

# **Systematical Ingredient Investigations of *Ficus tikoua* Bur. Fruit and**

## **Immunoregulatory and Antioxidant Effects of Different Fractions**

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## Abbreviations

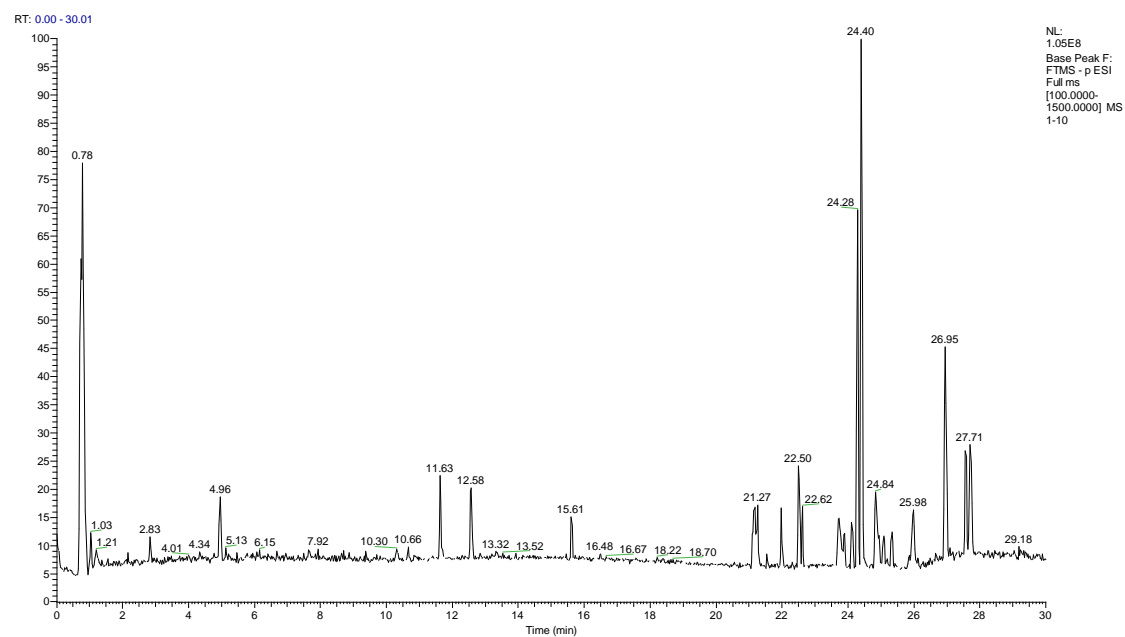
ABTS	2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid)
Ara	arabinose
BCA	bicinchoninic acid
BSA	bovine serum albumin
DPPH	2,2-diphenyl-1-picrylhydrazyl radical
ECL	enhanced chemiluminescence
ELISA	enzyme linked immunosorbent assay
FBS	fetal bovine serum
FRAP	ferric reducing antioxidant power
Gal	galactose
GalA	galacturonic acid
GC-MS	gas chromatography-mass spectrometry
Glc	glucose
GlcA	glucuronic acid
HPLC	high performance liquid chromatography
HRP	horseradish peroxidase
IC <sub>50</sub>	half maximal inhibitory concentration
LC-MS	liquid chromatography-mass spectrometry
LPS	lipopolysaccharide
Man	mannose
MTT	3,4,5-dimethylthiazol-2-yl-2,5-diphenyltetrazolium bromide

NMR	nuclear magnetic resonance
NO	nitric oxide
PGE <sub>2</sub>	prostaglandin E2
PMP	1-phenyl-3-methyl-5-pyrazolone
PVDF	poly vinylidene fluoride
Rha	rhamnose
SDS	sodium dodecyl sulfate
TFA	trifluoroacetic acid
TFC	total flavonoids content
TPC	total polyphenols content
TPTZ	tri-2-pyridyl-s-triazine
UV	ultraviolet
Xyl	xylose

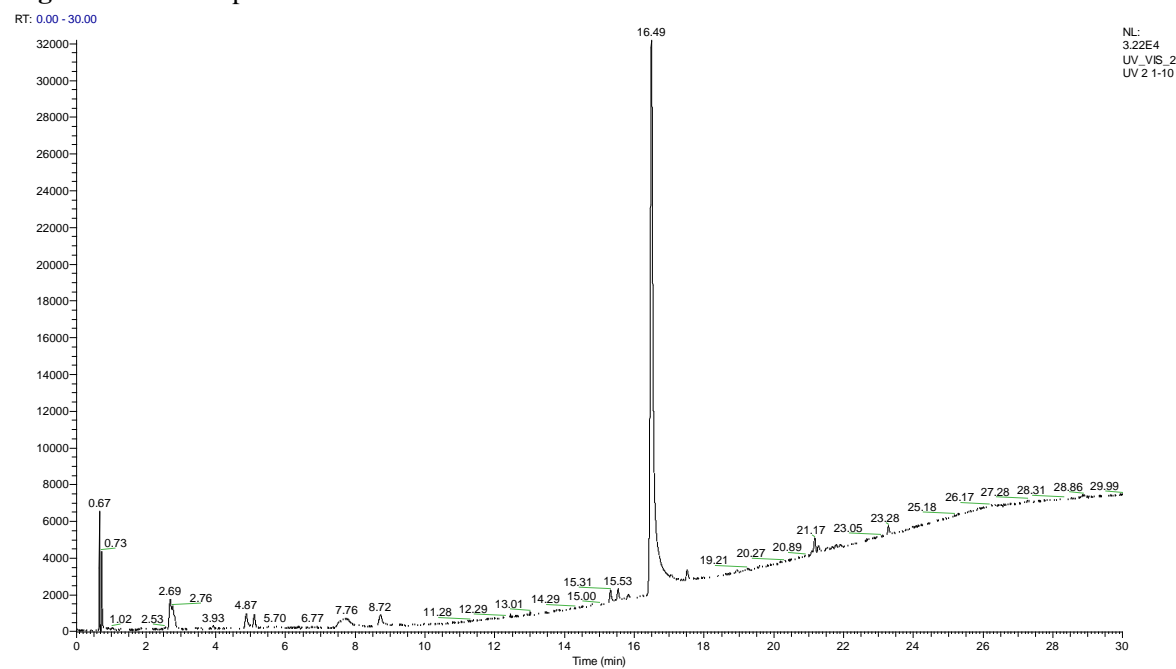
**Figure S1.** The picture of *Ficus tikoua* fruit.



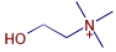
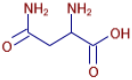
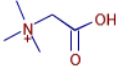

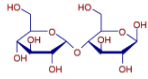
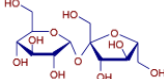
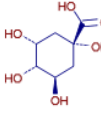

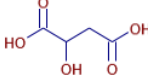
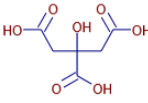
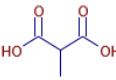
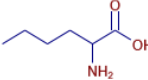
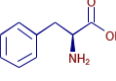


**Figure S2.** TIC LC-MS spectrum of the methanol extract of *F. tikoua* fruit.

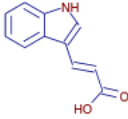
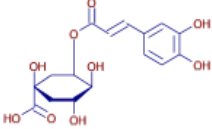
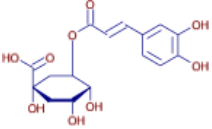
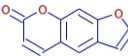
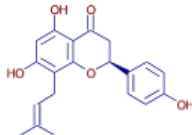
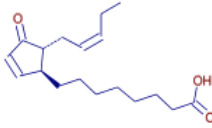
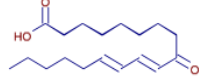
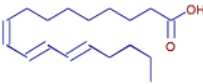
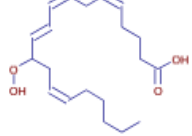
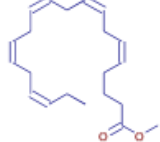
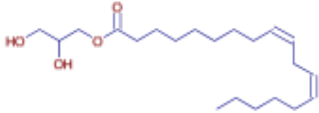
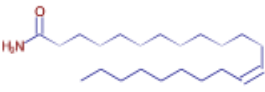



**Figure S3.** HPLC spectrum of the methanol extract of *F. tikoua* fruit.



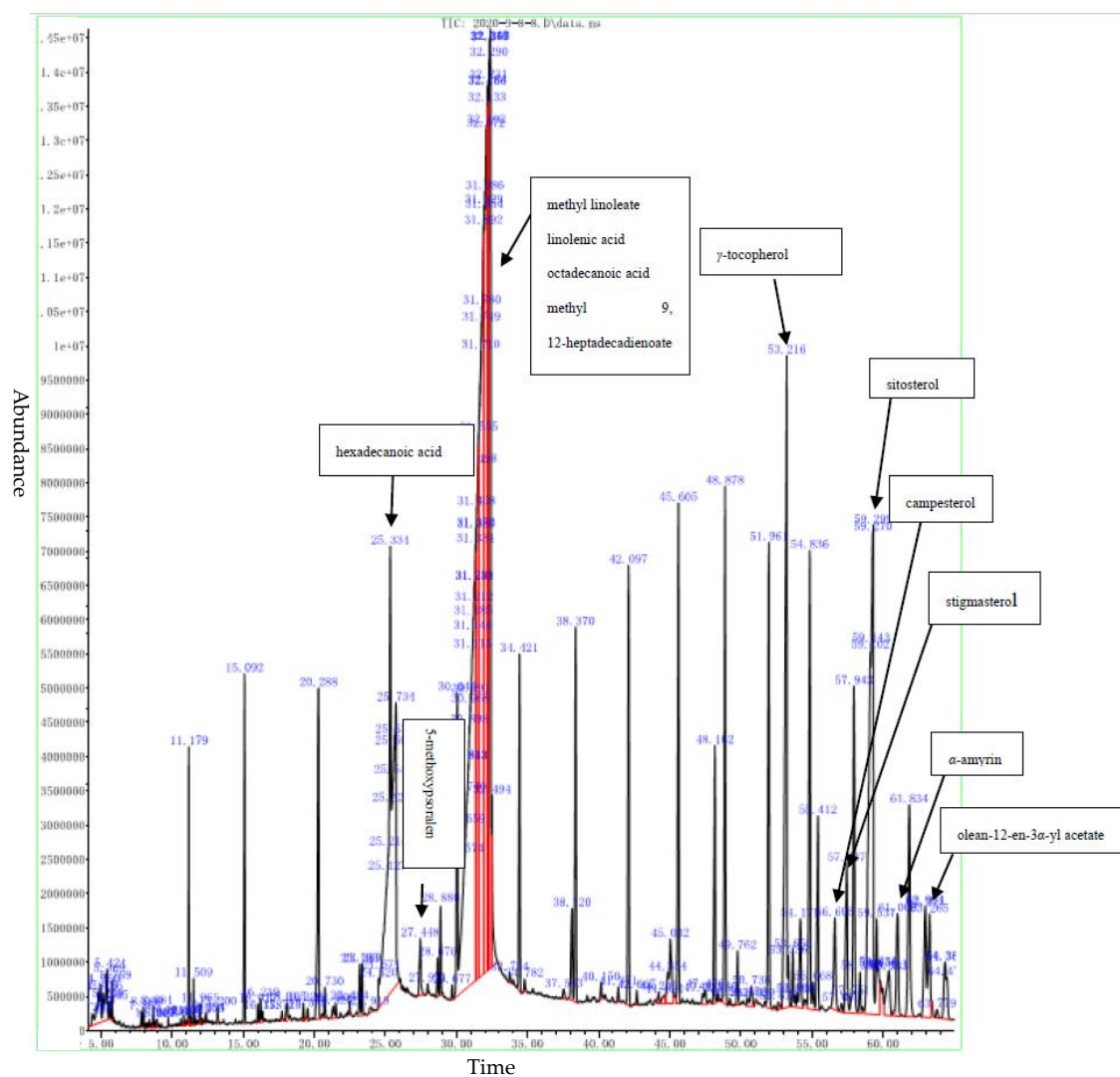
**Table S1.** Compounds identified by LC-MS from the methanol extract of *F. tikoua* fruit.

No.	$t_R$ (min)	compound name	molecular weight	molecular formula	structure
1	0.7	choline	103.1	C <sub>5</sub> H <sub>13</sub> NO	
2	0.7	asparagine	132.1	C <sub>4</sub> H <sub>8</sub> N <sub>2</sub> O <sub>3</sub>	
3	0.73	betaine	117.1	C <sub>5</sub> H <sub>11</sub> NO <sub>2</sub>	
4	0.74	<i>D</i> -(+)-proline	133.1	C <sub>5</sub> H <sub>9</sub> NO <sub>2</sub>	
5	0.74	<i>D</i> -(+)-maltose	364.1	C <sub>12</sub> H <sub>22</sub> O <sub>11</sub>	
6	0.74	sucrose	342.1	C <sub>11</sub> H <sub>22</sub> O <sub>11</sub>	
7	0.74	<i>D</i> -(-)-quinic acid	192.1	C <sub>7</sub> H <sub>12</sub> O <sub>6</sub>	
8	0.77	pipecolic acid	129.1	C <sub>6</sub> H <sub>11</sub> NO <sub>2</sub>	
9	0.79	<i>DL</i> -malic acid	134.0	C <sub>4</sub> H <sub>6</sub> O <sub>5</sub>	
10	1.03	citric acid	192.0	C <sub>6</sub> H <sub>8</sub> O <sub>7</sub>	
11	1.19	methylmalonic acid	118.0	C <sub>4</sub> H <sub>6</sub> O <sub>4</sub>	
12	1.23	<i>DL</i> -norleucine	131.1	C <sub>6</sub> H <sub>13</sub> NO <sub>2</sub>	
13	2.06	<i>L</i> -phenylalanine	165.1	C <sub>9</sub> H <sub>11</sub> NO <sub>2</sub>	
14	2.84	8-hydroxyquinoline	145.1	C <sub>9</sub> H <sub>7</sub> NO	
15	2.84	4-indolecarbaldehyde	145.1	C <sub>9</sub> H <sub>7</sub> NO	

16	3.46	indole-3-acrylic acid	187.1	C <sub>11</sub> H <sub>9</sub> NO <sub>2</sub>	
17	5.57	neochlorogenic acid	354.1	C <sub>16</sub> H <sub>18</sub> O <sub>9</sub>	
18	6.44	chlorogenic acid	354.1	C <sub>16</sub> H <sub>18</sub> O <sub>9</sub>	
19	11.44	psoralen	186.0	C <sub>11</sub> H <sub>6</sub> O <sub>3</sub>	
20	19.44	8-prenylnaringenin	340.1	C <sub>20</sub> H <sub>20</sub> O <sub>5</sub>	
21	21.22	9 <i>S</i> ,13 <i>R</i> -12-oxophytodienoic acid	292.2	C <sub>18</sub> H <sub>28</sub> O <sub>3</sub>	
22	21.82	9-oxo-10( <i>E</i> ),12( <i>E</i> )-octadecadienoic acid	294.2	C <sub>18</sub> H <sub>30</sub> O <sub>3</sub>	
23	21.99	$\alpha$ -eleostearic acid	278.2	C <sub>18</sub> H <sub>30</sub> O <sub>2</sub>	
24	22.00	(+/-)-12-HpETE	318.2	C <sub>20</sub> H <sub>32</sub> O <sub>4</sub>	
25	23.43	eicosapentaenoic acid methyl ester	322.2	C <sub>21</sub> H <sub>32</sub> O <sub>2</sub>	
26	24.46	1-linoleoyl glycerol	354.3	C <sub>21</sub> H <sub>38</sub> O <sub>4</sub>	
27	26.96	erucamide	337.3	C <sub>22</sub> H <sub>43</sub> NO	
28	28.44	docosanamide	339.3	C <sub>22</sub> H <sub>45</sub> NO	



**Figure S4.** TIC GC-MS spectrum of the hexane extract of *F. tikoua* fruit.



**Table S2.** Compounds identified by GC-MS from the hexane extract of *F. tikoua* fruit.

<i>t<sub>R</sub></i> (min)	compound name	CAS No.	relative area %
10.827	2,6-di-tert-butylbenzoquinon	719-22-2	0.02
11.507	2,4-di-tert-butylphenol	96-76-4	0.1
13.198	<i>n</i> -hexadecane	544-76-3	0.03
16.017	<i>n</i> -heptadecane	629-78-7	0.05
18.106	tetradecanoic acid	544-63-8	0.09
19.227	octadecane	593-45-3	0.05
19.540	6,10,14-trimethyl-2-pentadecanone	502-69-2	0.1
21.323	pentadecanoic acid	1002-84-2	0.07
22.487	nonadecane	629-92-5	0.03
23.192	7,9-ditert-butyl-1-oxaspiro[4.5]deca-6,9-diene-2,8-dione	82304-66-3	0.18
23.370	hexadecanoic acid, methyl ester	112-39-0	0.16
23.921	16-methyl-oxacyclohexadecan-2-one	4459-57-8	0.04
25.128	hexadecanoic acid	57-10-3	1.52
27.450	5-methoxypsoralen	484-20-8	0.3
27.971	1-nonadecene	18435-45-5	0.03
28.670	methyl linoleate	112-63-0	0.13
28.878	linolenic acid, methyl ester	301-00-8	0.33
29.675	methyl stearate	112-61-8	0.05
30.661	linoelaidic acid	506-21-8	0.57
30.845	linolenic acid	463-40-1	3.09
30.900	linolenyl alcohol	506-44-5	0.61
30.967	linoleic acid	60-33-3	0.84
31.378	methyl 9, 12-heptadecadienoate	29305-60-0	0.38
32.493	octadecanoic acid	57-11-4	0.74
33.737	eicosane	112-95-8	0.04
34.785	phytane	638-36-8	0.04
37.542	tetracosane	646-31-1	0.06
40.152	pentacosane	629-99-2	0.06
44.852	2-linoleoyl glycerol	3443-82-1	0.21
48.161	squalene	111-02-4	1.01
50.734	$\delta$ -tocopherol	119-13-1	0.14
53.216	$\gamma$ -tocopherol	7616-22-0	4.52
53.651	1-docosene	1599-67-3	0.22
53.804	nonacos-1-ene	18835-35-3	0.04
56.604	campesterol	474-62-4	0.65
57.437	stigmasterol	83-48-7	0.95
59.104	sitosterol	83-46-5	5.36
59.539	28-isofucosterol	481-14-1	0.48
61.010	$\alpha$ -amyrin	638-95-9	0.74

62.952	olean-12-en-3 $\alpha$ -yl acetate	33055-28-6	0.58
64.337	urs-12-en-24-oic acid, 3-oxo-, methyl ester	20475-86-9	0.26

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**Table S3.** Crude protein, amino acids, total polysaccharides, polyphenols, flavonoids, and vitamins contents of *F. tikoua* fruit.

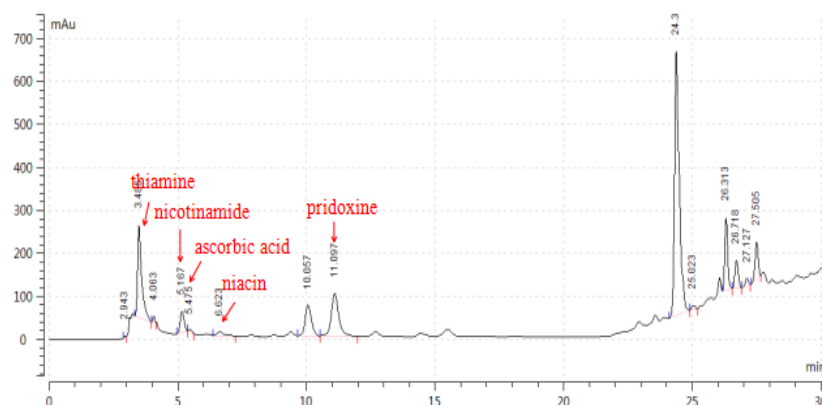
phytochemical	standard curve line	result
crude Protein	-	9.41 ± 0.03 (g/100g)
ash	-	10.29 ± 0.08 (g/100g)
vitamin	-	-
pyridoxine	-	66.67 ± 2.3 (mg/100g)
thiamine	-	205.42 ± 5.4 (mg/100g)
riboflavin	-	0
ascorbic acid	-	10.00 ± 0 (mg/100g)
cyanocobalamin	-	0
niacin	-	3.20 ± 0.4 (mg/100g)
folic acid	-	0
nicotinamide	-	15.40 ± 1.3 (mg/100g)
amino acids	-	9.28%
threonine	-	0.35%
proline	-	0.51%
isoleucine	-	0.40%
leucine	-	0.69%
phenylalanine	-	0.48%
lysine	-	0.51%
aspartic acid	-	1.48%
serine	-	0.50%

glutamate	-	1.40%
alanine	-	0.49%
glycine	-	0.44%
cystine	-	0.21%
methionine	-	0.12%
tyrosine	-	0.24%
histidine	-	0.35%
arginine	-	0.62%
proline	-	0.47%
total polysaccharide	$Y = 17.902x + 0.05, R^2 =$	$1.25 \pm 0.04$ (g/100g)
total polyphenols (TPC)	0.9970	$0.86 \pm 0.01$ (g/100g)
total flavonoids (TFC)	$Y = 28.611x - 0.424, R^2 =$	$8.00 \pm 0.11$ (mg/100g)
	0.9951	
	$Y = 3.4967x - 0.0467, R^2 =$	
	0.9969	

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Each value was expressed as mean  $\pm$  SE ( $n = 3$ ).

**Figure S5.** The HPLC analysis result of the vitamin composition of *F. tikoua* fruit.



**Figure S6.** The result of the monosaccharide composition of *F. tikoua* fruit. (A) The result of the HPLC spectrum of the PMP-labeled monosaccharide standard. (B) The result of the monosaccharide composition of *F. tikoua* fruit.

