

Study of ovules development in apomictic plants from the *Boecheera* genus, M4B line (Brassicaceae)

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Apomixis is a natural mechanism of plant reproduction via asexual seeds which produces seedlings genetically identical to the mother plant [1]. Sexuality and apomixis are not mutually exclusive modes of reproduction. Most apomicts (facultative) retain the capacity for sexual reproduction [2].

In this research work, we provided a cytoembryological analysis of apomictic female reproductive structures in *Boecheera*. We used a technique of the cleared ovule specimen by chloral hydrate and investigation of the slides with differential interference contrast (DIC) microscopy [3].

Representatives of the genus *Boecheera* are facultative apomicts, in this regard, ovules contain embryo sacs that develop in both sexual and apomictic ways. We identified that the nucellus is covered with a single-cell layer epidermis; there is a large Megaspore Mother Cell (MMC) (MMC stage) (fig.1A). At this stage, the outer integument consists of two layers of cells and covers the nucellus completely. The inner integument develops unevenly: on the left side it has almost completely formed, consisting of two layers of cells, while on the right, it is just beginning to form. Further, the MMC forms a dyad (fig. 1B): in the case of apomictic development by the restitution of megaspore's nucleus formation (apomeiosis) and in case of sexual development by the first meiotic division. At the stage of dyads (fig.1B) integuments are delayed in development, consisting of two layers of cells; the inner integument covers the nucellus by half. The stage of triads (fig. 1C) and tetrads can only be found in sexual ovules. Further, from the chalazal cell of the tetrad (in sexuals) and the chalazal cell of a dyad (in apomicts), the embryo sac develops by three mitotic divisions. Figure 1D shows the formed embryo sac, in which the egg cell and two polar nuclei are visible.

The present study confirms the facultative nature of apomixis in M4B line.

References

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Illustrations

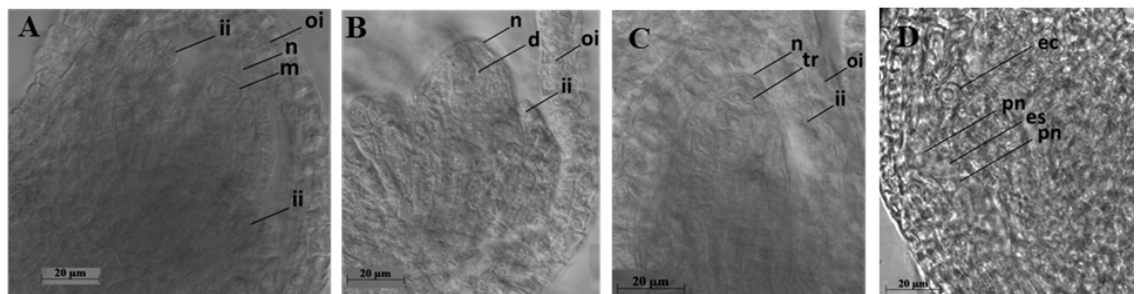


Рис. 1. Figure 1. The development of the embryo sac in apomictic plants M4B line. Nucellus – n; inner integument – ii; outer integument – oi; megasporocyte – m; dyad – d; triada – tr; egg cell – ec; pollar nucleus – pn; embryo sac – es. A – MMC stage; B – stage of dyads; C – stage of triads; D – embryo sac stage.