

# Protective Action Mechanisms of *Launaea Mucronata* Extract and Its Nano-Formulation against Nephrotoxicity in Rats as Revealed *via* Biochemical, Histopathological and UPLC-QTOF–MS/MS Analyses

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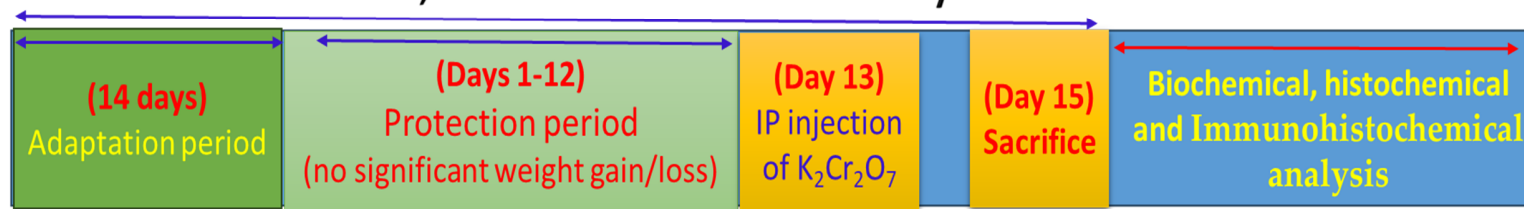
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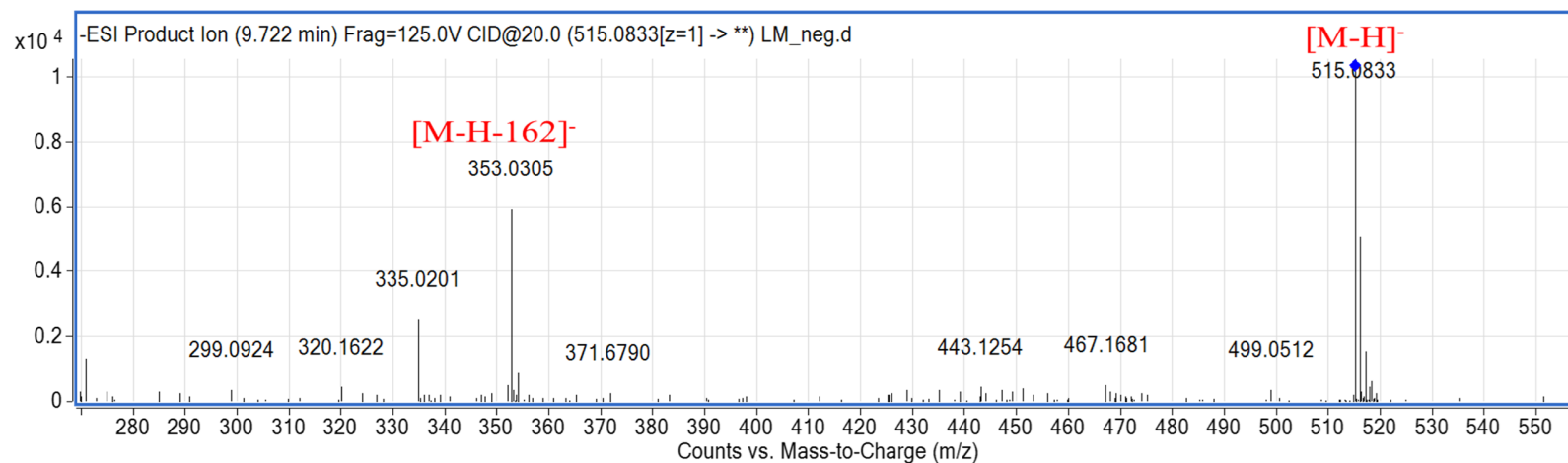
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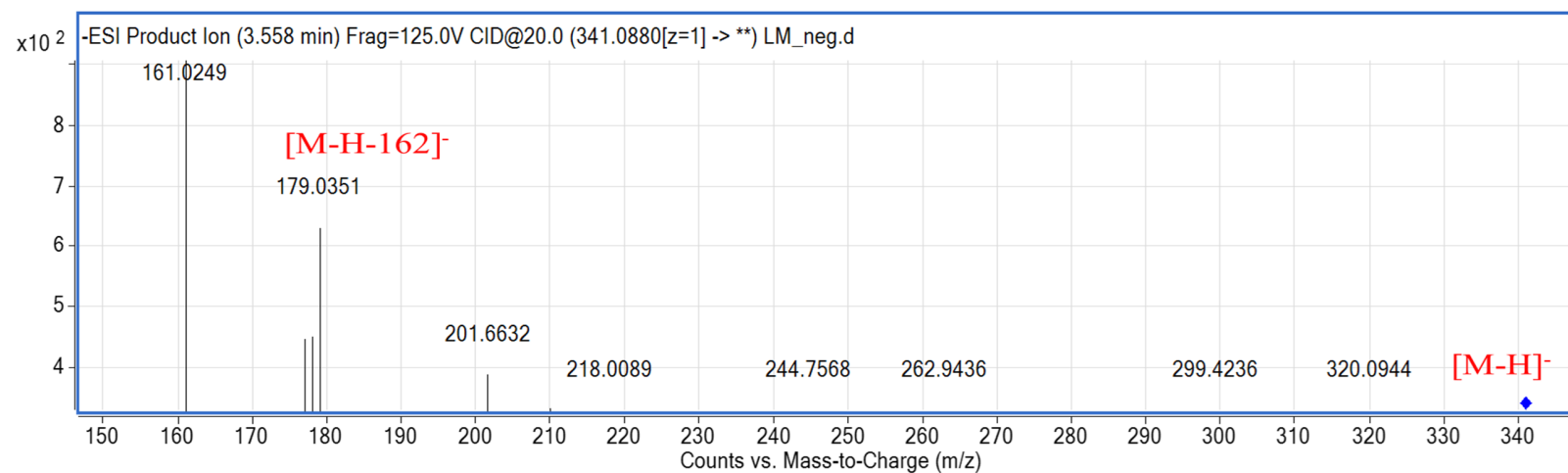
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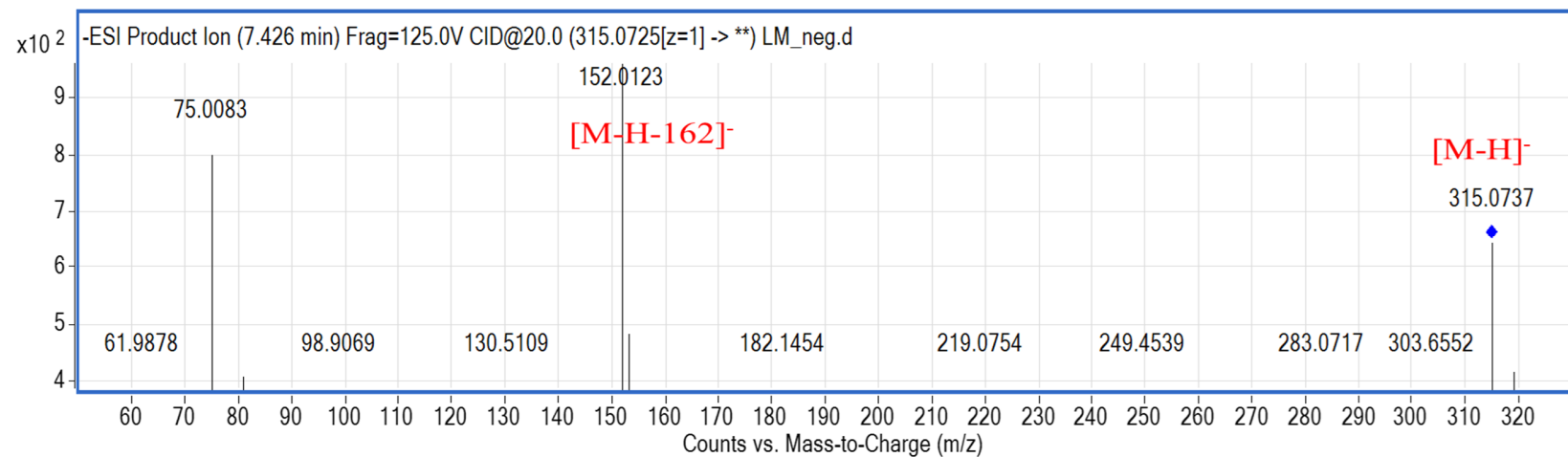
**Figure S1.** Experimental design and time cycle.



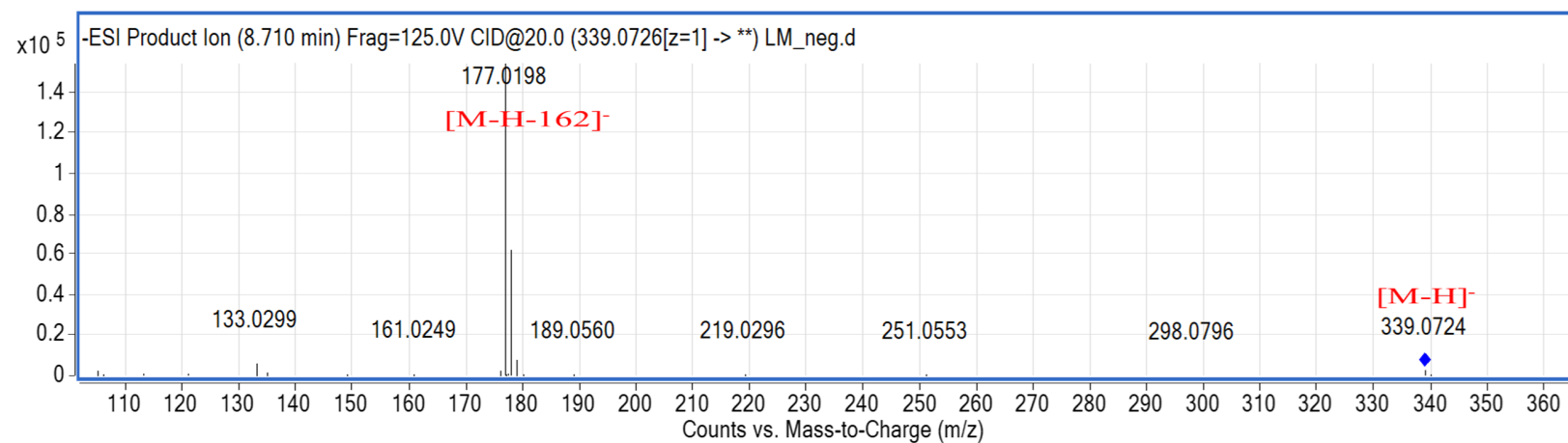
**Figure S2.** Negative mode MS/MS spectrum of chlorogenic acid hexoside.



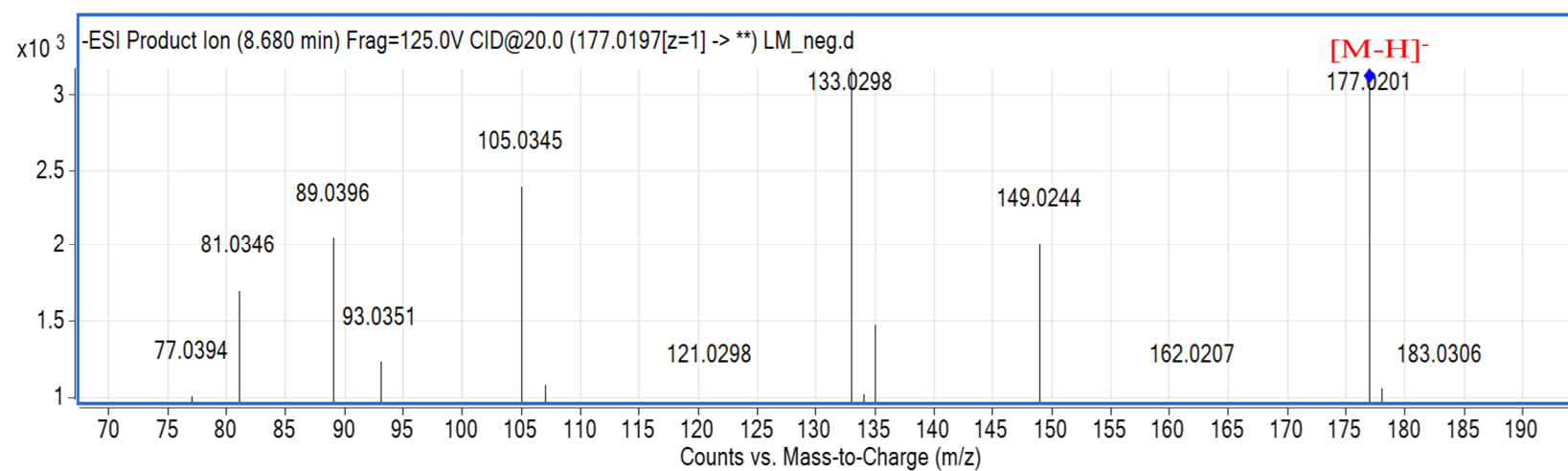
**Figure S3:** Negative mode MS/MS spectrum of caffeoyl hexoside.



**Figure S4:** Negative mode MS/MS spectrum of protocatechuic acid hexoside.

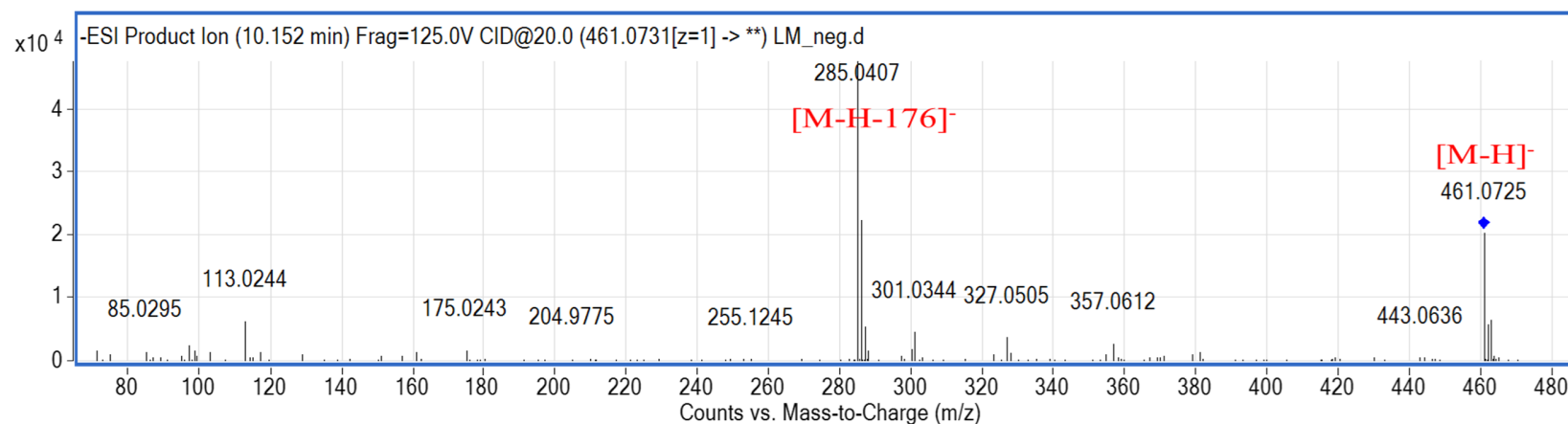


**Figure S5:** Negative mode MS/MS spectrum of aesculin.

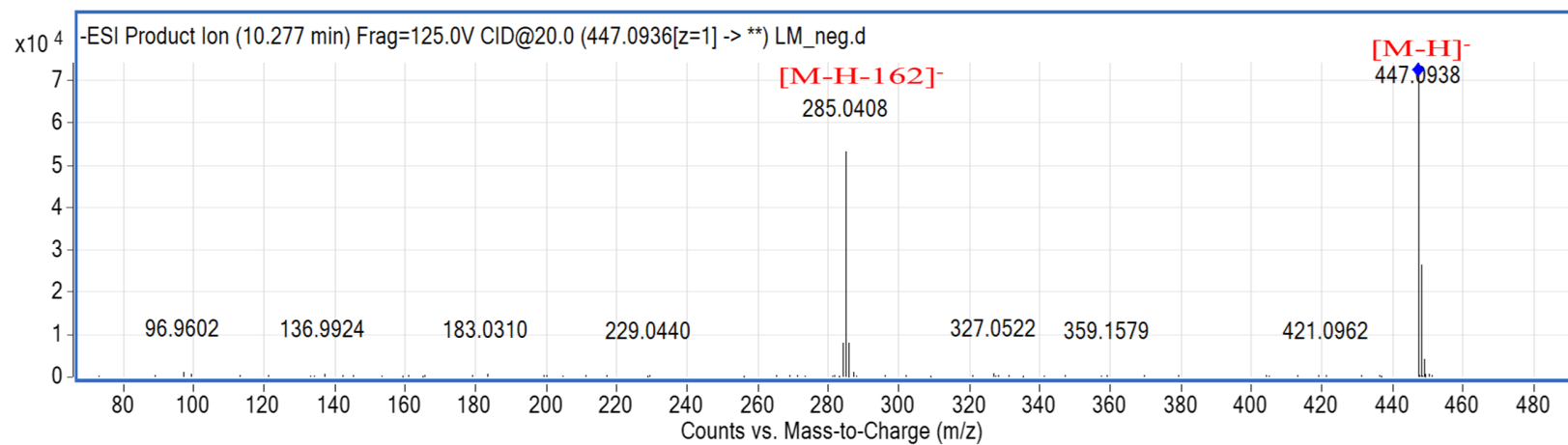


**Figure S6:** Negative mode MS/MS spectrum of aesculetin.

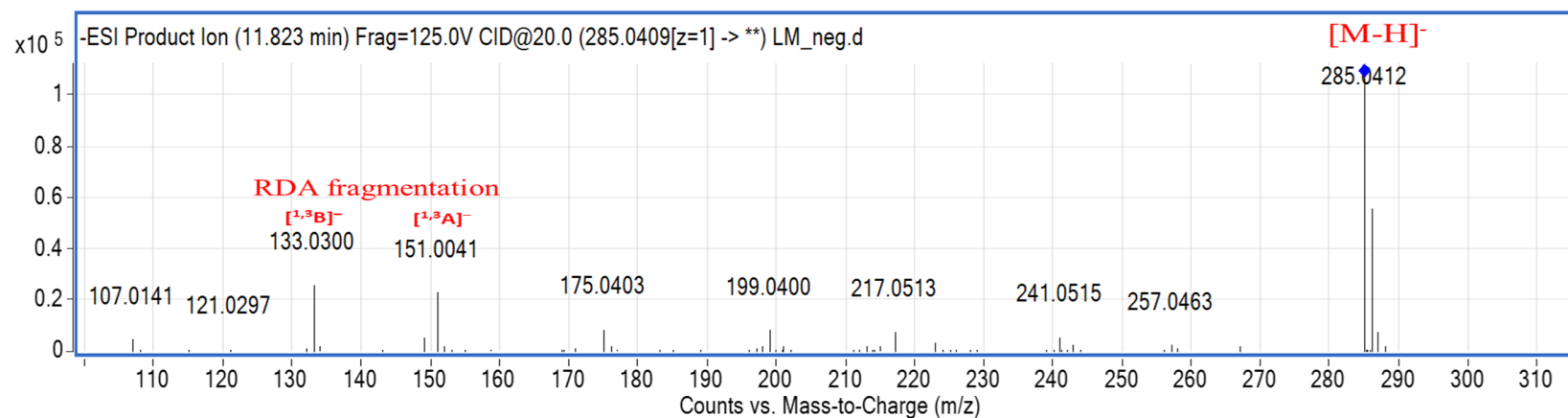




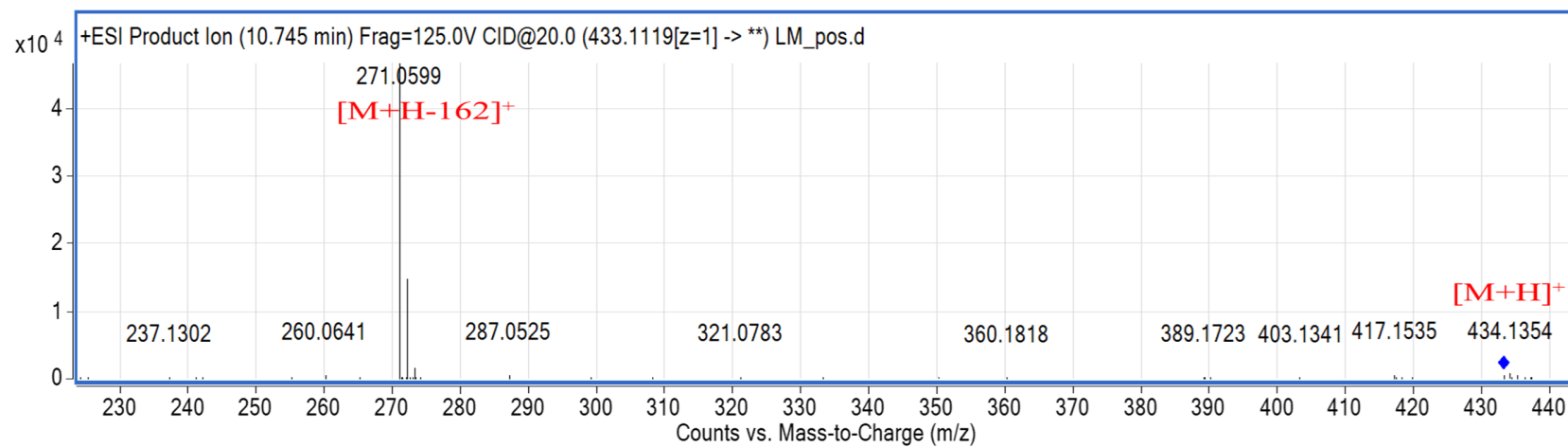
**Figure S7:** Negative mode MS/MS spectrum of luteolin-O-glucuronic acid.



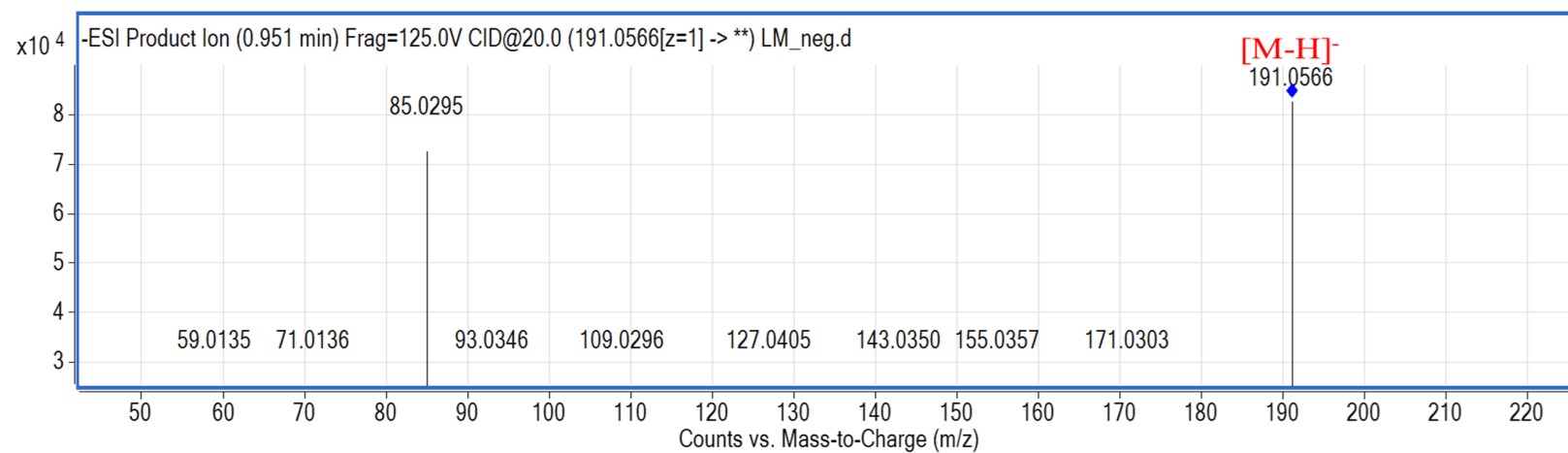
**Figure S8:** Negative mode MS/MS spectrum of luteolin-O-hexoside.



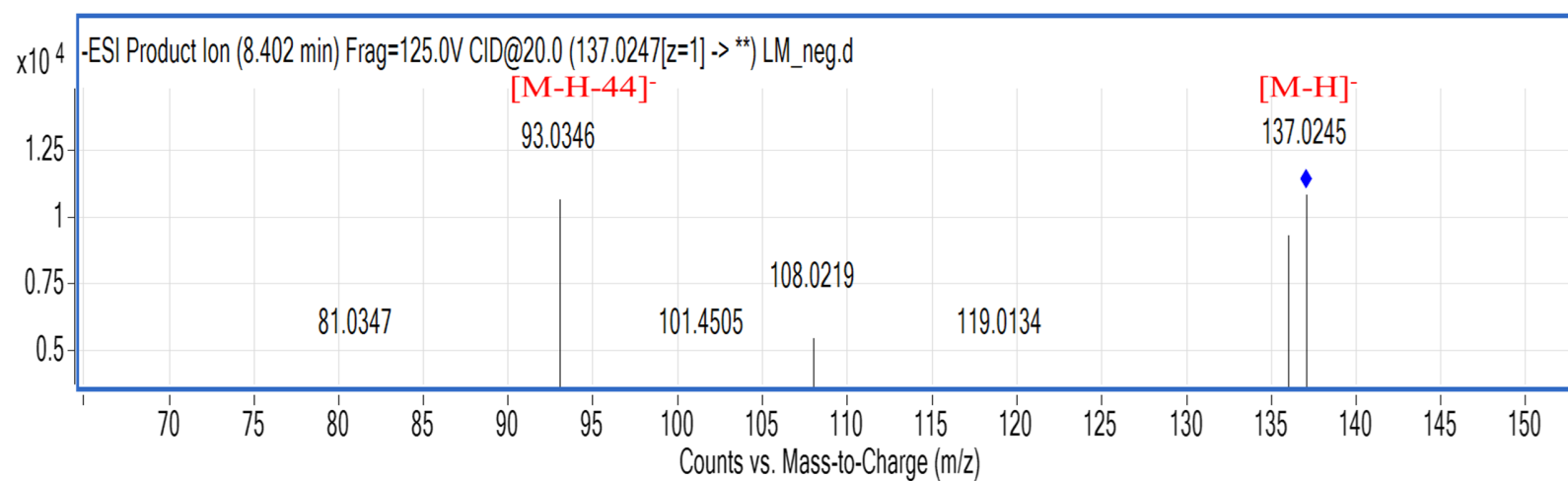
**Figure S9:** Negative mode MS/MS spectrum of luteolin.



**Figure S10:** Negative mode MS/MS spectrum of apigenin-O-hexoside.



**Figure S11:** Negative mode MS/MS spectrum of quinic acid.



**Figure S12:** Negative mode MS/MS spectrum of salicylic acid.

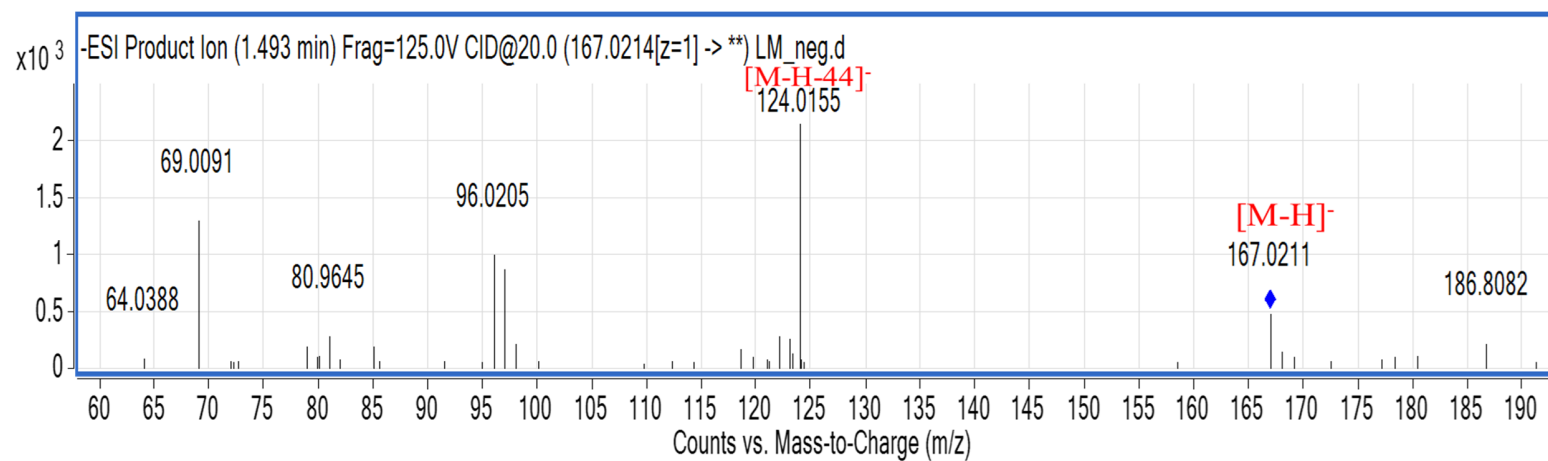


Figure S13: Negative mode MS/MS spectrum of tartaric acid.

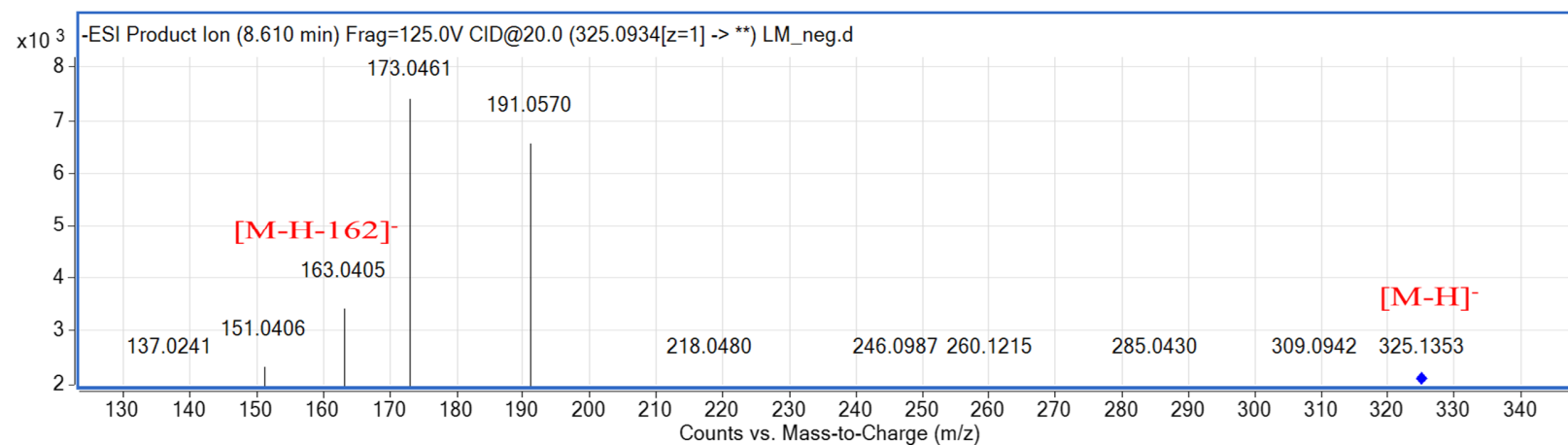
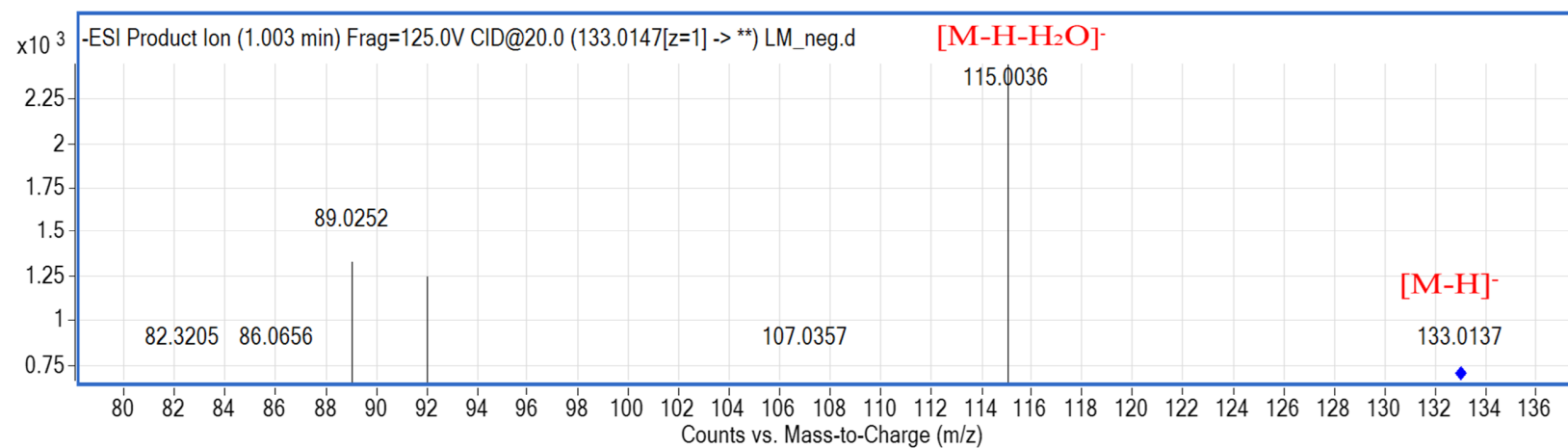
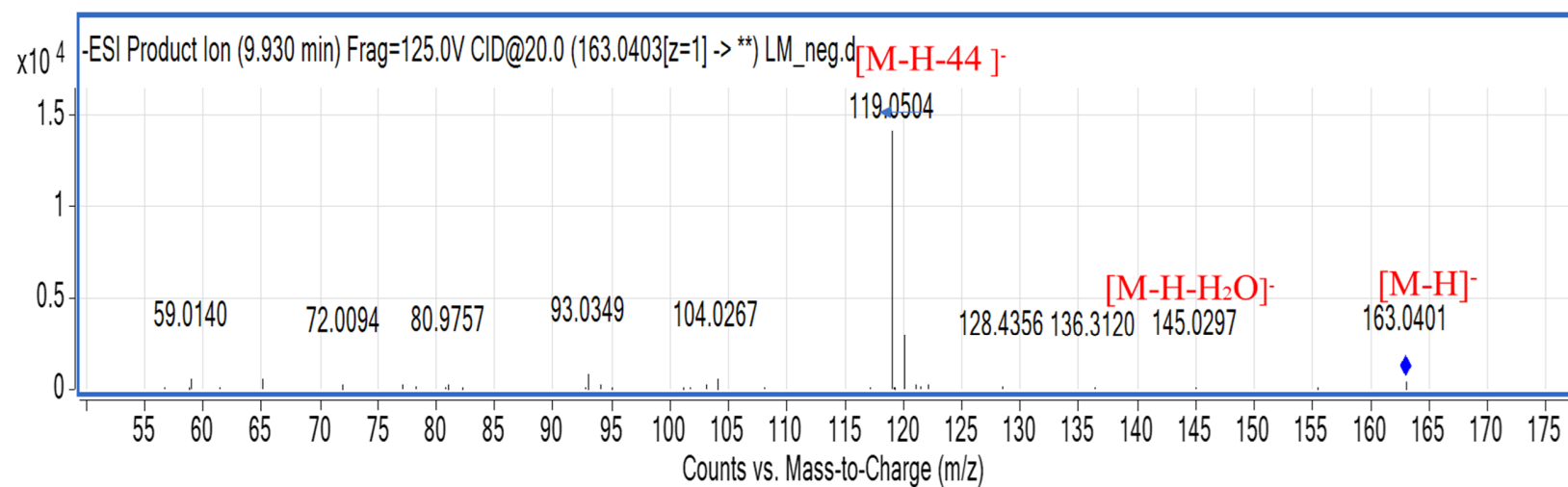


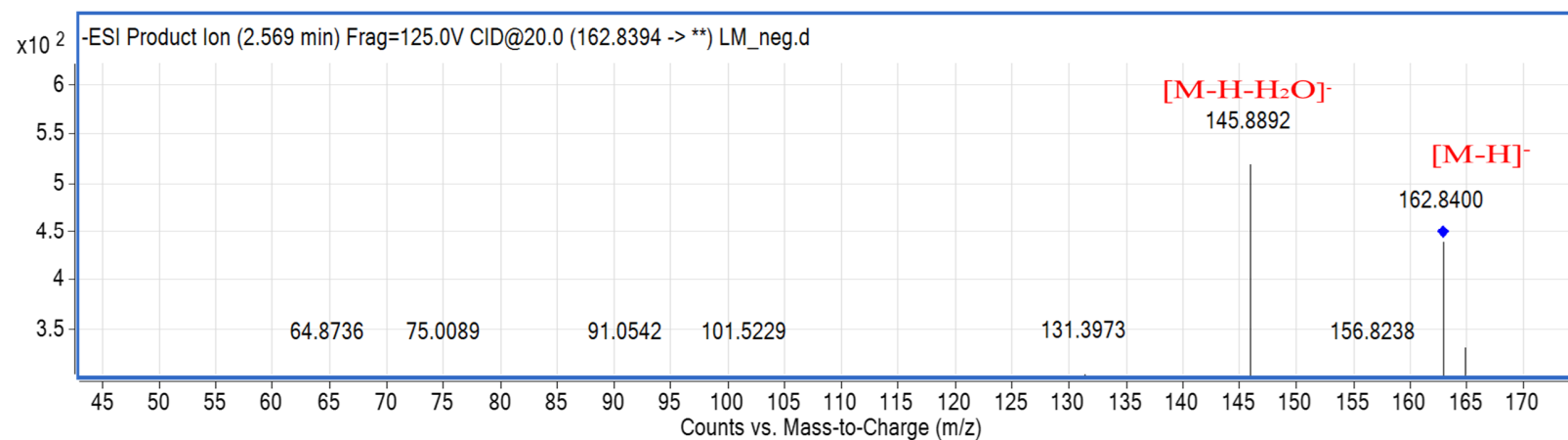
Figure S14: Negative mode MS/MS spectrum of coumaroyl hexoside.



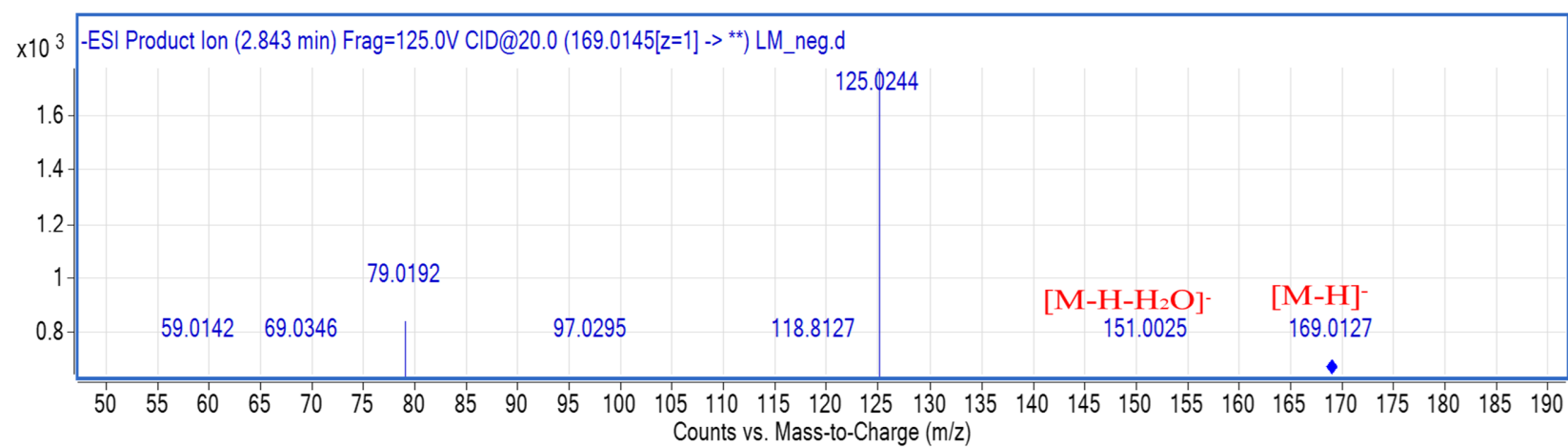
**Figure S15:** Negative mode MS/MS spectrum of malic acid.



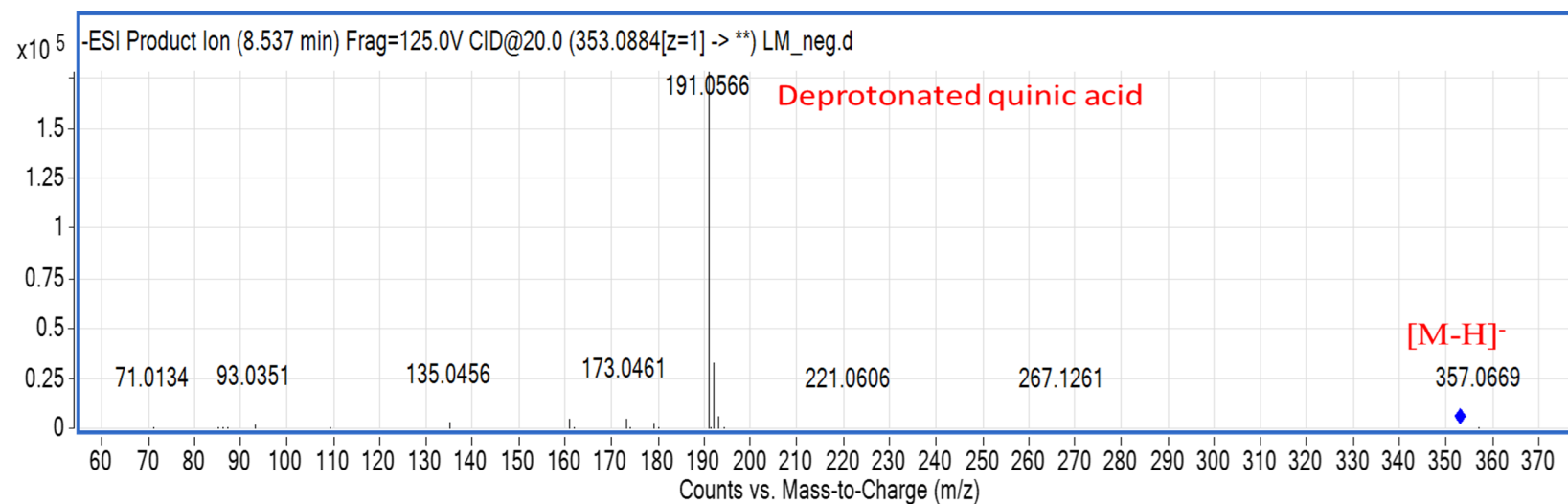
**Figure S16:** Negative mode MS/MS spectrum of *P*-hydroxy benzoic acid.



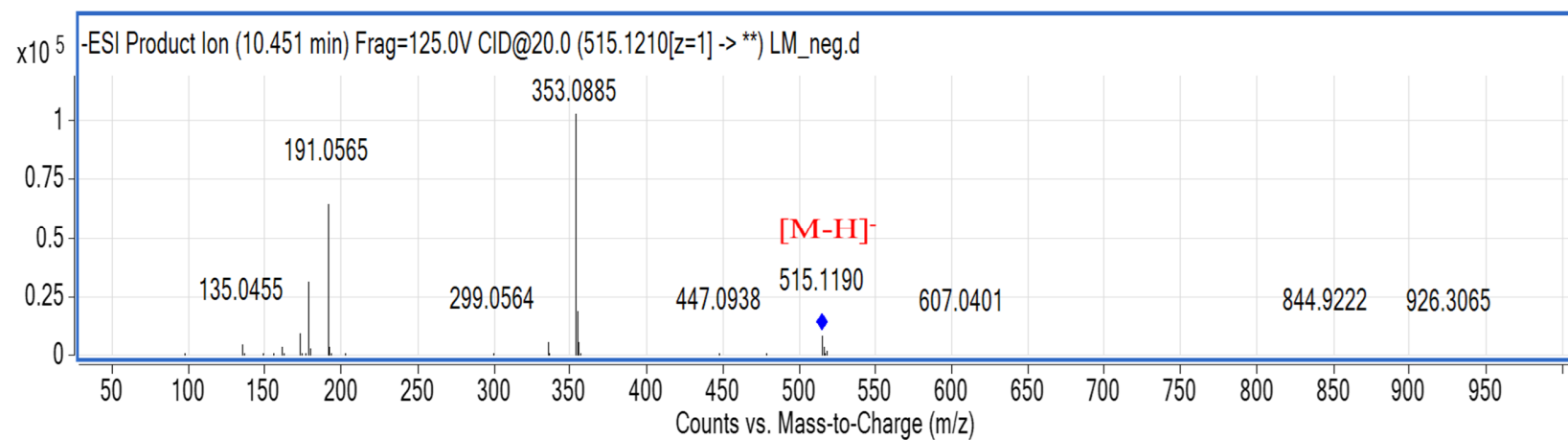
**Figure S17:** Negative mode MS/MS spectrum of *P*-coumaric acid.



**Figure S18:** Negative mode MS/MS spectrum of gallic acid.



**Figure S19:** Negative mode MS/MS spectrum of chlorogenic acid.



**Figure S20:** Negative mode MS/MS spectrum of dicaffeoylquinic acid.

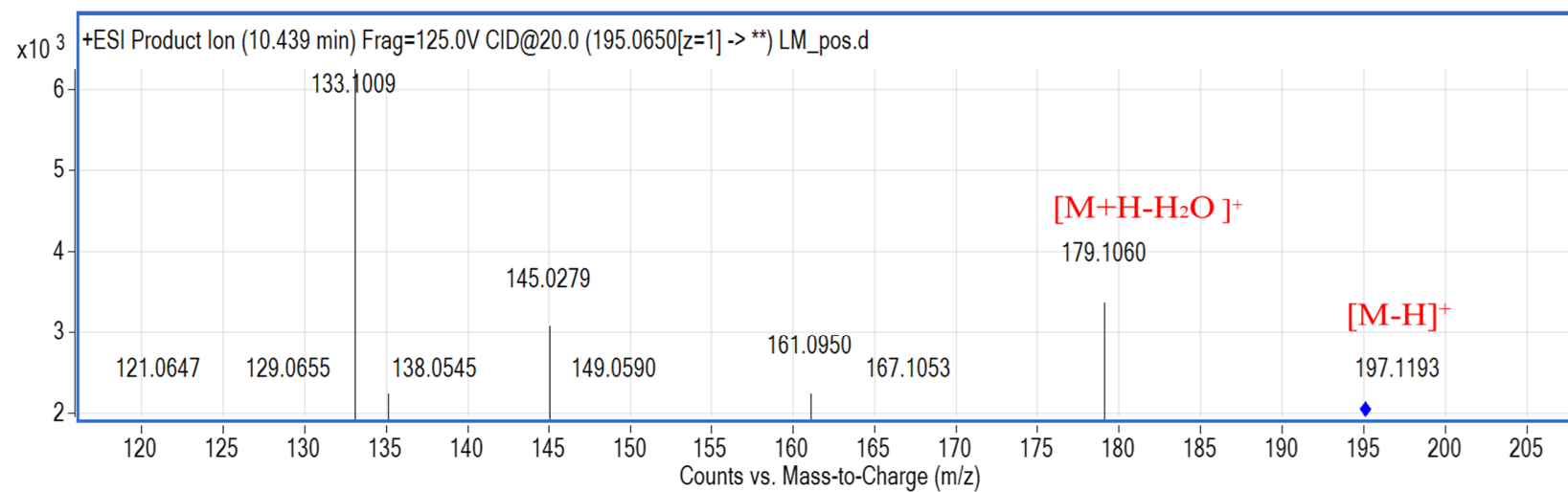


Figure S21: Negative mode MS/MS spectrum of ferulic acid.

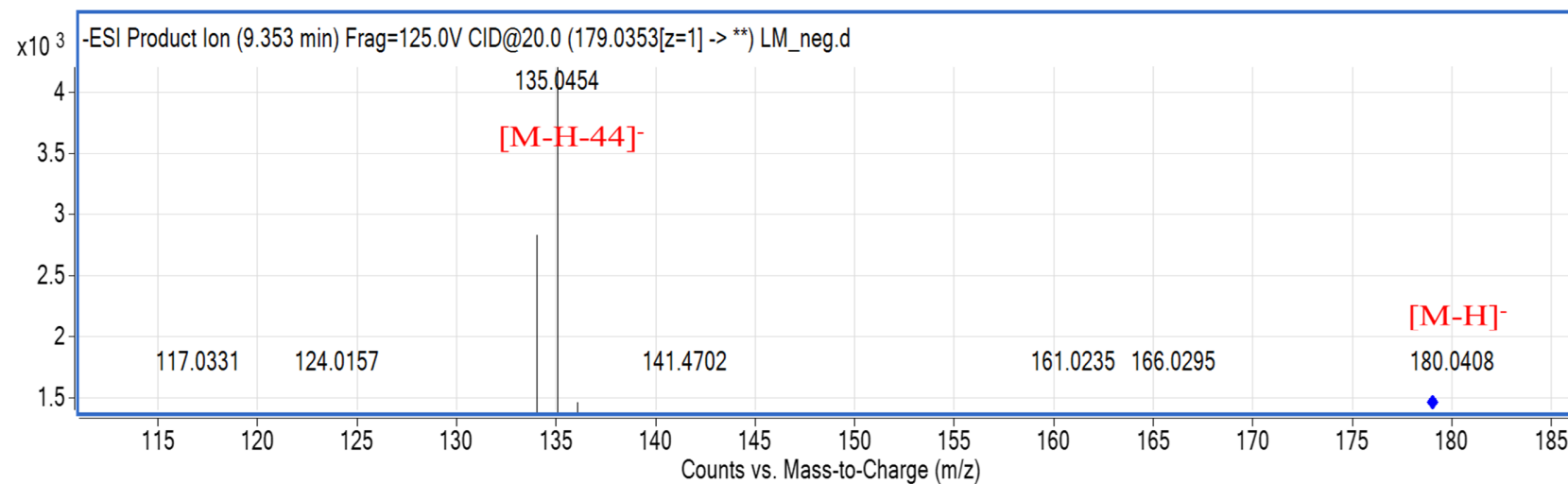
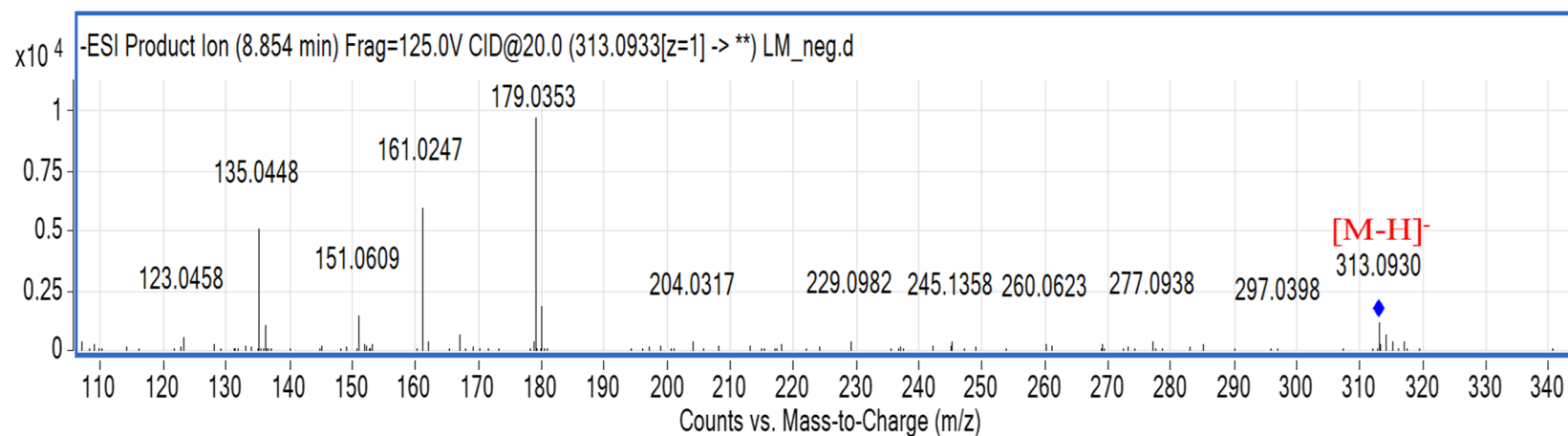
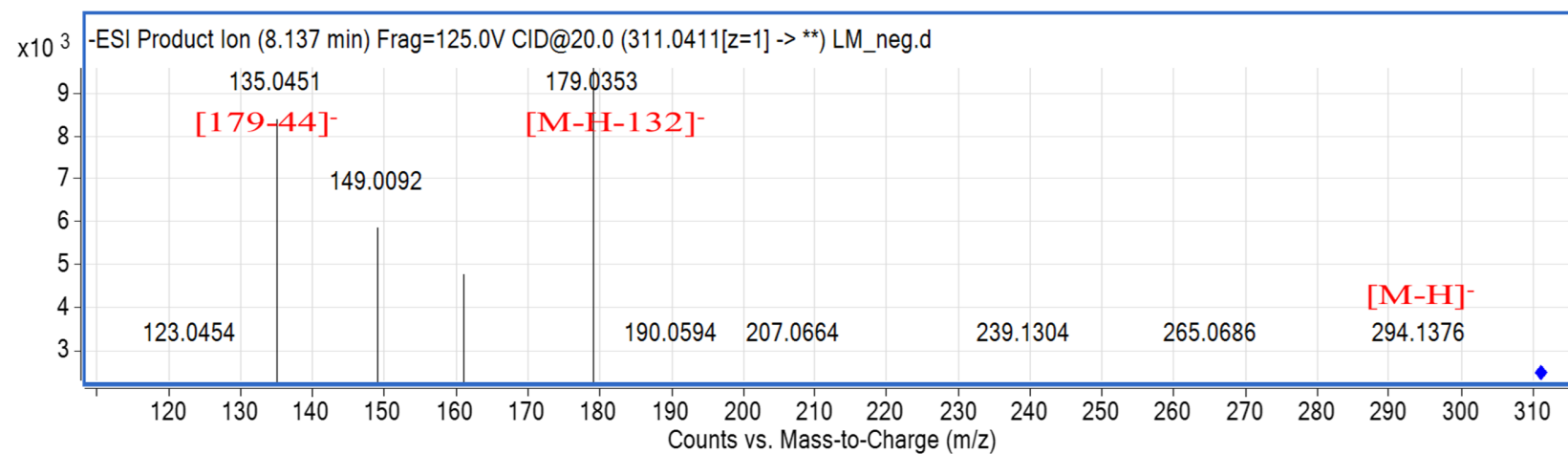


Figure S22: Negative mode MS/MS spectrum of caffeic acid.

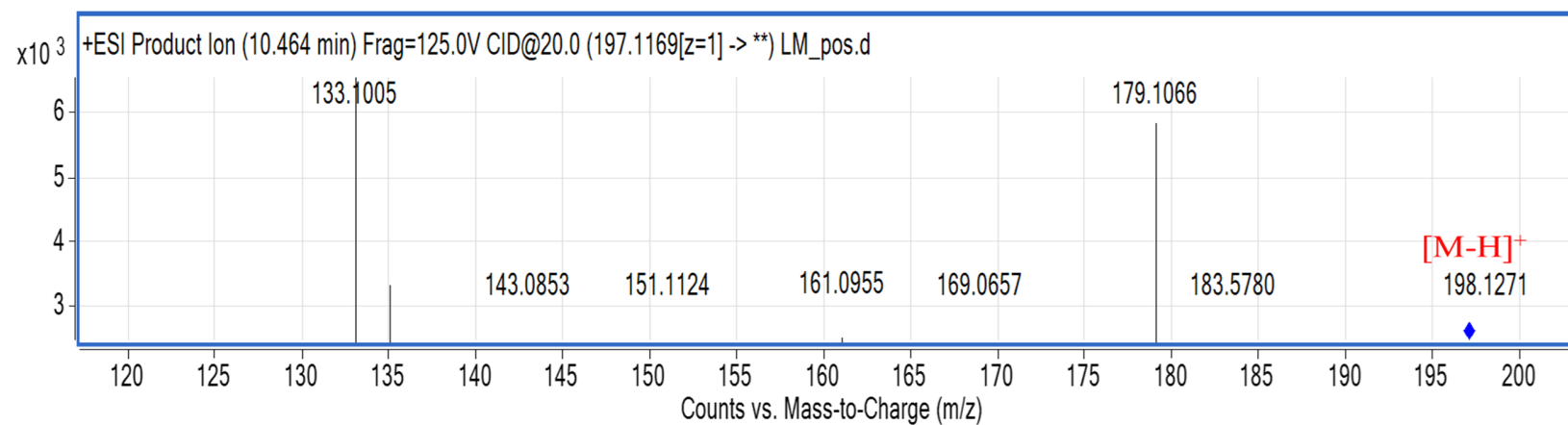




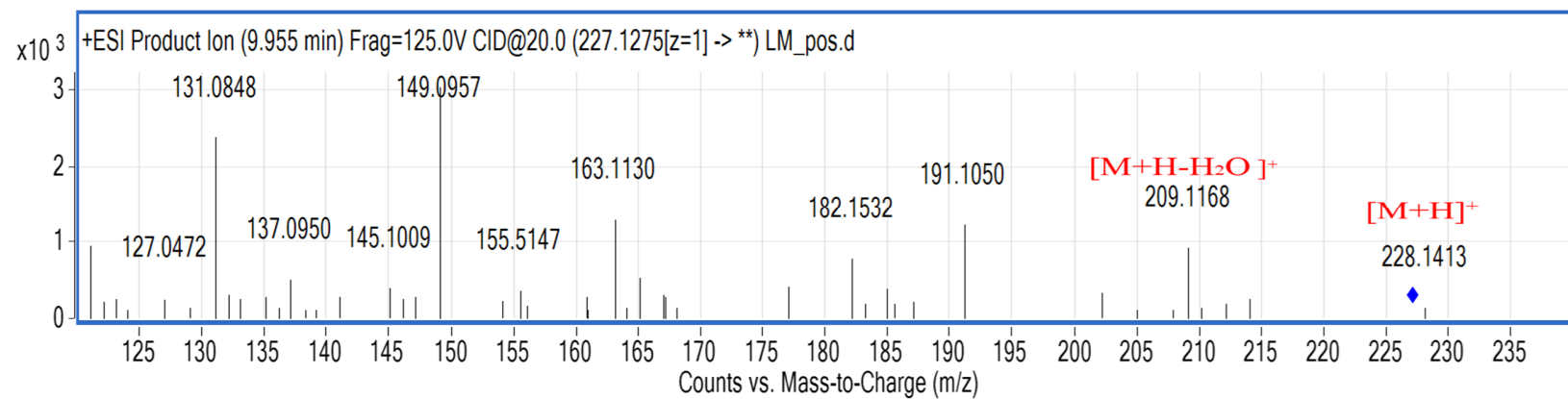
**Figure S23:** Negative mode MS/MS spectrum of caffeic acid derivative.



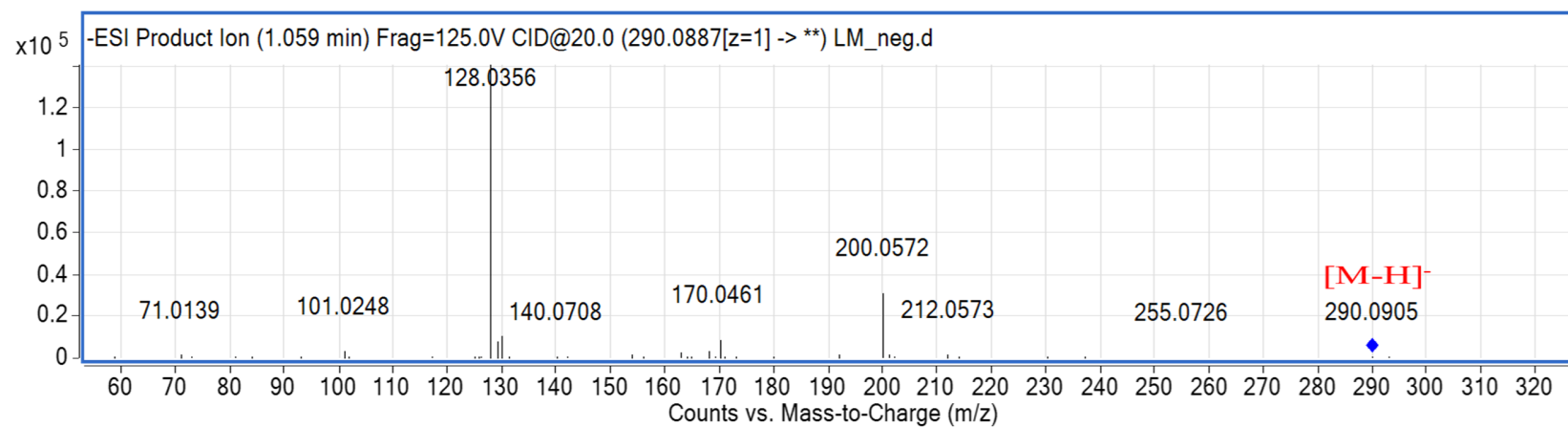
**Figure S24:** Negative mode MS/MS spectrum of caffeoyl tartaric acid.



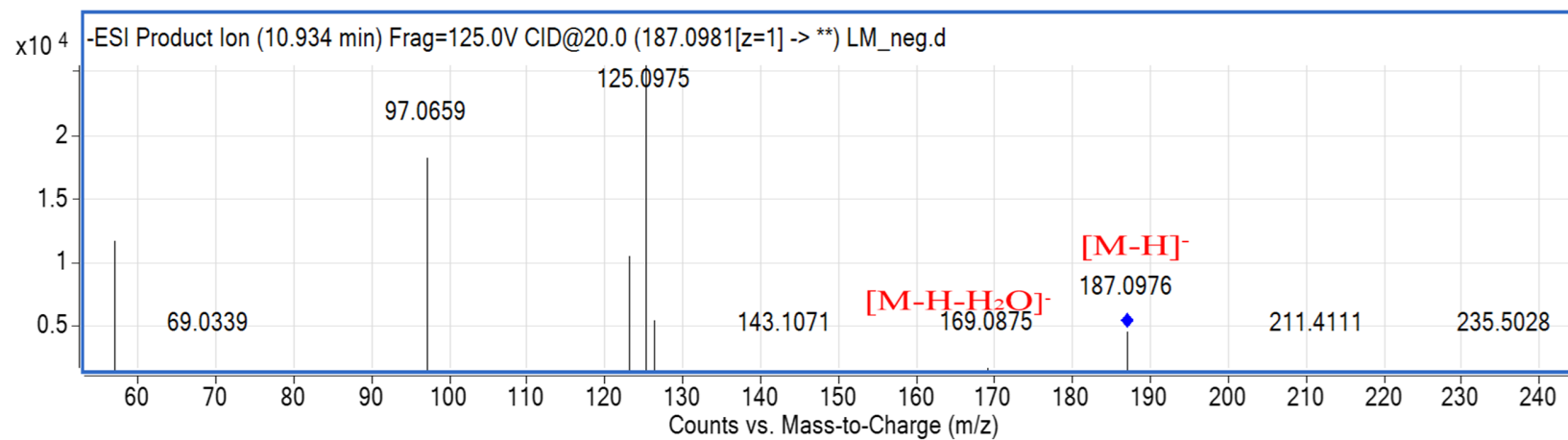
**Figure S25:** Negative mode MS/MS spectrum of unknown phenolic acid.



**Figure S26:** Negative mode MS/MS spectrum of hydroxy jasmonic acid.



**Figure S27:** Negative mode MS/MS spectrum of deoxy-dehydro-*N*-acetylneuraminic acid.



**Figure S28:** Negative mode MS/MS spectrum of nonanedioic acid.

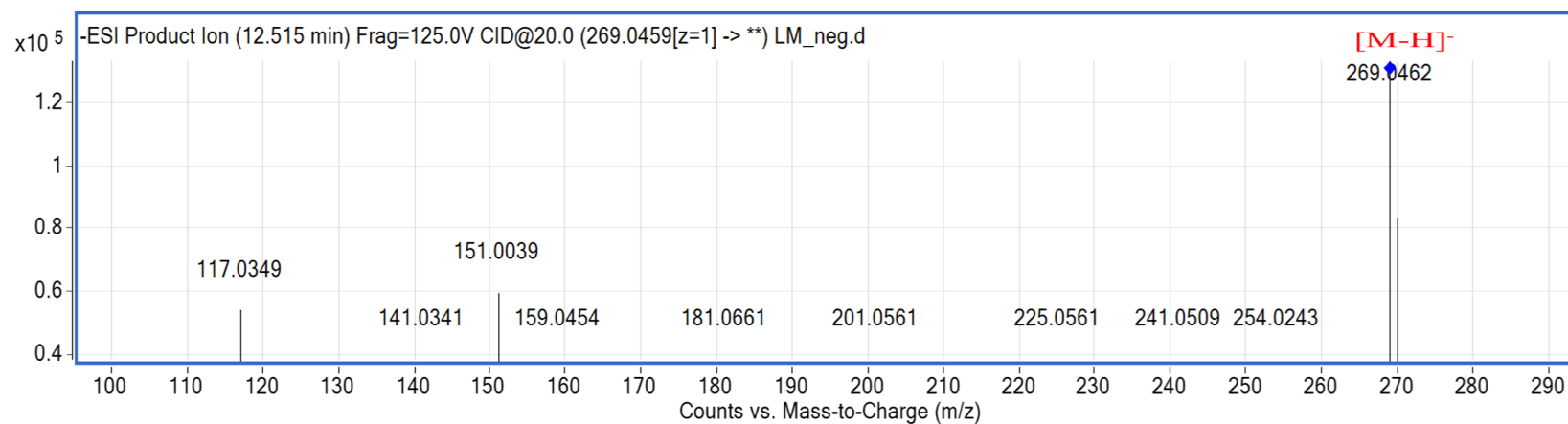


Figure S29: Negative mode MS/MS spectrum of apigenin.

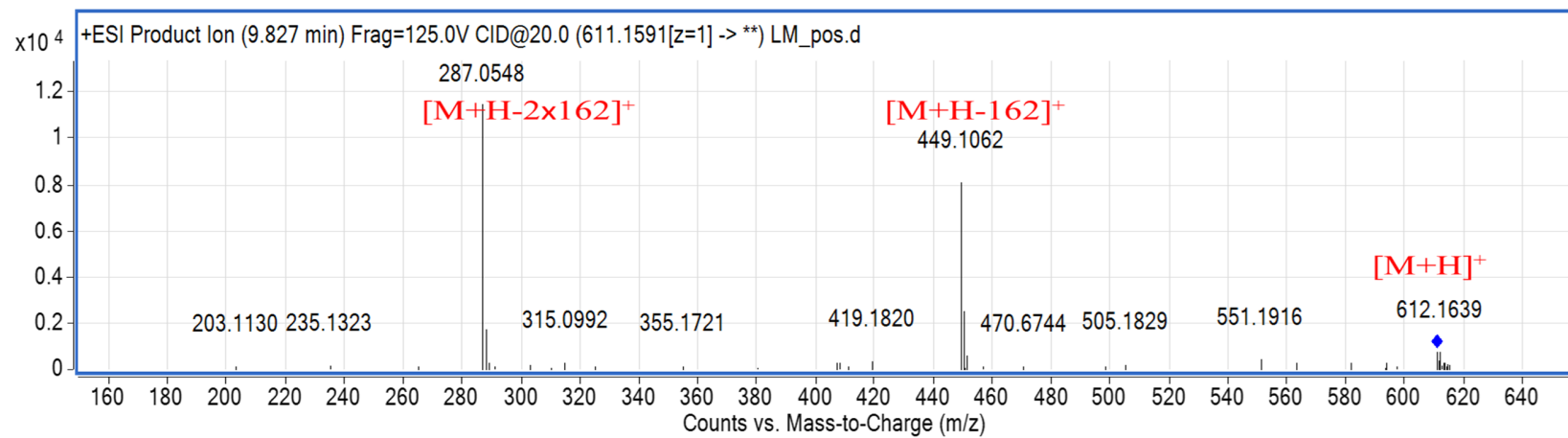


Figure S30: Positive mode MS/MS spectrum of luteolin-O-dihexoside.

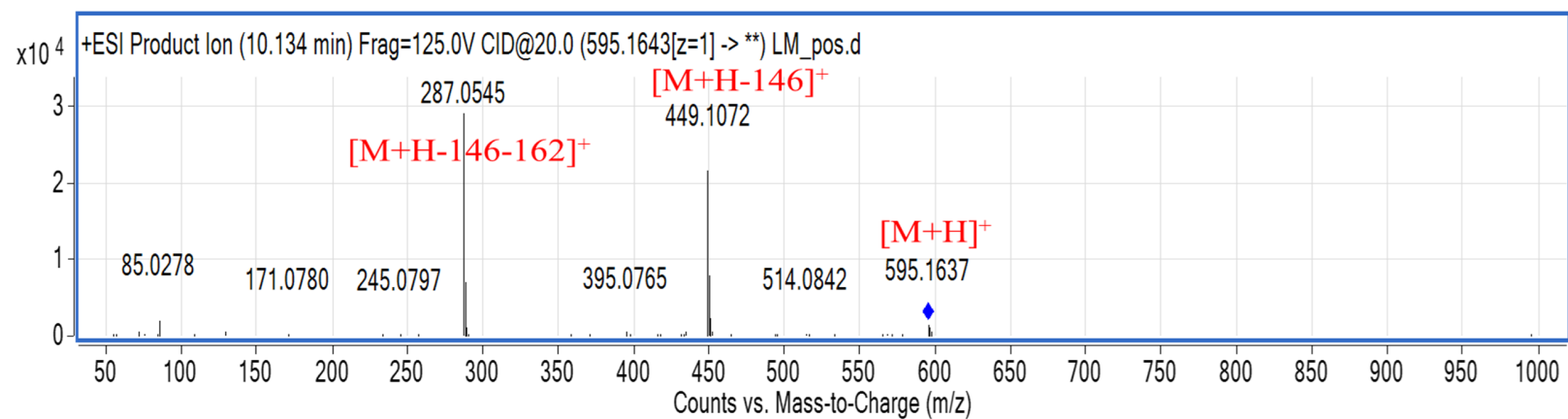


Figure S31: Positive mode MS/MS spectrum of luteolin-*O*-rutinoside.

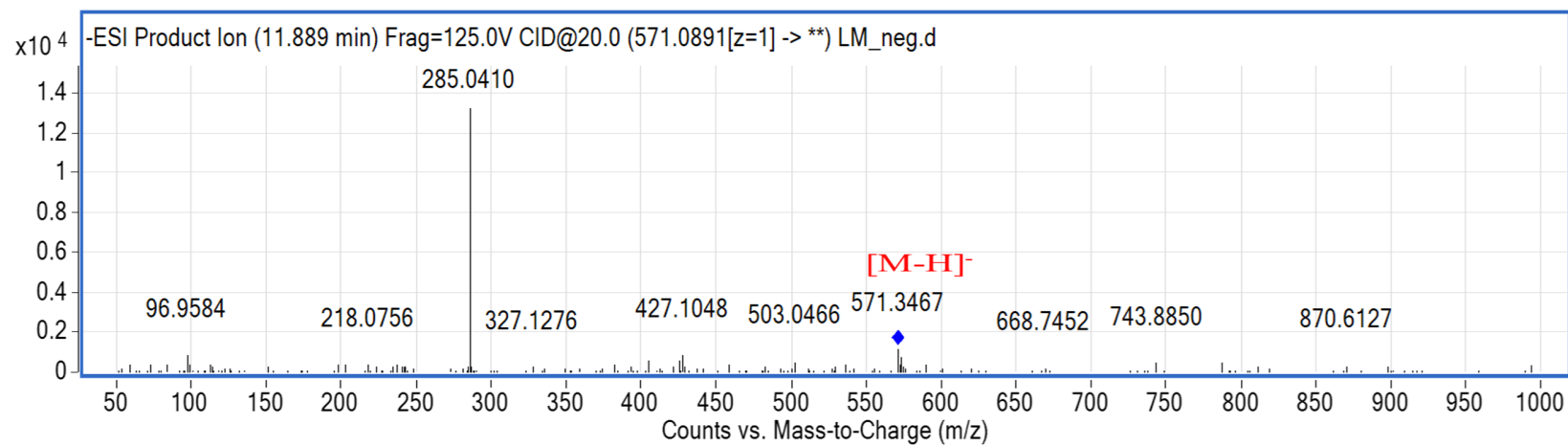


Figure S32: Negative mode MS/MS spectrum of unknown luteolin derivative.

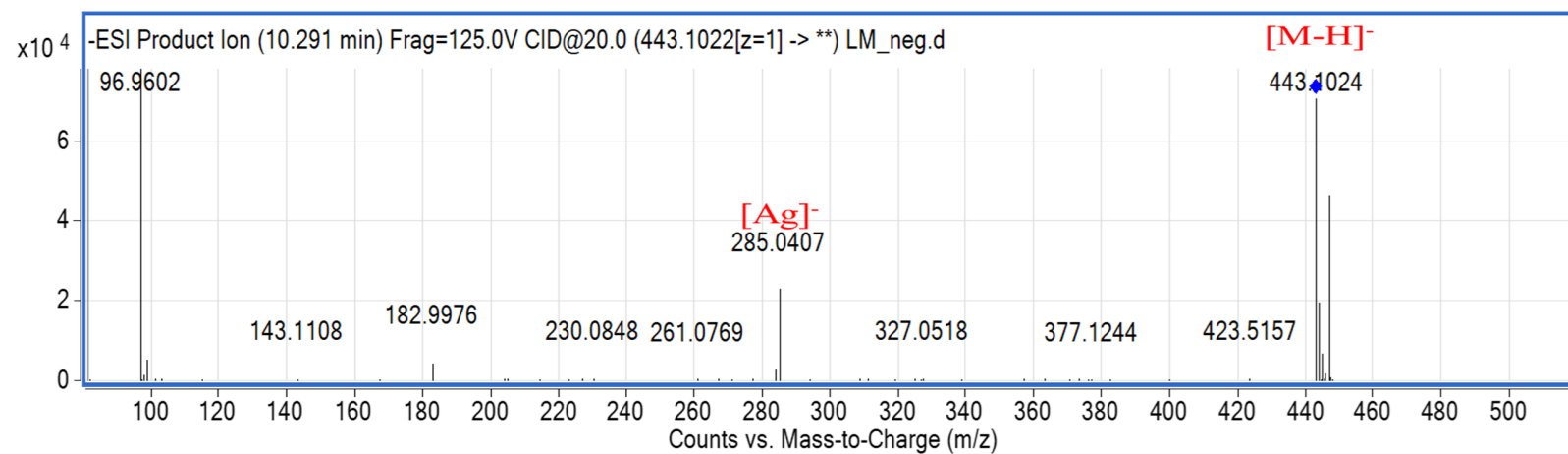


Figure S33: Negative mode MS/MS spectrum of unknown luteolin derivative.

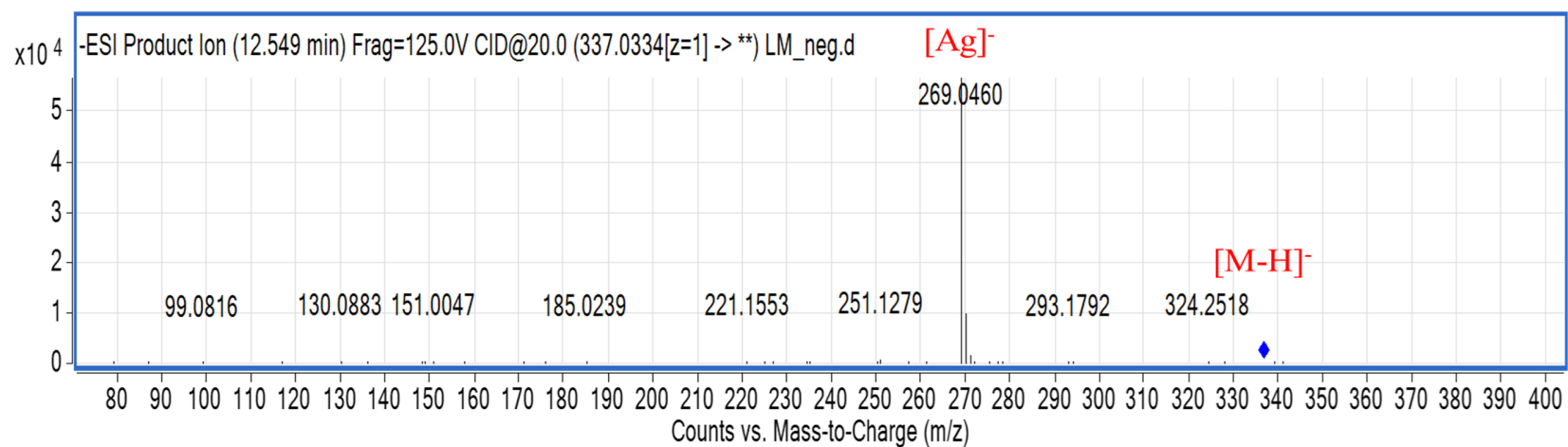
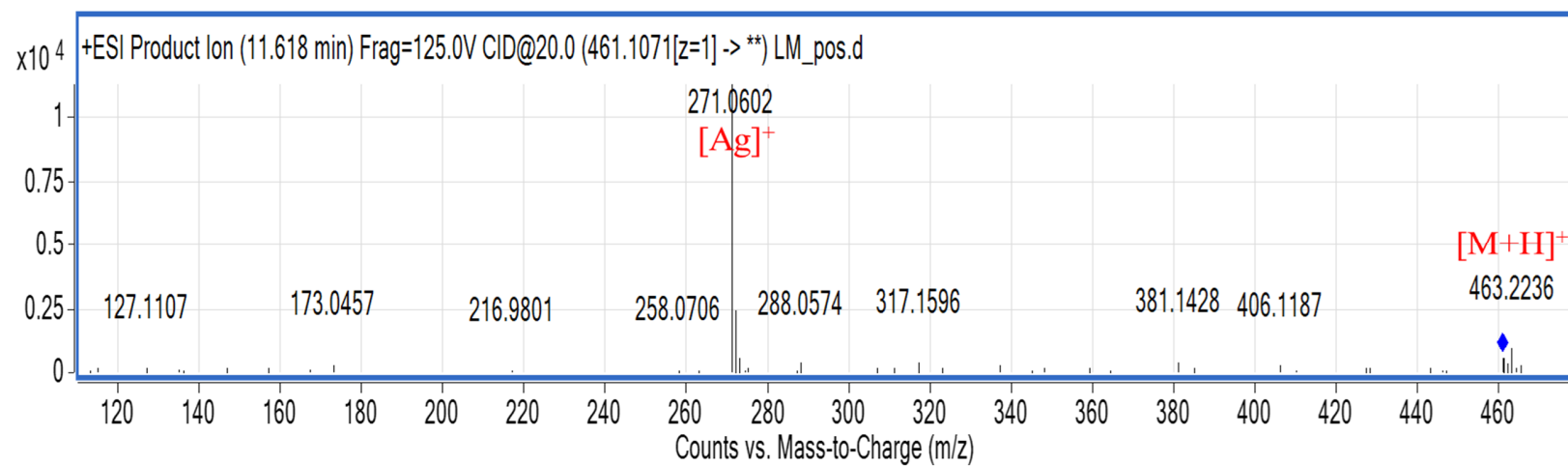
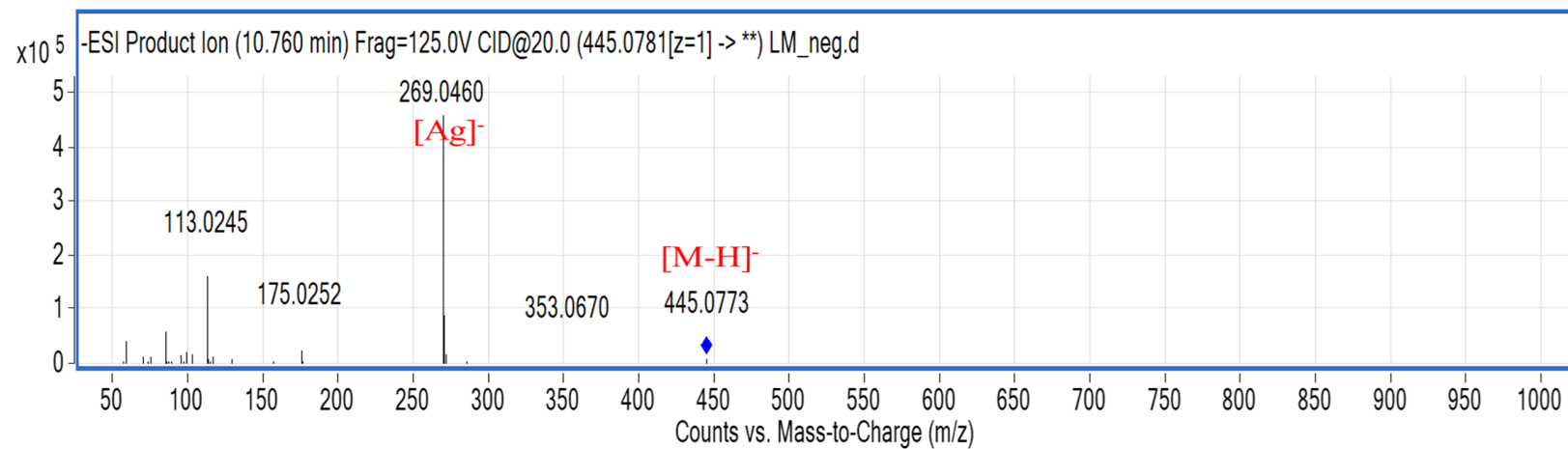


Figure S34: Negative mode MS/MS spectrum of unknown apigenin derivative.



**Figure S35:** Positive mode MS/MS spectrum of unknown apigenin derivative.



**Figure S36:** Negative mode MS/MS spectrum of unknown apigenin derivative.

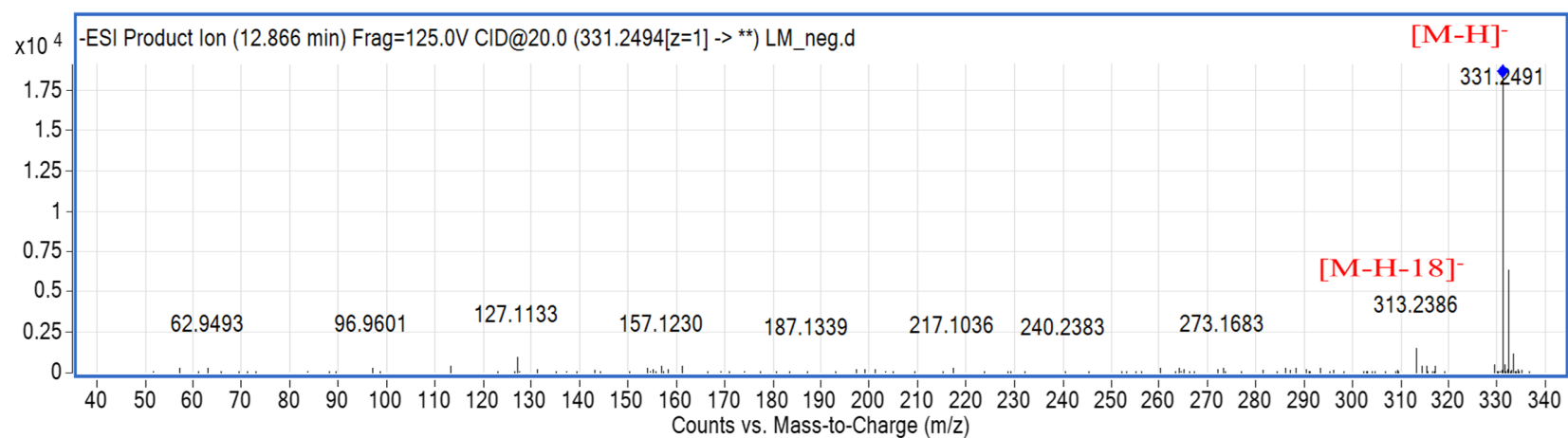


Figure S37: Negative mode MS/MS spectrum of trihydroxy octadecanoic acid.

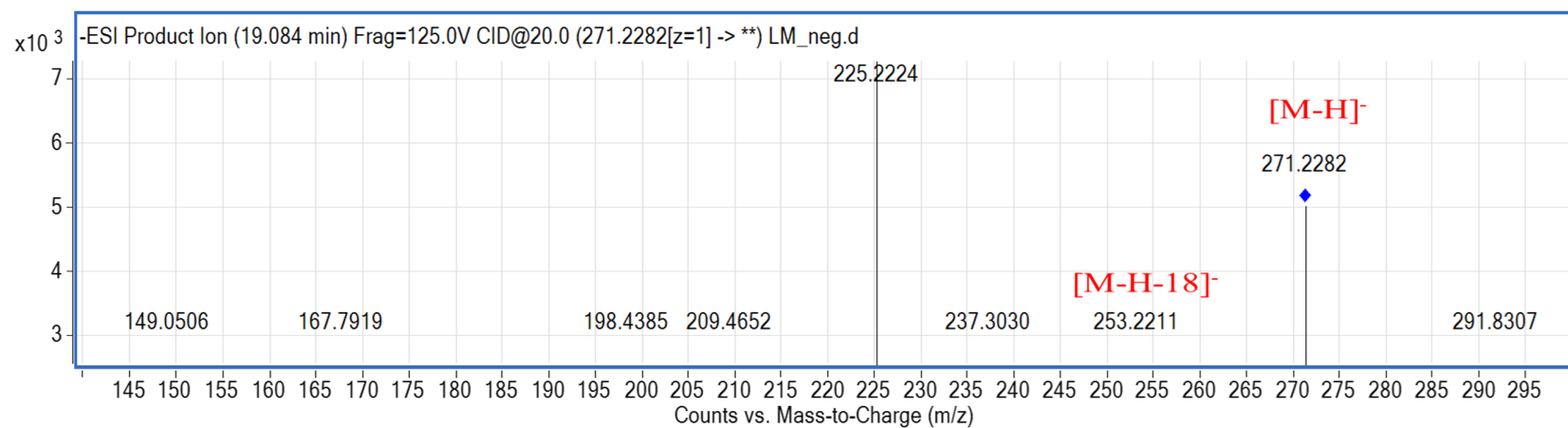


Figure S38: Negative mode MS/MS spectrum of hydroxy palmitic acid.



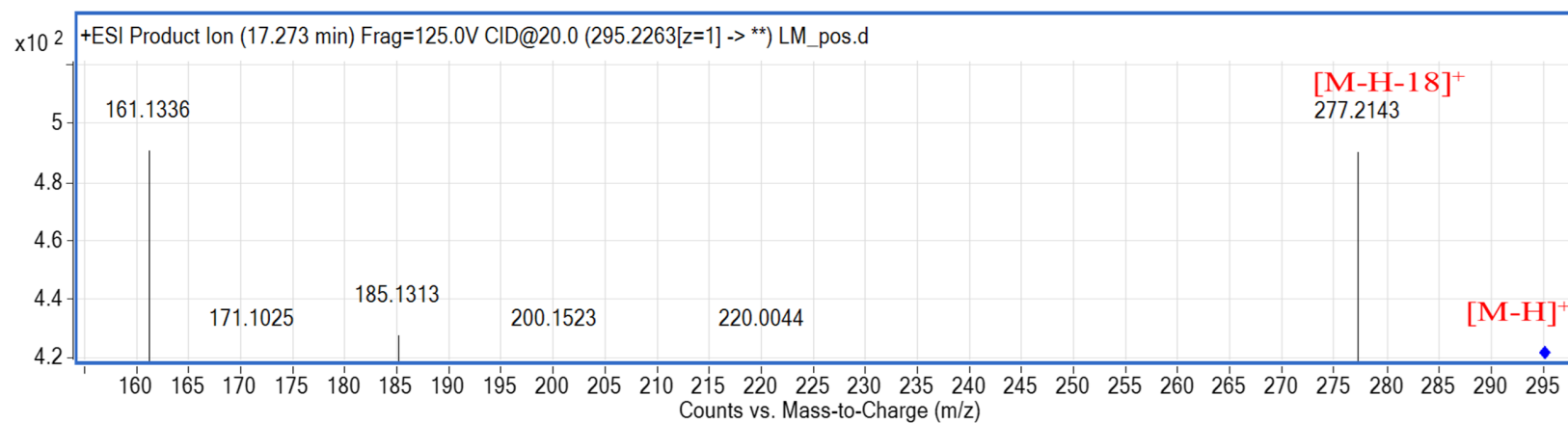


Figure S39: Positive mode MS/MS spectrum of hydroxy linoleic acid.

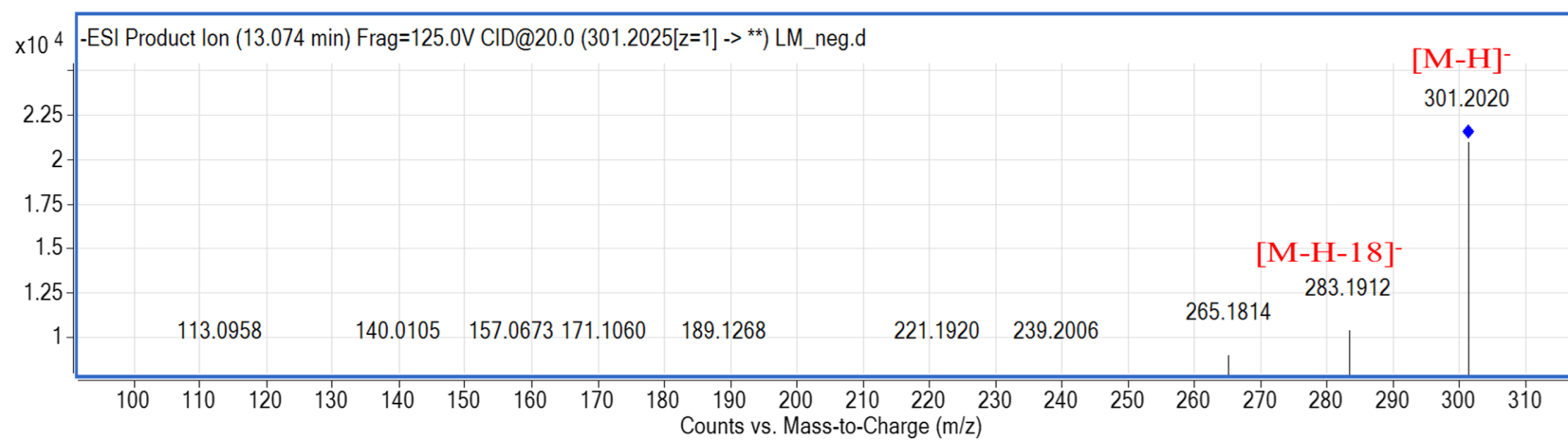
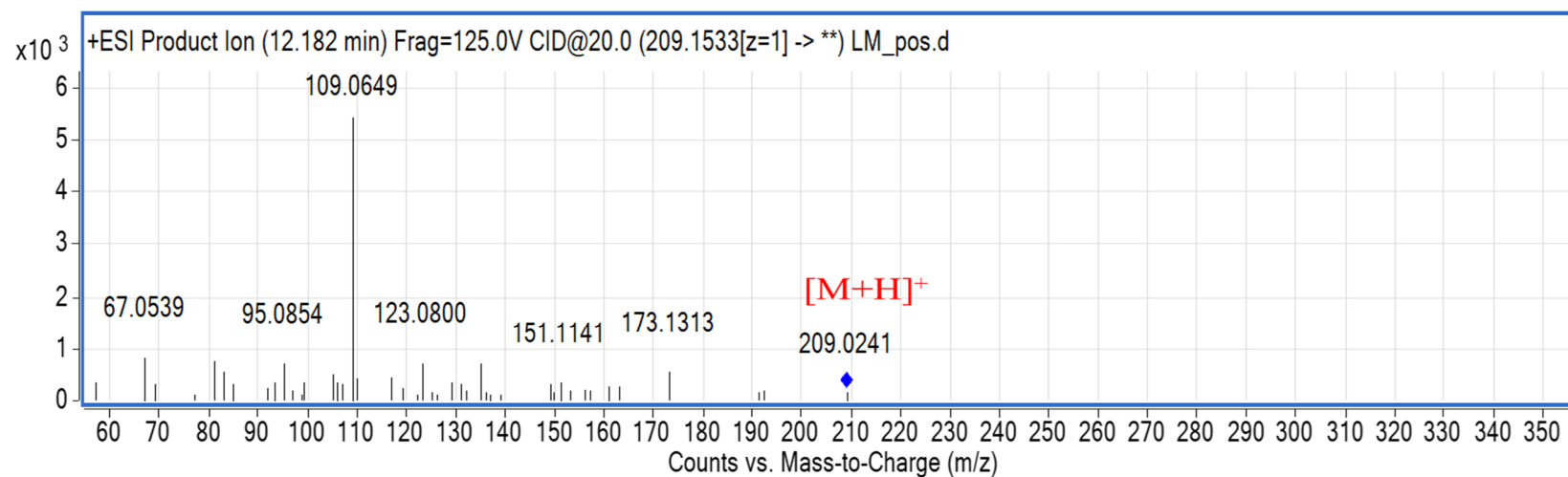
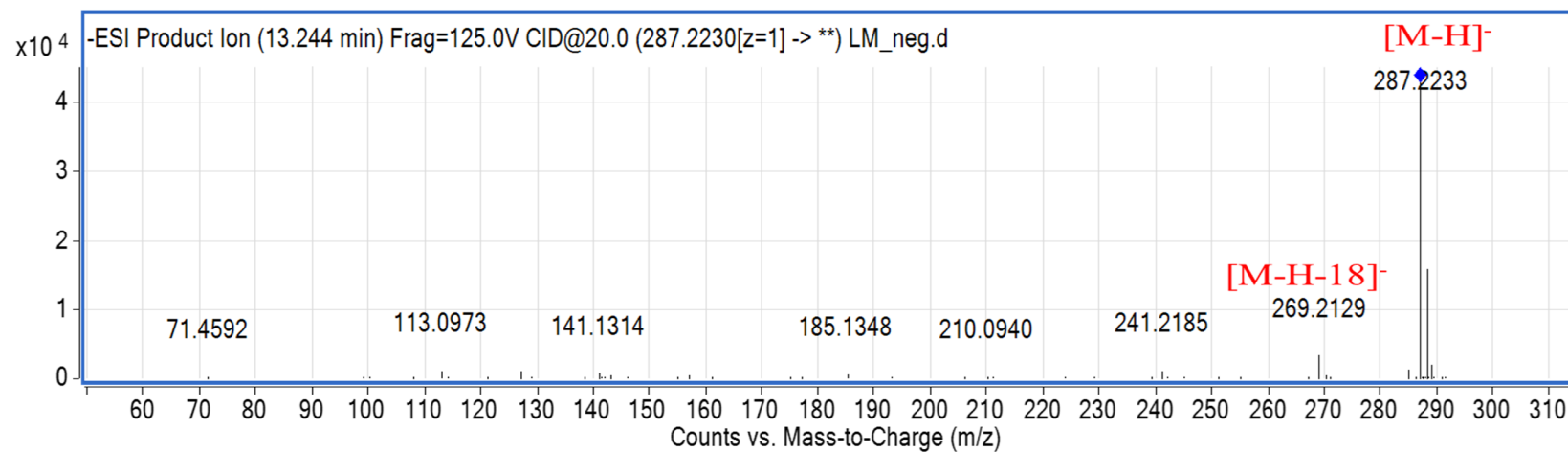


Figure S40: Negative mode MS/MS spectrum of hydroxy hexadecanedioic.



**Figure S41:** Negative mode MS/MS spectrum of tridecatrienoic acid.



**Figure S42:** Negative mode MS/MS spectrum of dihydroxy hexadecanoic.

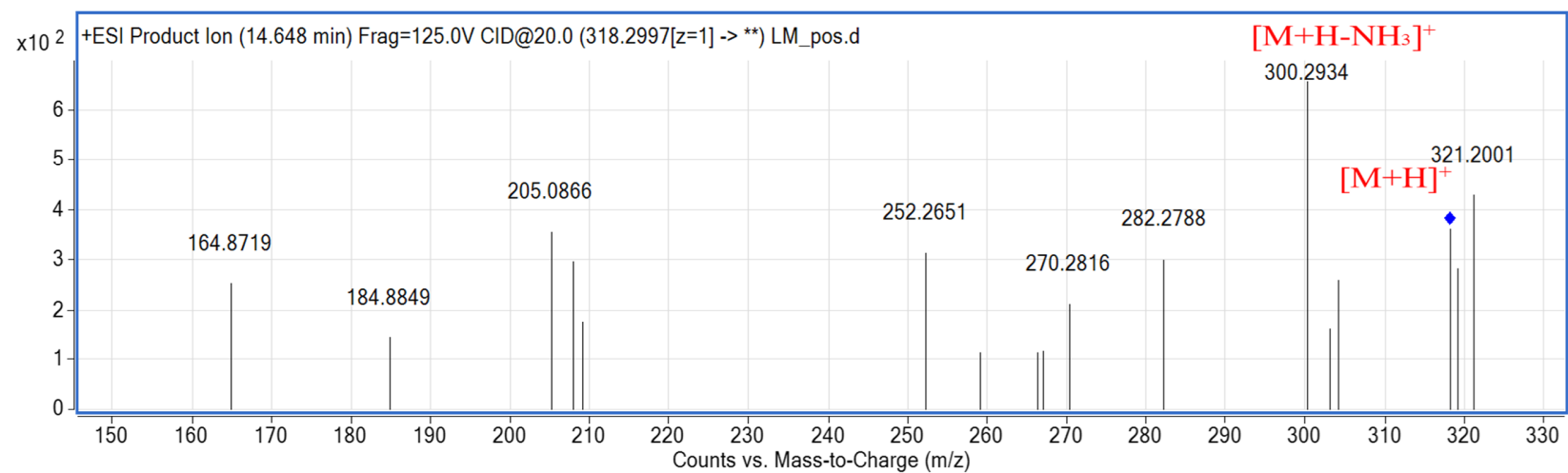


Figure S43: Positive mode MS/MS spectrum of amino octadecanetriol.

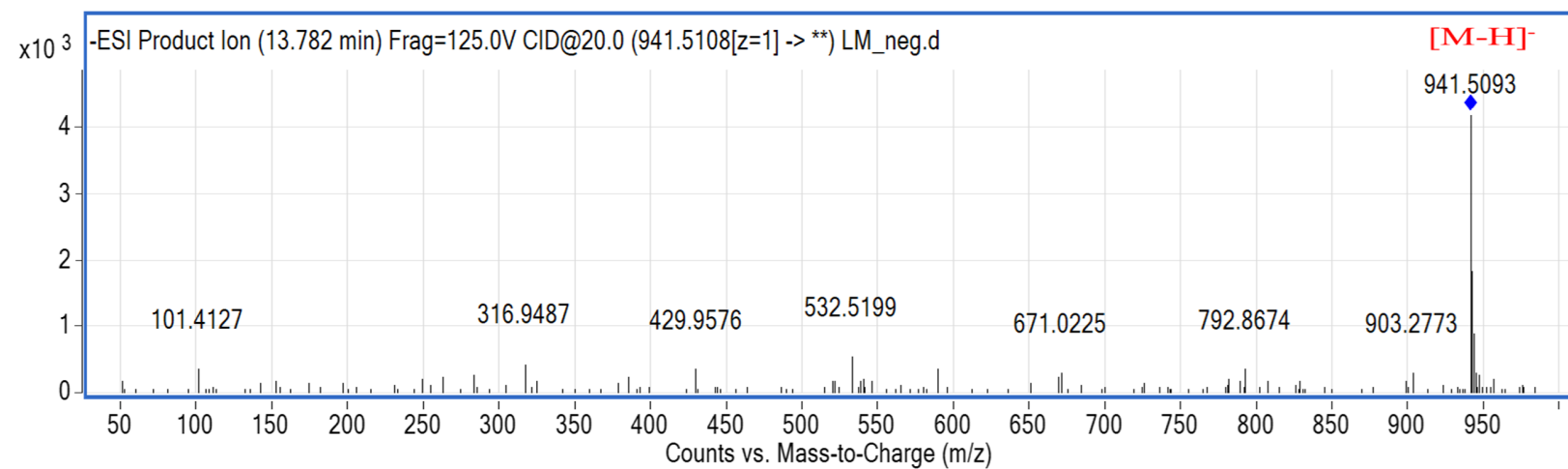


Figure S44: Negative mode MS/MS spectrum of phosphatidylinositol phosphate.