

Essential oils

How can we extract them with « green alternative » ?

Introduction

Techniques for the extraction

The different processes

A new process : Microwaves hydrodiffusion and gravity

Conclusion

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Essential oil : What & Why ?

✓ What ?

Definition

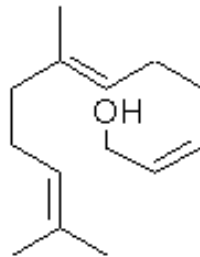
Different essential oils

Cineole
(eucalyptus)



Monoterpene

Farnesol
(anise)



Sesquiterpene



✓ Why ?

Properties

An example of essential oil

✓ What ?

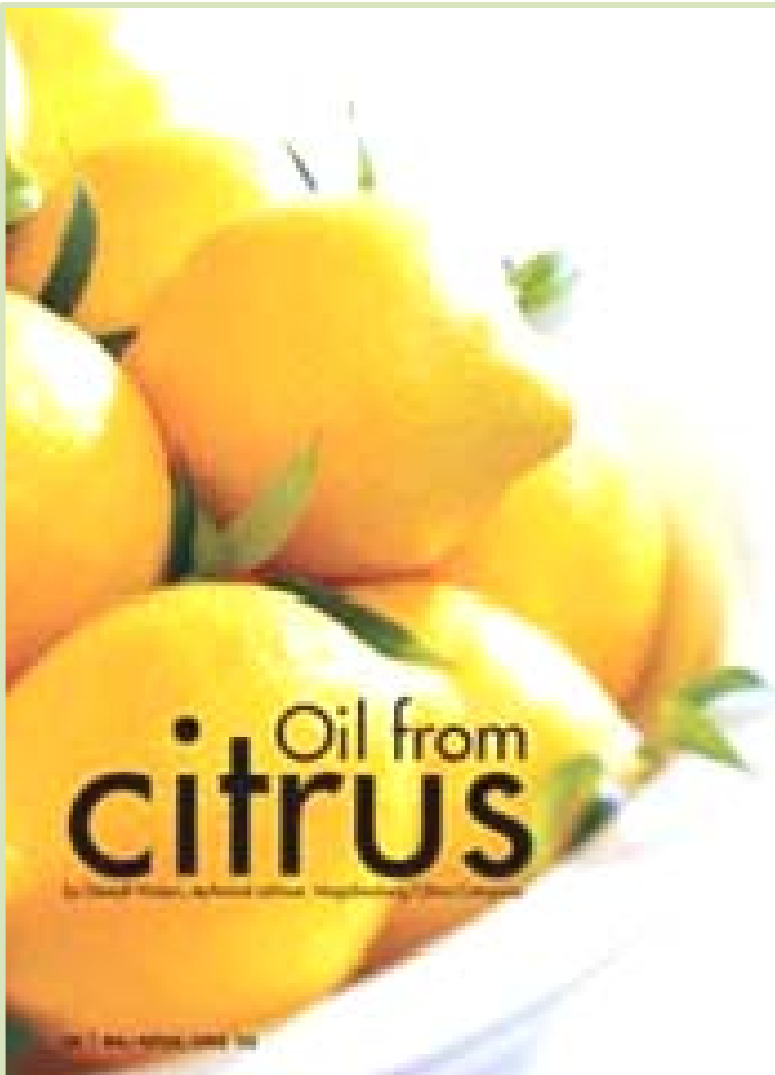
Citrus essential oils

✓ Why ?

the most widely used in the world

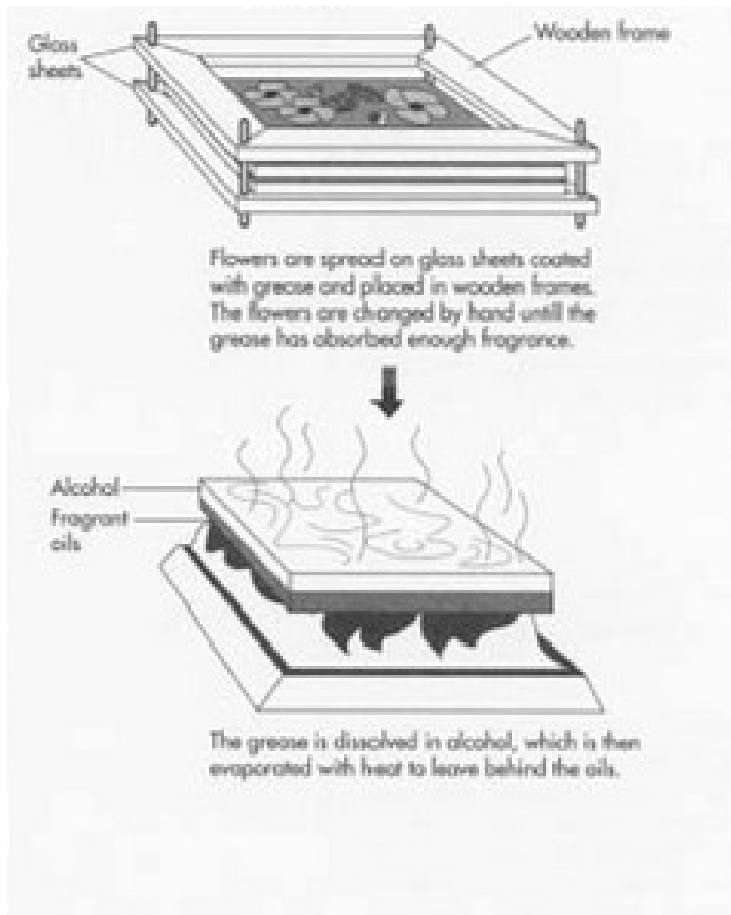
✓ Where ?

- aroma flavor
- pharmaceutical industries
- perfumery & cosmetic

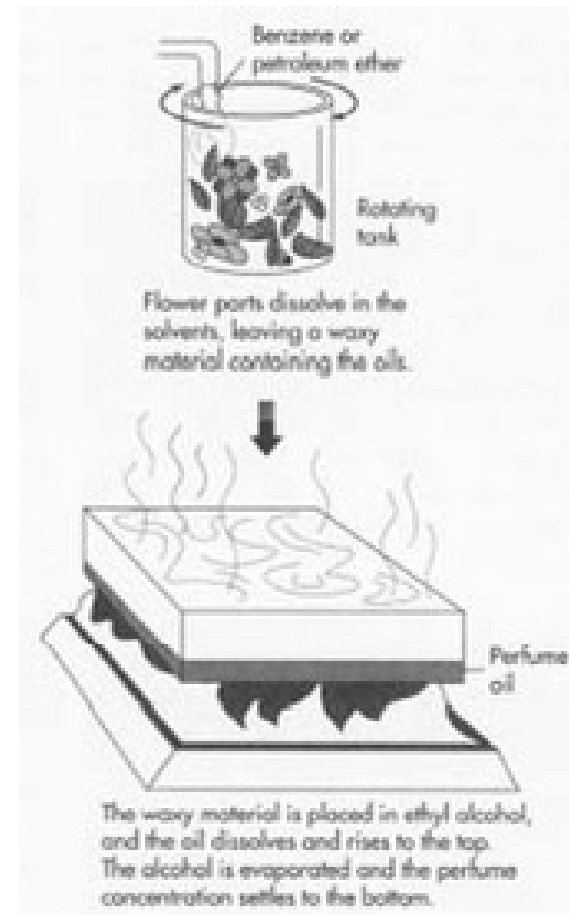


Different techniques

✓ Enfleurage

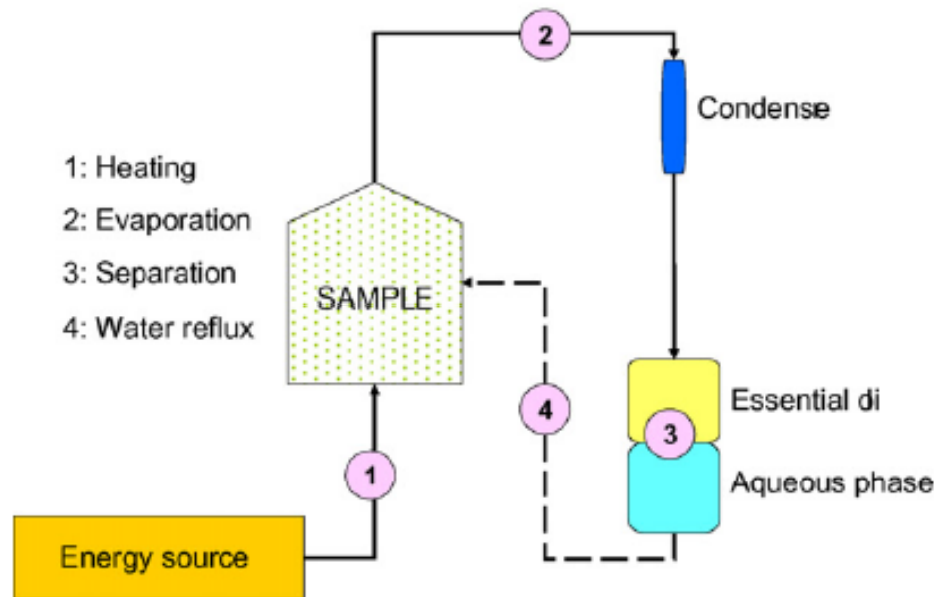


✓ Solvent extraction

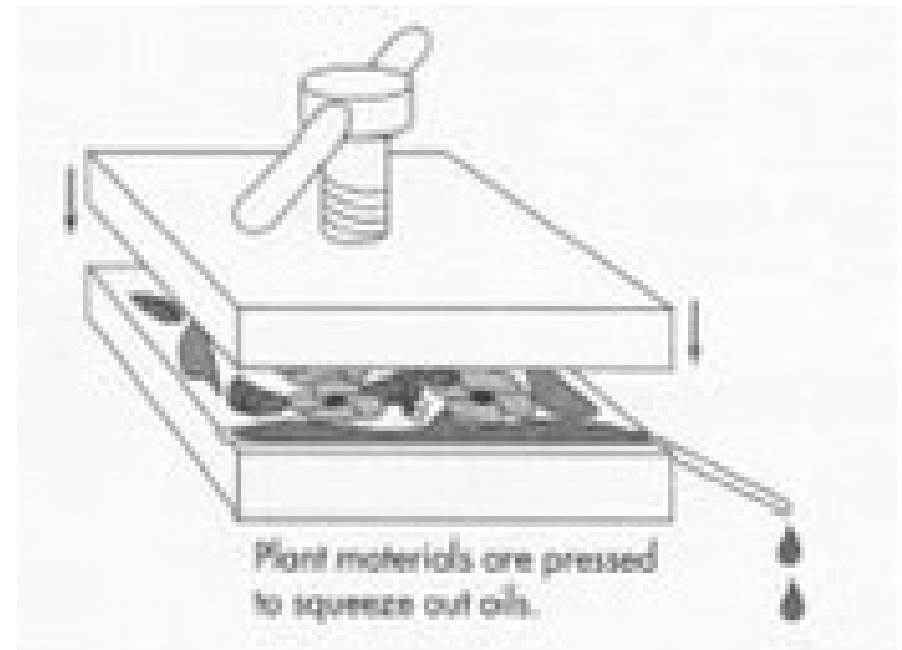


Different techniques

✓ Hydrodistillation



✓ Expression or cold pressing



A new and green alternative technique

Microwave hydrodiffusion and gravity

Material:

- Milestone microwave laboratory oven
- 500g of fresh citrus peels

Method:

- heating 15 min
- collected, dried, stored at 4°C

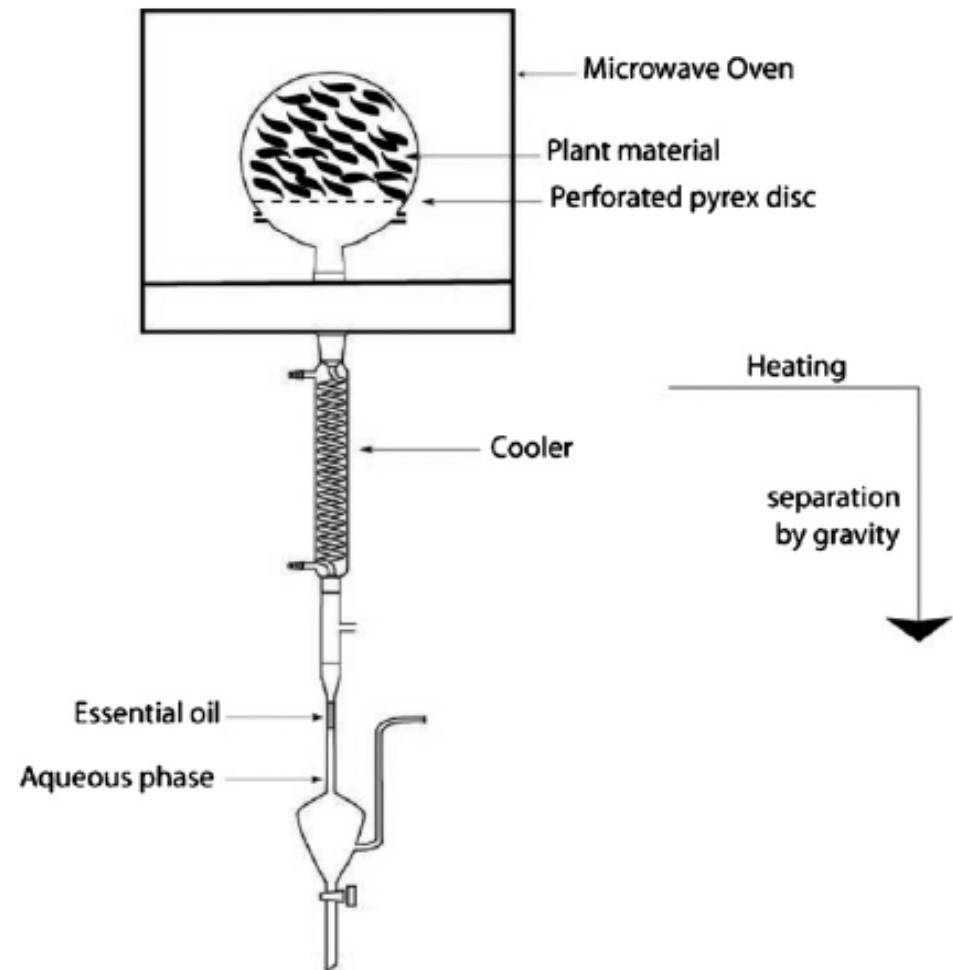


Fig. 1. Microwave hydrodiffusion and gravity.



References :
Journal of Chromatography A

Results and discussion

Determination of the appropriate microwave irradiation power

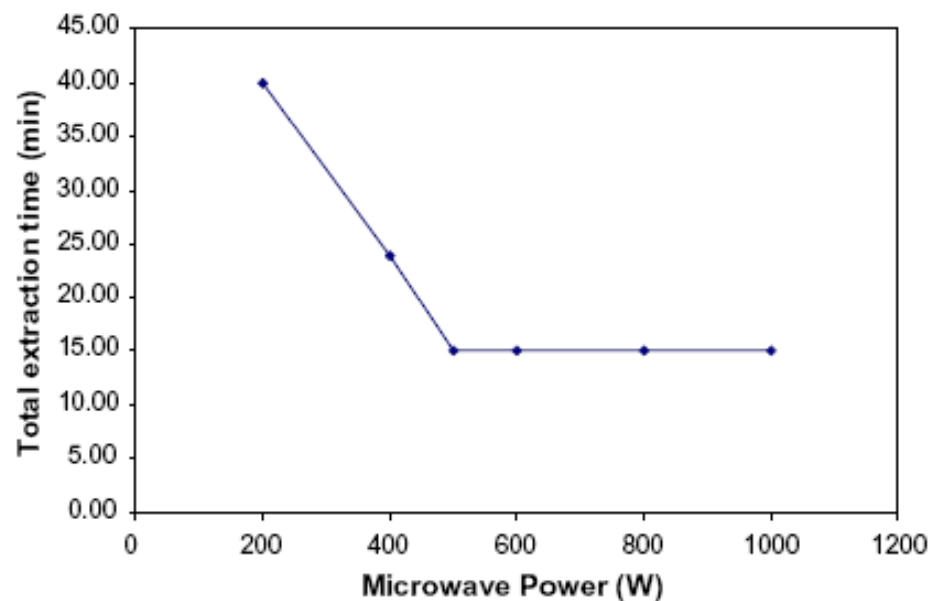


Fig. 2. Microwave power profile as a function of total extraction time with MHG.

Comparison of the yield of MHG and HD

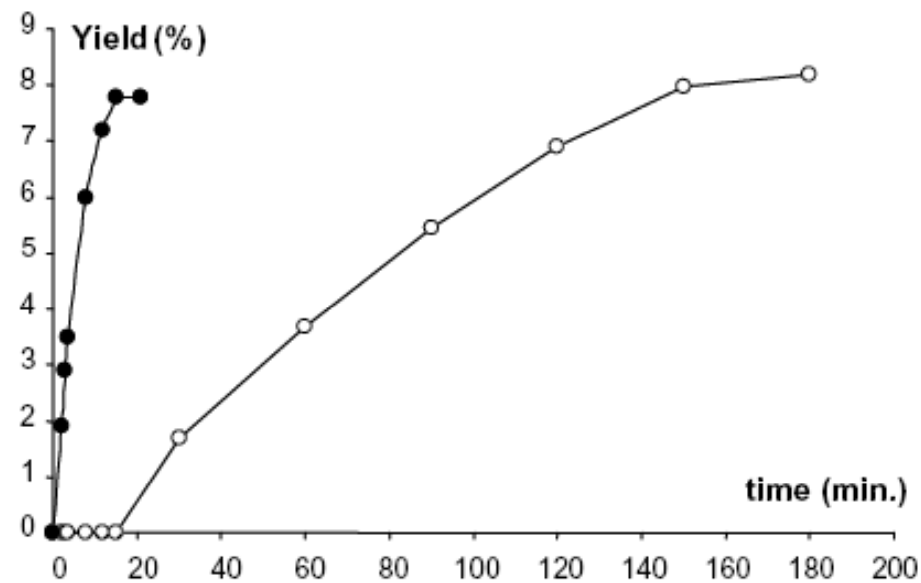


Fig. 3. Yield (g EO/g lime peel) profile of lime essential oil obtained by MHG (●) and HD (○) as function of the extraction time.

Conclusion

- ✓ containing volatile aroma compound from plants
- ✓ have many different properties
- ✓ can be extract with different process
- ✓ but too shortcomings

→ **We need a new process for the extraction of natural substances**

Advantages? >>>



Conclusion



- ✓ reduces the price of production
- ✓ reducing the final product price
- ✓ limit the risks of the use of essential oils
- ✓ eliminate harmful compounds dangerous for mankind

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Resources :

Scientific articles:

M.A. Vian et al., **Microwave hydrodiffusion and gravity, a new technique for extraction of essential oils.** J. Chromatogr. A 1190 (2008) 14-17.

N. Bousbia et al., **A new process for extraction of essential oil from *Citrus* peels: Microwave hydrodiffusion and gravity.** Journal of Food Engineering 90 (2009) 409-413.

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