

Purification of Curcumine, Demethoxycurcumine and Bisdemethoxycurcumine from Curcuma longa L.

Introduction

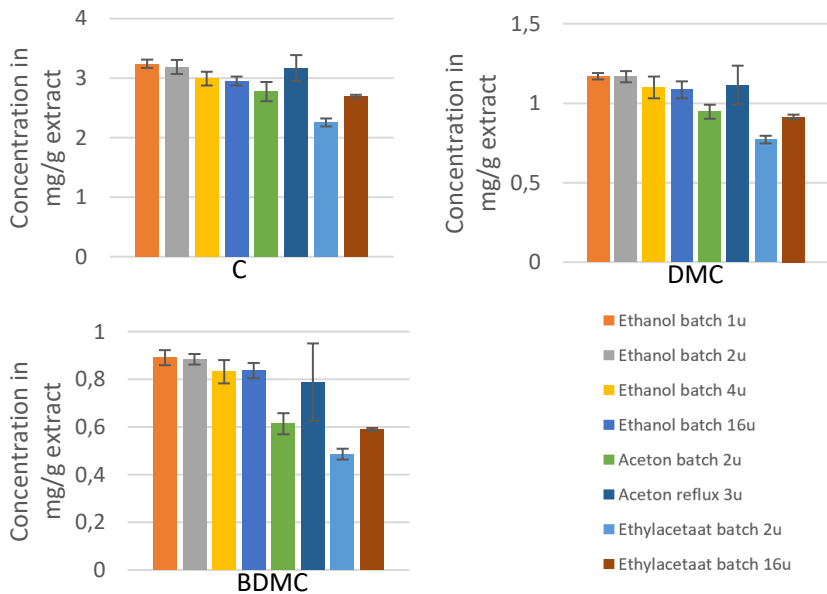
Many biobased plastics still use synthetic colourants as dyes, which can be toxic to the environment. An alternative to synthetic colourants are natural colourants, such as curcumine. Curcumine can be found in and extracted from *Curcuma longa* L. and has a yellow-orange colour. Curcumine, however, has poor UV-stability. The CurCol project aims to improve the UV-stability. On top of that, the CurCol projects also wants to make the colours blue and red from the yellow curcumine, so that all other colours can also be made. Results from recent studies also showed that curcumine is extracted from *Curcuma longa* L., as well as demethoxycurcumine (DMC) and bisdemethoxycurcumine (BDMC). It is possible that DMC and BDMC could possibly interfere with future experiments.

Definition

The aim of this project is to increase the purity of curcumine, DMC and/or BDMC in extract of *Curcuma longa* L. whilst keeping a high yield. This will be accomplished by using different techniques such as (re)crystallisation and adsorption. The samples will be analysed using HPLC.

Results

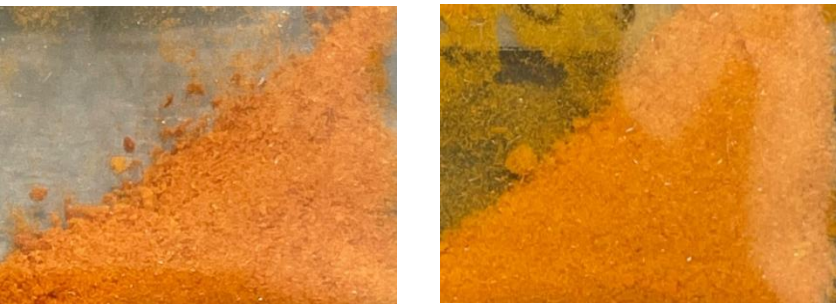
Extraction



Best extraction method for curcumine DMC and BDMC seems to be ethanol batch extraction for 1 hour. The worst seems to be ethylacetate batch extraction for 2 hours. Acetone gives the highest stdev. Purity is higher for ethylacetate which makes it the better choice.

Crystallisation

Crystallisation using ethanol or acetone did not result in crystals. Ethylacetate did after concentrating the extract.



On the left crystals, on the right the left crystals recrystallized.

	Purity (%)			Yield (mg)		
	C	DMC	BDMC	C	DMC	BDMC
Extraction	0,3	0,1	0,1	266	89,4	57,8
Crystallisation	55,2	12,4	3,3	161	36,2	9,62
Recrystallisation	68,3	11,0	1,2	81,7	13,1	1,48

Adsorption

Magnesium oxide and Diaion WA30 free base seemed to work as adsorption medium, due to the decrease in concentrations of the 3 curcuminoids. Desorption, however, has not yet been successful. The usual ratio of the 3 curcuminoids seemed to change as well with magnesium oxide, as more curcumine was adsorbed than BDMC. Silica showed no difference in concentrations, which suggests that silica does not adsorb the curcuminoids. More research needs to be done to see if silica might still increase the purity by adsorbing impurities.

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