

**Kinetic Analysis of Rolling of Carnation Petals
accelerated by Ethylene Action**

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The inward rolling of the petals is one of typical symptoms observed in the senescence process in climacteric corolla. When the lower part of petals of carnation (*Dianthus caryophyllus* L. cv. Yellow Liberty) was treated with exogenous ethylene, the rolling in petals was mimicked *in vitro*. According to the kinetic analysis, an intensified difference in the lengths between the adaxial and abaxial side of transverse section of petal was a causal factor of the rolling. The length of the adaxial side was selectively reduced by the treatment of ethylene. The kinetic curve of the adaxial side consisted of two distinct phases since that of the abaxial side has one phase. These results were confirmed by the microscopic observation of cell sizes in both sides. The rate of expansion/shrinkage of either side and the slope of each phase dynamically was varied by the treatment of chemicals such as Ca²⁺ ionophore, A23187. Recently, we found that malformin A1 (*cyclo*-D-Cys-D-Cys-L-Val-D-Leu-L-Ile), a fungal cyclic pentapeptide toxin from *Aspergillus niger*, influenced the rolling phenomenon. In this work, we present how chemicals including malformin A1 influence the rolling in carnation petals accelerated by ethylene action.

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