



Seasonal and circadian study of the essential oil of *Ocimum gratissimum* L. (basil) and its antifungal and antioxidant activities

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The interest in the therapeutic potential of medicinal plants can be observed in the last decades, insomuch 30% of prescribed drugs in the world have been obtained directly or indirectly from plants (1). The species *Ocimum gratissimum* belonging to the Lamiaceae family, has many applications and its essential oil proven pharmacological activities (2). Despite these characteristics, the species hybridizes to easily, in addition, there are reports from the influence of external factors such as temperature, humidity, soil type, light incidence, age and development of the plant, among other factors, in the variation of the chemical composition of the essential oils (3). The essential oils of *Ocimum gratissimum* were analyzed by GC-MS and then was evaluated its antioxidant and antifungal activity and its chemical composition in the circadian and seasonal influences. It was observed that the weather conditions have direct influence on the yield and content of chemical constituents of the essential oils, as these are stored in glandular trichomes on the surface of the leaf epidermis. The yield of essential oils varied significantly (4.75% - 7.06%), apparently increasing in warm days with high incidence of sunlight and decreasing in inverse conditions. An average of 28 compounds was identified, totaling an average of 98.9% of the total composition of the oils obtained. All samples showed thymol (33.2% - 63.4%) and γ -terpinene (21.0% - 45.1%) as the major components as well as high levels of p-cymene (2.1 % - 22.5%), all derived from the same biosynthetic process that occurs in the plant. Nevertheless, there were significant variations in the content of these constituents, so that, by combining the studies conducted, it was possible to set the collection of the essential oil according to the chemical interest. It was also possible to confirm the known antifungal and antioxidant potentials of the *Ocimum gratissimum* essential oil, with MIC of 0.7 μ L/mL against the fungus *Corynespora cassiicola* and 0.5 μ L/mL against their sporulation, and an average 1.6 times the standard antioxidant Trolox in the DPPH radical scavenging capacity, with values ranging from 1587.68 to 1674.05 mg TE/g. Despite variations in the chemical constitution of the oils there were not significant differences in biological activities. This may be due to the action of other constituents of high content, such as p-cymene and γ -terpinene, which also varied significantly during the study and have properties similar to thymol (antioxidant activity) or may be acting synergistically with the compound (antifungal).

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