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Ultrastructure of Antipodal Cells of Rice (Oryza sativa) after Anthesis, as Related to Nutrient Transport in Embryo Sac

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Abstract:
In a rice embryo sac, there is an antipodal mass located at the opposite side of the micropyle, directly adjoining nucellar cells. Immediately after anthesis, the antipodal cells are characterized by the presence of numerous rough endoplasmic reticula and the prominent ingrowths of the wall parietal to nucellar cells. Additionally, they contain large-sized and irregularly lobed nuclei. The lobed parts of the nucleus are connected by narrow and short bridges composed of nucleoplasm and surround part of the cytoplasm, in which many plastids, mitochondria and rough endoplasmic reticula are evident. Most cell organelles are evenly distributed in cytoplasm around the nucleus and the terminal ends of endoplasmic reticula occasionally join the wall ingrowths protruding from the nucellus side. Some round-shaped structures with attached ribosomes are present in antipodal cytoplasm near the wall bordering a central cell. The nucellar cells in the neighborhood of the antipodal mass are already beginning to degenerate. It is proposed that this behaviour of antipodal cells and cell organelles is implicated in the possible role of the antipodals in apoplastic movement of nutrients from nucellar cells into a central cell in the embryo sac. Furthermore, we briefly describe the various routes of nutrient transfer in rice embryo sac.

Keywords:
Antipodal cell, Lobe-shaped nucleus, Oryza sativa, Ultrastructure, Wall ingrowth

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