

Attributes of Ginetum (Angiospermic Character)

Ginetum is a peculiar genus of gymnosperms angiosper which shows a very close resemblance with the angiosperms. It has always occupied a very important position in any discussion relating to the origin of angiosperms. A few considerations are outlined below.

Asber and Parkin (1908) have regarded Ginetum as a very close associate of Angiosperms and they believe that both the groups have been derived from a common ancestor - *Hemiaangiosperm*.

As to Thomson (1916) the ancestor

of angiosperms are not for Gymnosperms. Both belong to angiosperms.

Wagner (1914) studied detailed structure of Quercus in a series of ~~microscopic~~ ^{microscopic} sections of the Quercus lenticels and found that on the basis of these studies he found that they can be included under angiosperms, particularly it can be regarded that Pterocarpaceae for angiosperms.

The Gymnosperm through structure (Anderson 1911) has based on detailed study of Quercus with chromosome and has with some other as a bifurcated phloem, between Pterocarpaceae (having more) and Quercaceae (having more). However this feature that has been considered on the basis that the basic chromosome no. is 14 and Quercus are not 14 and it is in all the cells.

Angiospermic character

- 1) Habit:- Majority of species of Quercus are trees or they possess tree like habit some are shrubs.
- 2) Leaves:- In this aspect it resembles that of broad leaved dicotyledonous and green leaves possessing reticulate venation.
- 3) Phyllotaxy (Opposite (decussate))



Reticulate venation

- 4) Stomata:- It is of syndesmosis type.
- 5) Vessels:- Quercus is peculiar in having vessels (tracheids) as one of the constituents of xylem. The presence of vessels has been stated as a proof of Quercus's attachment to the level of angiosperms.



xylem
 phloem
 cambium
 pith

Fig showing vascular bundles arranged in a ring.

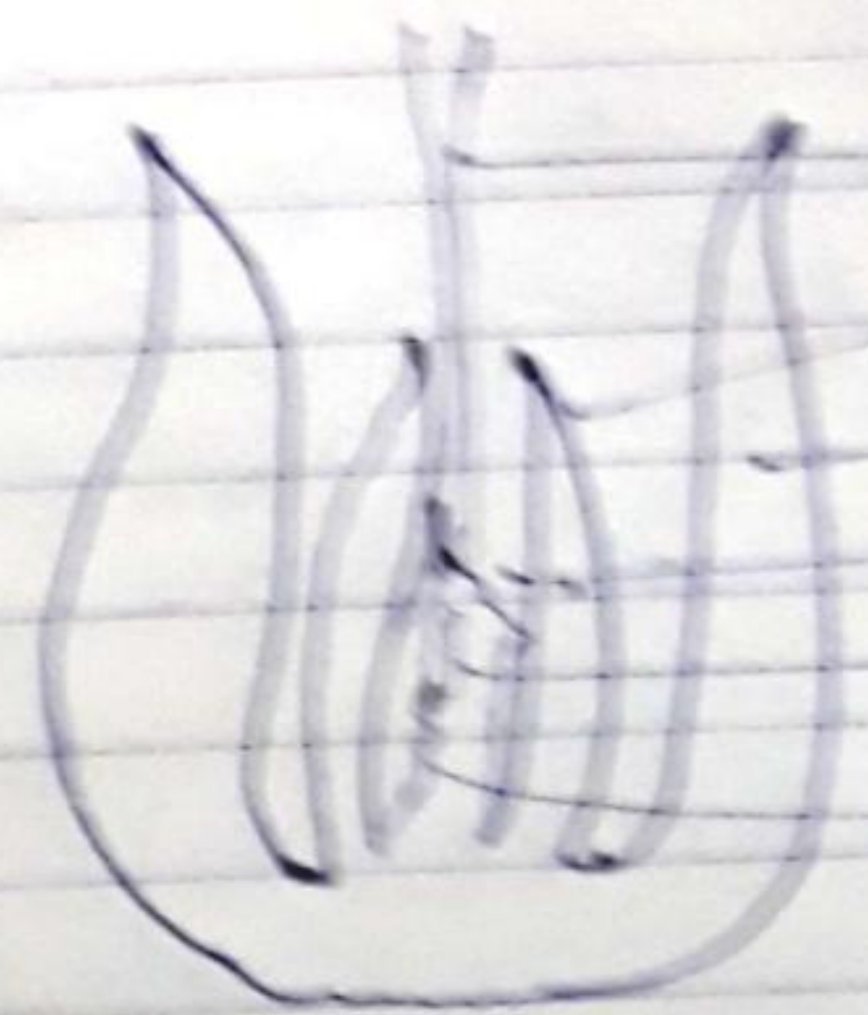
In Companion cell - After the emergence of the
 phloem, companion cells in the cortex of
 the stem are formed.

In Stem apex - The stem apex of Guajacum has been
 observed to be made of two embryonal layers namely the
 outer cortex, which resembles most of the members
 of angiosperms in the character of stem apex.
Leaf trace - Arrangement of leaf-traces near
 the base of many umbelliferae.

Microphyllous tube

A long microphyllous tube is formed by the elongation of the inner envelope of the ovule.

In Guajacum, pollen grains are found to
 lodge in the microphyllous tube. Hence it is considered that
 the microphyllous tube is analogous to the style and
 stigma of the angiosperms.



Inner integument
 outer integument
 nucellus
 ovule
 G-gametophyte
 nucellus tissue

Fig showing L.S. of ovule of Guajacum

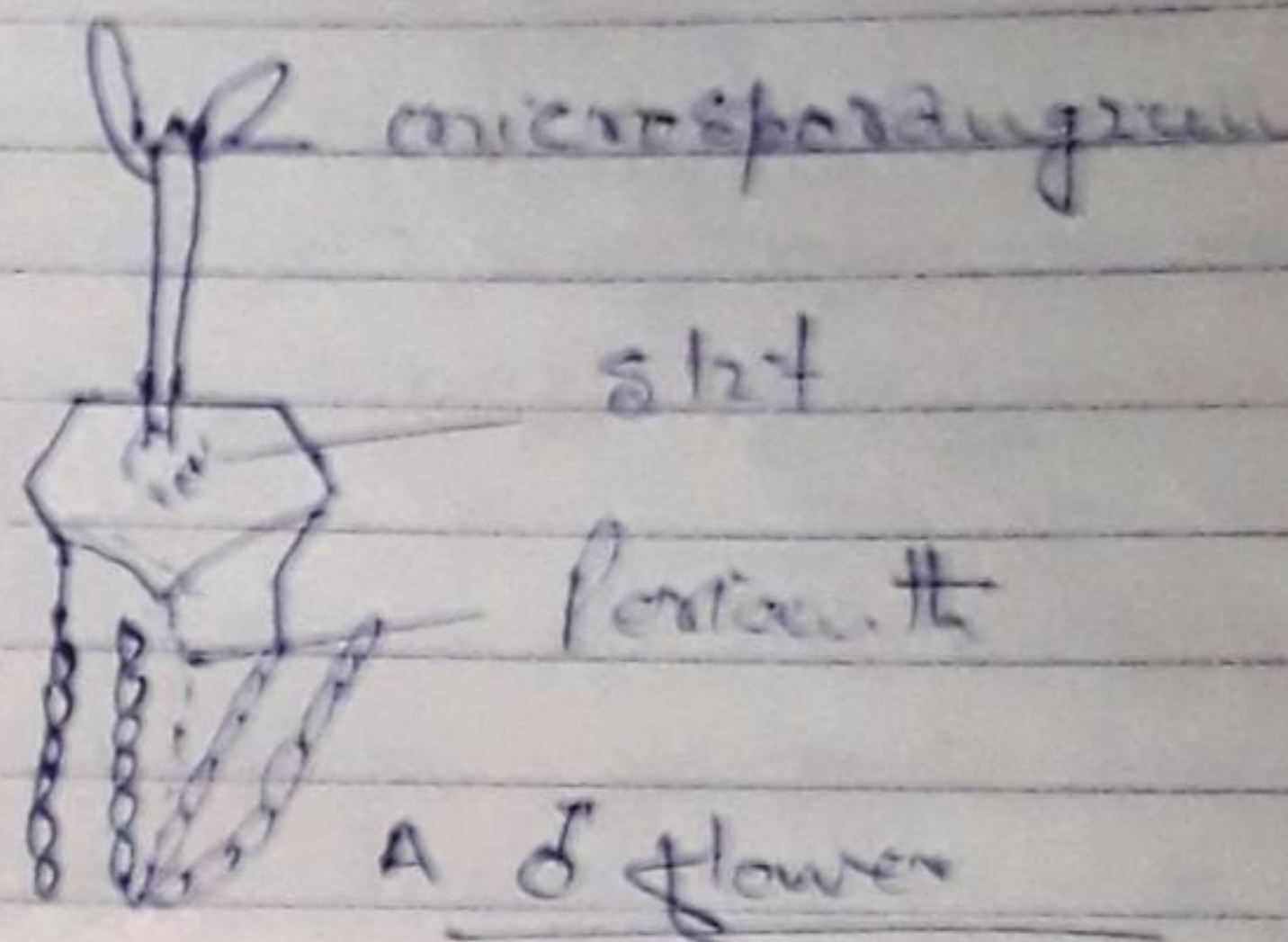
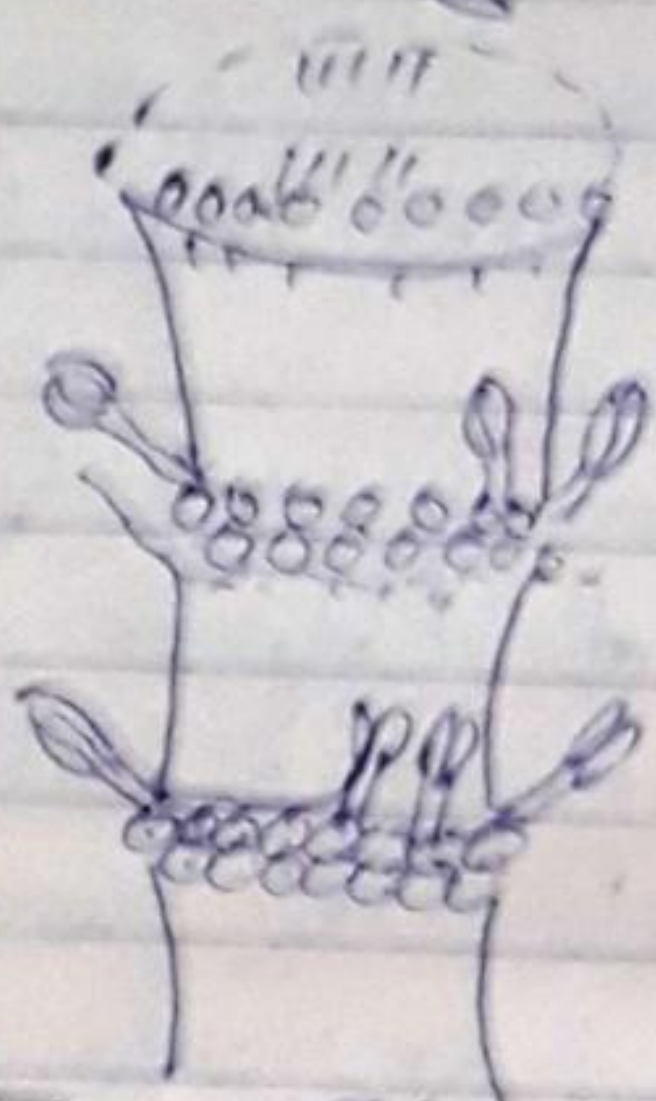
9). In the structure and composition of inflorescence

st seeds near the angiosperms. It is present either

solitary and axillary or fasciculated.

10) Megasporogenesis :- In Gnetales the development of gametophyte is of tetrasporic type, which is found in many angiosperms.

11) Perianth :- Sheath like perianth is found in male as well as female flower.



A portion of ♂ branch

fig showing Inflorescence (a portion only)

12) Integument :- 3 envelopes are found over ovule in which inner two are considered as integuments. In the bitermic aspect also Gnetales comes near angiosperms

13) Female gametophyte - In many points the female Gametophyte of Gnetales is that of Angiosperms.

i) Like angiosperms the female gametophyte of Gnetales has no archegonium.

ii) The lower part of the female gametophyte generally becomes cellular, where as the upper part remains free nucleus.

iii) Any nucleus of the upper part of the female gametophyte can act as an egg nucleus.

iv) Usually there is found a tendency for the formation of endosperm only after the fertilization has taken place.

13) The cells of the lower part of the embryo are pluripotent

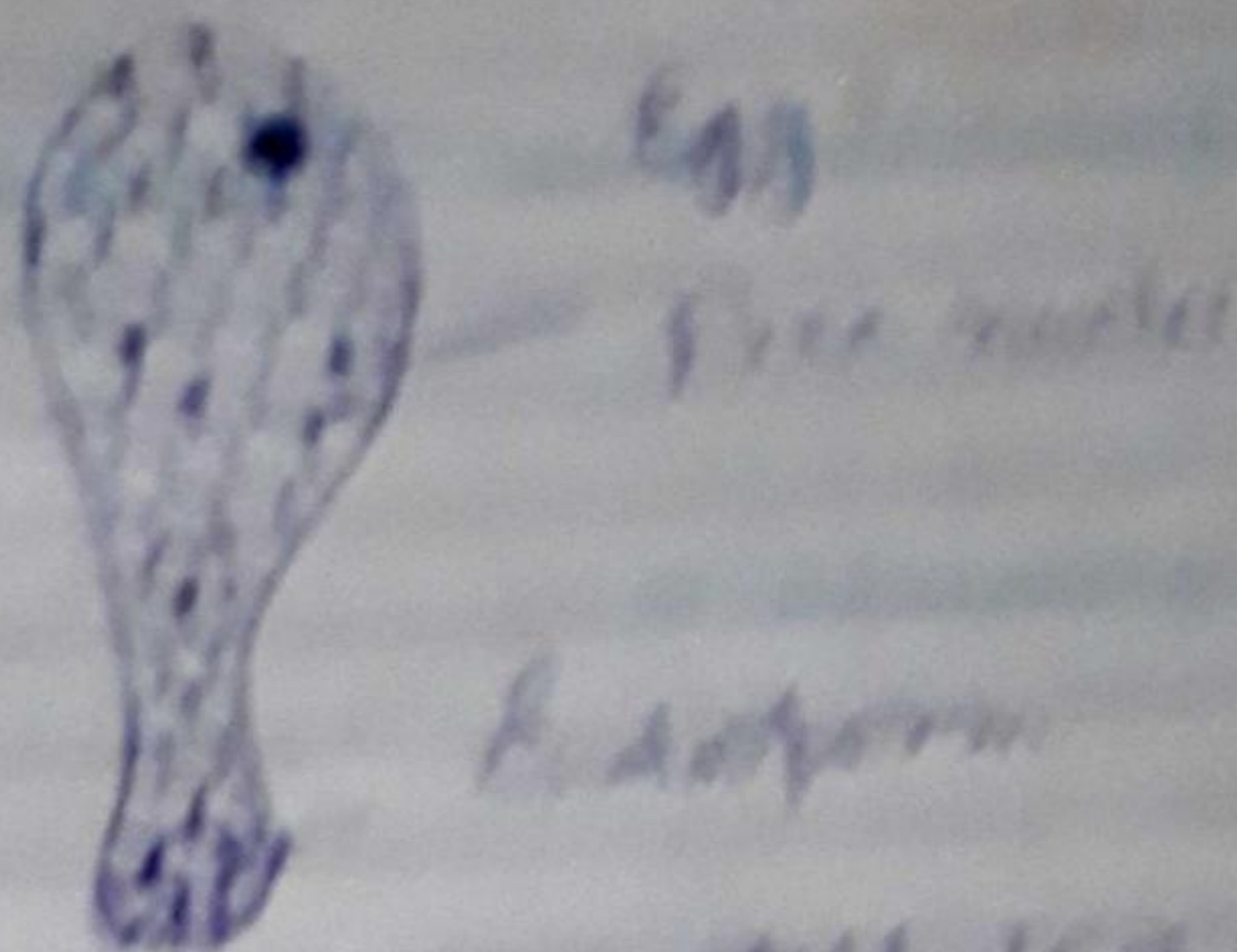


Fig showing, growth of embryo of D. p.

14) Male flower: Instead of developing the flower is found in the case of *Chara*.

The male flower consists of a stalk bearing a unilocular sporangium (anther) enclosed in a sheath (perianth).

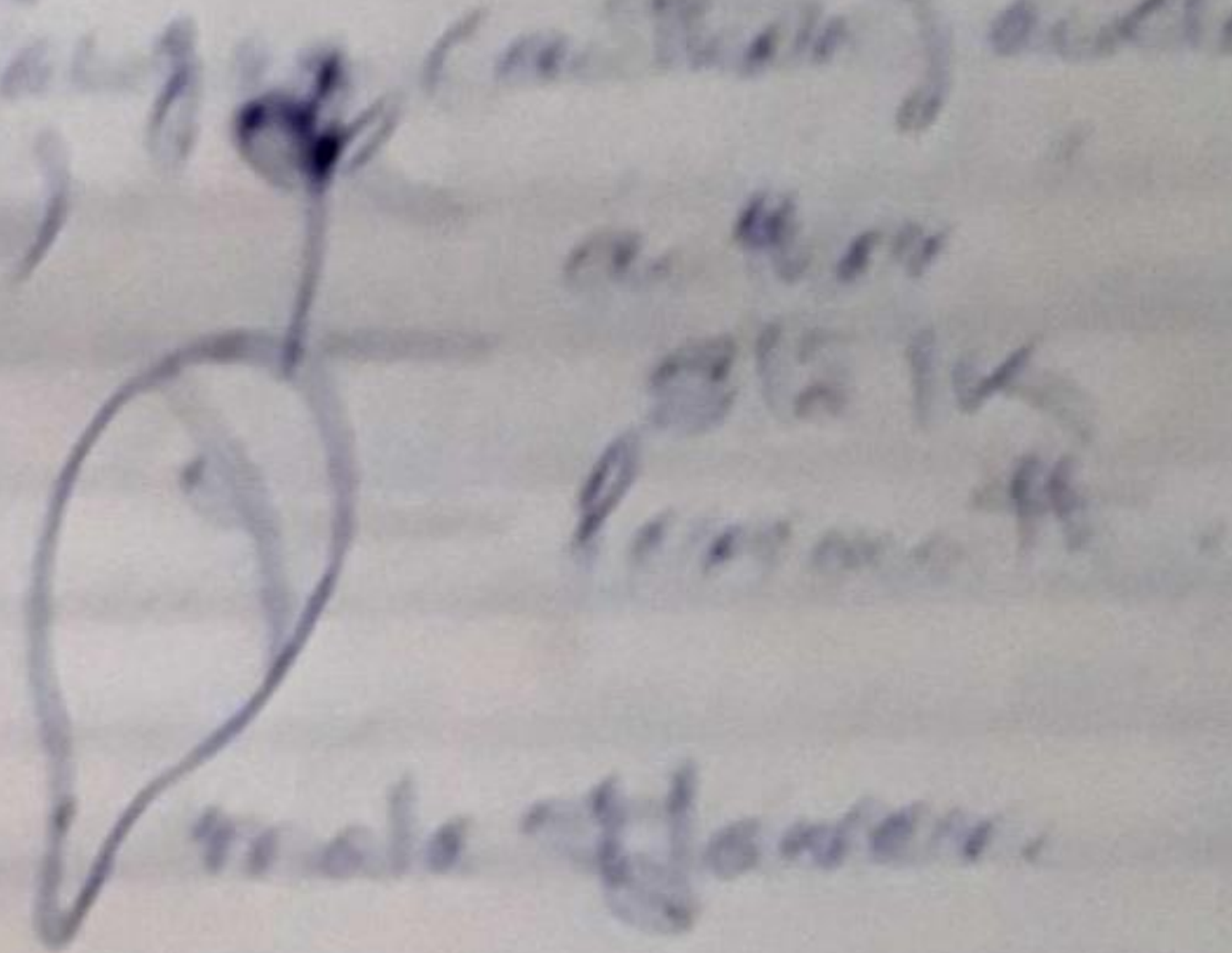


Fig showing, a male flower.

15) Male gametophyte: In the development of macrospore, no. mitotical cell is formed (A.C. Thompson 1916)

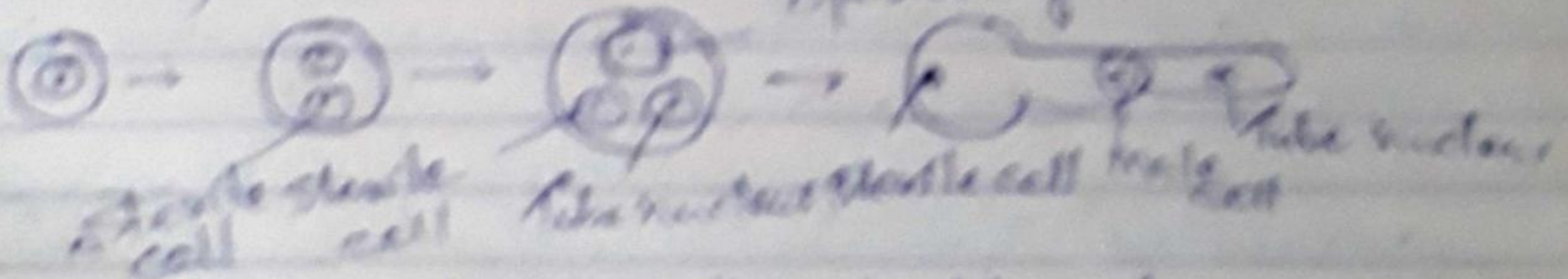


Fig showing, 2 stages of the development of macrospore (A.C. Thompson 1916)

16) Zygote: The development of zygote is cellular rather than nuclear.

Gymnospermic Characters -

There are some characters which are possessed by Gnetales, due to which Gnetales is still placed in the group.

Gymnosperm :-

- 1) Ovules are not contained in the ovary but are naked.
- 2) Pollen grains fall directly on the ovary nucellus in the absence of stigma.
- 3) Male and female strobilli resemble gymnosperms, though perianth is present.
- 4) Tracheids in xylem are along with bordered pits.
- 5) V. bundles are arranged in successive concentric ring (Resemblance with Cycads).
- 6) Prothallial cells are present in the development of male spore (A.C. to Negri and Madhulata 1957).
- 7) In the development of female gametophyte we find free nuclear division.
- 8) Possession of rudimentary pollen chamber also pulls Gnetales in the Gymnosperm.

A.C. to P. Maheshwari (1950) "it seems that while the angiosperms have probably passed through some stages as are shown by Gnetales we have no decisive evidence in favour of any close relationship.

Today (1911) and Berridge (1911) advocated that Cycadeoidea has got much resemblance with Gnetales.