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BOOK OF ABSTRACTS



"Jasmine fields" by Rosa Elisa La Rosa, acrylic on canvas, Milazzo 2022

Essential oil composition of *Lithraea molleoides* (Vell.) Engler (Anacardiaceae), a controversial medicinal, edible, and allergenic species from South America

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Objective

Lithraea molleoides (Vell.) Engler (Anacardiaceae family) is an evergreen tree species native from South America, considered as a medicinal and edible plant in Argentina [1]. The infusions and decoctions from the vegetative aerial parts are frequently used as medicines for respiratory and digestive illnesses [1]. Besides, the fruits are employed to elaborate fermented beverages [1]. However, in Uruguay this plant is not recognized as medicinal/edible, and it is considered highly allergenic, with frequently reported cases of contact dermatitis in the face and the arms occurring in sensitized people [2]. Not volatile alk(en)yl-catechols (ACs) have been pointed out as responsible of such contact dermatitis [2]. Moreover, an orally transmitted tradition in Uruguay indicates that such affections are also possible when the people just approach to the trees, without being necessary the contact (that is, an eventual airborne allergy). This suggests the intervention of volatile allergens in the process, a fact that needs to be better investigated given the medicinal/edible utilization of this plant species. As a first step to validate such traditional information, the aim of this work was to characterize the chemical compositions of *L. molleoides* essential oils (LMEOs) of Uruguayan origin using different GC-MS methods and stationary phases.

Methods

Aerial parts (i. leaves + small stems; ii. fruits) of *L. molleoides* were collected at Iporá (Tacuarembó, Uruguay), and their essential oils were obtained by both hydrodistillation at laboratory scale and steam distillation at pilot scale. The oils were dried and diluted properly in cyclohexane before the GC-MS analyses. Different stationary phases were employed to obtain more detailed information about the LMEOs composition: SE52-MS, MEGA-Wax-MS, SLB-IL60i, and 2,3-diethyl-6-tertbutyldimethylsilyl- β -cyclodextrin (CD). Mass spectra and linear retention index (LRI) comparisons with commercial/in-house libraries were performed to identify the components.

Results

The yields of LMEOs were around 0.2% (v/w) for both plant materials. Monoterpenes and sesquiterpenes were the main components of the LMEOs, some of which have been previously reported as contact allergy elicitors, among them: α - and β -pinene, δ -3-carene, myrcene (main component: almost, 40% of the oil), *p*-cymene, limonene, 1,8-cineole, α -terpinene, α -terpinolene, α -phellandrene, linalool, α -terpineol, α -terpinal acetate, β -caryophyllene, aromadendrene, and caryophyllene oxide [3]. As expected, by their low volatility, ACs were not detected in the samples. In addition, and for genuineness purposes, the determination of the enantiomeric excesses of monoterpene chiral compounds was performed with a CD derivative as chiral selector.

Conclusions

The fact that at least 16 reported volatile allergens represented more than 50% of the chemical composition of LMEOs suggests the need of more detailed investigations to ensure the safe use of this plant species.

REFERENCES

- [1] López P., Basile P., Wallace F., Olivaro C., Minteguiaga M., Ferreira F. (2021). Medicinal and Aromatic Plants from South America V.2, Springer Nature, Cham. pp. 339-356.
- [2] Alé S., Ferreira F., González G., Epstein W., (1997). Allergic contact dermatitis caused by *Lithraea molleoides* and *Lithraea brasiliensis*: identification and characterization of the responsible allergens, Am. J. Contact Derm., 8, 144-149.
- [3] de Groot A.C., Schmidt E, (2016). Essential Oils, Contact Allergy and Chemical Composition, CRC Press-Taylor and Francis, Boca Raton.