

Appendix A Primers used in this study

Primer name	Primer sequence (5'-3')	Description
SF-blue F	ATGGCGACGAACTTCACG	Blue sensitive opsin
SF-blue R	CTAAGCTTCGGCAGTAGG	
SF-LW1 F	ATGTCGCTGACGTTGGAT	long wavelength sensitive opsin 1
SF-LW1 R	TTAAGCGGCAGGTTTCTC	
SF-UV F	ATGTATAACCAAATGAAAATTCC	Ultraviolet sensitive opsin
SF-UV R	CTATGCTGGCGCTGCAG	
SF-LW2 F	ATGGCAGAACACGGTCCT	long wavelength sensitive opsin 2
SF-LW2 R	CTAGGCAGCAGGCTTCTCG	

Appendix B Summary of the sequence assembly after Illumina sequencing. SF=*Spodoptera frugiperda*, AF=female adults, AM=male adults.

The names of samples	SFAF-1	SFAF-2	SFAF-3	SFAM-1	SFAM-2	SFAM-3
Total reads (Gb)	7.7	8.24	7.98	9.26	8.31	8.07
Total number of contigs	229715					
Total number of unigenes	120282					
N50 of assembled contigs (bp)	1626					
Mean length of contigs (bp)	676					

Appendix C Summary of the sequence assembly after Illumina sequencing. HA=*Helicoverpa armigera*, AF=female adults, AM=male adults.

The names of samples	SFAF-1	SFAF-2	SFAF-3	SFAM-1	SFAM-2	SFAM-3
Total reads (Gb)	7.53	8.3	7.54	7.84	8.76	7.52
Total number of contigs	86126					
Total number of unigenes	39147					
N50 of assembled contigs (bp)	2881					
Mean length of contigs (bp)	1743					