INTISARI

Ekstrak daun belimbing wuluh (*Averrhoa bilimbi L.*) mengandung senyawa aktif tanin yang berperan menurunakan laju korosi kawat ortodonti *stainless steel*. Penelitian mengenai stabilitas ekstrak daun belimbing wuluh diperlukan untuk mengembangkan ekstrak bahan alam sebagai inhibitor korosi. Penelitian ini bertujuan untuk mengetahui pengaruh konsentrasi kombinasi pengawet *methylparaben* dan *propylparaben* 0.18% : 0.02% dan 0.06% : 0.03% dengan dan tanpa ekstrak daun belimbing wuluh 10% terhadap stabilitas dan laju korosi kawat ortodonti *stainless steel* selama 21 hari penyimpanan.

Penelitian ini menggunakan 24 sampel kawat ortodonti *stainless steel* yang dibagi secara acak dalam 6 kelompok dengan diameter kawat 0.7 mm dan panjang kawat 3 cm yang dibentuk seperti huruf U. Keseluruhan kawat diukur berat awalnya menggunakan timbangan analitik. Setiap hari kawat direndam dalam perlakuan yang berbeda sesuai kelompoknya selama 19 menit 8 detik, kemudian kawat direndam dalam saliva dan disimpan dalam inkubator suhu 37˚ selama 21 hari. Pengukuran berat akhir dilakukan pada hari ke-0 dan hari ke-21, dilanjutkan perhitungan dengan rumus untuk mengetahui nilai laju korosi kawat. Pengukuran stabilitas dilakukan pada hari ke-0 dan hari ke-21 menggunakan spektrofotometer UV-Vis.

Hasil analisis *Kruskall-Wallis* terhadap stabilitas diperoleh nilai signifikansi <0.05, sedangkan hasil uji *Kruskall-Wallis* terhadap laju korosi pengukuran hari ke-0 diperoleh nilai signifikansi >0.05 dan pengukuran hari ke-21 diperoleh signifikansi <0.05. Hasil uji *post hoc Mann-Whitney U* terhadap stabilitas diperoleh signifikansi <0.05 antar seluruh kelompok, sedangkan uji *post hoc Mann-Whitney* terhadap laju korosi pengukuran hari ke-21 diperoleh signifikansi >0.05 antar seluruh kelompok, kecuali kelompok 4 dan kelompok 5. Kesimpulan dari penelitian adalah ekstrak daun belimbing wuluh dengan penambahan kombinasi pengawet *methylparaben* dan *propylparaben* konsentrasi 0.06% dan 0.03% memiliki stabilitas yang lebih tinggi dibanding kombinasi pengawet yang sama konsentrasi 0.18% dan 0.02%, akan tetapi penambahan kombinasi pengawet *methylparaben* dan *propylparaben* konsentrasi 0.06% dan 0.03% memiliki laju korosi yang lebih tinggi dibanding penambahan kombinasi pengawet yang sama konsentrai 0.18% dan 0.02% selama 21 hari penyimpanan.

Kata kunci : ekstrak daun belimbing wuluh, inhibitor korosi, laju korosi, stabilitas ekstrak, pengawet, *methylparaben*, *propylparaben*

ABSTRACT

The leaf extract of star fruit (Averrhoa bilimbi L.) contains an active compound of tannins, which reduces the corrosion rate of stainless steel orthodontic wires. Research on the stability of starfruit leaf extract is needed to develop extracts of natural ingredients as corrosion inhibitors. This study aims to compare the concentration of the preservative combination methylparaben and propylparaben 0.18%: 0.02% and 0.06%: 0.03% with and without 10% starfruit leaf extract on the stability and corrosion rate of stainless steel orthodontic wire for 21 days of storage.

This study used 24 samples of stainless steel orthodontic wire randomly divided into six groups with a wire diameter of 0.7 mm and a wire length of 3 cm shaped like the letter U. The overall weight of the wires was measured initially using an analytical balance. Every day the wire was immersed in a different treatment according to the group for 19 minutes 8 seconds, then the wire was immersed in saliva and stored in an incubator at 37˚ for 21 days. The final weight measurement was carried out on day 0 and day 21, followed by calculations using the formula to determine the value of the corrosion rate of the wire. Stability measurements were carried out on day 0 and day 21 using a UV-Vis spectrophotometer.

The results of the Kruskall-Wallis data analysis on stability obtained a significance value of <0.05, while the results of the Kruskall-Wallis test on the corrosion rate on the 0-day measurement obtained a significance value > 0.05 and the 21-day measurement obtained a significance value <0.05. The results of the post hoc Mann-Whitney U test on stability obtained a significance of <0.05 between all groups, while the post hoc Mann-Whitney test on the corrosion rate on day 21 obtained a significance of >0.05 between all groups, except for group 4 and group 5. Conclusions from The research showed that starfruit leaf extract with the addition of a combination of preservatives methylparaben and propylparaben with concentrations of 0.06% and 0.03% had higher stability than the combination of preservatives with the same concentration of 0.18% and 0.02%. Still, the addition of a combination of preservatives methylparaben and propylparaben with concentrations of 0.06% and 0.03% had The corrosion rate was higher than the addition of the same preservative combination with concentrations of 0.18% and 0.02% for 21 days of storage.

Keywords : *starfruit leaf extract, corrosion inhibitor, corrosion rate, extract stability, preservative, methylparaben, propylparaben*