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Dynamics of Amyloplast Sedimentation in Growing Yam Tubers and Its Possible Role in Graviperception

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Abstract: The mechanism of gravitropism in yam tubers was investigated using two cultivars of Chinese yam, cv. Nagaimo which elongates to form a long tuber, and cv. Genkotsujirou which elongates in the initial stage and then spherically thickens. In both cultivars, many amyloplasts were locally formed and settled down vertically in each cell at the part beneath the stele of the elongating tuber. In contrast, amyloplasts in the stele in the apical part of the elongating tuber in these cultivars were smaller in number and size than those in the part beneath the stele and did not settle down vertically. In the thickening tuber of Genkotsujirou, the number of amyloplasts decreased and they did not settle down vertically in the part beneath the stele. In Nagaimo tuber tilted on an inclined plate, amyloplasts in the part beneath the stele in apical part of tuber also settled in the direction of gravity. Tubers elongated vertically as soon as they passed through the inclined plate. In such tubers, amyloplasts in the part beneath the stele were vertically settled down. These results indicated that amyloplasts in the part beneath the stele would play a role as statoliths for the perception of gravity. Crystal cells and tannin cells dispersed in the part beneath the stele of tuber as in the cortex surrounding the stele. The result indicated that the part beneath the stele is a part of cortex. Therefore, the cortex in the apical part of tuber was presumably important as the site of gravity perception.

Keywords: [Amyloplast](#), [Chinese yam](#), [Geotropism](#), [Gravity](#), [Starch](#), [Tuber](#), [Yam](#)

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