

## ABSTRAK

Inhibitor organik korosi terbukti dapat menghambat laju korosi kawat ortodonti *stainless steel*, salah satunya menggunakan ekstrak daun belimbing wuluh yang memiliki banyak kandungan zat aktif tanin. Uji stabilitas diperlukan untuk pengembangan dari ekstrak daun belimbing wuluh menjadi sebuah produk inhibitor korosi. Tujuan penelitian untuk mengetahui pengaruh suhu penyimpanan ekstrak daun belimbing wuluh terhadap stabilitas ekstrak dan laju korosi kawat ortodonti *stainless steel*.

Penelitian ini menggunakan 32 sampel kawat ortodonti *stainless steel* diameter 0,7 mm, dipotong sepanjang 3 cm dan dibengkokkan seperti huruf U. Sampel dibagi menjadi 2 kelompok acak, kemudian diukur berat awalnya. Kawat perlakuan 1 direndam menggunakan ekstrak daun belimbing wuluh yang disimpan pada suhu 4°C dan kawat kelompok perlakuan 2 direndam dengan ekstrak daun belimbing wuluh yang disimpan pada suhu 25°C. Kawat direndam saliva buatan dengan pH 6,7 dan disimpan di inkubator suhu 37°C, setiap hari selama 13 menit 24 detik kawat direndam dengan ekstrak daun belimbing wuluh sesuai kelompok perlakuan. Pengukuran absorbansi untuk melihat jumlah kandungan zat tanin ekstrak daun belimbing wuluh dan penimbangan ulang kawat untuk mengetahui laju korosi dilakukan pada hari ke 1, 28 dan 42.

Hasil analisis data *one way ANOVA* dan uji *Post Hoc LSD* diperoleh nilai signifikansi <0.05. Kesimpulan dari penelitian ini yaitu suhu penyimpanan ekstrak daun belimbing wuluh berpengaruh terhadap stabilitas dan laju korosi kawat ortodonti *stainless steel*. Penyimpanan ekstrak daun belimbing wuluh pada suhu 4°C menghasilkan ekstrak yang lebih stabil dan peningkatan laju korosi yang lebih sedikit dibandingkan dengan penyimpanan suhu 25°C.

Kata kunci : daun belimbing wuluh, laju korosi, stabilitas ekstrak, suhu penyimpanan, *stainless steel*

## **ABSTRACT**

Corrosion organic inhibitor has been studied and proved that it can resist the corrosion rate of orthodontic stainless steel wire, including by using the *Averrhoa bilimbi* leaf extract which contains enough amount of tannin. The stability test is required in developing the *Averrhoa bilimbi* leaf extract as a corrosion inhibitor product. The purpose of this study is to determine the effect of storage temperature of *Averrhoa bilimbi* leaf extract on the extract's stability and the corrosion rate of orthodontic stainless steel wire.

This study used 32 samples of the orthodontic stainless steel wire with a diameter of 0.7 mm. The samples were cut with a length of 3 cm and bent to form 'U' shape. The samples then were randomly divided into two groups and their initial weight was measured. The wires of treatment group 1 were soaked in *Averrhoa bilimbi* leaf extract that had been stored with the temperature of 4°C and the wires of treatment group 2 were soaked in *Averrhoa bilimbi* leaf extract that had been stored with the temperature of 25°C. The wire soaking in artificial saliva with the pH of 6.7 and stored in an incubator with the temperature of 37°C, every day for 13 minutes 24 seconds the wire soaked in *Averrhoa bilimbi* leaf extract. The absorbance measurement and wire reconsideration were conducted on the first, 28<sup>th</sup>, and 42<sup>nd</sup> days to find out the tannin contained on *Averrhoa bilimbi* leaf extract and also the corrosion rate.

The results of data analysis using one-way ANOVA and Post Hoc LSD tests showed the significance value of <0.05. This study concludes that the storage temperature of *Averrhoa bilimbi* leaf extract gives impact to the extract's stability and corrosion rate of orthodontic stainless steel wire. The temperature storage of 4°C can produce more stable extract and less corrosion rate compared to the temperature storage of 25°C.

**Keywords:** *Averrhoa bilimbi* leaf, corrosion inhibitor, corrosion rate, stability of extracts, storage temperature, stainless steel