



Supplementary Materials

The Desaturase Gene *Nlug-desatA2* Regulates the Performance of the Brown Planthopper *Nilaparvata lugens* and Its Relationship with Rice

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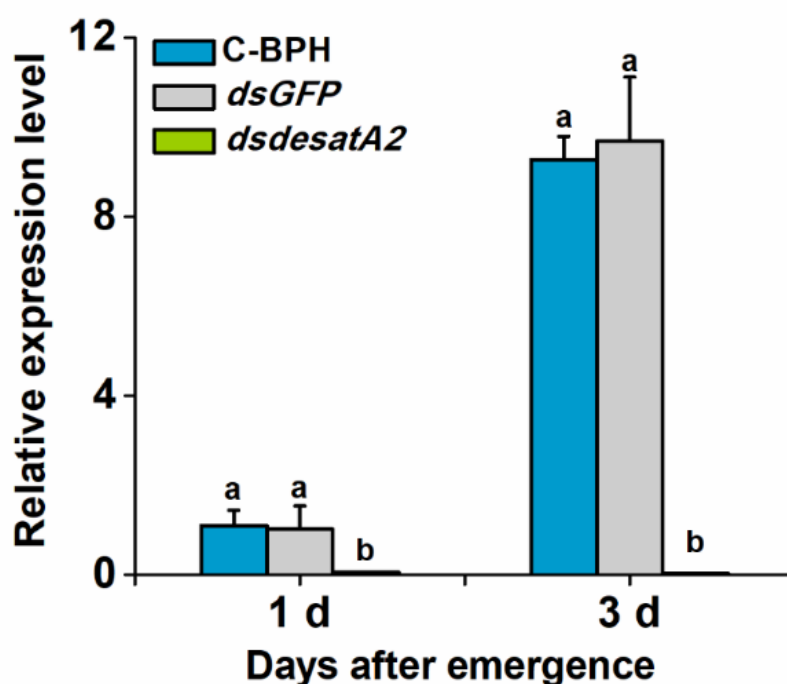


Figure S1. The silencing efficiency of *Nlug-desatA2* by RNAi. Mean transcript levels (+ SE, $n = 3$) of *Nlug-desatA2* in whole bodies of newly emerged and 3-day-old BPH female adults that were injected with dsRNA of *Nlug-desatA2* or *GFP* (*dsGFP*), or not injected (C-BPH) at third nymph instar (5 and 7 days after injection). The results (threshold cycle values) of the qRT-PCR assays were normalized to the expression of *RPS15*. Letters indicate significant differences among different treatments ($P < 0.05$, Duncan's test).

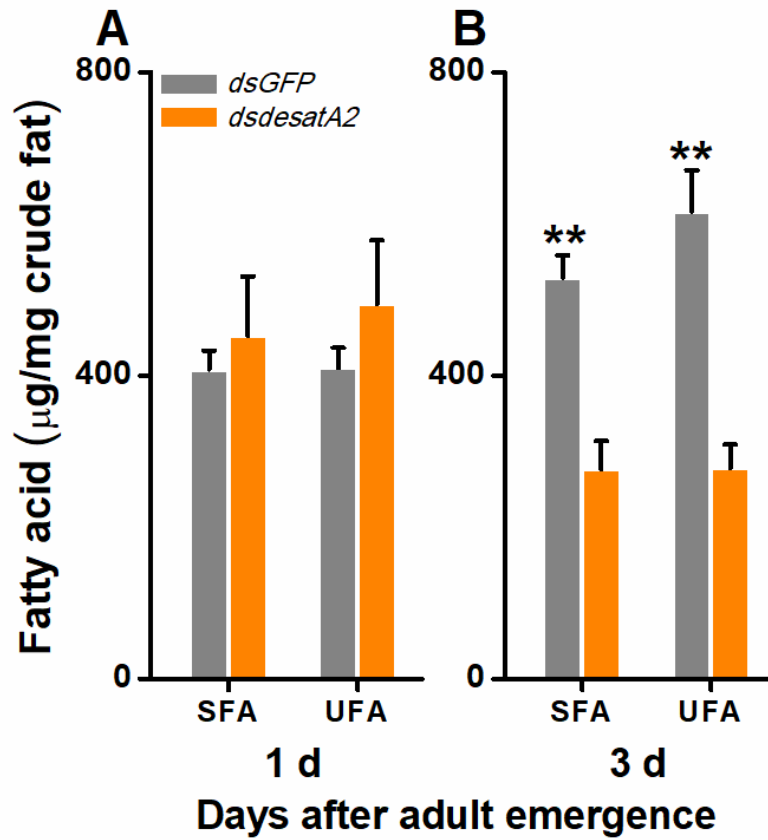


Figure S2. The effect of *Nlug-desatA2*-knockdown on the level of total saturated and unsaturated fatty acids. Mean levels (+ SE, n = 3) of fatty acids per milligram crude fat from the whole body of 1- (A) and 3-day-old (B) female adult that were injected with 0.25 μg dsRNA of *Nlug-desatA2* (*dsdesatA2*) or *GFP* (*dsGFP*) at the third-instar nymph stage. SFA, saturated fatty acids; UFA, unsaturated fatty acids. Asterisks indicate significant difference between *dsGFP* and *dsdesatA2* injection. (** $P < 0.01$, Student's t test).

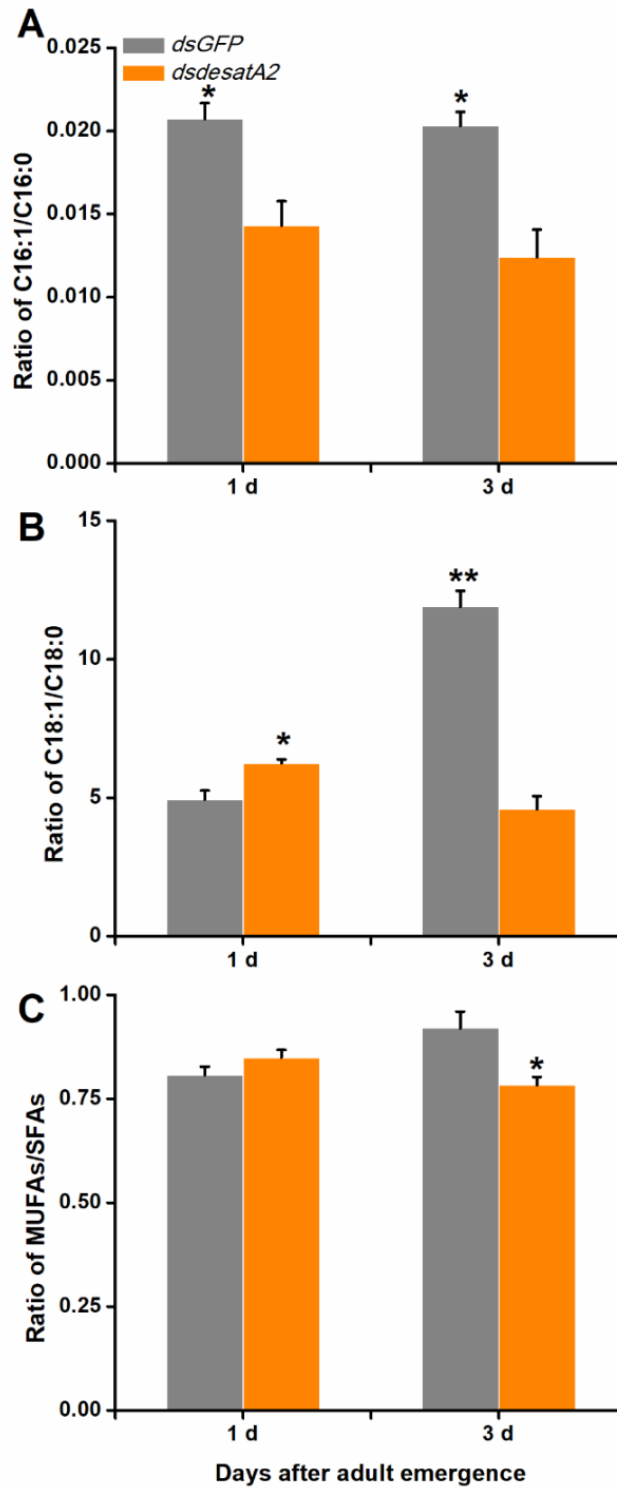


Figure S3. The effect of knocking down *Nlug-desatA2* on the desaturase indices in BPH. The ratio of C16:1 to C16:0 (A), C18:1 to C18:0 (B) and MUFAs to SFAs (C) in the whole bodies of 1- and 3-day-old female adults that had been injected with 0.25 μ g dsRNA of *Nlug-desatA2* (*dsdesatA2*) or *GFP* (*dsGFP*) at the third-instar nymph stage. Asterisks indicate significant difference between treatments (* $P < 0.05$, ** $P < 0.01$, Student's *t*-test).

Table S1. Primers used for dsRNA synthesis.

Primers	Primer Sequences (5'-...-3')
<i>Nlug-desatA2</i> -F	GGATCCTAATACGACTCACTATAGGGTGGAGAAATGTTGCTGCCT
<i>Nlug-desatA2</i> -R	GGATCCTAATACGACTCACTATAGGCGGTGTCTGTGAACTTGTGG
<i>GFP</i> -F	GGATCCTAATACGACTCACTATAGGAAGGGCGAGGAGCTGTTACCG
<i>GFP</i> -R	GGATCCTAATACGACTCACTATAGGCAGCAGGACCATGTGATCGCGC

F: forward primer; R: Reverse primer.

Table S2. Primers used for qRT-PCR.

Gene	Genbank accession number	Forward primer (5'---3')	Reverse primer (5'---3')
<i>Nlug-desatA2</i>	MH271234	CTGGAGCAGAAGTCATCCCT	CGCTGTTGTTGTTGTTGTTG
<i>RPS15</i>	ACN79501	TAAAAATGGCAGACGAAGAGCCCAA	TTCCACGGTTGAAACGTCTGCG
<i>NIvg</i>	AB353856	ATGAGTTCAACCCAGCATCA	GATGAGCTTGAGCTGCTGTC
<i>NIvgR</i>	GU723297	AGGCAGCCACACAGATAACCGC	AGCCGCTCGCTCCAGAACATT
<i>JHAMT</i>	KP769805	GAACCTGCAGGCCAAACACA	ACCACTCGGTTGGGCTGAAT
<i>JHE</i>	EU380769	AAGTAACTGGCAGATTCAACC	CTCGAATAGATGTGCTGCAGG
<i>Met</i>	KP797880	GGTGGTAAACGGATTGGAAA	CATCGTCAGCCAACTCGATA
<i>Tor</i>	JQ793898	GGCTACAGGGATGTCAA	GAGATAGATTCAAACGGAAAG
<i>Rheb</i>	JX175249	ACGGCGGGTCAGGATGAGTA	TCGAAGGACTTGGATGAGGTGA
<i>S6K</i>	KP769804	AGGACACTGCGCACACCAAG	CAATTCTCCGCCGCTCAGAT
<i>Lpp</i>	AB465596	GACGGTCACTATGTGTTGGC	CAACACTGTCCACCCTATCG
<i>AKH</i>	JQ082123	AGCTGATAAGATGGCTCGTGCT	TGGATGCCTTGCAGCCTTCT
<i>AKHR</i>	MH238458	TCGCATGCACCAACTCTTGC	CGCTGCGTTTGAGAGCCATT

Table S3. Knockdown of *Nlug-desatA2* leads to ovarian atrophy phenotype of female BPH adults.

Treatment	Repeat*	Ovarian Atrophy (n)	Normal Ovary (n)	All (n)	Ratio (Ovarian Atrophy/All) (%)	Mean Ratio (%)	SE
C-BPH	1	1	23	24	4.17	5.28	0.73
	2	1	19	20	5.00		
	3	2	28	30	6.67		
<i>dsGFP</i>	1	1	21	22	4.55	5.94	1.05
	2	1	18	19	5.26		
	3	2	23	25	8.00		
<i>dsdesatA2</i>	1	16	3	19	84.21	83.30	0.54
	2	28	6	34	82.35		
	3	20	4	24	83.33		

* Three experiments.