Title	Comparative ultrastructure of Ilpumbyeo, a high-quality Japonica rice, and its mutant, Suweon 464: SEM and TEM studies
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Abstract

A new rice variety Suweon 464 (S-464) developed from a high-quality japonica rice, Ilpumbyeo (IP), revealed extreme differences in cooking quality, physicochemical properties and the content of basis components. The objective of this study is to determine how the differences existing between the two would reflect in ultrastructure of endosperm cells *in situ* and isolated starch granules. For SEM, the midregion of whole grains and isolated starch granules were viewed whereas for TEM, starch endosperm of 20 DAF were prepared by a conventional method. In SEM, IP starch granules, in intercellular cleavage planes, were embedded in the matrix material made presumably of the remains of degenerating cytoplasmic constituents (cytosol + organelles). Large compound starch granules of IP were readily split during fracturing exposing clustered individual starch granules within them in intra-cellulary cleaved cells. In S-464, compound starch granules were enclosed within a sac-like structure tolerant to fracturing, retaining their structural integrity. In isolated preparation, IP starch consisted entirely of individual starch granules whereas S-464 consisted mostly of large compound starch granules still enclosed within the sac apparently survived the harsh treatments received during the isolation process preventing the release of the individuals. In TEM, S-464 starch granules, solidly condensed in appearance, were highly contrasted by the presence of intergranular spaces whereas those in IP, fluffy in appearance, were tightly appressed each other causing some of them to fuse with adjacent ones. The boundary of amyloplasts and starch granules were coated by a thin proteinaceous layer, presumed to be the counterpart of the sad that encloses the compound granules observed in SEM. The capability of retaining structurally intact compound starch granules after the various harsh treatments, fracturing and isolation process appeared to be unique to S-464, and it may be a major determinant in the contribution to its characteristic physicochemical properties.