

Hypoglycemic effects of *Rhodiola crenulata* (HK. f. et.Thoms) H. Ohba in vitro and in vivo and its ingredients identification by UPLC-Triple-TOF/MS

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Table S1. HPLC identification and quantification of phenolics in the root of RC, RCS and RCRS

compounds	formula	R ²	content (mg/g)		
			RC	RCS	RCRS
gallic acid	$y = 3165.5x + 7.7118$	0.9999	7.65 ± 0.45	24.27 ± 1.36	0.28 ± 0.01
salidroside	$y = 205.44x + 0.7704$	1	5.55 ± 0.53	-	8.33 ± 1.32
coumaric acid	$y = 7894.2x + 45.334$	0.9999	1.54 ± 0.13	-	2.18 ± 0.08
kaempferol 3- <i>O</i> -rhamnoside	$y = 2272.7x + 51.662$	1	1.38 ± 0.07	-	2.35 ± 0.91
rhodionin	$y = 2018.3x + 17.212$	1	12.90 ± 1.23	-	19.60 ± 2.83
kaempferol	$y = 3640.9x + 5.6232$	1	3.28 ± 0.03	-	5.00 ± 0.49
crenulatin	$y = 3307.7x + 6.17$	0.9999	0.12 ± 0.01	-	0.34 ± 0.03
rhodiolin	$y = 3687x + 104$	1	1.73 ± 0.09	-	3.13 ± 0.15
Total flavonoids (mg QEs/g)	$y = 0.0473x + 0.0168$	0.9994	51.74 ± 15.73	13.85 ± 2.40	70.46 ± 15.23
Total phenolics (mg GAEs/g)	$y = 92.8x + 0.0686$	0.9997	192.09 ± 33.88	67.08 ± 4.17	340.72 ± 5.81

Table S2. Correlations among phenolic compounds and assays

	gallic acid	salidroside	coumaric acid	kaempferol 3-O-rhamnoside	rhodionin	kaempferol	crenulatin	rhodiolin	Total flavonoids	Total phenolics	amylase	sucrase	maltase
gallic acid		-0.999	-0.999	-0.992	-0.999	-0.999	-0.925	-0.987	-0.999	-0.964	-0.989	-0.718	0.450
salidroside	-0.999		0.999	0.996	0.999	0.999	0.936	0.991	0.998	0.971	0.984	0.739	-0.424
coumaric acid	-0.999	0.999		0.991	0.998	0.998	0.920	0.985	0.999	0.960	0.991	0.708	-0.464
kaempferol 3-O-rhamnoside	-0.992	0.996	0.991		0.996	0.996	0.964	0.999	0.990	0.988	0.964	0.796	-0.342
rhodiogin	-0.999	0.999	0.998	0.996		0.999	0.939	0.992	0.998	0.973	0.982	0.745	-0.416
kaempferol	-0.999	0.999	0.998	0.996	0.999		0.940	0.993	0.998	0.974	0.982	0.746	-0.414
rhodiolin	-0.925	0.936	0.920	0.964	0.939	0.940		0.973	0.917	0.992	0.859	0.928	-0.080
crenulatin	-0.987	0.991	0.985	0.999	0.992	0.993	0.973		0.984	0.993	0.953	0.819	-0.304
Total flavonoids	-0.999	0.998	0.999	0.990	0.998	0.998	0.917	0.984		0.958	0.991	0.704	-0.469
Total phenolics	-0.964	0.971	0.960	0.988	0.973	0.974	0.992	0.993	0.958		0.914	0.877	-0.197
amylase	-0.989	0.984	0.991	0.964	0.982	0.982	0.859	0.953	0.991	0.914		0.608	-0.577
sucrase	-0.718	0.739	0.708	0.796	0.745	0.746	0.928	0.819	0.704	0.877	0.608		0.296
maltase	0.450	-0.424	-0.464	-0.342	-0.416	-0.414	-0.080	-0.304	-0.469	-0.197	-0.577	0.296	

A strong correlations were observed between α -amylase inhibitory activity. (α -amylase to TPC: $r = 0.914$; α -amylase to TFC: $r = 0.991$; α -amylase to salidroside: $r = 0.984$; α -amylase to coumaric acid: $r = 0.991$; α -amylase to kaempferol 3-O-rhamnoside: $r = 0.964$; α -amylase to rhodiogin: $r = 0.982$; α -amylase to kaempferol: $r = 0.982$; α -amylase to rhodiolin: $r = 0.953$) and some ingredients. Sucrase inhibitory activity is correlated with crenulatin ($r = 0.928$), rhodiolin ($r = 0.819$), and TPC ($r = 0.877$). A weak correlations between maltase inhibitory effect and gallic acid ($r = 0.450$). These results demonstrated that the phenolic ingredients from RCRS extract might contribute to the α -amylase and α -glucosidase (sucrase and maltase) inhibitory activity.

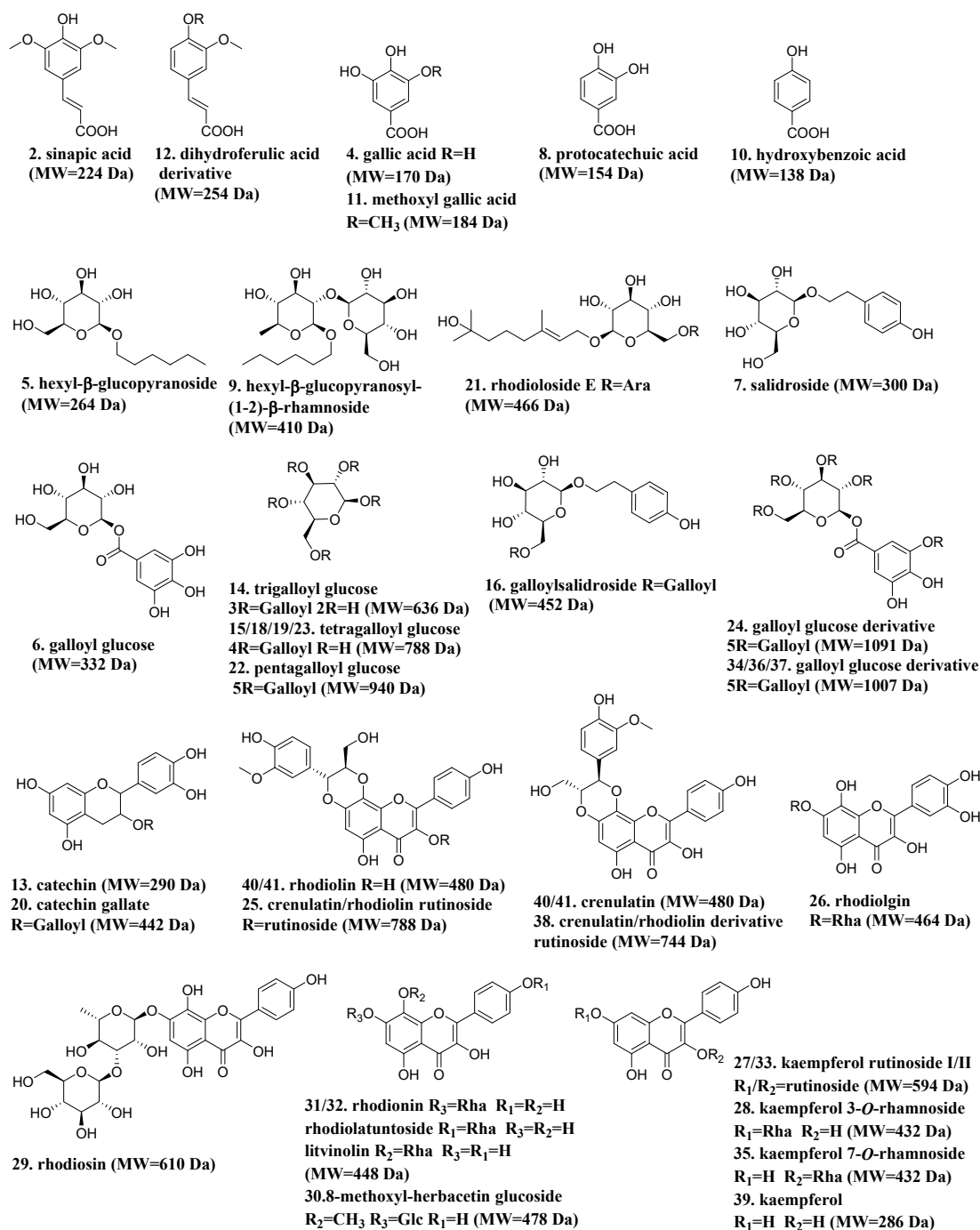


Fig. S1 Chemical structural of bioactive constituents of RCRS extract