

## Solid-phase Extraction of Organic Acids from *Salicornia herbacea* L. (Hamcho) Combined with HPLC

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A solid-phase extraction (SPE) method for the determination of procatechuic acid, ferulic acid and caffeic acid in *Salicornia herbacea* L. (Hamcho) has been developed. The optimal condition was obtained by using a C18 SPE cartridge. By using ethanol and acetonitrile /water/ trifluoroacetic acid as washing and eluting solvents, most interferences originating from the hamcho matrix were eliminated. The extracts were sufficiently clean to be directly injected into HPLC for further chromatographic analysis. Good linearity was obtained from 0.1 to 200  $\mu\text{g/mL}$  ( $r^2 > 0.999$ ) for procatechuic acid, 0.2 to 400  $\mu\text{g/mL}$  ( $r^2 > 0.999$ ) for caffeic acid and 0.3 to 600  $\mu\text{g/mL}$  ( $r^2 > 0.999$ ) for ferulic acid with the relative standard deviations less than 3.6%. The mean recoveries of procatechuic acid, ferulic acid and caffeic acid from hamcho were more than 79.2% and the detection limit (S/N = 3:1) was 0.02  $\mu\text{g/mL}$  for procatechuic acid, 0.01  $\mu\text{g/mL}$  for caffeic acid and 0.04  $\mu\text{g/mL}$  for ferulic acid. This method is a viable alternative tool to the existing HPLC methods for analyzing the amount of procatechuic acid, ferulic acid and caffeic acid in hamcho.