Constituents in evening primrose oil with radical scavenging, cyclooxygenase, and neutrophil elastase inhibitory activities.


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Cold-pressed, non-raffinated evening primrose oil was found to contain lipophilic radical scavengers. A highly enriched fraction of these compounds could be obtained from the oil by extraction with aqueous ethanol and subsequent liquid-liquid partitioning with petroleum. LC-DAD-MS analysis revealed that the fraction contained three aromatic compounds with identical UV and ESI-MS spectra. The compounds were isolated by RP-HPLC and their structures established by chemical and spectroscopic means as 3-O-trans-caffeoyl derivatives of betulinic, morolic, and oleanolic acid. The morolic acid derivative was a new compound. The three esters exhibited pronounced radical scavenging activity against the stable 2,2-diphenyl-1-picrylhydrazyl radical and were potent inhibitors of neutrophil elastase and cyclooxygenase-1 and -2 in vitro. Commercial samples of evening primrose oils contained only traces of these lipophilic antioxidants.