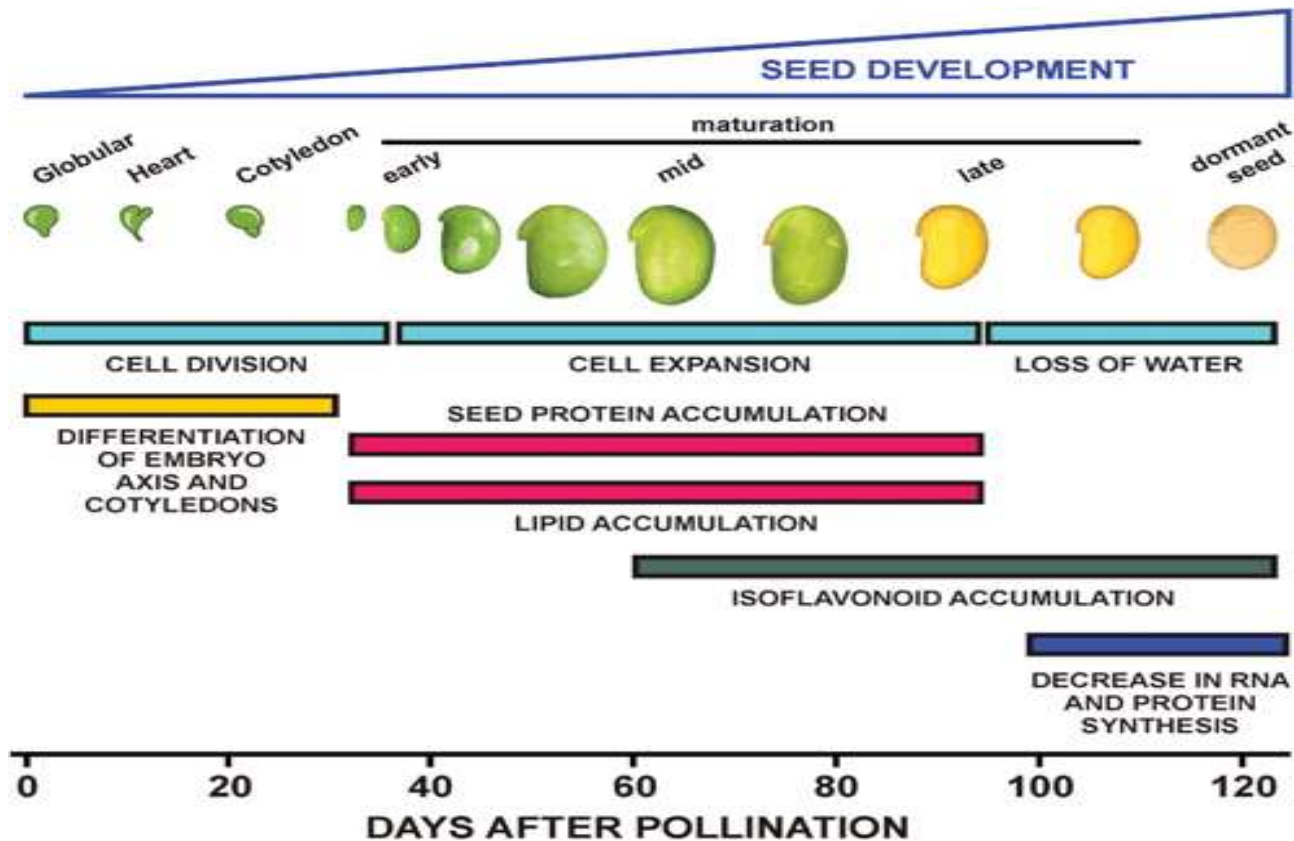
# Scope in Biotechnology

- Knowledge of embryology is highly essential for a skilled biotechnologist working in the field of plant tissue culture e.g. For isolation of embryo – embryo rescue technique



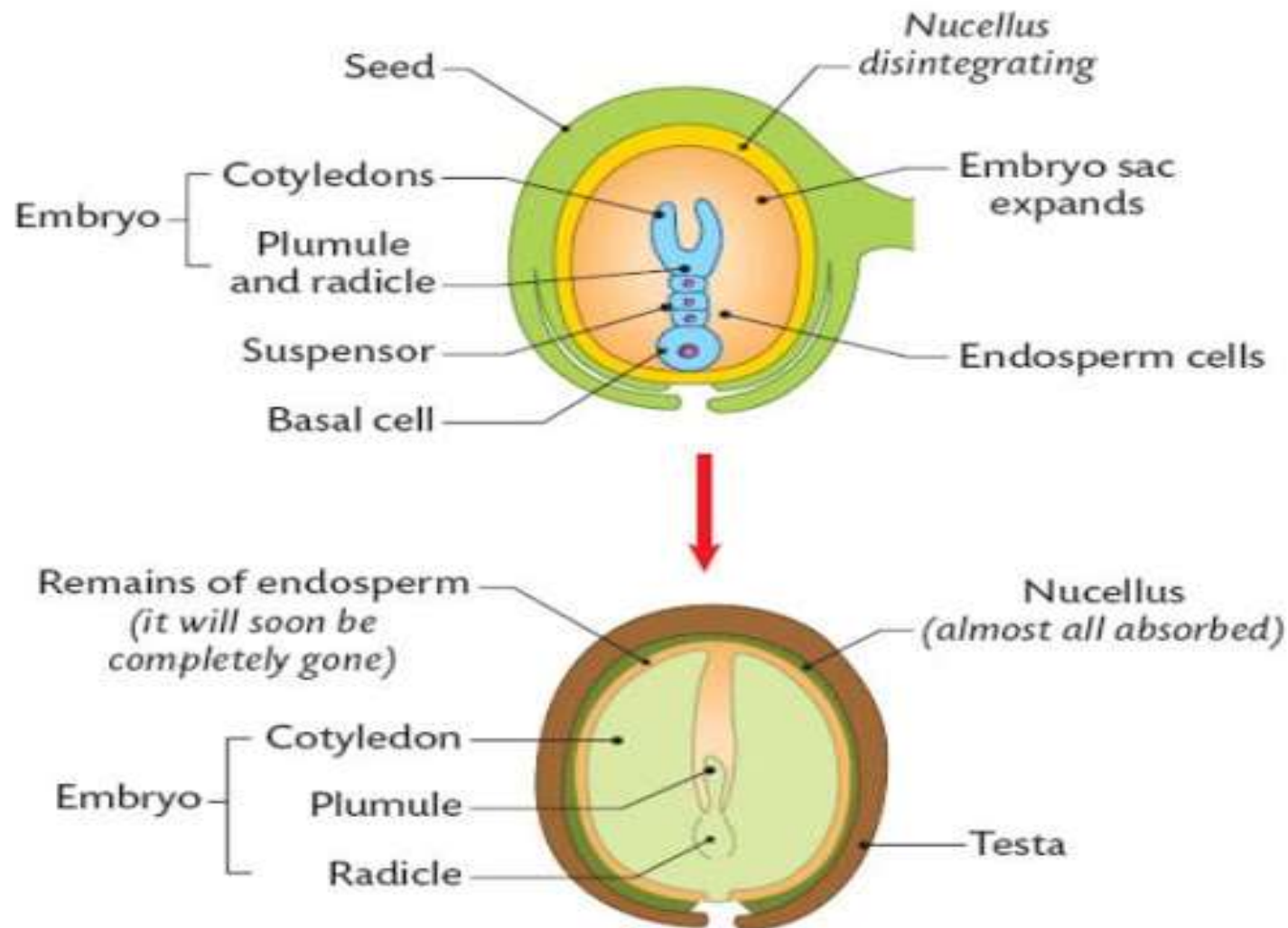
# Scope in Histochemistry

- Histochemical studies of embryonic tissue provide information about the biochemical substances accumulated during the developmental and differentiation stage of tissue.



# Anatomy Embryology

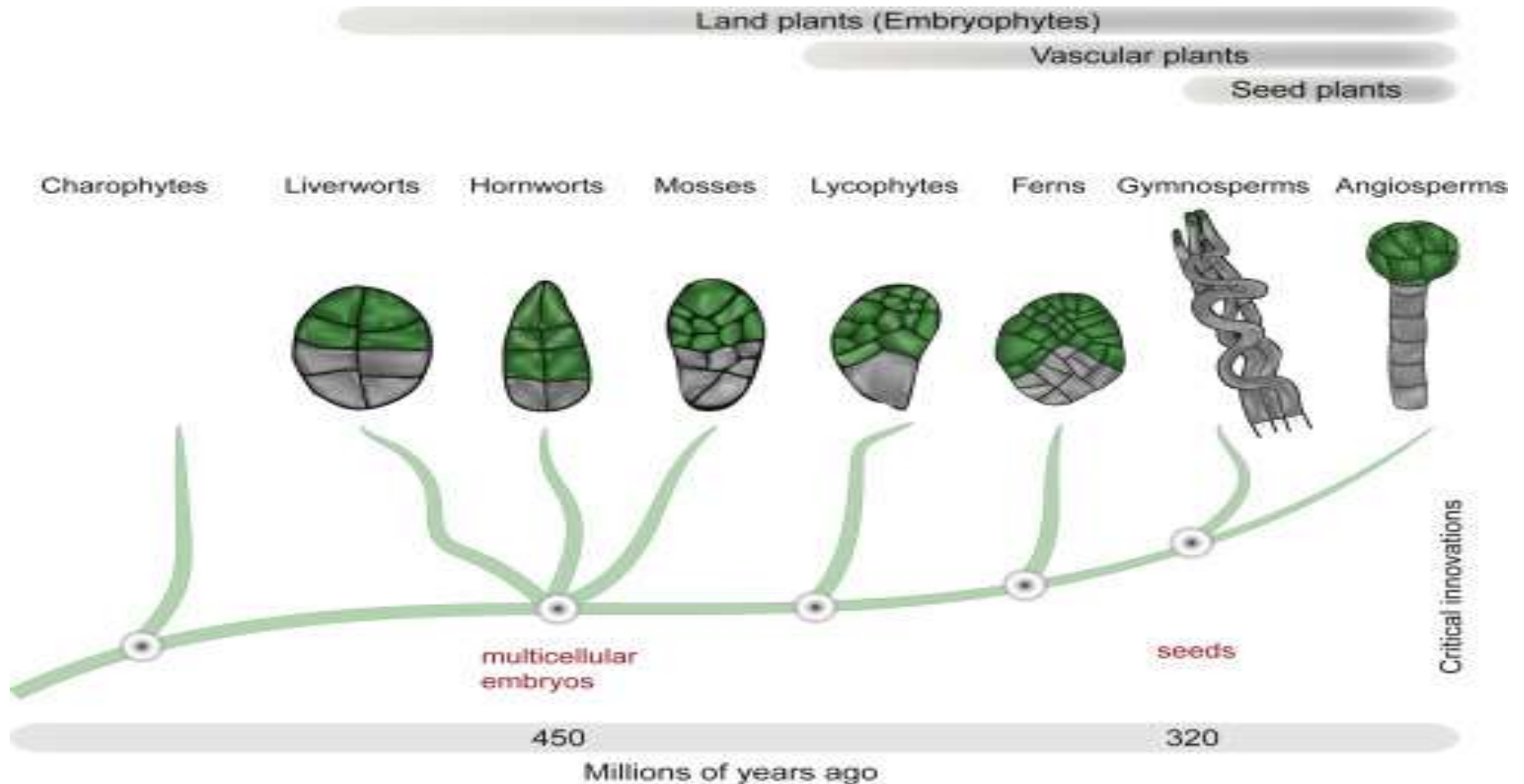
- Internal structure of embryo provides us information about the position and interrelationship of different region of an embryo.





# Organic evolution and Embryology

- By understanding diversity in nature and development of embryo one can understand primitiveness and advanced nature of plants at the embryonic stage.



# Plant Physiology and Embryology

- Embryological processes such as embryogenesis, sporogenesis, fertilization, organogenesis, fruit and seed development, seed germination etc based on many physiological events. This information is applicable in agriculture for increasing productivity of crop.

# Types of Embrology

- **General plant embryology explains-**  
the basic laws of the origin and development of generative and embryological structures  
(sporogenesis, gametogenesis, endospermogenesis, embryogeny, apomixis).
- **Comparative plant embryology -**  
studies embryological processes in various species in order to obtain data for solving problems of systematics and phytoeny.
- **Specialized plant embryology -**  
is devoted to the study of embryological processes in the plants of individual systematic groups.
- **Experimental plant embryology-**  
recreates the course of development of plant-organisms in order to reveal the functional, biochemical, and genetic nature of embryonic processes.

# Reference

<https://www.slideshare.net/HimanshiChauhan1/history-of-embryology-in-plants>

<http://www.jiwaji.edu/pdf/ecourse/botany/Botany%20II%20Sem%20Notes%20on%20Embryology-I.pdf>