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The Second Meiosis Occurs in Cytochalasin D-Treated Eggs of *Corbicula leana* Even Though It Is Not Observed in Control Androgenetic Eggs because the Maternal Chromosomes and Centrosomes Are Extruded at First Meiosis

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Abstract

The hermaphroditic freshwater clam *Corbicula leana* reproduces by androgenesis. In the control (androgenetic development), all maternal chromosomes and maternal centrosomes at the meiotic poles were extruded as the two first polar bodies, and subsequently, second meiosis did not occur. But, in *C. leana* eggs treated with cytochalasin D (CD) to inhibit polar body extrusion, the second meiosis occurred. At metaphase-I, the spindle showed the typical bipolar structure and two spheroid centrosomes were located at its poles. All the maternal chromosomes were divided at anaphase-I, but they were not extruded as polar bodies due to the effects of CD. After completion of first meiosis, the maternal centrosomes split into four. At the second meiosis, twin or tetrapolar spindles were formed and two groups of maternal chromosomes divided into four sets of chromosomes. After the second meiosis, the spindle disassociated and the four maternal centrosomes disappeared. Four groups of maternal chromosomes transformed into the four female pronuclei. Male and female pronuclei became metaphase chromosomes of the first mitosis. The present study clearly indicates that typical meiosis systems still proceed in androgenetic triploid *C. leana*. We conclude that the androgenetic form may have arisen from the meiotic form.

Keywords

bivalvia; androgenesis; cytochalasin D; second meiosis; tubulin; centrosomes; spindle; pronuclei

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