

## Accepted Manuscript

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

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PII: S0022-1910(16)30361-4

DOI: <http://dx.doi.org/10.1016/j.jinsphys.2017.01.012>

Reference: IP 3602

To appear in: *Journal of Insect Physiology*

Received Date: 31 October 2016

Revised Date: 18 January 2017

Accepted Date: 19 January 2017

Please cite this article as: Huang, H-J., Liu, C-W., Xu, H-J., Bao, Y-Y., Zhang, C-X., Mucin-like protein, a saliva component involved in brown planthopper virulence and host adaptation, *Journal of Insect Physiology* (2017), doi: <http://dx.doi.org/10.1016/j.jinsphys.2017.01.012>

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

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8  
9 **Abstract**

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

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