

SUPERCRITICAL FLUID EXTRACTION OF LIPID COMPOUNDS FROM HEATHER (*CALLUNA VULGARIS*).

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Farmers' incomes have been in a decline since the 1970s and in the UK this reached a record low in 2000.¹ This trend has been particularly evident following the foot and mouth disease outbreak, most notably in upland areas, where farmers have to compete with invasive indigenous plants. If upland farmers could consider these plants as an asset, rather than a hindrance, they would be in a much stronger position to diversify and add value to upland areas. Heather (*calluna vulgaris*) is one such plant that is currently unexploited in the UK (of the remaining heather moorland in the world 75% is found in Britain).^{2,3} The harvesting and extraction of chemicals from such crops could potentially add value to an otherwise wasteful process. Previous investigations of heather have shown that they contain a wealth of secondary metabolites, in particular a high proportion of waxes, phenolic compounds and triterpenoids.^{4,5,6}

The aim of this project is to identify and selectively extract potential high value chemicals, namely, waxes, flavonoids and triterpenoids from heather. Initial work conducted has focused on developing protocols and procedures for the separation and identification of such compounds and groups of compounds. Extractions with hexane and chloroform have yielded amounts of wax, between 0.2–1.45% of the dry weight of the plant.⁴ Waxes included sterols, free fatty acids, wax esters, resin acids, sterol esters and triglycerides. Qualitative and quantitative analysis of such waxes are carried out by high temperature GC and GC-MS. Supercritical carbon dioxide was also investigated as an extraction solvent for waxes. Pure supercritical carbon dioxide extracted a greater yield of wax than previously reported for heather.⁴ The process conditions during the extraction with supercritical CO₂ are still to be optimised with respect to pressure, temperature, the nature and percentage of the modifier.

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