

ABSTRACT

Nadhira Syifa Aulia. 24020120140127. Molecular Characterization, Antioxidant Activity Test, and Molecular Docking of Strawberry (*Fragaria x ananassa*) as Anticancer. Under the guidance of Hermin Pancasakti Kusumaningrum and Anto Budiharjo.

Cancer is a deadly disease worldwide, one type of which is breast cancer. The incidence rate of breast cancer in women in Indonesia is estimated to be 12 per 100,000, with advanced stages occurring in more than 80% of cases. Therefore, an anticancer drug is needed that has high sensitivity to cancer cells with minimal side effects. Phytochemical compounds in strawberry plants have anticancer activity that can inhibit breast cancer receptors. This study aims to determine the molecular characterization, antioxidant activity, and potential of phytochemical compounds in strawberry plants as anticancer. The molecular characterization methods used include DNA isolation, DNA amplification with PCR, DNA electrophoresis, Sanger Dideoxy sequencing, and BLAST. The antioxidant activity of strawberry fruits was tested in vitro using the DPPH method with a UV-Vis spectrophotometer. Phytochemical compounds in strawberry fruits were further tested with molecular docking to prove their potential as anticancer agents. The protein receptor of breast cancer used in this study is HER2 (*Human Epidermal Growth Factor Receptor 2*). The molecular docking analysis was brought with PyRx and visualized with Biovia Discovery Studio. The results of molecular characterization of strawberries showed the highest homology with *Fragaria x ananassa* CP139775.1 at 100%. The results of antioxidant activity of strawberry fruits showed an IC₅₀ value of 31.65. The results of molecular docking results showed that the compound with the highest potential as a HER2 protein inhibitor is *ellagic acid* with a binding affinity value of -9.6 kcal/mol and it complies with Lipinski's Rule of Five pharmacological tests.

Keywords: *Breast Cancer, Strawberry, Phytochemical, Molecular Docking*