

**Table S1** Multiple Reaction Monitoring (MRM) conditions for amino acids and anthocyanin on LC/MS/MS

No.	parameter	Precursor ion [M+H] <sup>+</sup> (m/z)	Product ion (m/z)	Q1 Pre Bias (V)	Collision energy (V)	Q3 Pre Bias (V)
<i>Amino acids</i>						
1	alanine	90.05	44.00	−16.00	−12.00	−17.00
2	arginine	133.00	74.00	−13.00	−17.00	−16.00
3	asparagine	175.00	70.00	−30.00	−26.00	−15.00
4	aspartic acid	134.00	74.00	−22.00	−16.00	−17.00
5	cysteine	122.00	59.00	−12.00	−24.00	−28.00
6	glutamine	147.00	84.00	−25.00	−18.00	−19.00
7	glutamic acid	148.00	84.00	−14.00	−17.00	−10.00
8	glycine	76.00	30.00	−13.00	−12.00	−12.00
9	histidine	156.00	110.00	−10.00	−15.00	−12.00
10	isoleucine	132.10	86.00	−13.00	−12.00	−10.00
11	leucine	132.10	86.10	−13.00	−12.00	−10.00
12	lysine	147.00	84.00	−14.00	−19.00	−23.00
13	methionine	150.00	104.00	−10.00	−13.00	−23.00
14	phenylalanine	166.00	120.00	−30.00	−13.00	−16.00
15	proline	116.05	70.00	−12.00	−17.00	−16.00
16	serine	106.05	60.00	−18.00	−13.00	−14.00
17	threonine	120.00	74.00	−12.00	−12.00	−17.00
18	tryptophan	205.05	146.05	−13.00	−20.00	−20.00
19	tyrosine	182.05	136.05	−12.00	−15.00	−19.00
20	valine	118.05	72.00	−12.00	−13.00	−16.00
<i>Anthocyanins</i>						
1	cyanidin-3- <i>O</i> -glucoside	449	287	−10	−21	−12
2	peonidin-3- <i>O</i> -glucoside	463	301	−30	−23	−16

**Table S2** The importance of the studies on phytochemical compounds in the mulberry fruits

Parameter	Importance in fruits
Phenols	Phenolic compounds are secondary metabolites that are produced in the shikimic acid of plants. Furthermore, phenolic compounds were discovered in several fruits, and the content of phenolic compounds varied depending on the ripening stage of the fruit. In more detail, phenolics have important properties such as anti-aging, anti-inflammatory, antioxidant and anti-proliferative agents.
Flavonoids	Flavonoids are a group of natural substances that are a class of polyphenolic secondary metabolites and are found in numerous fruits. The amount of flavonoids in the fruit varies depending on the stage of ripening. Even more, flavonoid compounds are shown to have biological activity such as, antioxidative activity, anti-inflammatory activity, anticancer activity, etc.
Amino acids	Amino acids were supposed to perform important roles in human health. In fruits, the free amino acids are metabolized or stored as nutritional sources, and some are utilized as signaling molecules to regulate cellular functions, including enzyme activity, gene expression, and redox-homeostasis. A many of amino acids were discovered in mulberry fruits. Additionally, amino acids may contribute to the flavor of fruits, and some free amino acids are key determinants of food taste. Glutamate is characteristic of umami flavor umami flavor; glycine, alanine, and proline characteristic of sweetness. However, the content of amino acids changed with ripening.