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[\[PDF \(226K\)\]](#) [\[References\]](#)**Freezing Injury and Rheological Properties of Agricultural Products**[Shigehiko OHNISHI](#)¹⁾, [Tomoyuki FUJII](#)²⁾ and [Osato MIYAWAKI](#)³⁾1) *Fermentation and Food Research Institute*2) *Faculty of Applied Life Sciences, Niigata University of Pharmacy and Applied Life Sciences*3) *Department of Applied Biological Chemistry, The University of Tokyo*

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Time changes in electrical and rheological properties of carrot and potato cell tissues after freezing-thawing or chloroform-vapor treatment were compared to clarify the mechanism of cell tissue softening by freezing injury. Integrity of cell plasma membrane was analyzed by the electrical measurement and rheological properties of cell tissues were determined by the vibrating reed method. Changes in the rheological properties by the chloroform-vapor treatment were assumed to be caused only by the loss of turgor pressure, while those by the freezing-thawing were caused by loss of this pressure and injuries to the cell wall and intercellular structure. The change in the rheological properties of carrot and potato tissue by the freezing-thawing and chloroform-vapor treatment were compared to determine the contribution ratio of the loss of turgor pressure and injuries to the cell wall and intercellular structure, which are known as major causes of softening by freezing injury. Findings showed that the loss of turgor pressure due to plasma membrane injury is the main reason for cell tissue softening by freezing injury while injuries to the cell wall and intercellular structure have an auxiliary role.

Keywords: [freezing injury](#), [impedance](#), [carrot](#), [potato](#), [cell plasma membrane](#), [cell wall](#), [turgor pressure](#)



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