Oosorption in the dung beetle, *Onthophagus lenzii* (Insecta: Coleoptera): Fine structural changes of the follicular cells during the early phase of oosorption

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The dung beetle, *O. lenzii*, has only single ovary consisting of one meroistic-telotrophic ovariole, as observed in other species of *Onthopahgus* (Willimzik, 1930; Halffter and Matthews, 1960). Oosorption in this material takes place in the prechorionic oocyte being extruded from the ovariole, as seen in *Euoniticellus* (Tyndale-Biscoe and Watson, 1977). As the first step of oosorption in this species, the follicular epithelium begins to invaginate into the oocyte, frequently at the lateral parts of the egg follicle. Basal part of the oocyte breaks the thick muscle layer covering the ovariole, sometimes at several places, and enters the heamocoel. The extra-ovariolar mass of the oocyte is gradually resorbed.

In this study, fine structural changes of the follicular cells during the early phase of oosorption will be described to elucidate why the invagination of the follicular epithelium may occur.

Normally, the follicular epithelium of *O. lenzii* consists of two different cell types, i.e., electron light cells and electron dense cells. The former are the principal constituent of the epithelium, whereas the latter are few in number, usually triangular in form and intervene the former here and there.

During the process of oosorption these electron dense cells degenerate quickly. In the electron light cells, on the other hand, many vacuoles containing membranous component are seen to appear at the apical as well as basal regions of the cell, most probably by intensive invagination of the cell membrane. With increase in number of the vacuole, the cell organelles, such as well-developed rER, ribosome-coated vesicles, mitochondria and poorly-developed Golgi bodies accumulate around the nucleus, whereas in the apical as well as basal parts of the cells extension of the area with low electron density occurs, where the organelles may hardly be seen. Subsequently microvilli become to disappear and the space between the follicular epithelium and the oocyte is stretched greatly.

These changes occurred in the follicular cells may be seen first in those covering the lateral part of the oocyte and then extend towards those at the anterior as well as posterior regions of the follicular epithelium also covering the oocyte.

These observations may suggest that invagination of the follicular epithelium and the extrusion of the egg follicle occur first in the area where the epithelium is weakened by the degeneration of the follicular cells.

References

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