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Structural Changes and Fate of Crystalloplastids during Growth of Calcium Oxalate Crystal Idioblasts in Japanese Yam (*Dioscorea japonica* Thunb.) Tubers

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Abstract: The structural changes of crystalloplastids during calcium oxalate crystal idioblasts growth in Japanese yam tubers were examined by transmission electron microscopy. Idioblasts developed in the cortex of tubers during the tubers development were large and elliptic and contained many crystalloplastids. The crystalloplastids were shown to have novel morphological characterizations. The single or multiple obvious electron-translucent parts without membrane structures were formed in the crystalloplastids during the crystal formation. Coincidentally, the electron-dense parts containing plastid ribosomes and tubular membranes were formed at the periphery of crystalloplastids. During further progress of crystal formation, obvious electron-translucent parts enlarged and finally electron-dense parts disappeared, forming the crystalloplastids similar to small vacuoles and/or vesicles. The majority of such crystalloplastids entered and was incorporated into the central vacuoles of idioblasts during crystal formation. The plastids remaining in the cytoplasm of mature idioblasts were proplastid-like organelle. Thus, the fate of crystalloplastids with growth of idioblasts was shown in Japanese yam tubers. It was suggested that the incorporation of crystalloplastids into central vacuoles of the idioblasts was one of the processes of material transportation involved in calcium oxalate crystal formation.

Keywords: [Calcium oxalate](#), [Crystal idioblast](#), [Crystalloplastid](#), [Electron microscopy](#), [Raphide](#), [Tuber](#), [Yam](#), [Yamanoimo](#)

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