

Supplementary Figure S1 Tolerance test of different species of *Monascus* to different growth inhibitors. The tolerance of six *Monascus* species in restrictive media containing different concentrations of pH (A), lactic acid (B) and ethanol (C) was analyzed by determination of biomass increment by glucosamine assay. Error bars indicate the standard deviation (SD) of the means (n=3), and different lowercase letters represent significant differences in biomass of different *Monascus* species under the same treatment conditions (p < 0.05).



Supplementary Figrue S2 Relationship between lactic acid concentration and pH in initial rice milk medium.



M.purpureus BHQ33.M01

Supplementary Figrue S3 Hongqu BHQ33 powder was added to optimized restrictive media with 3.98% (v/v) lactic acid and 6.24%(v/v) ethanol for 7d at 30°C, 200 r/min and spread on PDA plates to obtain *Monascus*.



Supplementary Figure S4 Effect of lactic acid and ethanol on morphology after reactivation of *Monascus*. The spore suspension of *Monascus* A1, A4, B1, B6, B7, C1 were inoculated into the selective medium containing 3.98% (v/v) lactic acid and 6.24% (v/v) ethanol for 7d at 30 °C and 200 r/min. The fermentation broth of the selective medium was used as the treatment group, and the spore suspension harvested from the PDA plate was used as the control group. Each group contained 6 *Monascus* species. The two groups of *Monascus* have activated to PDA plates again and then spotted on the modified PDA for 7d at 30°C to observe the colony morphology.



Supplementary Figure S5 High throughput sequencing of fungi of Hongqu BHQ33. *Monascus purpureus* accounted for 100% of *Monascus*. Other fungi not listed include *Candida maltosa, Candida tropicalis, Mortierella kuhlmanii, Cyberlindnera fabianii, Meyerozyma caribbica, Mortierella humilis, Mortierella kuhlmanii, Talaromyces radicus* and unclassified.

Test indicators	M. serorubescens A1		Druchuc	M. lunisporas A4		D value	M. sanguineus B1		Dualua
	Control	Experience	P value	Control	Experience	P value	Control	Experience	P value
Biomass (mg/mL)	21.86±0.98	22.45±1.32	0.567	9.30±0.75	10.11 ± 1.18	0.374	37.28±1.13	36.79±1.30	0.646
Liquefying enzyme (10 ³ U/g)	2.36 ± 0.30	2.34±0.13	0.915	6.99 ± 0.61	6.67±0.71	0.587	1.13 ± 0.05	1.14 ± 0.04	0.973
Saccharifying enzyme (10 ³ U/g)	2.25±0.31	2.23±0.23	0.957	4.23 ± 0.58	4.21±0.67	0.974	1.02 ± 0.33	1.06 ± 0.14	0.846
Pigment (U/mL)	44.08 ± 2.69	42.63±3.04	0.567	$38.00{\pm}1.31$	39.39±3.13	0.545	109.50 ± 2.29	$108.50 {\pm} 2.05$	0.603
γ - aminobutyric acid (µg/mL)	91.01±10.99	83.16±10.29	0.418	82.55±12.61	81.79±17.32	0.954	31.75±1.85	31.66±0.98	0.947
Lovastatin (µg/mL)	8.81 ± 0.14	8.83±0.25	0.874	4.40 ± 0.42	4.02 ± 1.16	0.619	14.20±0.66	14.27 ± 0.65	0.906
Citrinin (µg/mL)	5.29 ± 0.68	4.92±0.55	0.506	0	0	-	8.87 ± 0.79	8.15±0.25	0.208
							M. purpureus C1		
Tastindiastan	M. kaol	iang B6	Dualua	M. argent	inensis B7	Draha	M. purp	ureus C1	Drughua
Test indicators	<i>M. kaol</i> Control	iang B6 Experience	P value	<i>M. argent</i> Control	inensis B7 Experience	P value	<i>M. purp</i> Control	<i>ureus</i> C1 Experience	P value
Test indicators Biomass (mg/mL)	<i>M. kaol</i> Control 24.03±1.82	iang B6 Experience 23.08±1.10	P value 0.486	M. argent Control 20.36±0.45	inensis B7 Experience 20.24±0.97	P value 0.859	<i>M. purpt</i> Control 27.58±1.46	ureus C1 Experience 26.90±0.40	P value 0.479
Test indicators Biomass (mg/mL) Liquefying enzyme (10 ³ U/g)	M. kaol Control 24.03±1.82 2.10±0.22	iang B6 Experience 23.08±1.10 2.17±0.23	P value 0.486 0.730	M. argent Control 20.36±0.45 2.19±0.19	inensis B7 Experience 20.24±0.97 2.20±0.16	P value 0.859 0.922	M. purp Control 27.58±1.46 1.93±0.16	ureus C1 Experience 26.90±0.40 1.97±0.16	P value 0.479 0.793
Test indicators Biomass (mg/mL) Liquefying enzyme (10 ³ U/g) Saccharifying enzyme (10 ³ U/g)	<i>M. kaol</i> Control 24.03±1.82 2.10±0.22 1.65±0.15	iang B6 Experience 23.08±1.10 2.17±0.23 1.69±0.06	P value 0.486 0.730 0.722	M. argent Control 20.36±0.45 2.19±0.19 1.31±0.17	inensis B7 Experience 20.24±0.97 2.20±0.16 1.30±0.13	P value 0.859 0.922 0.937	<i>M. purp.</i> Control 27.58±1.46 1.93±0.16 1.57±0.17	ureus C1 Experience 26.90±0.40 1.97±0.16 1.59±0.22	P value 0.479 0.793 0.917
Test indicators Biomass (mg/mL) Liquefying enzyme (10 ³ U/g) Saccharifying enzyme (10 ³ U/g) Pigment (U/mL)	M. kaol Control 24.03±1.82 2.10±0.22 1.65±0.15 53.21±2.52	iang B6 Experience 23.08±1.10 2.17±0.23 1.69±0.06 54.04±2.40	P value 0.486 0.730 0.722 0.700	M. argent Control 20.36±0.45 2.19±0.19 1.31±0.17 23.23±1.30	inensis B7 Experience 20.24±0.97 2.20±0.16 1.30±0.13 23.48±1.19	P value 0.859 0.922 0.937 0.818	M. purp Control 27.58±1.46 1.93±0.16 1.57±0.17 33.97±1.27	ureus C1 Experience 26.90±0.40 1.97±0.16 1.59±0.22 33.32±1.44	P value 0.479 0.793 0.917 0.588
Test indicators Biomass (mg/mL) Liquefying enzyme (10 ³ U/g) Saccharifying enzyme (10 ³ U/g) Pigment (U/mL) γ - aminobutyric acid (µg/mL)	M. kaol Control 24.03±1.82 2.10±0.22 1.65±0.15 53.21±2.52 109.48±15.17	iang B6 Experience 23.08±1.10 2.17±0.23 1.69±0.06 54.04±2.40 107.93±12.32	P value 0.486 0.730 0.722 0.700 0.897	M. argent Control 20.36±0.45 2.19±0.19 1.31±0.17 23.23±1.30 104.45±3.73	inensis B7 Experience 20.24±0.97 2.20±0.16 1.30±0.13 23.48±1.19 104.17±3.99	P value 0.859 0.922 0.937 0.818 0.933	M. purp Control 27.58±1.46 1.93±0.16 1.57±0.17 33.97±1.27 111.56±4.75	ureus C1 Experience 26.90±0.40 1.97±0.16 1.59±0.22 33.32±1.44 113.78±2.90	P value 0.479 0.793 0.917 0.588 0.528
Test indicators Biomass (mg/mL) Liquefying enzyme (10 ³ U/g) Saccharifying enzyme (10 ³ U/g) Pigment (U/mL) γ - aminobutyric acid (µg/mL) Lovastatin (µg/mL)	<i>M. kaol</i> Control 24.03±1.82 2.10±0.22 1.65±0.15 53.21±2.52 109.48±15.17 6.63±0.72	iang B6 Experience 23.08±1.10 2.17±0.23 1.69±0.06 54.04±2.40 107.93±12.32 6.63±0.31	P value 0.486 0.730 0.722 0.700 0.897 0.991	M. argent Control 20.36±0.45 2.19±0.19 1.31±0.17 23.23±1.30 104.45±3.73 2.32±0.33	inensis B7 Experience 20.24±0.97 2.20±0.16 1.30±0.13 23.48±1.19 104.17±3.99 2.33±0.67	P value 0.859 0.922 0.937 0.818 0.933 0.990	M. purp Control 27.58±1.46 1.93±0.16 1.57±0.17 33.97±1.27 111.56±4.75 2.95±0.51	ureus C1 Experience 26.90±0.40 1.97±0.16 1.59±0.22 33.32±1.44 113.78±2.90 2.89±0.52	P value 0.479 0.793 0.917 0.588 0.528 0.900

Supplementary Table S1 Effect of lactic acid and ethanol on metabolism after reactivation of Monascus

Notes: Metabolites were detected by shake flask fermentation with the modified potato dextrose water after reactivation of six *Monascus* species with PDA plate after different treatments. The experience group differed from the control group in whether they were treated with the selective medium containing 3.98% (v/v) lactic acid and 6.24% (v/v) ethanol.