

Supplementary materials

Nitric oxide mediates red light-induced perylenequinone production in *Shiraia* mycelium culture

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Table S1. Primers and relevant information of reference and target genes. F: forward primer, R: reverse primer.

Fig. S1. HPLC chromatograms of PQ standards. 1. Elsinochrome C; 2. Elsinochrome B; 3. Hypocrellin C; 4. Elsinochrome A; 5. Hypocrellins A.

Fig. S2. Effects of red light on the pH value (A) and residual sugar (B) in *Shiraia* sp. S9. The culture was maintained in a 150 mL flask containing 50 mL medium at 28°C and 150 r/min under the dark or red light treatment. The intensity of red light (627 nm) was 200 lx. Values are mean $\pm$ SD from three independent experiments.

Fig. S3. Effects of different concentrations of SNP under red light treatment on biomass (A), HA content in mycelium (B), the released HA in cultural broth (C) and total HA production (D) of *Shiraia* sp. S9. The culture was maintained in a 150 mL flask containing 50 mL medium at 150 r/min and 28°C under the dark or red light treatment for 8 days. The intensity of red light (627 nm) was 200 lx. SNP (1, 5, 10 and 20 μ M) were added 30 min prior to the red light treatment. Values are mean $\pm$ SD from three independent experiments (* p < 0.05 and ** p < 0.01 vs. control. # p < 0.05 and ## p < 0.01 vs. red light treatment).

Fig. S4. Effects of addition time of SNP (5 μ M) under red light treatment on HA production of *Shiraia* sp. S9. The fungal dry biomass (A), HA content in mycelium (B), the released HA in cultural broth (C) and total HA production (D) in liquid culture. The culture was maintained in a 150 mL flask containing 50 mL medium at 150 r/min and 28°C under the dark or red light treatment for 8 days. The intensity of red light (627 nm) was 200 lx. SNP (5 μ M) was added on day 1-5 of culture, 30 min prior to the red light treatment. Values are mean $\pm$ SD from three independent experiments (* p < 0.05 and ** p < 0.01 vs. control. # p < 0.05 and ## p < 0.01 vs. red light treatment).

Table S1

Primers and relevant information of reference and target genes. F: forward primer, R: reverse primer.

Gene symbol	Gene name	Sequence
<i>18S</i>	18S rRNA gene	F: ACGCAGCGAAATGCGATAAG R: CAAATTGTGCTGCGCTCCAA
<i>PKS</i>	Polyketide synthase	F: TGCTGAGGTAGCAGTCAAGC R: TTATGCTACGGTCGTCGCTC
<i>Omef</i>	O-methyltransferase	F: GAACTACCTGAAGGCACGCT R: GCTCGGAAGGATACTCGCTC
<i>Mono</i>	Salicylate 1-monooxygenase	F: TCTCGGGGAATTATGGCACG R: ACAACCGTTCTCGCATCAGT
<i>FAD</i>	FAD/FMN-containing dehydrogenase	F: TGTGACCGCCATCACCTTAC R: TTGTCGTATGGGTGGGAAGC
<i>MCO</i>	Multicopper oxidase	F: TATGGCGCTACGAGTGGAC R: ACTCCCTGGCCGATAACGTA
<i>ZFTF</i>	Zinc finger transcription factor	F: GAACACCGTCGCAAGATTCG R: TCATTGGCATCGCTTGGAGT
<i>MFS</i>	Major facilitator superfamily	F: TCCCGTAGCCTTGCTTTCTG R: CCGGCTTCTTCTTGACGCTA
<i>SSPK</i>	stage v sporulation protein k	F: ATGAGAAGGAGCGGCGTATG R: GTATGACTTCCACCCGCACA
<i>ISP7</i>	sexual differentiation process protein	F: GCCAGCAGTTCAGGGATACA R: AAGATGGTGATGGCACCGAA
<i>CSN3</i>	cleistothecium development	F: CTAGATACGCCATGCCTCCC R: TACGTCTCGACCCTACCACA
<i>BrlA</i>	transcriptional factor	F: GTCCAGACATTACCCCCAG R: CTTGTTGACATTGGGCTGGC
<i>WetA</i>	transcriptional factor	F: CACCTCGACCTCACACTTCC R: GGATGGCGATGAGACTGGAG
<i>HSP30</i>	30 kDa heat shock protein	F: GTCGTCGCAGCACATCTCAA R: TCCGGCTTCGTTCTTACAGC

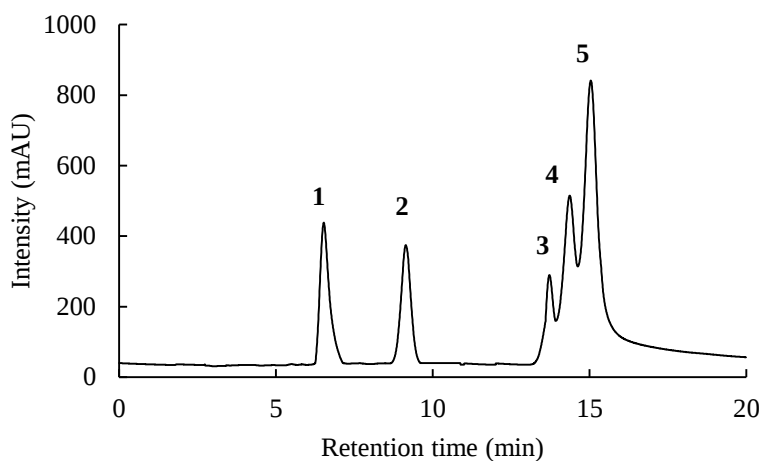


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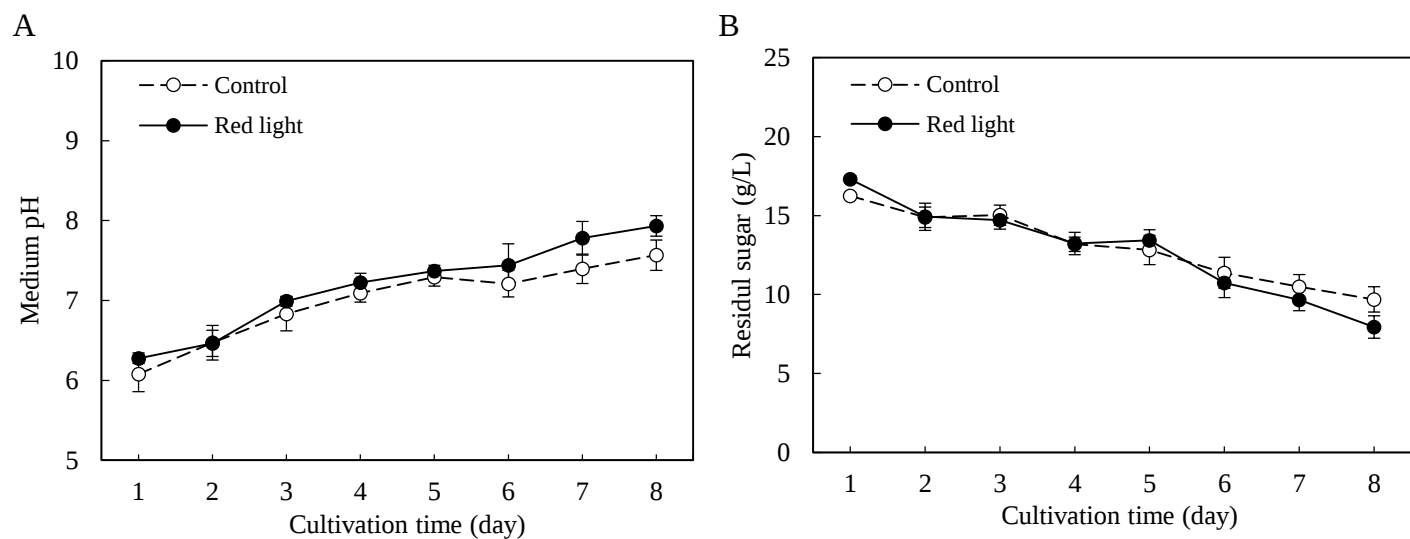


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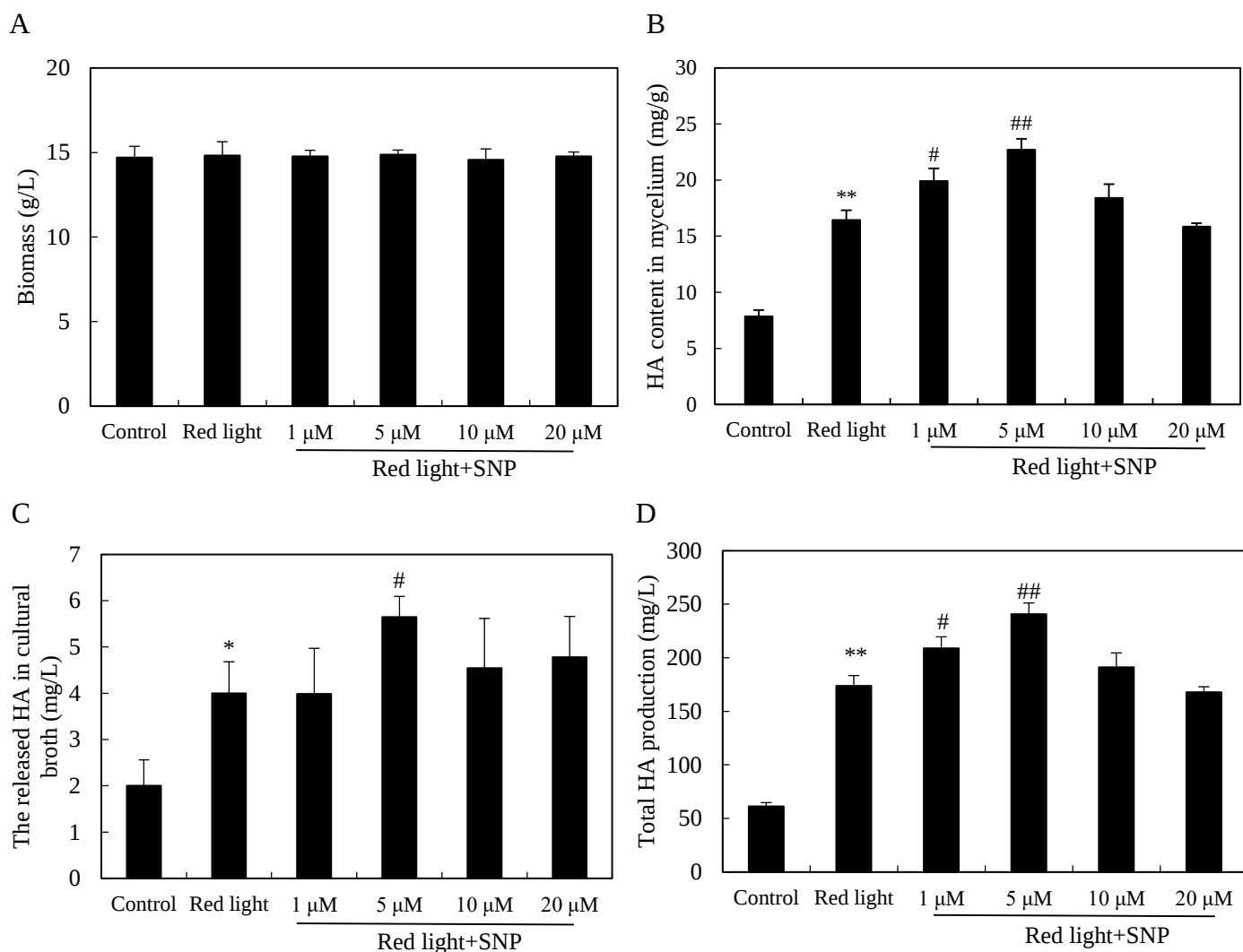


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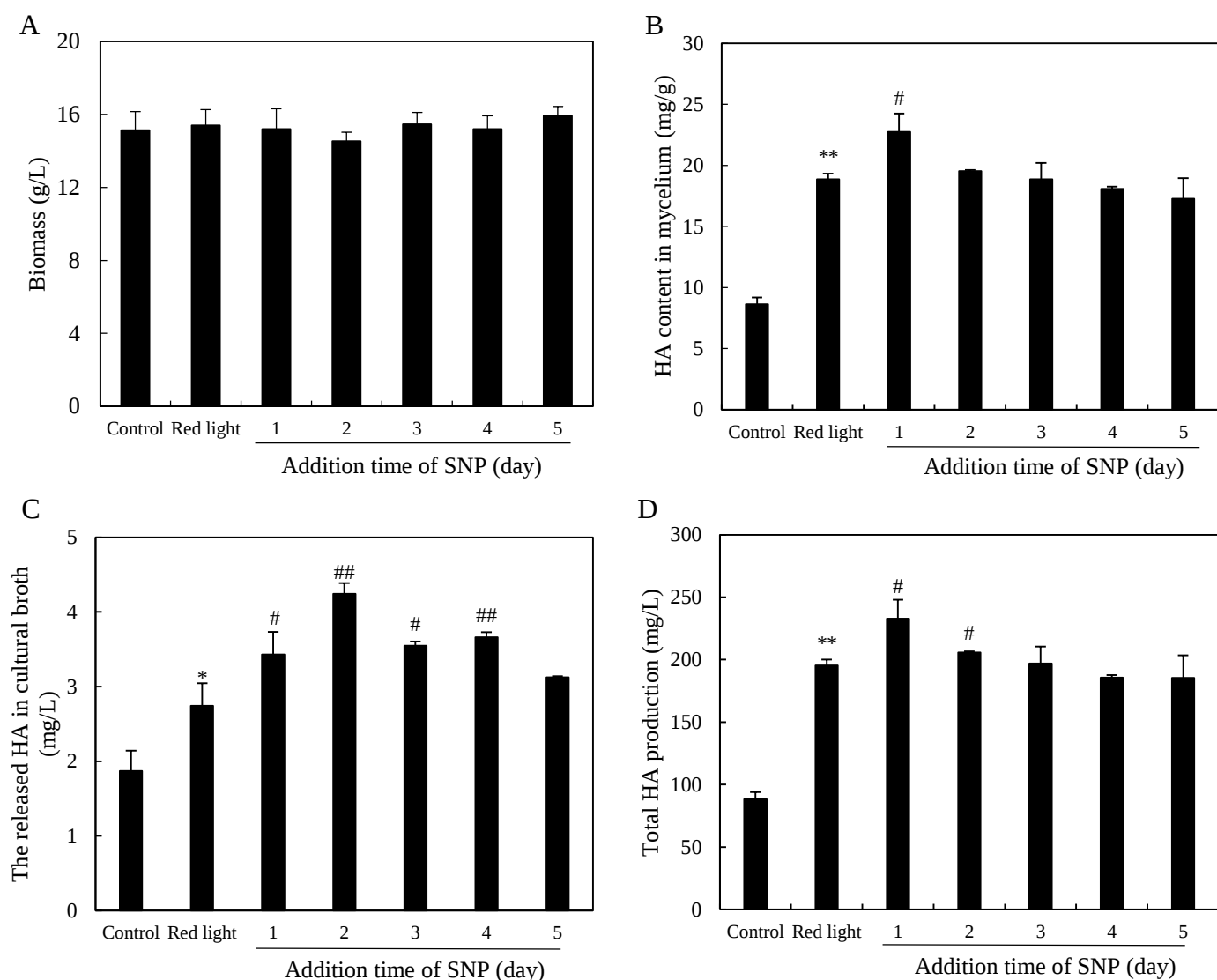


Fig. S4. Effects of addition time of SNP (5 μ M) under red light treatment on HA production of *Shiraia* sp. S9. The fungal dry biomass (A), HA content in mycelium (B), the released HA in cultural broth (C) and total HA production (D) in liquid culture. The culture was maintained in a 150 mL flask containing 50 mL medium at 150 r/min and 28°C under the dark or red light treatment for 8 days. The intensity of red light (627 nm) was 200 lx. SNP (5 μ M) was added on day 1-5 of culture, 30 min prior to the red light treatment. Values are mean $\pm$ SD from three independent experiments (* p < 0.05 and ** p < 0.01 vs. control; # p < 0.05 and ## p < 0.01 vs. red light treatment).