There are approximately 200 species of jasmine around the world, and they are cultivated for flowers and fragrance. Due to the sweet and aromatic nature of the jasmine flower, over 40 percent of women in central Asia and central Europe use jasmine essential oils (absolutes) to create multiple volatile compounds that contribute to the distinct smell. Some compounds present in jasmine essential oils include benzyl acetate, benzyl alcohol, citronellol, and methyl jasmonate. Jasmine essential oils are widely used for their calming and sedative properties. Despite their widespread use in the cosmetics industry, the effects of jasmine essential oils on the skin are not well studied. Jasmine essential oils are thought to produce hydrosol effects in the skin; although there is a lack of scientific evidence to support this benefit, the work was conducted in order to study the effects of jasmine essential oils on the skin. Prior to assessing the biological activities of jasmine essential oils, the components of jasmine essential oils were analyzed by GC-MS (gas chromatography-mass spectrometry). Biological effects were analyzed using full thickness in vitro skin equivalents and Affymetrix microarrays. Bioinformatics were performed using Pipeline-Genome from Adams Bio-Results showed different patterns of gene expression for each of the jasmine essential oils. Multiple genes and biological processes involved in epidermal functions, including keratinocyte differentiation, were regulated, suggesting that jasmine essential oils may improve the epidermal skin barrier.

**RESULTS**

**AIMS**

1. Analytical Chemistry

![Figure 1: Chromatograms from Different Jasmine Essential Oils](image1.png)

There are several jasmine essential oils with different qualities available from various suppliers. After initial organoleptic evaluation, a few were analyzed further using a GC-MS. Examples of gas chromatograms are shown in Figure 1. Different jasmine essential oils exhibited altered chromatograms. The top chromatogram shows the closest fingerprint of the chromatogram of standardized Jassioneum officinalis essential oil, and was chosen for further studies. The middle and the bottom chromatograms are different from the top one, but similar to each other. The peaks after +EI retention times are noticeably missing from the middle and the bottom chromatograms. Further examination of mass spectrometry revealed that the peaks near +EI retention times were identified to be different molecules (Figure 2). While one from the top was identified to be methyl jasmonate, a critical component of jasmine essential oil, one from the bottom two were identified as +EI mono-functional alcohols, also known as α-menthol. As mentioned previously, methyl jasmonates are first identified from jasmine essential oils and are a well-known constituent. On the other hand, α-menthol is not typically present in jasmine essential oils. In addition, α-menthol is an allergen, listed on the 26 fragrance allergens by the European Union. These results suggest that the middle and bottom chromatograms are altered jasmine essential oils.

2. Biological Activities

![Figure 2: Identification of Key Constituents by Mass Spectrometry](image2.png)

**CONCLUSIONS**

- Quality of jasmine essential oils varies among differently essential raw materials.
- Different jasmine essential oils have different biological activities.
- Jasmine essential oils regulated genes involved in terminal differentiation of keratinocytes, suggesting a role in epidermal barrier function.

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