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"JÚLIO DE MESQUITA FILHO"  
Campus de São José do Rio Preto

**MARIA EDUARDA DA MATA MARTINS**

**Perfil de Voláteis de Hidrolatos de Manjeriçao (*Ocimum basilicum* L.) e de  
Capim-Limão (*Cymbopogon citratus*)**

**São José do Rio Preto**

**2022**

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Dissertação apresentada como parte dos requisitos para obtenção do título de Mestre em Engenharia e Ciência dos Alimentos, junto ao Programa de Pós-Graduação em Engenharia e Ciência de Alimentos, do Instituto de Biociências, Letras e Ciências Exatas da Universidade Estadual Paulista “Júlio de Mesquita Filho”, Campus de São José do Rio Preto.

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*Aos meus pais, Luiz e Joana, todo meu amor e gratidão por serem meus amigos, conselheiros, incentivadores e minhas referências de fé, honestidade, compreensão e cumplicidade.*

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## RESUMO

O hidrolato, ou hidrossol, são águas aromáticas que são produzidas durante a destilação de plantas aromáticas. Há uma grande demanda por óleos naturais e hidrolatos no mercado internacional. O objetivo deste estudo foi avaliar o perfil volátil de hidrolatos comerciais de manjeriço e capim-limão. Três hidrolatos de manjeriço (M1, M2 e M3) e dois hidrolatos de capim santo (CL1 e CL2) foram obtidos por doação. A separação, quantificação e identificação dos compostos voláteis dos hidrolatos foram realizadas por cromatografia gasosa-espectrometria de massas (GC-MS), além do índice de retenção. Trinta e um compostos voláteis foram detectados/identificados nos três hidrolatos de manjeriço. Em dois hidrolatos de manjeriço, o eugenol foi o composto majoritário, no outro hidrolato, o linalol foi o composto majoritário. Nos hidrolatos de capim-limão, os principais picos/compostos voláteis foram uma mistura de dois terpenos e acetato de 6-isopropil-3-metil-1-ciclohexen-1-il. Diferenças no perfil volátil de hidrolatos podem estar associadas às condições edafoclimáticas e de processo.

**PALAVRAS-CHAVE:** *Ocimum basilicum* L.. *Cymbopogon citratus*. Hidrolato.CG-EM.

## ABSTRACT

The hydrolate, or hydrosol, is aromatic waters that are produced during the distillation of aromatic plants. There is high demand for natural oils and hidrolate in the international markets. The objective of this study was to evaluate the volatile profile of basil and lemongrass commercial hidrolates. Three basil hidrolates (M1, M2 and M3) and two lemongrass hidrolates (CL1 and CL2) were obtained by donation. The separation, quantification, and identification of the volatile compounds in the hidrolates were carried out using a gas chromatography-mass spectrometry (GC-MS), in addition retention index. Thirty-one volatile compounds were detected/identified in the three basil hidrolates. In two basil hydrolates, eugenol was the major compound, in the other hydrolate, linalool was the major compound. In lemongrass hydrolates, the major peaks/volatile compounds were a mixture of two terpenes and 6- isopropyl-3-methyl-1-cyclohexen-1-yl acetate. Differences in the volatile profile of hydrolates can be associated with edaphoclimatic and process conditions.

**KEY-WORDS:** *Ocimum basilicum L.*, *Cymbopogon citratus*, Hydrolate, GC-MS.

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## 1 INTRODUÇÃO

O Brasil é o país com maior biodiversidade em todo o mundo. A flora brasileira é reconhecida como uma das mais importantes com uma grande variedade de plantas nativas ricas em compostos bioativos e metabólitos secundários (BEUCHLE *et al.*, 2015; MENDONÇA *et al.*, 2020). Além disso, a demanda do consumidor por produtos naturais vem crescendo, e isso tem estimulado a pesquisa das plantas medicinais e aromáticas, com um valor total estimado em 2019 em cerca de 66 milhões de euros (FAO, 2021). Estas plantas destinam-se além do consumo *in natura* à produção de óleos essenciais, com aplicação na indústria agroalimentar, cosmética e farmacêutica.

Os óleos essenciais, com forte impacto odorífero, são obtidos por meio de diferentes partes de plantas, principalmente, de folhas, flores, raízes, sementes, frutas e cascas. Os óleos são constituídos por uma complexa mistura de terpenos provenientes principalmente de metabólitos secundários (DJOUAHRI; BOUDARENE; MEKLATI, 2013). O odor característico dos óleos é resultado de dezenas ou centenas de compostos voláteis, encontrados em concentrações muito baixas, em nanograma ou picograma (FRANCO; JANZANTTI, 2004; THOMAZINI; FRANCO, 2000).

Geralmente, os óleos essenciais são obtidos pelo processo de destilação de qualquer biomassa vegetal. Uma proporção deste óleo fica dissolvida na água de destilação levando a uma mistura chamada de hidrolato, que contém uma quantidade variável de óleo essencial. Este óleo contém compostos voláteis solúveis em água que lhes conferem seu valor econômico.

Os hidrolatos apresentam utilização mundial, nos mais diversos setores, como perfumaria, indústria alimentícia e aromaterapia. Com o advindo da pandemia de Covid-19, o uso e o consumo de óleos essenciais e hidrolatos aumentaram, principalmente por suas propriedades calmantes, anti-inflamatórias, aromatizantes, entre outras características atribuídas a estes produtos, podendo ser utilizados de três formas, aplicando diretamente na pele, por inalação ou ingestão.

Dentre os hidrolatos produzidos com matéria-prima nacional pelas indústrias brasileiras, optou-se pela avaliação dos hidrolatos de manjeriço (*Ocimum basilicum* L.) e de capim limão (*Cymbopogon citratus*). O hidrolato de manjeriço possui uma vasta literatura para auxiliar na discussão e aprendizado

das possíveis diferenças entre os hidrolatos e talvez com o óleo essencial (FERRAZ *et al.*, 2022; MAHMOUD *et al.*, 2022; MOHAMMED *et al.*, 2020), além do alto valor agregado em seu óleo, preço entre 115-199 USD/kg. Enquanto o hidrolato de capim limão, de importância nacional, possui poucos estudos científicos (AJAYI; SADIMENKO; AFOLAYAN, 2016; KPOVIESSI *et al.*, 2014; PLATA-RUEDA *et al.*, 2020) e pouco valor agregado ao seu óleo essencial, cerca de 25 USD/kg (Ultra International B.V., 2021). Vale mencionar que a produção e consumo de óleos essenciais é bem maior que de hidrolatos e nem todas as empresas de óleo essencial comercializam hidrolatos.

Portanto, o mercado de óleos essenciais e hidrolatos é próspero no Brasil, e possui condições de agregar valor às suas matérias-primas, transformando-as em produtos beneficiados. Diante do exposto, o objetivo deste trabalho foi avaliar o perfil de voláteis dos hidrolatos de manjerição e capim limão comerciais por cromatografia gasosa-espectrometria de massas, a fim de indicar semelhanças e diferenças entre os produtos comerciais de mesma matéria-prima.

## 6 CONCLUSÃO

Trinta e um compostos voláteis foram detectados/identificados nos três hidrolatos de manjeriço comerciais. Em dois hidrolatos de manjeriço comerciais o eugenol foi o majoritário, enquanto em outro hidrolato, o linalol foi majoritário.

Nos hidrolatos de capim-limão comerciais, os picos/compostos voláteis de maior % de área foram uma mistura de 2 terpenos e o acetato de 6-isopropil-3-metil-1-ciclohexen-1-ila.

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