

Volatile composition, biological properties and potential uses of hydrolates

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Introduction

An hydrolate (H) is internationally defined as the distilled aromatic water that remains after hydro- or steam distillation and separation of the essential oil (EO), Fig. 1. Because EO is the prime distillation product, hydrolate is considered a by-product or even a waste. The movement towards a circular economy has increased the interest in the essential oil industry co-products, such as hydrolates.

Volatiles composition and Bioactivities

Hydrolates composition has been mostly studied on their volatile constituents (mainly oxygen-containing compounds) and biological properties (Fig.2). In total, **333 hydrolates** after EO isolation from **186 species** and **49 families** were surveyed (Fig.3).

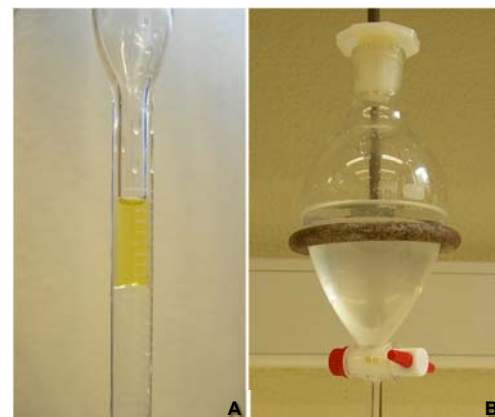


Figure 1. Separation of the essential oil (supernatant) from the hydrolate bottom layer (A) and liquid-liquid extraction of the hydrolate (B).

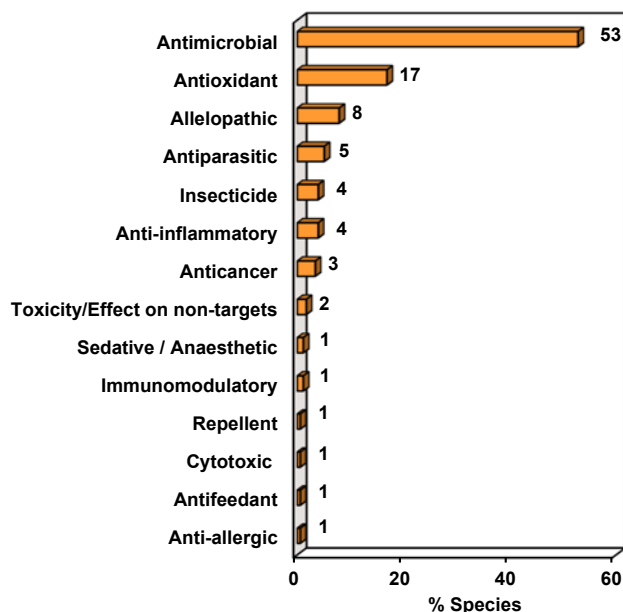


Figure 2. Percentage of studies that assessed hydrolates biological properties. Included are only studies that showed hydrolates positive response to the test.

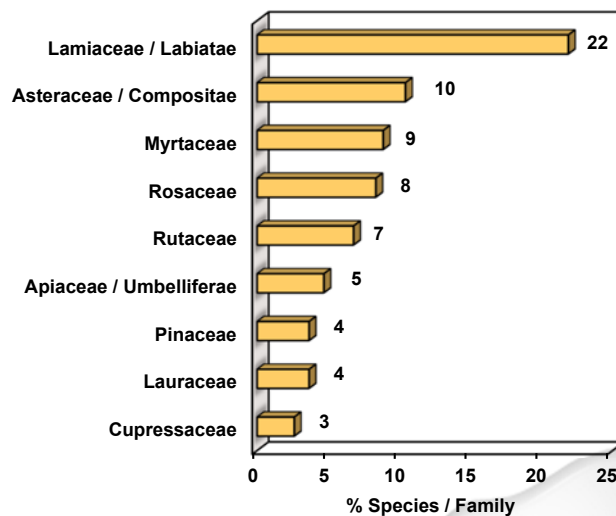


Figure 3. Percentage of species per family, whose hydrolates have been studied. Represented are only families with a number of species studied ≥ 3 .

Potential uses

Therapeutical

- Anticancer
- Anti-inflammatory
- Immunomodulatory

Non-therapeutical

- Aquaculture management
- Bioherbicides
- Disinfectant
- Pest control

Conclusions

- ✓ In the context of sustainability and circular economy, the hydrolates are one of the co-products of EO industry, and highly desirable as input for other processes. They have shown a diverse range of biological properties, with potential application in many industries.

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