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Mucin-like protein, a saliva component involved in brown planthopper virulence and host adaptation

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Abstract

The rice brown planthopper (BPH), *Nilaparvata lugens*, can rapidly adapt to new resistant rice varieties within several generations, rendering its management burdensome. However, the molecular mechanism underlying its adaptability remains unclear. In this study, we investigated the potential role of mucin-like protein (NlMul) in *N. lugens* virulence and adaptation to host resistance. NlMul is an important glycoprotein that constitutes both gelling and watery saliva, and specifically expressed in the salivary glands at all developmental stages except the egg period. Knocking down the expression of *NlMul* resulted in the secretion of short and single-branched salivary sheaths. NlMul might help BPH deal with plant resistance, and altered gene expression was observed when BPHs were transferred from a susceptible rice variety to a resistant one. The *NlMul*-deficient BPHs showed disordered developmental duration and a portion of these insects reared on resistant rice exhibited lethal effects. Our results uncover a saliva-mediated interaction between insect and host plant, and provide useful information in rice breeding and planthopper

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