

Extraction of eucalyptus for cosmetic use *UniversalExtractor E-800: Extraction of plant material for active ingredients for cosmetics at the example of eucalyptus (Eucalyptus nitens)*

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The research and development of natural and sustainable alternatives for cosmetics, just as effective as conventional synthetic ingredients, is a strong driving force behind innovation. Extraction is a crucial step in the development process of such natural ingredients. This application note describes the extraction of plant material using BUCHI's UniversalExtractor E-800 by the example of eucalyptus.

1. Introduction

Traditional extraction methods as maceration are easy-to use and low in costs, but they are energy-, time- and solvent-consuming. In the so-called screening it is necessary to test a large number of extracts to identify a raw material of interest. Automated extraction methods allowing to process several raw materials simultaneously or a single raw material under different conditions, can considerably increase the efficiency of the screening. In this application note, the traditional maceration is compared to the automated methods of the UniversalExtractor E-800.

2. Experimental

Equipment: UniversalExtractor E-800, Rotavapor R-3, HPLC

Samples: Eucalyptus shoots, Eucalyptus nitens (Deane and Maiden) Maiden (family Myrtaceae). The samples were air-dried in the dark and ground.

Maceration: the samples were extracted with ethanol for 1 h 20 min under stirring. The extract was concentrated using a Rotavapor R-3.

UniversalExtractor E-800: Approx. 10 g of plant material were extracted with 150 mL ethanol using the parameters given in Table 1.

Table 1: Parameters for the extraction with the UniversalExtractor E-800.

Step	Soxhlet	Soxhlet warm	Hot extraction	Twisselmann
Extraction				
Time	0 min	0 min	80 min	80 min
cycles	6 cycles	6 cycles		
Heating level ¹	10	10	10	10
Heating chamber	-	5	5	5
Rinse				
Time	10 min	10min	10min	10min
Heating level	10	10	10	10
Drying	□AP 0 min	□AP 0 min	□AP 0 min	□AP 0 min

¹ The heating levels are lower than recommended by BUCHI on purpose to have a gentle extraction.

3. Results

The determined extract contents in % is compared in Figure 1.

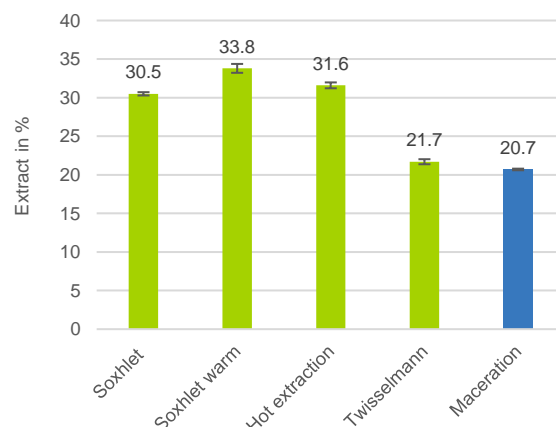


Figure 1: Comparison of total extract content obtained with different extraction methods. (mean value n=3, error bars indicate standard deviation)

The yielded extract content using the methods Soxhlet, Soxhlet warm or Hot extraction are in average 11.3 % higher than with the traditional maceration. Whereas the extraction method Twisselmann shows equivalent results to the traditional maceration. The extracts were analysed by HPLC to compare the profiles obtained by the different extraction methods and the traditional maceration. All extracts obtained by using the UniversalExtractor E-800 present similar chromatographic profiles. They are characterized by highly polar compounds and more lipophilic compounds.

4. Conclusion

The UniversalExtractor E-800 from BUCHI is particularly suitable for the extraction of plant raw materials for the development of natural cosmetic active ingredients.

5. Acknowledgements

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6. References

For more detailed information refer to Application Note 420/2021, go to BUCHI Application finder on www.buchi.com/application