

## Changes of glucosidase activity and insect body weight of the whitebacked planthopper after fed on resistant rice plants

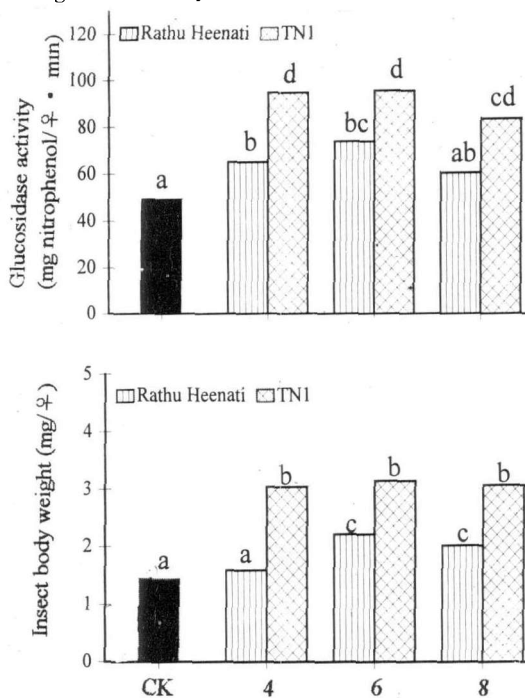
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Glucosidase is an important digestive enzyme in insect. The plant-sucking insect, the whitebacked planthopper *Sogatella furcifera*, ingests rice phloem sap and must use this enzyme to decompose the main sugar source of disaccharide sucrose into monosaccharide glucose and fructose for normal absorption. In studying the resistant mechanism, we investigated the changes of glycosides activity and insect body weight of *S. furcifera* after fed on the highly-resistant rice variety Rathu Heenati (RHT) and susceptible TN1.

The 4-, 6- and 8-week old rice plants of RHT and TN1 were enclosed with mylar cages. The brachypters were introduced into cages and collected at 3 days after infestation and weighed. The uncaged insect served as control. Insects were homogenized with citrate buffer and centrifuged. Homogenates and substrate (p-nitrophenyl- $\alpha$ -glucoside) solution were incubated at 33 C for 2 h and added with Tris-HCl buffer for interruption enzymatic reaction. The absorbance of color solutions was measured at 420 nm. Glucosidase activity expressed in milligram of nitrophenol released per insect per min.

Figure shows that glucosidase activity in *S. furcifera* increased significantly and insects gained heavier body weight on susceptible TN1 plants than on resistant RHT plants at 3 d after infestation. The glucosidase activity was

positively correlated with the change of insect body weight. The present results suggest that relatively low glucosidase activity in *S. furcifera* is possibly due to glucosidase activity inhibited by certain inhibitor(s) presented in resistant rice plant. And the insect ingested more phloem sap, absorbed sufficient nutrient and grew normally.



Glucosidase activity (top) in *Sogatella furcifera* at 3 d after feeding on the plants of different ages of resistant Rathu Heenati and susceptible TN1 and changes in insect body weight (bottom). Columns with the same letters are not significantly different at 95% level by LSD.

## Regulation technique in soil moisture at paddy field

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Early cultivator Zhongzao 1 (indica) and late rice cultivar Xiushui 2 (japonica) were used for