

COMPARISON OF LEAF AND STEM TRICHOMES OF RICE VARIETIES PTB33 AND BG380: EVIDENCE FOR RESISTANCE TO BROWN PLANTHOPPER

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The Rice Brown Planthopper (BPH), *Nilaparvata lugens* (stal.) is a serious monophagous insect pest in rice-producing countries worldwide. BPH can reduce rice yield and also perform as a vector for viral diseases. The use of resistant rice varieties is a perfect means for managing BPH. Among host plant resistance mechanisms, morphological factors provide a natural barrier for BPH attack. Very little is known on the use of morphological markers to distinguish BPH resistant and susceptible rice varieties. This study aimed to recognise and compare the characteristics and distribution of trichomes in highly resistant (*Ptb33*) and susceptible (*Bg380*) rice varieties and understand the effect of surface morphology on resistance against BPH. Paddy seeds collected from Rice Research and Development Institute, Bathalagoda, were germinated and transferred into pots in a plant house. Images of stem and leaf samples (2 months old) were analysed using a scanning electron microscope (SEM) under $\times 500$ and $\times 250$ magnification. Approximate trichome surface density was calculated for 1 cm^2 by counting trichomes on six different places of the image, using a $1'' \times 1''$ grid. The mean density of macro-hairs on the adaxial surface of leaf Bg380 and Ptb33 was 50 cm^{-2} and 83.3 cm^{-2} , respectively. Angular prickles were present only in the abaxial surface Bg380 (83.3 cm^{-2}); instead, Ptb33 had macro hairs with a mean density of 66.6 cm^{-2} . Unbarbed prickles were high in Bg380 (800 cm^{-2}) while low in Ptb33 (550 cm^{-2}). Curved barbed prickles were observed on Bg380 stem (183 cm^{-2}), while pointed, barbed prickles were observed on Ptb33 (633 cm^{-2}). Short hard stiff macro-hairs were observed in both Bg380 and Ptb33 (317 cm^{-2} , 450 cm^{-2}). Dense, long macro hairs on leaves, pointed barbed prickles, and short stiff and pressed macro hairs on the stem of Ptb33 may affect the adult settling, finding ovipositioning sites, and reducing suitable feeding sites. At the same time, curved barbed prickles may facilitate nymphs' retention on Bg380. Thus, this study suggests that the stem and leaf morphological features such as density and length of trichomes could positively correlate with the resistance of rice varieties against BPH.

Keywords: Brown Planthopper, Morphology, SEM analysis, Trichomes