

0 Gymnosperms Compassion of ovule of cycas and pinus

✓ Ovule of cycas is orthotropous.
Each ovule has a very thick integument. It remains enclosed completely by nucellus, except at the apical origin where it forms a nucellar beak and micropyle within a beak like portion, there is a pollen chamber. [The mature integument exhibits differentiation into outer fleshy layer; the Sarcotesta, the middle stony layer, Sclerotesta and inner fleshy layer. usually two vascular strands enter ends of the ovule, out of which outer strand enters the outer fleshy layer and it consists of about a dozen vascular bundle which enters up to the micropyle. The second strand, passes through the inner fleshy layer & consists of numerous vascular bundle. In the beginning a parenchymatous cell becomes prominent and after divisions its large cell develops as megaspore mother cell. which after meiotic division forms a linear tetrad of 4 haploid megaspore. The upper three megaspores are non-functional and degenerate soon. The functional megaspore is known as embryonal cell.

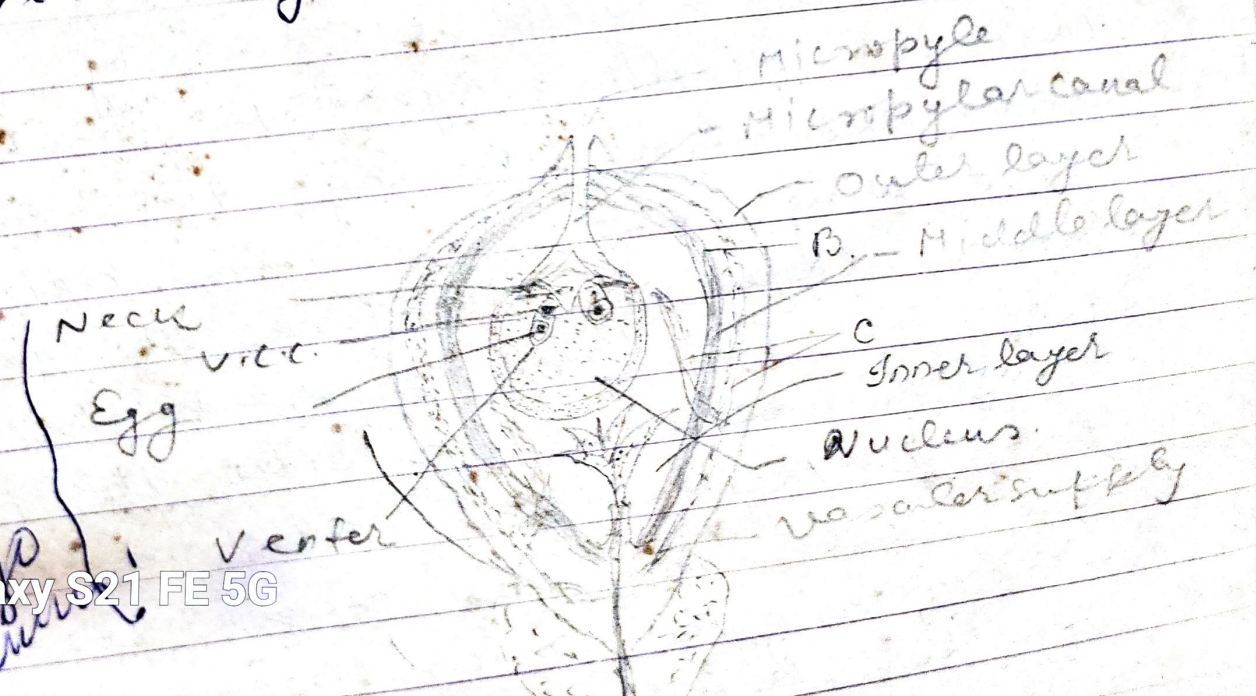
The megaspore of cycas, like megaspore of all spermatophytes is permanently retained in the megasporangium.

Sporangium or ovule^{or} the mega spore^{cell} has papillate exospore and fibrillar inner endospore. After female prothallus successive processes female prothallus or endosperm is formed. A nutritive tapetum~~is~~ tapetum layer is formed. Some of its spore surface cell near the micropylar end of female gametophyte enlarge and form 2 to 5 archegonial initials which finally develops into archegonium. Mature archegonium has ventral canal cell large egg, but neck canal cells are not found and this is its main feature of cycas archegonium.

Now coming to pinus ovule it appears that ovule of pinus also arise from a round hump of tissue called nucellar. From its base integument develops, the microphytes are directed inward, towards the axis of the cone. The integument is three layered, i.e. outer and inner fleshy and middle stony. At the apex of the nucellus a cell enlarge and functions as archesporial cell which has forms tapetal cell and megaspore mother cell. After meiotic division linear tetrad of 4 haploid megaspores are formed. FERUSON (1906) has reported variation in the cone of megaspore produced.

Out of this three, ~~two~~ degenerate and the remaining the farthest from microspyle matures and becomes megaspores or embryo sac. After differentiation the megasporocyte mother cell is surrounded by a zone of modified nucella wall cell. Foster and Clifford (1953) has called it as ^{Spongy} tissue.

Case is orthotropus and the pollination is anemophilous but in pinus winged pollen grains enter its pollination process. In cycas there is clear pollen chamber but in pinus pollen chambers are not so prominent like cycas. No neck canal cell is found in both the case. No. of archegonia in pinus varies with its species but in cycas it is generally two. (Page-300, fig-331, fig-334)



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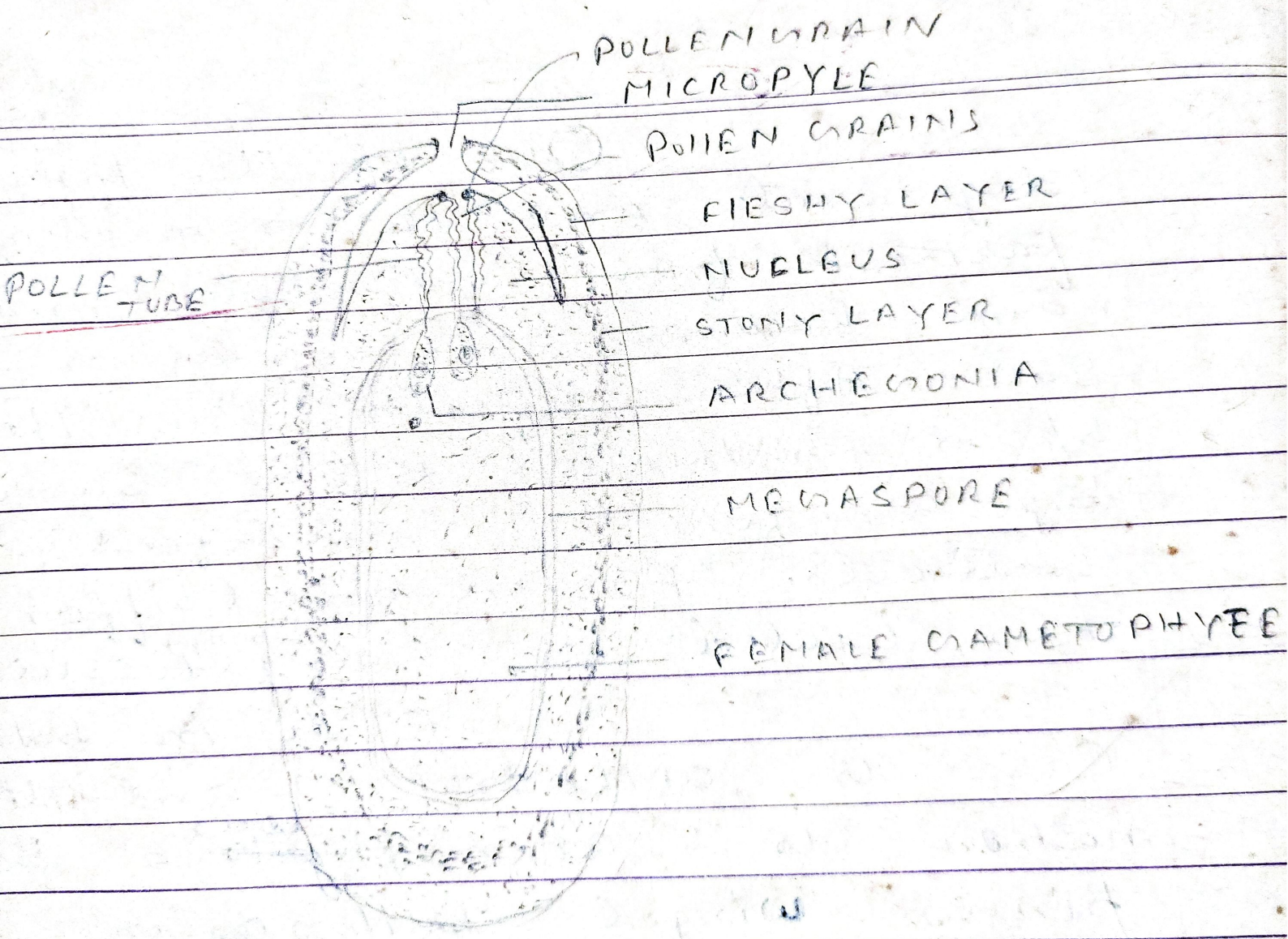


Fig. 2.5 of ovule of PINUS

of Pinus