

Q. Give a detail account of the structure and development of female gametophyte in Gymnosperm. Point out their evolutionary importances.

INTRODUCTION → A megaspore represent the first cell of the female gametophyte. It develops from the archesporial cells of the nucellus. The megaspore mother cell divides reductionally into megaspore tetrad of which only one, two or all the four megaspores takes part in the formation of female gametophyte. Hence the female gametophyte may be mono-sporic, bisporic or tetrasporic. They are reduced and endosporic in gymnosperm. They show an evolutionary tendencies which finally leads to angiospermic condition.

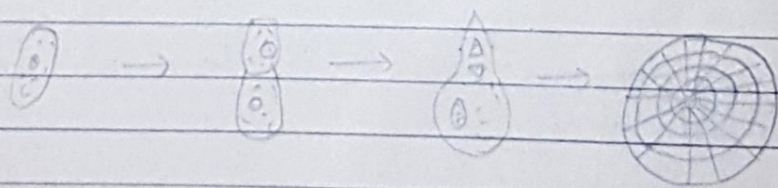
DEFINITION → The structure arising out on germination of megaspore has been referred as female gametophyte or prothallus or endosperm.

It is haploid in gymnosperms and is formed before fertilization.

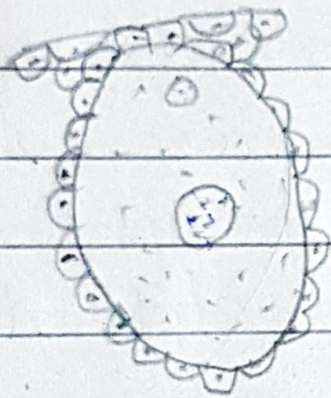
STRUCTURE & DEVELOPMENT OF FEMALE GAMETOPHYTE AND ARCHEGONIUM → ~~BE~~
CYCAS → The simplest condition occurs in

Cycas where it is monosporic. The lower megaspore of the tetrad is functional. The megaspore increases in size with the surrounding cells becoming spongy in nature. The nucleus of the functional megaspore undergoes free nuclear division to form 1000 or more nuclei. Then a central vacuole appears in the megaspore which grows to force the nuclei in the peripheral layer. Finally cell walls are laid down between the nuclei. It starts from the peripheral part and grows towards the centre to form the female gametophyte. The cells contain starch grain. It has no chlorophyll nor are the rhizoids.

ARCHEGONIUM → In cycas the micropylar cell function as the archegonial initial. It divides into outer primary neck cell and an inner central cell. The former by vertical division from the short neck of the archegonial. The latter gives rise to small v.c.c and a large egg cell. There is no N.c.c in the neck.



stages of development of the female gametophyte in cycas.



Archegonia of Cycas revoluta