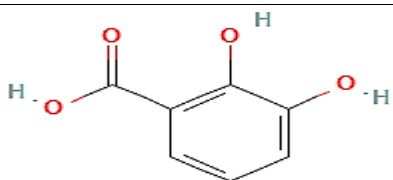
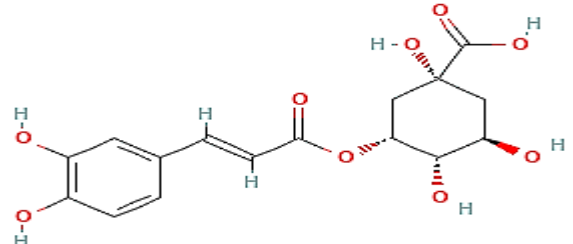
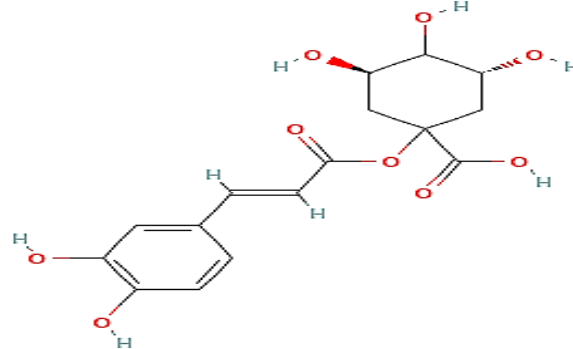
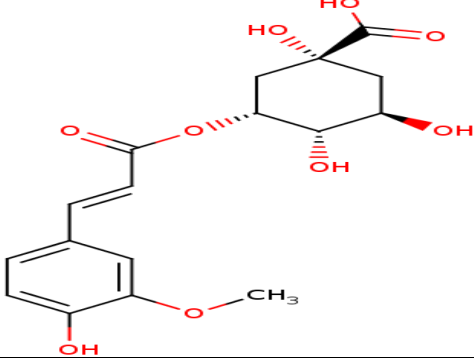
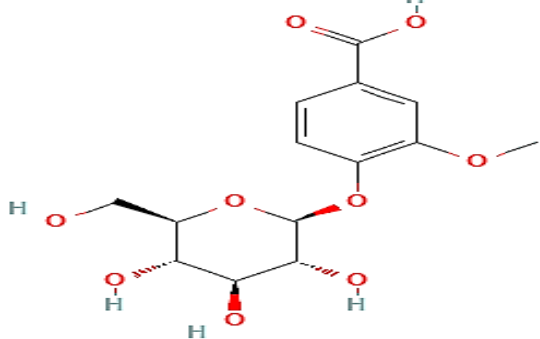
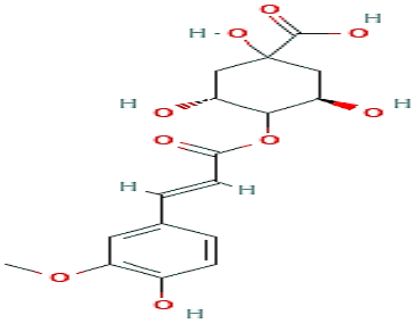
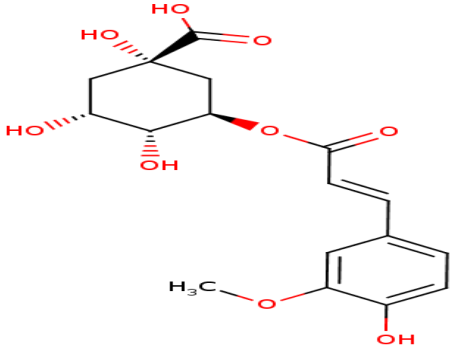
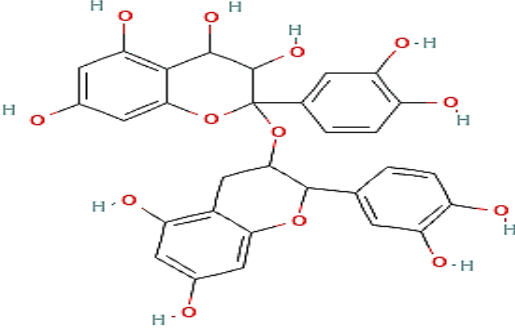
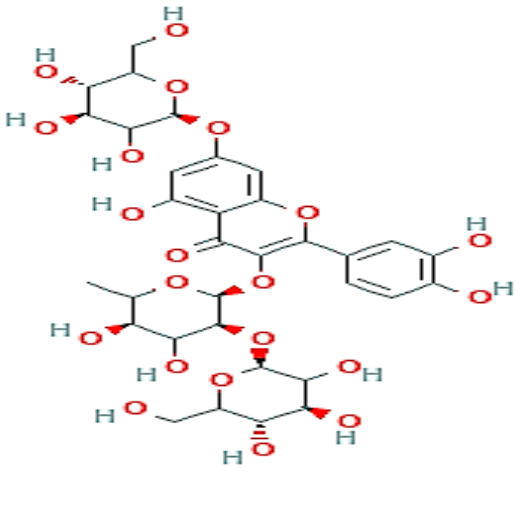


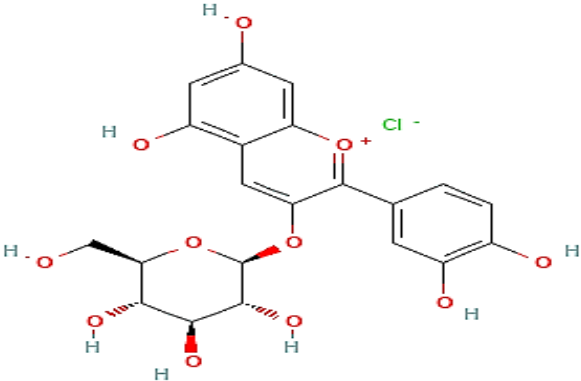
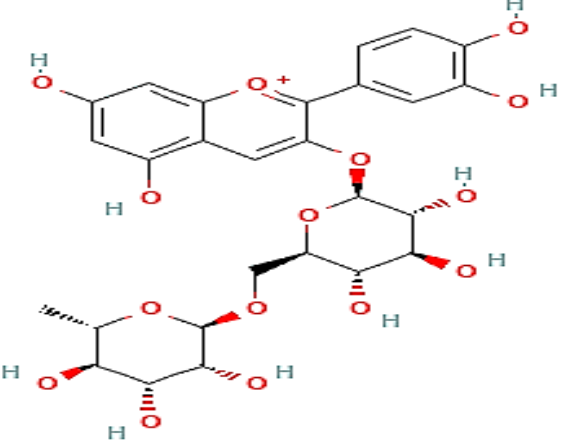
Figure S1. HPLC-DAD-MS (ESI⁺) chromatogram specific to the phenolic profile for black mulberry fruit at two wavelengths (280 nm and 340 nm)

Table S1. Chemical structures of tentative compounds identified in black mulberry fruit by HPLC-DAD-MS (ESI+).
Source: PubChem (nih.gov) and phenol-explorer.eu.

Class	Compounds/ CID	Chemical structures
Phenolic acids	Dihydroxybenzoic acid CID: 19	
	5-Caffeoylquinic acid (Chlorogenic acid) CID: 5280633	
	1-Caffeoylquinic acid CID: 10155076	
	3-Feruloylquinic acid CID: 5317346	
	Vanillic acid-glucoside CID: 14132336	

	<p>4-Feruloylquinic acid CID: 10177048</p>	 <p>The structure shows a central cyclohexane ring with a carboxylic acid group at position 1, a methoxy group at position 2, and a feruloyl ester group at position 4. The feruloyl group consists of a propenoic acid moiety attached to a 4-methoxyphenyl ring.</p>
	<p>5-Feruloylquinic acid CID: not available</p>	 <p>The structure shows a central cyclohexane ring with a carboxylic acid group at position 1, a hydroxyl group at position 2, a hydroxyl group at position 3, and a feruloyl ester group at position 5. The feruloyl group consists of a propenoic acid moiety attached to a 4-methoxyphenyl ring.</p>
	<p>Procyanidin dimer CID: 107876</p>	 <p>The structure shows a dimer of procyanidin units. It consists of two flavan-3-ol units linked by an ether bond at the C4 position of one unit and the C8 position of the other unit. Each unit has a phenyl ring with multiple hydroxyl groups.</p>
	<p>Quercetin 3-glucosyl-(1->2)- rhamnoside-7-glucoside CID: 44259290</p>	 <p>The structure shows a complex glycoside molecule. It features a central quercetin aglycone core. The quercetin core is substituted with a glucosyl group at position 3, a rhamnosyl group at position 7, and a glucosyl group at position 1. The rhamnosyl group is linked to the glucosyl group at position 3 via a (1->2) glycosidic bond.</p>

Flavonoids	<p>Quercetin 3-O-rutinoside CID: 5280805</p>	
	<p>Quercetin 3-O-glucoside CID: 5280804</p>	
	<p>Quercetin 3-O-rhamnoside CID: 5280459</p>	
	<p>Kaempferol 3-O-glucuronide CID: 5318759</p>	

	<p>Cyanidin 3-O-glucoside CID: 197081</p>	 <p>The chemical structure of Cyanidin 3-O-glucoside consists of a cyanidin cation (a flavylium cation with a 3-hydroxyphenyl group at the C4 position) and a glucose molecule linked via an O-glycosidic bond at the C3 position. A chloride ion (Cl⁻) is shown as the counterion. The glucose molecule is in its cyclic pyranose form with specific stereochemistry indicated by wedges and dashes.</p>
<p>Anthocyanins</p>	<p>Cyanidin 3-O-rutinoside CID: 441674</p>	 <p>The chemical structure of Cyanidin 3-O-rutinoside features a cyanidin cation core. At the C3 position, it is linked to a rutinoside moiety, which is a disaccharide composed of a glucose unit and a rhamnose unit. The glucose unit is linked to the cyanidin core, and the rhamnose unit is attached to the glucose. The stereochemistry of the sugar units is clearly defined with wedges and dashes.</p>

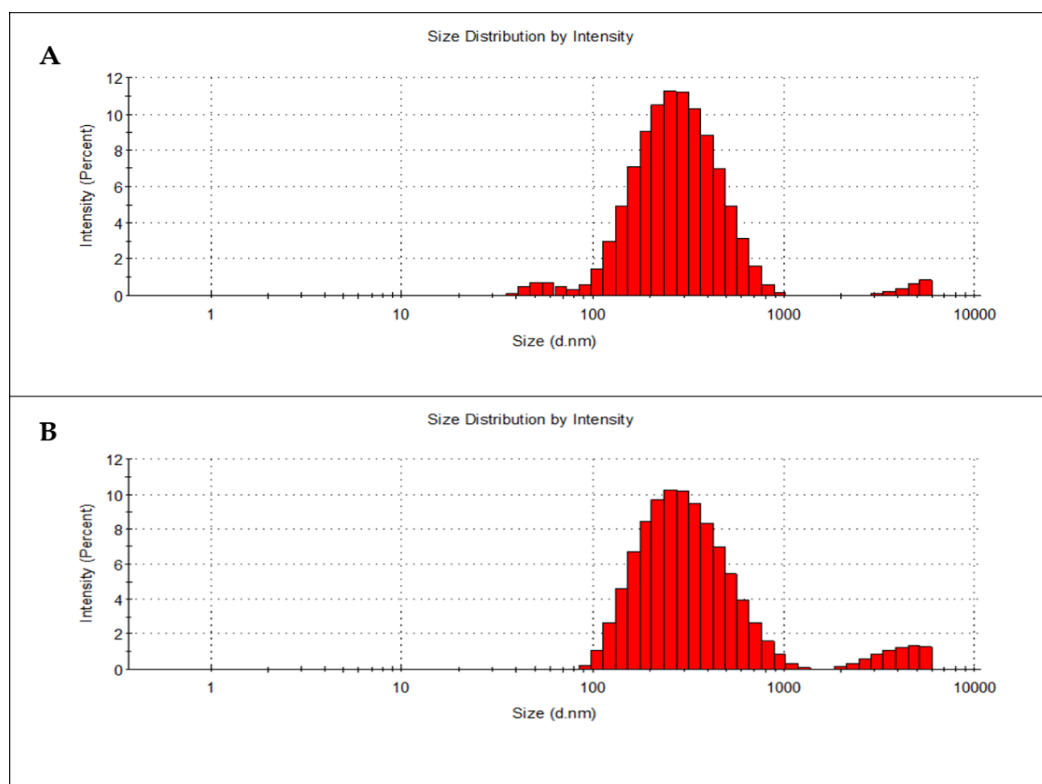


Figure S2. A -Histograms of the diameter distribution for L; B - Histogram of the diameter distribution for MnL.