Parts of ovule → (their formation)

(i) Integument ⇒ normally there are two integuments (Bitegmic ovule) but in some cases single integument is formed. (unitegmic ovule). Ategmic condition, that is ovule without integument has been reported in some members of olacaceae. In some plants a third integument is also found known as aril. Bitegmic is characteristic of monocots & polypetalae.

(ii) Caruncle ⇒ It is formed by the proliferation of the integumentary cells at the micropylar region. The integuments may fuse between themselves or with the nucellus or with the funiculus.
eg- Euphorbiaceae.

presence of chlorophyll in the integuments was first of all reported by Hofmeister in Bursrigia minor.
Stomata have also been reported in the integuments of Crossypium.

(iii) Micropyle → The micropyle formed by the outer integument is known as the exostome & that formed by the inner integument is known as the endostome. The exostome alone rarely forms the micro-

eg - Euphorbiaceae.

(iv) **Obturator** – In several families certain structures are formed in the ovules which help in directing the path of the pollen tubes towards the micropyle. Such integuments are known as obturator. In Anacardiaceae, Labiatae

(v) **Nucellus** → On the basis of extent of development of the nucellus two types of ovules have been recognised. Crassinucellate & tenuinucellate.

In crassinucellate type there is a well developed parietal layer of nucellus below the nucellar epidermis. This parietal layer consists of few to several layers of cells which separates the megaspore mother cell from the nucellar epidermis.

In the tenuinucellate type there is no presence of any parietal layer & as such the megaspore mother cell lies directly below the nucellar epidermis. The nucellus is gradually used up as the embryosac matures.

(vi) **Endothelium** → In those plants where the nucellus is completely used up the embryo sac comes in direct contact with the inner layer of the integument because the nucellus degenerates early in the development

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