Identification and quantification of potential anti-inflammatory hydroxycinnamic acid amides from root bark of *Lycium barbarum*

Hydroxycinnamic acid amide (HCAA) are commonly found in flowering plants [1], when conjugation of cinnamate derivatives with tyramine, tryptamine and dopamine derivatives [2]. A large number of studies have reported various biological activities exhibited by the HCCA family, including anti-fungal [3], antioxidant [4], anti-inflammatory [5] and anti-cancer [1] properties.

*Cortex Lycii*, the root bark of *Lycium barbarum*, exhibits various bioactivities that lead to an extensive study of their active components. The aim of this study was to synthesize a set of hydroxycinnamic acid amide (HCCA) compounds, including caffeic acid, ferulic acid and 3,4-dihydroxyhydrocinnamic acid with extended phenolic amine components to use as references for identifying and quantifying corresponding compounds extracted from *Cortex Lycii*, as well as to investigate the anti-inflammatory properties of these compounds *in vitro* by using an RAW264.7 macrophage model. With optimized LC-MS/MS and NMR analysis, a total of 14 amide compounds were successfully identified from *Cortex Lycii*. In addition to those previously reported in the literature, 11 of the compounds were identified in this plant for the first time. The amide compounds with a tyramine moiety were the most abundant, followed by dopamine with extended amine components. *In vitro* studies indicated seven HCCA compounds had a potent NO inhibitory effect on NO with IC$_{50}$ as low as 2.5 µM (*trans*-N-caffeoyl phenethylamine). These findings indicate that *Cortex Lycii* demonstrated promising anti-inflammatory effects and could potentially be used to provide bioactive components in the prevention and treatment of inflammation and inflammation-related diseases.

References: