

Title Pre-harvest effects on naturally occurred isothiocyanates (ITCs) of cruciferous sprouts  
Authors H. Ito and M. Kimura  
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### **Abstract**

An anticarcinogenic property of crucifers has been elucidating. Cruciferous vegetables contain glucosinolates. When raw crucifers are grated, chewed or chopped, glucosinolates come into contact with endogenous myrosinase (thioglucoside glucohydrolase EC 3:2:3:1), and isothiocyanates (ITCs), nitriles, etc are released as the breakdown products of glucosinolates. ITCs are responsible for the protection from carcinogen. 4-Methylsulfinylbutyl ITC (L-sulforaphane) of broccoli sprouts is famous for strongly inducing phase 2 detoxication enzymes. 4-Methylthio-3-butenyl ITC (MTB-ITC) of Japanese radish sprouts called kaiware-daikon in Japan has also an anticarcinogenic property. Therefore, preharvest effects on naturally occurred both ITCs content were researched. In advance, a rapid and simple L-sulforaphane determination method using a gas chromatograph (GC) was developed. Varieties and harvest time had an effect on both ITCs content. The earlier harvest time was, the more both ITCs content was. A greening period had no effect on the L-sulforaphane content and also appeared to have no effect on the MTB-ITC content. GC and GC-mass spectrometry analysis of broccoli sprouts revealed 4-methylthiobutyl ITC and 4-methylthiobutyl nitrile as the main components that were similar to the structure of L-sulforaphane. The L-sulforaphane content was lower than the MTB-ITC content though exogenous myrosinase treatment after a microwave treatment increased the L-sulforaphane content about twentyfold. The MTB-ITC content was almost unchangeable more than 17 days under the storage of 7 degrees centigrade. The low content of L-sulforaphane should be considered.