

Microscopical Observation Nano Distribution of Oleuropein and *In Silico* Observation on Olive Leaves (*Olea europaea* L.)

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ABSTRACT

All this time, olive oil has been known for its benefits that extracted from the fruit. However, apparently there are other parts from the plant (*Olea europaea*) which have many benefits, especially for health and that one part is leaf. Oleuropein belongs to the iridoid group which has antibacterial, antiviral and antifungal activities and is useful for resisting various types of internal infections. Oleuropein can also increase the production of thermogenin inside the body; thermogenin is a compound that has ability to burn fat effectively. In a recent study, oleuropein can be useful for lowering blood pressure. Studies on animals show that the extract of olive leaf can prevent nerve damage, thus, it is good for preventing strokes. This study aims to determine the important compounds of olive oil, oleuropin, found in olive leaves.

Discovery of secondary metabolites in olive leaves was carried out with histochemical analysis by giving certain reagents to epidermal tissue on the leaves observed with an Olympus DP73 microscope. After discovering the metabolite content, the *in silico* method was analyzed using computer simulation method through the PubChem data base (<https://pubchem.ncbi.nlm.nih.gov/>). The specifications of the chemical elements found in olive leaves (*Olea europaea* L) will be found out through PubChem. Metabolite compounds that were found in a plant species were carried out with the KNApSack-3D database (http://kanaya.naist.jp/knapsack_jsp/top.html).

The result shows that histochemical analysis on the 5 positive secondary metabolites contained in olive leaves were alkaloids, terpenoids, flavonoids, lipophilic. Meanwhile, the secondary metabolites contained in olive leaves can be seen primarily in the form of 3D structures with *in silico* analysis. Specific compounds that were found only in olive leaves are 1-Acetoxypinoresinol, oleuropein, Cis-3-Hexenyl acetate, cis-2-Hexen-1-ol and Methyl nonanoate. It showed that the oleuropein compound is found in olive leaves.

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