

Supplementary

LC-ESI-QTOF-MS/MS Profiling and Antioxidant Activity of Phenolics from Custard Apple Fruit and by-Products

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Abstract: Custard apple is an edible fruit grown in tropical and subtropical regions. Due to its abundant nutrient content and perceived health benefits, it is a popular food for consumption and is utilized as a medicinal aid. Although some published research had provided the phenolic compound of custard apple, the comprehensive phenolic profiling of Australian grown custard apple is limited. Hence, this research aimed to evaluate the phenolic content and their antioxidant potential by various phenolic content and antioxidant assays, followed by characterization and quantification the phenolic profile using LC-ESI-QTOF-MS/MS and HPLC-PDA. African Pride peel had the highest value in TPC (61.69 ± 1.48 mg GAE/g), TFC (0.42 ± 0.01 mg QE/g) and TTC (43.25 ± 6.70 mg CE/g), followed by Pink's Mammoth peel (19.37 ± 1.48 mg GAE/g for TPC, 0.27 ± 0.03 mg QE/g for TFC and 10.25 ± 1.13 mg CE/g for TTC). African Pride peel also exhibited the highest antioxidant potential for TAC (43.41 ± 1.66 mg AAE/g), FRAP (3.60 ± 0.14 mg AAE/g) and ABTS (127.67 ± 4.60 mg AAE/g), whereas Pink's Mammoth peel had the highest DPPH (16.09 ± 0.34 mg AAE/g), RPA (5.32 ± 0.14 mg AAE/g), *OH-RSA (1.23 ± 0.25 mg AAE/g) and FICA (3.17 ± 0.18 mg EDTA/g). LC-ESI-QTOF-MS/MS experiment successfully characterized 85 phenolic compounds in total, encompassing phenolic acids (20), flavonoids (42), stilbenes (4), lignans (6) and other polyphenols (13) in all three parts (pulp, peel and seeds) of custard apple. The phenolic compounds in different portion of custard apples were quantified by HPLC-PDA and showed that African Pride peel had higher concentrations of the most abundant phenolics. This is the first study to provide the comprehensive phenolic profile of Australian grown custard apples, and the results highlighted that each part of custard apple can be a rich source of phenolics for the utilization of custard apple fruit and waste in the food, animal feedings and nutraceutical industries.

Keywords: Custard apple; phenolic compounds; antioxidant potential; LC-ESI-QTOF-MS/MS; HPLC-PDA

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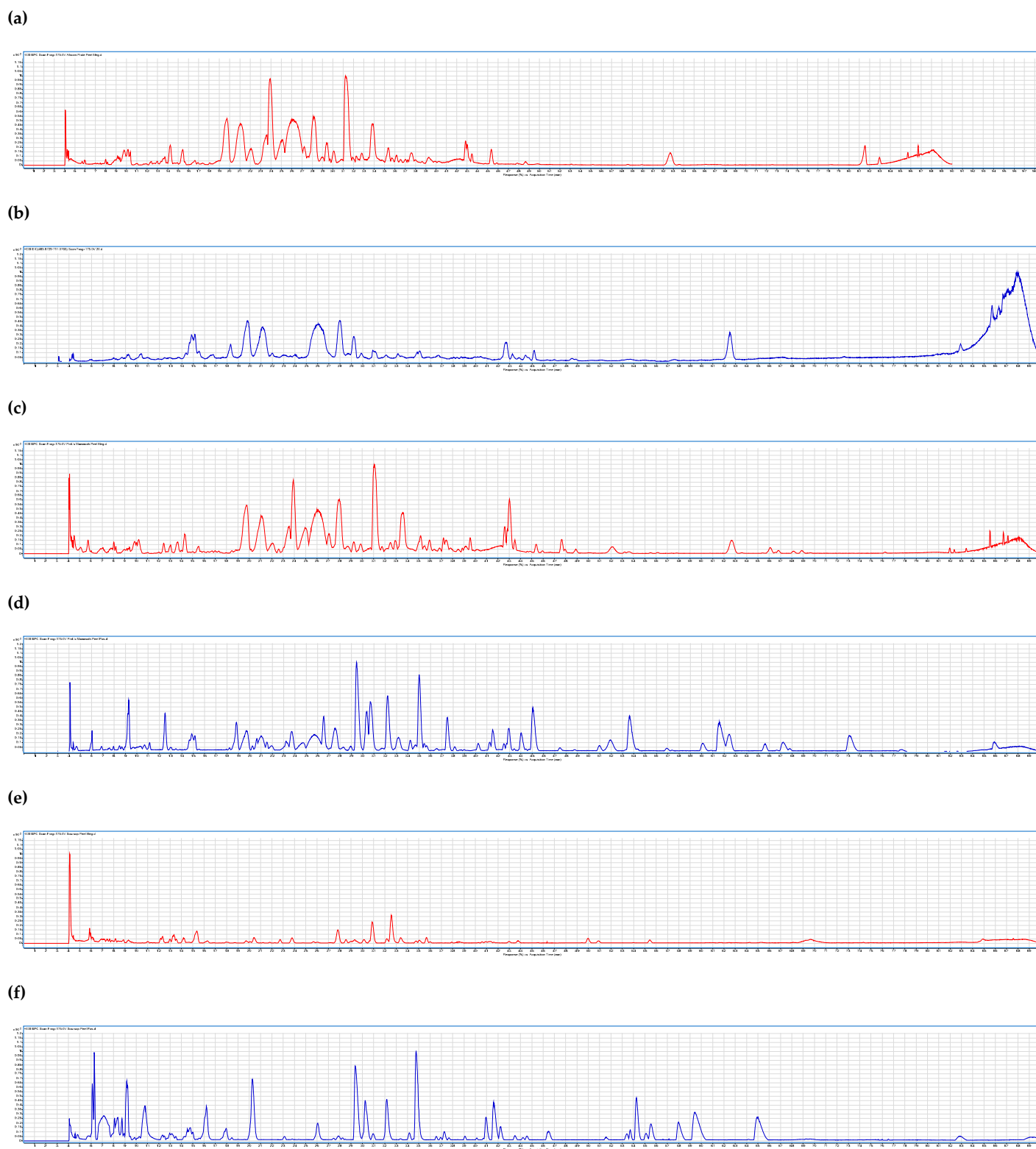


Figure S1: LC-ESI-QTOF-MS/MS basic peak chromatograph (BPC) for characterization of phenolic compounds of custrad apple peels. **(a)** African Pride in negative ionization mode; **(b)** African Pride in positive ionization mode; **(c)** Pink's Mammoth in negative ionization mode; **(d)** Pink's Mammoth in positive ionization mode; **(e)** Soursop in negative ionization mode; **(f)** Soursop in positive ionization mode.

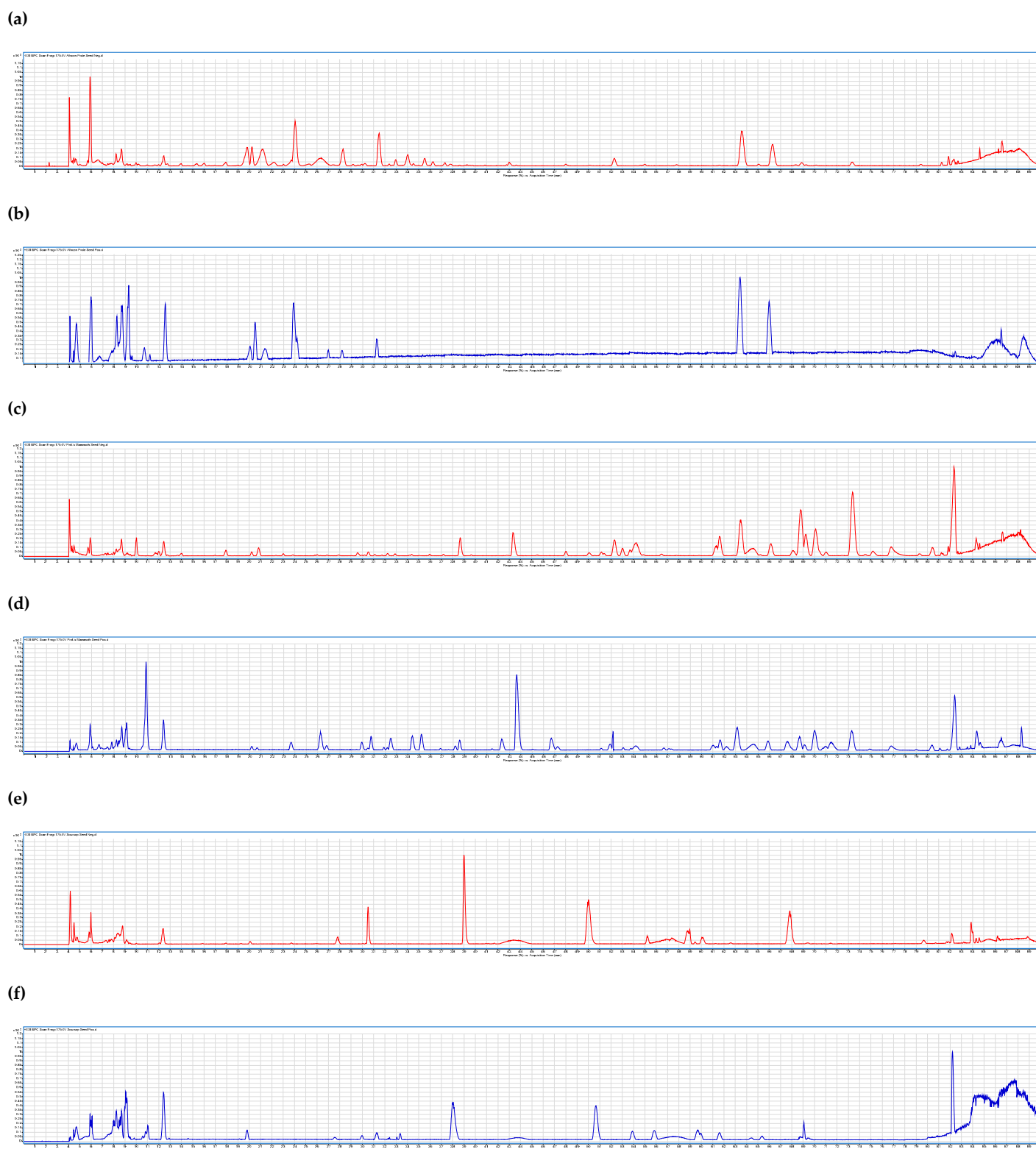


Figure S2: LC-ESI-QTOF-MS/MS basic peak chromatograph (BPC) for characterization of phenolic compounds of custrad apple seeds. **(a)** African Pride in negative ionization mode; **(b)** African Pride in positive ionization mode; **(c)** Pink's Mammoth in negative ionization mode; **(d)** Pink's Mammoth in positive ionization mode; **(e)** Soursop in negative ionization mode; **(f)** Soursop in positive ionization mode.

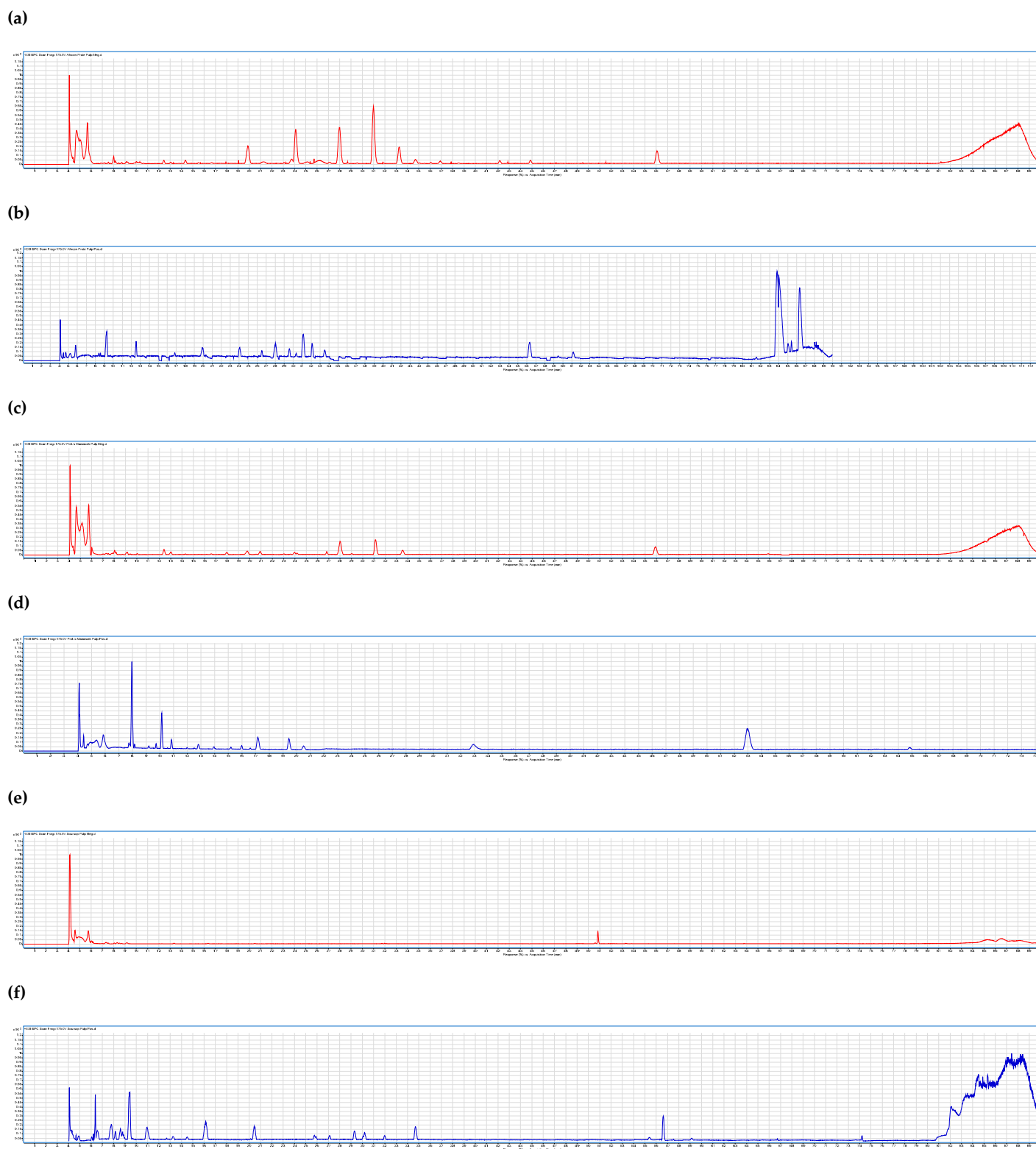


Figure S3: LC-ESI-QTOF-MS/MS basic peak chromatograph (BPC) for characterization of phenolic compounds of custrad apple pulp. **(a)** African Pride in negative ionization mode; **(b)** African Pride in positive ionization mode; **(c)** Pink's Mammoth in negative ionization mode; **(d)** Pink's Mammoth in positive ionization mode; **(e)** Soursop in negative ionization mode; **(f)** Soursop in positive ionization mode.