

8. Describe the angiospermic character of *Gnetum*.

*Gnetum* shows the nearest approach to angiosperms. Some botanists are of opinion that *Gnetum* might have been a possible ancestor of angiospermic plants by virtue of possessing several characters alike to them, whereas others suggested that Gnetales and angiosperms had a common ancestor. A few of these considerations are as follows -

Arder & Parkin (1908) suggested that both Gnetales and angiosperms have originated from a hypothetical stock Hemiangiosperms.

The angiospermic character of *Gnetum* are as follows -

#### A. Vegetative character -

1. Climbing habit of sporophytic plants with twining stem in *G. africanum*, *G. neglectum*, *G. Ula* etc.
2. Presence of opposite decussate leaves with coriaceous texture, oblong lanceolate shape and reticulate venation.
3. Presence of distinct tunica-carpus configuration in the shoot apices.

#### B. Anatomical character -

1. Presence of polyfascicular ectophalic eustele.
2. Vessels are associated with the tracheids of xylem.
3. Presence of fibrous cells and companion cells in the secondary phloem of some sps.
4. Normal activity of the cambium in most of the sps is similar to dicot stem.
5. Anomalous secondary growth in the stelar region of climbing stems is due to unusual activity of secondary cambial strips.

#### C. Reproductive character -

(a) Male sporophyte -

1. The complex staminate strobilus resembles spike or catkin inflorescence
2. The male flowers have their own unisexual perianth
3. The microsporophylls is compared to a true glanum leg assuming its stalk a filament and pure connate sporangia as a bilobed anther
4. The epidermis of microsporangial jacket bears fibrous leards in its all the cells being similar to endothecium of angiospermic anther.
5. The existence of bisporangiate strobilus in G. apocynum & G. gramin may be compared to the bisexual flowers.

(b) Female strobilus -

1. The ovulate strobilus appears to be a paniculate catkin inflorescence.
2. The perianth in G. Ula is biserial as in the majority of angiospermic features.
3. The inner integument is comparable to the ovary producing a long micropylar tube equivalent to style with indistinct stigma. It has a nutritive tissue similar to that of the style in many angiosperms (Digweir & Tilson, 1913, Vasil 1959).

(c) The male gametophyte -

Complete elimination of male prothallial cell (Thompson 1916) and the production of 2 nonmotile male gametes by a generative cell per pollen tube. (Pearson 1914, Negi & Madhulata 1957).

(d) The ♀ gametophyte -

1. The development of the female gametophyte is tetraporate.
2. The female gametophyte is only partly cellular before fertilization and becomes completely



cellular nuclei only after fertilization. Some of the free nuclei act as egg as there are no archegonia.

3. The formation of meristematic tissue being equivalent to antipodal cells at the chalazal region is delayed of two eggs simultaneously by a single pollen tube is comparable to double fertilization.

(c) Embryology — The zygote doesn't undergo any free nuclear division.

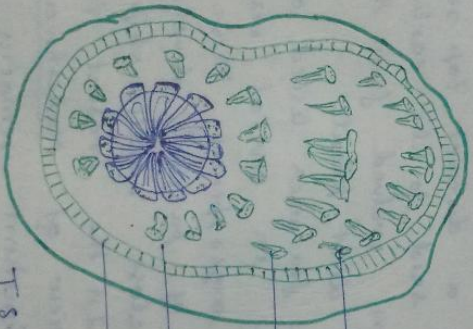
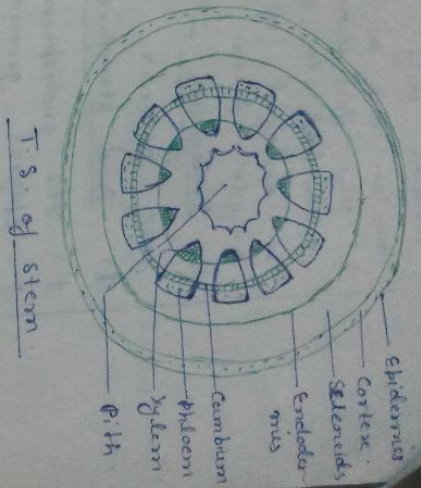
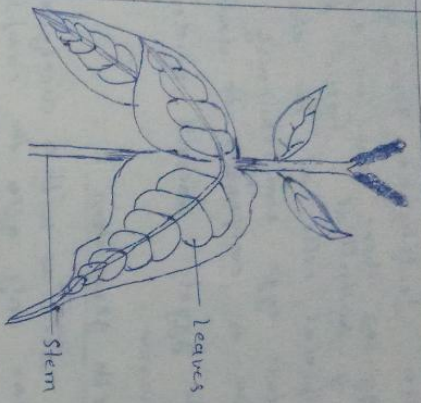
(d) Seed structure with germination —

1. The endospermic seed is with a dicotyledonous embryo.
2. Epigeal germination only after the completion of a prescribed period of dormancy.
3. Formation of a distinct tap root system by a radicle is said to be earlier than that of shoot system evolved from the plumule being similar to dicot plants.

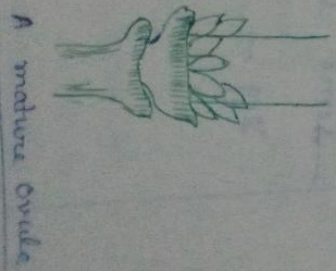
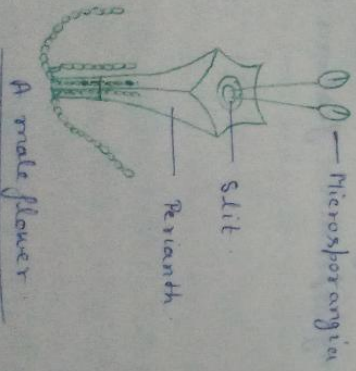
The features listed above indicate clearly that Gnetum in several respects has a relevant approach to angiosperms. These similarities appear in the cases of parallel development and do not portray any close relationship.

In the present time we can conclude it with the view of Maheshwari and Basil (1961). "The genus Gnetum remains largely a phylogenetic puzzle. It is gymnosperms but possesses some strong angiospermic features."

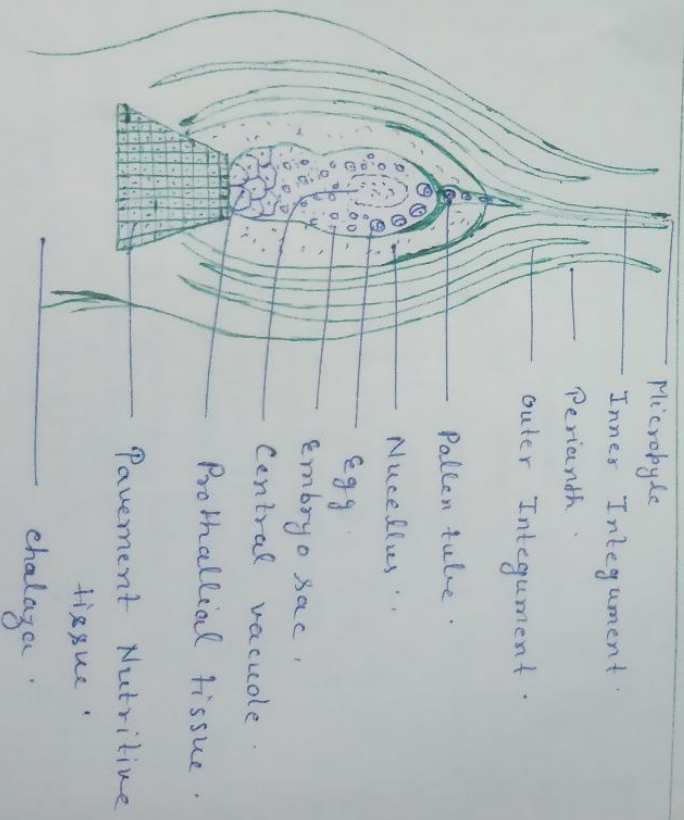
Fig —



T.S. of old stem showing Eustele







Female gametophyte



Presence of abhije decussate leaves with