

*Supplementary data for*

**Revealing the Hypoglycemic Effect of Red Yeast Rice: Perspectives  
from the Inhibition of  $\alpha$ -Glucosidase and the Anti-Glycation  
capability by Ankaflavin and Monascin**

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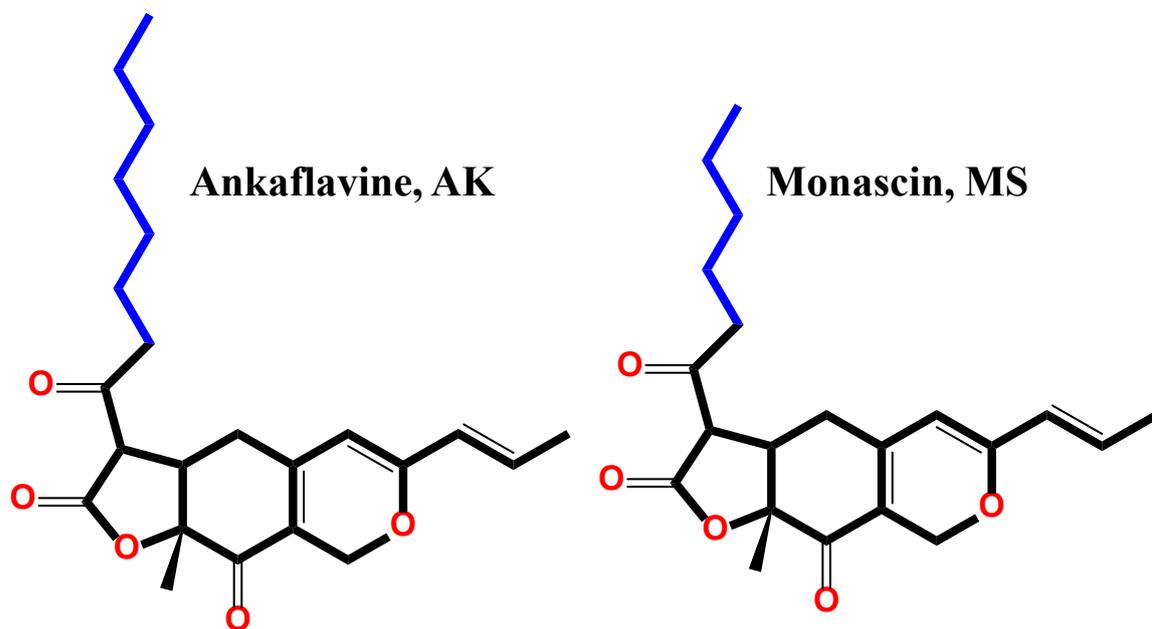
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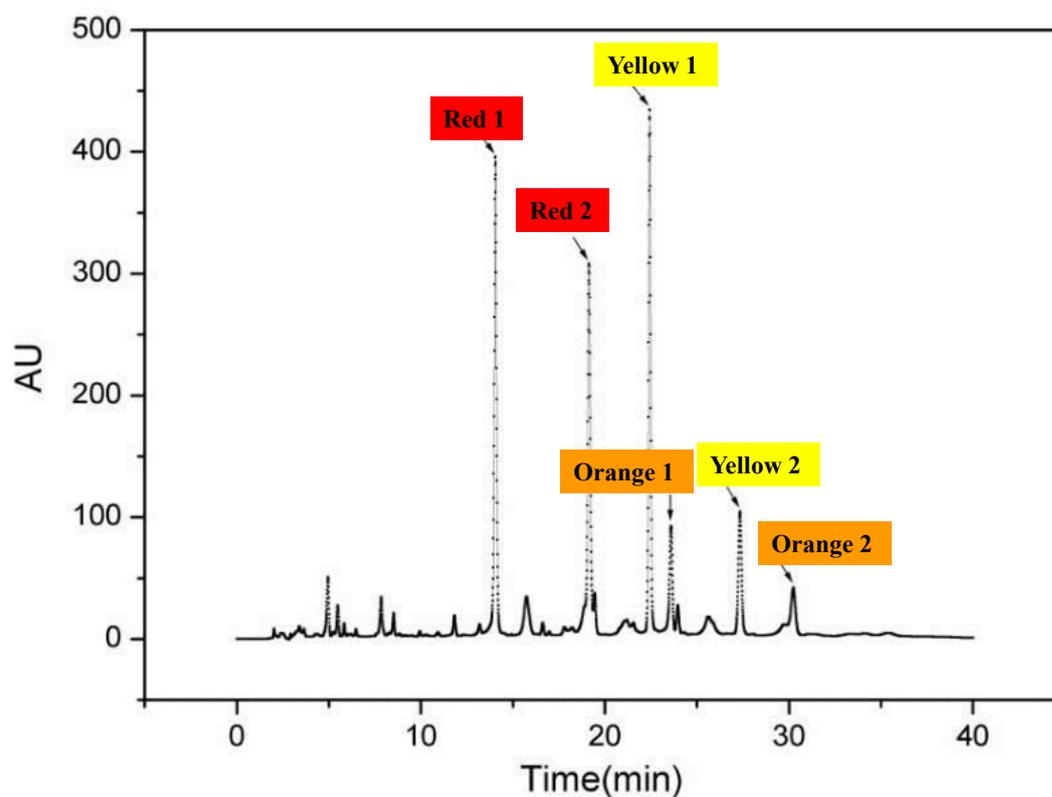
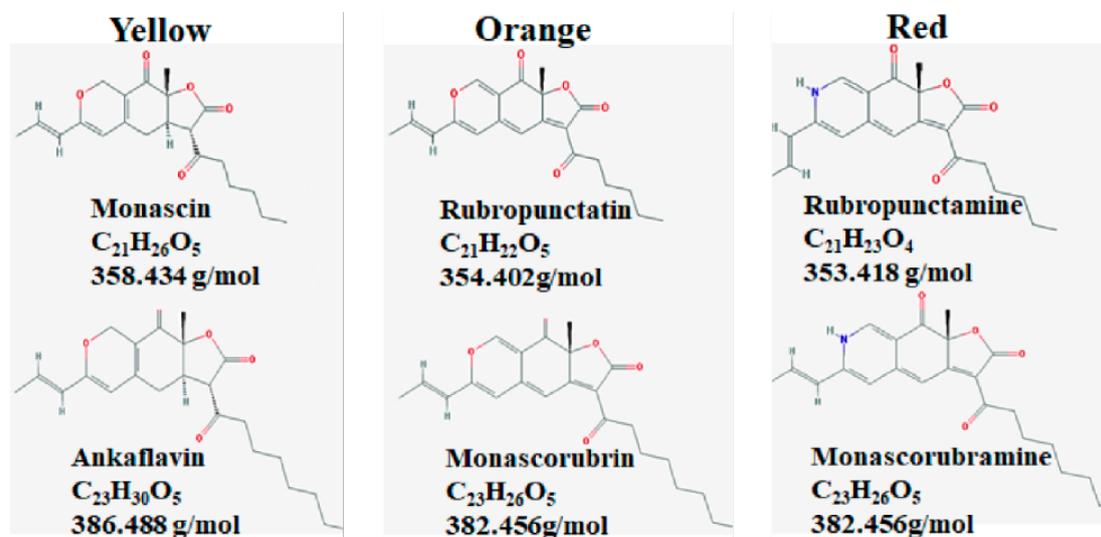
## **Experimental section**

*Monascus*-fermented rice bought from the local market was crushed in a grinder and passed through 80-mesh sieve, and then 10 g of the obtained powder was mixed with 100 mL of ethanol-water solution (v/v, 7/3), followed by ultrasonic extraction for 30 min. After that, the solution was brought to solid-liquid separation by centrifugation (4000 rpm, 20 min), and the supernatant was collected. This operation was repeated three times. The collected supernatant was dried in an oven, and analyzed by reversed-phase high-performance liquid chromatography (RP-HPLC).

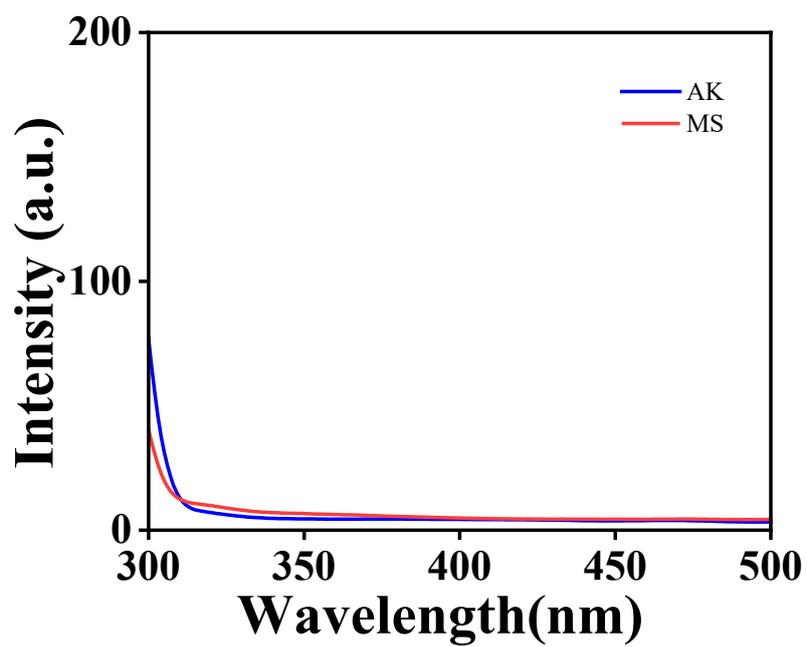
## Figures



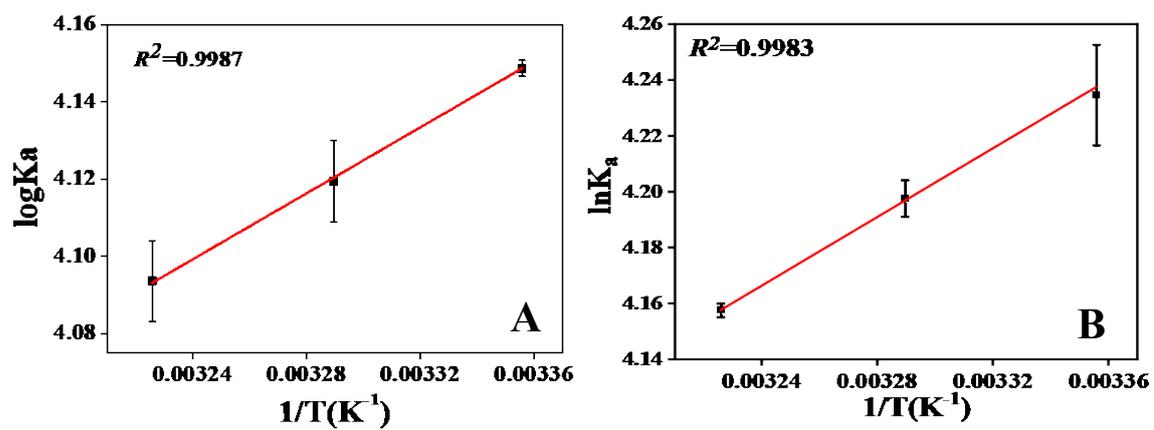
**Figure S1.** The chemical structures of AK and MS.



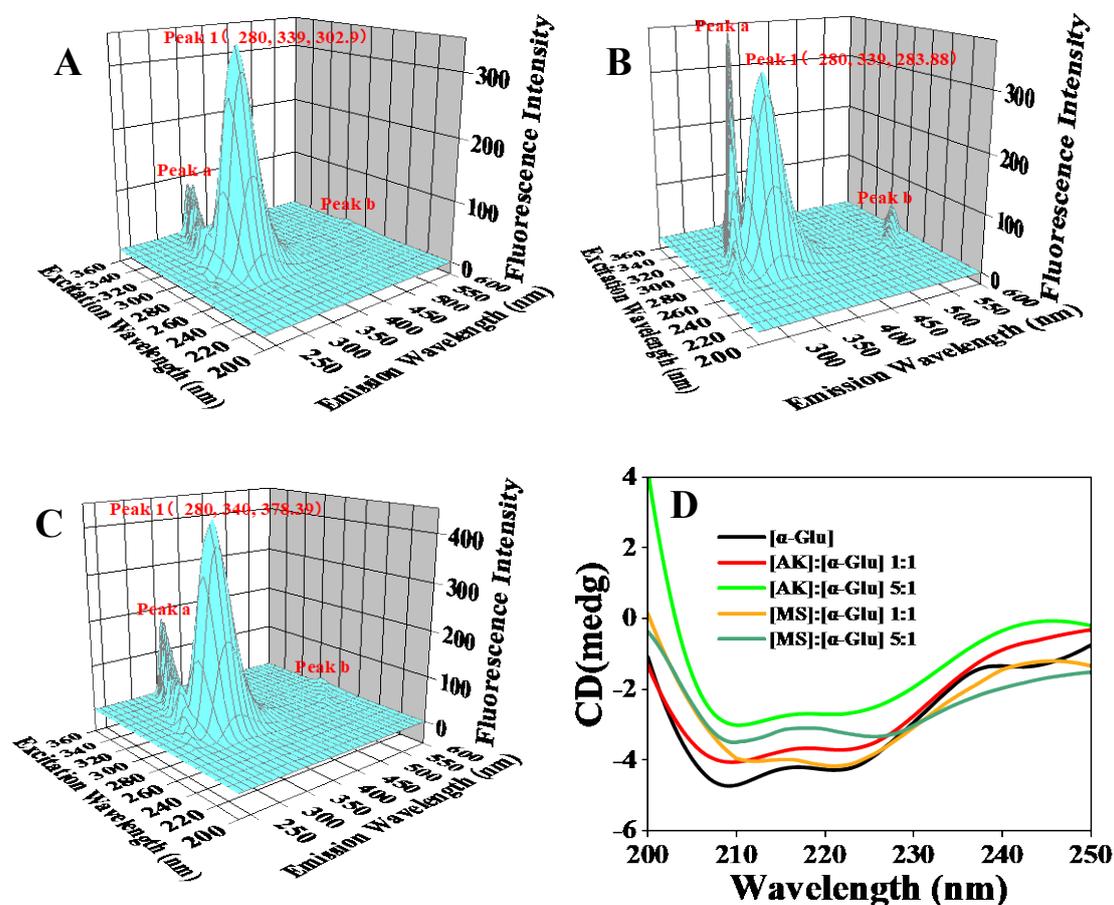
**Figure S2.** The six kinds of *Monascus* pigments and their HPLC profile. Conditions: formic acid (0.1%) in water as eluent A and acetonitrile as eluent B; a gradient elution procedure: 60% B, 0-12 min; 60-90% B, 12-25 min; 90% B, 25-27 min; and 90-60% B, 27-30 min; detection at 410 nm under a flow rate of 1 mL/min with an injection volume of 20  $\mu$ L.



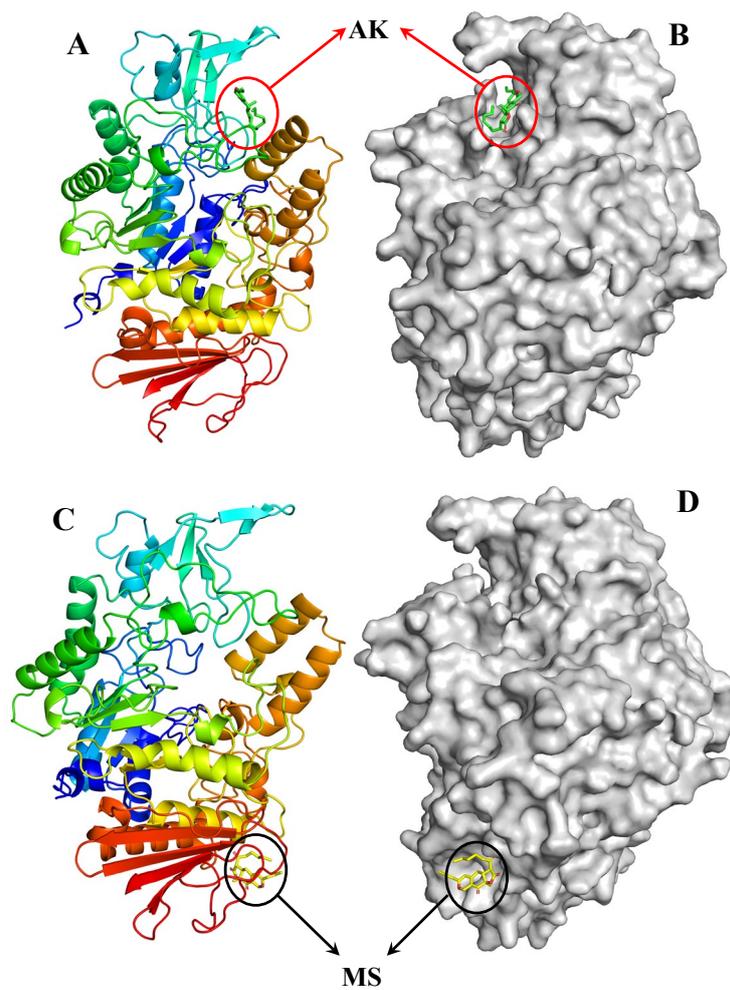
**Figure S3.** The fluorescence spectra of AK and MS at 298 K,  $\lambda_{\text{ex}} = 280$  nm.



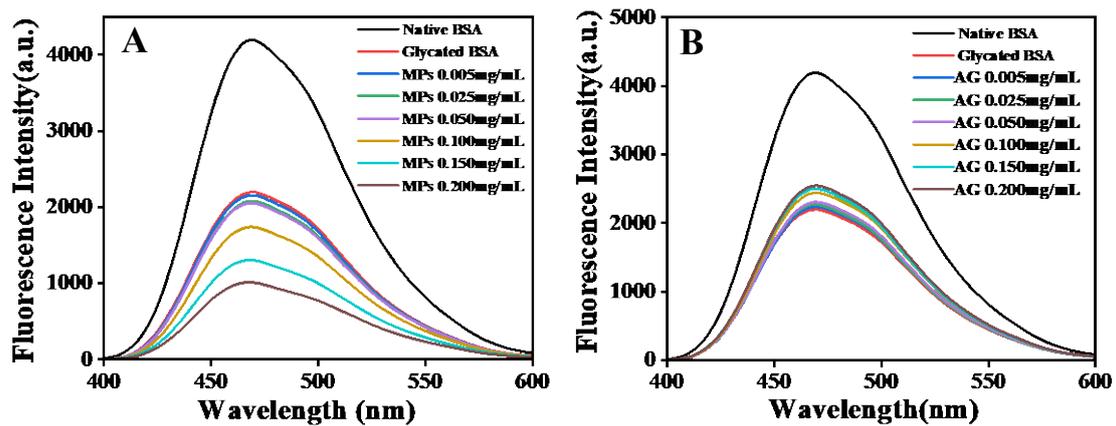
**Figure S4.** The van't Hoff plots for the binding of AK (A) and MS (B) to  $\alpha$ -Glu, respectively.



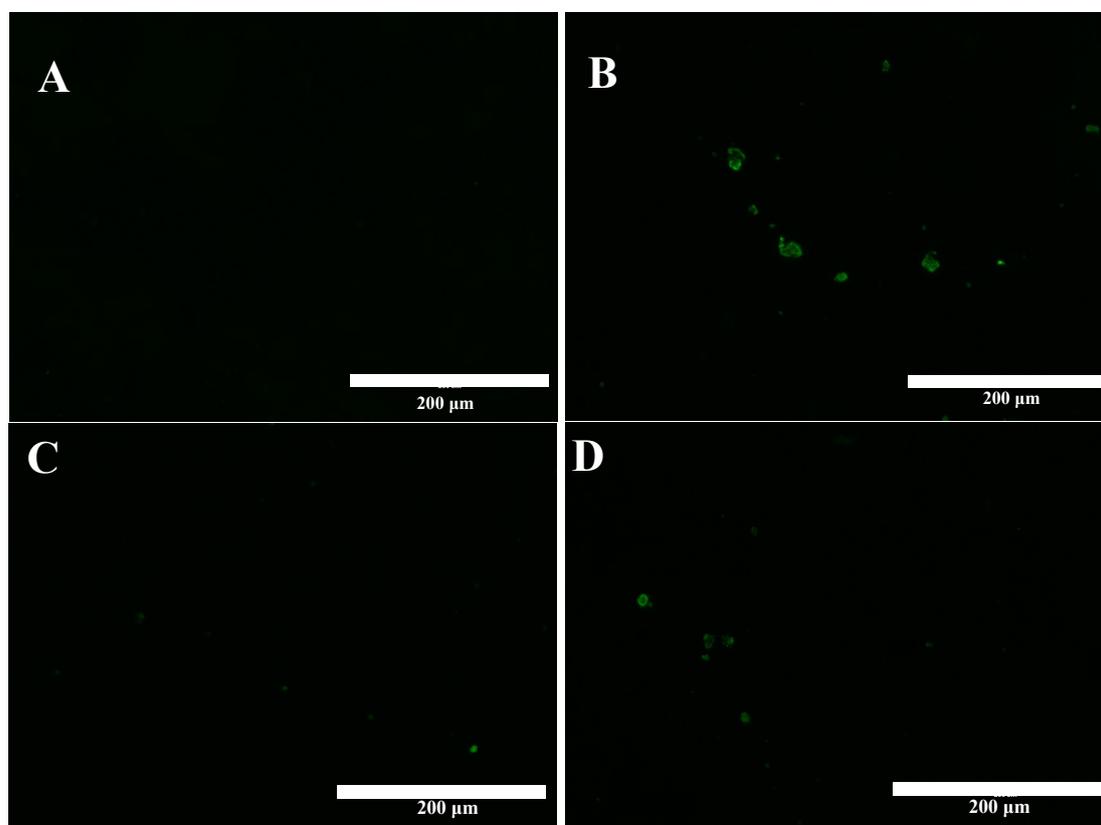
**Figure S5.** Three-dimensional fluorescence spectra of  $\alpha$ -Glu alone (A), AK- $\alpha$ -Glu system (B), and MS- $\alpha$ -Glu system (C). Conditions:  $C_{\alpha\text{-Glu}} = 2.0 \mu\text{M}$ ,  $C_{\text{AK}} = 13.0 \mu\text{M}$ , and  $C_{\text{MS}} = 13.0 \mu\text{M}$ ,  $\text{pH} = 6.8$ ,  $T = 298 \text{ K}$ . Far-UV CD spectra of AK- $\alpha$ -Glu system and MS- $\alpha$ -Glu system (D). Conditions:  $C_{\alpha\text{-Glu}} = 2.0 \mu\text{M}$ ,  $C_{\text{AK}} = 2.0$  and  $10.0 \mu\text{M}$ , respectively, and  $C_{\text{MS}} = 2.0$  and  $10.0 \mu\text{M}$ , respectively.



**Figure S6.** Molecular docking results of AK- $\alpha$ -Glu system (A and B) and MS- $\alpha$ -Glu system (C and D) in the absence of substrate (*p*NPG).



**Figure S7.** The 8-anilino-1-naphthalenesulfonic acid (ANS) fluorescence spectroscopy of native bovine serum albumin (BSA), glycated BSA, *Monascus* pigments (MPs)-treated glycated BSA (A), and aminoguanidine (AG)-treated glycated BSA (B).



**Figure S8.** Fluorescent inverted microscope images of native BSA (A), glycated BSA (B), glycated BSA treated with 0.050 mg/mL MPs (C), and glycated BSA treated with 0.050 mg/mL AG (D).

## Tables

**Table S1.** The contents of the secondary structures of  $\alpha$ -Glu in the absence and presence of AK/MS.

Systems	Molar ratio	$\alpha$ -Helix (%)	$\beta$ -sheet (%)	$\beta$ -turn (%)	Random coil (%)
	[AK/MS]:[ $\alpha$ -Glu]				
$\alpha$ -Glu	0:1	31.7	17.9	17.3	31.8
AK- $\alpha$ -Glu	1:1	28.0	20.3	18.0	34.7
	5:1	26.9	21.7	18.0	39.0
MS- $\alpha$ -Glu	1:1	29.0	19.7	17.5	35.9
	5:1	24.7	23.0	18.5	39.3

**Table S2.** The contents of the secondary structures of native BSA, glycated BSA, MPs-treated and AG-treated glycated BSA.

	Native BSA	Glycated BSA	MPs-treated BSA	AG-treated BSA
$\alpha$ -Helix (%)	67.6	47.8	60.1	58.3
$\beta$ -Sheet (%)	4.9	9.9	6.3	6.7
$\beta$ -Turn (%)	11.6	14.4	12.6	12.8
Random coil (%)	13.8	22.9	15.9	19.7