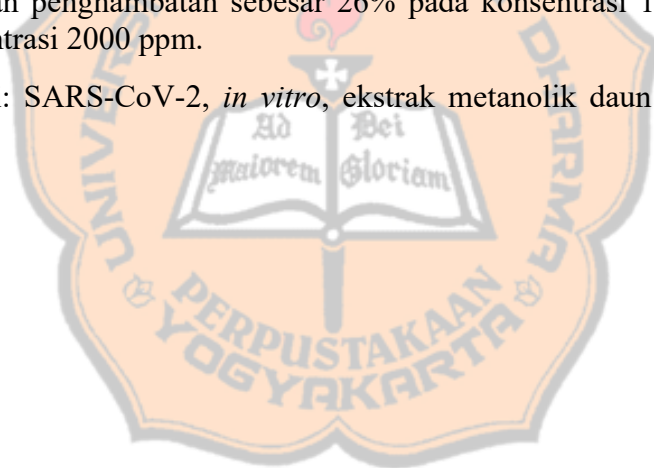


ABSTRAK

Persentase kasus *severe acute respiratory syndrome coronavirus-2* (SARS-CoV-2) sampai pertengahan November 2021 mencapai 254.900.850 kasus dengan jumlah kematian sebanyak 5.127.043 jiwa di seluruh dunia. Beberapa antivirus seperti redemsvir, klorokuin fosfat, dan favipiravir telah digunakan dalam pengobatan SARS-CoV-2, tetapi obat tersebut belum memberikan efek yang baik sehingga perlu adanya suatu obat baru untuk mengobati SARS-CoV-2. Penelitian ini bertujuan untuk menguji aktivitas penghambatan tanaman herbal terhadap 3CLpro melalui *in silico* dan *in vitro* serta mengidentifikasi kandungan flavonoid yang merupakan senyawa hits. *In silico* dilakukan menggunakan *software Discovery Studio* dan *AutodockTools*. Hasil *docking* menunjukkan senyawa *hit* yaitu *procyanidin B1* pada daun belimbing dengan energi bebas ikatan terendah yaitu -9,38 kkal/mol. Hasil uji KLT dengan fase diam F₂₅₄, fase gerak etil asetat:n-heksana dengan perbandingan 0,8:3 (v/v) dan pereaksi semprot sitroborat menunjukkan keberadaan senyawa flavonoid pada ekstrak metanol daun belimbing dengan R_f 0,65 dan 0,75. Aktivitas ekstrak metanol daun belimbing sebagai penghambat enzim 3CLpro SARS-CoV-2 menggunakan *fluorescence resonance energy transfer (FRET)-based 3CLpro assay*. Pengujian ekstrak secara *in vitro* menunjukkan penghambatan sebesar 26% pada konsentrasi 1000 ppm dan 75% pada konsentrasi 2000 ppm.

Kata kunci: SARS-CoV-2, *in vitro*, ekstrak metanolik daun belimbing, *FRET-based*



ABSTRACT

The percentage of cases of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) until the mid of November 2021 reached 254.900.850 cases with a death toll of 5.127.043 people worldwide. Some antivirals such as redemsvir, chloroquine phosphate, and favipiravir have been used in the treatment of SARS-CoV-2, but these drug has not given a good effect thus a new drug is needed to treat SARS-CoV-2. This study aims to determine the inhibitory activity of herbal plants against 3CLpro through in silico and in vitro and identify the flavonoid content which is a hit compound. In silico was done using Discovery Studio and AutodockTools software. The results of the docking show that the hits compound, procyanidin B1 in star fruit leaves, has the lowest free bond energy of -9.38 kcal/mol. The results of the TLC test with the stationary phase F_{254} , the mobile phase ethyl acetate:n-hexane with a ratio of 0.8:3 (v/v) and the spray reagent of sitroborate showed the presence of flavonoid compounds in the methanol extract of star fruit leaves with R_f 0.65 and 0.75. The activity of methanol extract of Starfruit leaves against 3CLpro SARS-CoV-2 was tested with fluorescence resonance energy transfer (FRET)-based 3CLpro assay. In vitro extract test showed 26% inhibition at 1000 ppm concentration and 75% at 2000 ppm concentration.

Keywords: SARS-CoV-2, in vitro, star fruit methanolic extract, FRET-based

