

Purple tea: chemical characterization, and evaluation as inhibitor of pancreatic lipase and fat digestion in mice

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Electronic supplementary information (ESI)

Table 1S. Antioxidant activities of green tea and purple tea

Antioxidant evaluation	Green tea	Purple tea
Chemical-based antioxidant activities		
DPPH (IC ₅₀ µg/mL)	10.5± 0.5 ^(a)	9.1± 0.4 ^(a)
FRAP (µmol of Trolox equivalent/mg extract)	3822± 167 ^(a)	4178± 525 ^(a)
ORAC (µmol of Trolox equivalent/mg extract)	3661 ± 1559 ^(a)	5547 ± 428 ^(b)
Cell-based antioxidant activities		
TBARS (IC ₅₀ , ng/mL)	16.00±0.001 ^(a)	18.00±0.001 ^(b)
OxHLIA (IC ₅₀ , µg/mL, Δt=60 min)	13±1 ^(a)	12.7±0.4 ^(b)

Different letters overwritten to the averages of the same line indicate a significant difference at the level of 5%. DPPH IC₅₀ Trolox= 110±12 µg/mL; OxHLIA, Δt=60 min IC₅₀ Trolox =21.80±0.20 µg/mL; TBARS IC₅₀, Trolox= 5.8 ± 0.6 µg/mL.

Table 2S. Cytotoxic and anti-inflammatory activities of green tea and purple tea

Bioactivities	Tea extracts		Positive control
Cytotoxic activity (GI₅₀, µg/mL)	Green	Purple	ellipticine
NCI H460 (non-small cell lung carcinoma)	59±4 ^(a)	58±3 ^(a)	1.03±0.09
HepG2 (cervical carcinoma)	20±2 ^(a)	21±2 ^(a)	1.1±0.2
MCF7 (hepatocellular carcinoma)	68 ±5 ^(a)	74±3 ^(b)	1.1±0.2
HeLa (breast carcinoma)	64±3 ^(a)	71±4 ^(b)	1.91±0.06
PLP2 (porcine liver primary cells)	120±8 ^(a)	121±3 ^(a)	3.2±0.7

Anti-inflammatory activity (IC₅₀, µg/mL)	Green	Purple	Dexamethasone
RAW264.7	82±4 ^(a)	76±5 ^(a)	6±1

Different letters overwritten to the averages of the same line indicate a significant difference at the level of 5%.

Data sets

1) Data set used to construct the graph of panel A in Figure 2: concentration dependences (C , given as μmL) of the actions of purple and green tea extracts on the activity of the pancreatic lipase (v), expressed as fraction of the control (no extract added).

C	Purple tea without preincubation				Purple tea after preincubation			
50	0.90	0.90	0.95	0.90	0.79	0.81	0.79	0.769
100	0.95	0.95	0.90	0.90	0.468	0.467	0.424	0.464
150	0.70	0.71	0.70	0.749	0.308	0.32	0.381	0.38
200	0.551	0.561	0.551	0.561	0.247	0.211	0.214	0.233
250	0.362	0.463	0.424	0.41	0.215	0.216	0.114	0.121
300	0.347	0.375	0.335	0.337	0.056	0.8	0.06	0.115
400	0.197	0.22	0.138	0.221	0.02	0.05	0.04	0.07

C	Green tea without preincubation				Green tea after preincubation			
50	1.00	1.00	0.97	0.99	0.95	0.97	0.92	0.95
100	0.95	0.90	1.00	0.90	0.95	0.90	0.90	0.95
150	0.92	0.92	0.95	0.90	0.90	0.93	0.91	0.92
200	0.92	0.90	0.87	0.87	0.86	0.88	0.86	0.90
250	0.90	0.95	0.85	0.91	0.76	0.78	0.76	0.81
300	0.83	0.83	0.81	0.85	0.70	0.72	0.72	0.70
400	0.80	0.76	0.81	0.77	0.60	0.58	0.61	0.54

2) Data set of the kinetics of the inhibition of the pancreatic lipase by the purple tea extract (Figure 2, panel B). v = reaction rate ($\mu\text{mol}/\text{min}$); S = substrate concentration (p-nitrophenyl-palmitate; μM)

S (μM)	No addition		Purple tea extract (50 μg/mL)		Purple tea extract (200 μg/mL)	
	20	0.400	0.379	0.289	0.290	0.008
40	0.672	0.665	0.526	0.550	0.034	0.063
60	0.827	0.897	0.701	0.720	0.097	0.093
80	0.951	0.980	0.762	0.781	0.202	0.200
100	1.011	1.028	0.716	0.725	0.267	0.240
160	1.019	1.042	0.887	0.874	0.400	0.410
200	1.011	1.017	0.831	0.901	0.414	0.412
300	1.060	1.016	0.921	0.863	0.391	0.366

3) Data set of the time course of plasma triglycerate concentrations after an olive oil load under various conditions (triglyceride tolerance tests; Figure 3).

3a) Actions of the purple tea extract and orlistat (mean value at time zero: 186.5 ± 15.7 mg/dL)

Time (min)	Control			After orlistat administration (50 mg/kg)		
	90	490	267	385	203	244
180	521	494	577	191	132	200
270	481	563	337	146	130	156
360	357	375	173	270	236	124

Time (min)	After purple tea extract administration (100 mg/kg)			After purple tea extract administration (250 mg/kg)		
	90	297	332	404	241	263
180	455	470	417	288	291	284
270	412	431	387	297	216	222
360	207	250	241	209	149	187
Time (min)	After purple tea extract administration (100 mg/kg)					
	90	182	193	233		
	180	131	173	204		
	270	122	167	172		
	360	121	153	162		

3b) Actions of the green tea extract and orlistat (mean value at time zero: 176.6 ± 24.5 mg/dL)

Time (min)	After green tea extract administration (100 mg/kg)		
90	447	556	451
180	567	456	363
270	239	412	393
360	221	341	283