

INTISARI

Penumpukan radikal bebas dalam tubuh dapat menyebabkan penuaan dini. Tubuh mempunyai enzim yang dapat mengikat radikal bebas, namun bila terlalu banyak paparan radikal bebas yang diterima maka tubuh membutuhkan antioksidan dari luar. Salah satu komponen non-gizi yang mempunyai potensi antioksidan adalah senyawa resveratrol. Penelitian ini bertujuan mengkaji aktivitas antioksidan resveratrol melalui mekanisme penangkapan radikal (antiradikal) dan stabilitas kimianya terhadap pengaruh pH dan ion logam.

Uji aktivitas antiradikal dilakukan dengan metode penangkapan radikal 2-2'-difenil-1-pikrihidrazil (DPPH) yang hasilnya diekspresikan dalam nilai IC_{50} dan stoikiometri reaksinya. Sebagai kontrol positif vitamin C digunakan. Hasil yang diperoleh berupa %penangkapan radikal dan %sisa DPPH yang masing-masing digunakan untuk menghitung IC_{50} dan stoikiometri reaksi. Stabilitas kimiawi resveratrol terhadap pengaruh pH diketahui dengan mengamati nilai k_{obs} , $t_{1/2}$, dan t_{90} serta kurva pH-laju degradasi. Stabilitas terhadap penambahan ion logam Cu^{2+} dianalisis secara statistik dengan uji paired t-test.

Berdasarkan data yang diperoleh, resveratrol merupakan antioksidan sedang dengan nilai IC_{50} sebesar $11,05 \pm 0,304 \mu\text{g/mL}$. Stoikiometri reaksi menyatakan bahwa 1 mol resveratrol mampu mereduksi $0,86 \pm 0,014$ molekul DPPH. Resveratrol cenderung stabil pada pH asam namun mengalami penurunan kestabilan pada pH yang lebih tinggi. Penambahan ion logam Cu^{2+} pada pH asam tidak meningkatkan harga tetapan laju degradasi secara signifikan.

Kata kunci : resveratrol, antiradikal, stoikiometri, stabilitas kimia

ABSTRACT

The accumulation of free radicals in the body can cause premature aging. Our body has an enzyme that can bind free radicals, but if too much free radical exposure is received then the body needs antioxidants from the outside. One of the non-nutritional components that have antioxidant potential is the resveratrol. This study aims to examine the antioxidant activity of resveratrol through radical scavenging mechanism (antiradical) and its chemical stability against the effect of pH and metal ions Cu^{2+} .

Antiradical activity test was performed by 2-2'-diphenyl-1-picrihydrazyl (DPPH) radical scavenging method which results are expressed in IC_{50} and stoichiometric reactions. As a positive control vitamin C is used. The results obtained are %radical scavenging and %residual DPPH which each used to calculate IC_{50} and stoichiometric reactions. The chemical stability of resveratrol against the effect of pH is known by observing the values of k_{obs} , $t_{1/2}$ and t_{90} and pH-rate profile. Stability of resveratrol by the effect of Cu^{2+} metal ions is statistically analyzed by paired t-test.

Based on the data obtained, resveratrol is a moderate antioxidant with IC_{50} value of $11.05 \pm 0.304 \mu\text{g/mL}$. Stoichiometric reactions showed that 1 mol of resveratrol is capable of reducing 0.86 ± 0.014 DPPH molecule. Resveratrol tends to be stable at acidic pH but decreases stability at higher pH. Addition of Cu^{2+} metal ions to acidic pH did not increase the value of the degradation rate constant significantly.

Keywords : resveratrol, antiradical, stoichiometric, chemical stability