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PHYSIOCHEMICAL STRESSES AND VARIETAL RESISTANCE IN RICE: EFFECTS
ON WHITEBACKED PLANTHOPPER SOGATELLA FURCIFERA (HORVATH)

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ABSTRACT

SALIM, MUHAMMAD, University of the Philippines at Los Banos, June, 1988. Physiochemical Stresses and Varietal Resistance in Rice: Effects on Whitebacked Planthopper *Sogatella furcifera* (Horvath).

Major Professor: Dr. Ramesh C. Saxena

Effects of nutritional, salinity and temperature, stresses on the expression of resistance of rice cultivars to *S. furcifera* were determined empirically under controlled conditions in a phytotron. Insect's food intake, and assimilation, growth, longevity, fecundity, and population build up were significantly higher on plants grown in nutrient solution with 200 ppm N than with 5 ppm N. High K level in plants adversely affected the insect's behavior and biology. Phosphorous-stressed plants did not have consistent effects on the insect. Low as well as high levels of Fe application increased insect population. Application of Si at 100 or 400 ppm and Al at 30 or 90 ppm to the nutrient solution significantly decreased the insect population. Salinity-stress (NaCl and CaCl₂ at EC 10 ds/m and EC 12 ds/m decreased the level of insect resistance in IR2035-117-3 plants. Both high (35/27°C) and low (26/18°C or 24/16°C) temperature regimes decreased resistance of IR2035-117-3. N, P, K, Fe, Al, salinity and temperature stresses significantly reduced plant growth. The quantity of allelochemicals increased with increase in the application of K, but allelochemicals were less in quantity in salinity and

temperature-stressed plants. External application of steam distillate extract of resistant IR2035-117-3 plants on susceptible TN1 plants rendered them less attractive to S. furcifera females and decreased intake of food and increased nymphal mortality. In contrast, application of extract from susceptible plants on resistant plants increased food intake of insect. However, regardless of the stress, the difference between the susceptibility of TN1 and resistance of IR2035-117-3 cultivars remained distinct.