

INTISARI

Resin komposit *nanofiller* banyak digunakan sebagai bahan restorasi karena memiliki nilai estetika yang tinggi dan juga sifat fisik dan mekanis yang tinggi. Resin komposit *nanofiller* bersifat menyerap air yang tinggi dan dapat terdegradasi oleh asam. Teh hitam memiliki kandungan asam berupa theaflavin yang dapat menimbulkan kekasaran pada resin komposit *nanofiller*. Tujuan dari penelitian ini adalah untuk mengetahui pengaruh lama perendaman teh hitam terhadap kekasaran permukaan resin komposit *nanofiller*.

Sampel resin komposit *nanofiller* 3M ESPE FILTEK Z250 berbentuk cakram diameter 10 mm dan ketebalan 2 mm ($n=12$) dilakukan perendaman dalam *aquadest* pada suhu 37°C selama 24 jam lalu kekasaran permukaan awal diukur dengan menggunakan *surface roughness tester*. Sampel dibagi tiga kelompok berdasarkan lama perendaman dalam teh hitam (3 hari, 5 hari, dan 7 hari). Perendaman dilakukan dalam larutan teh hitam dengan konsentrasi 1% dan ditempatkan dalam incubator untuk menjaga suhu 37°C . Seluruh sampel diukur kekasaran permukaan akhir menggunakan *surface roughness tester*. Data selisih kekasaran permukaan awal dan akhir dianalisis menggunakan uji *One Way ANOVA* dan *post hoc* LSD ($\alpha=0,05$).

Rerata nilai kekasaran permukaan adalah $0,1350 \pm 0,0858 \mu\text{m}$ (3 hari), $0,1675 \pm 0,1237$ (5 hari), dan $0,4250 \pm 0,1814$ (7 hari). Hasil uji ANAVA menunjukkan nilai signifikansi sebesar 0,028 yang menunjukkan terdapat pengaruh yang bermakna ($p<0,05$). Hasil uji LSD menunjukkan perbedaan rerata kekasaran yang bermakna antar semua kelompok ($p<0,05$) kecuali antara kelompok 3 hari dan 5 hari. Kesimpulan penelitian ini adalah lama perendaman dalam teh hitam mempengaruhi kenaikan kekasaran resin komposit *nanofiller*.

Kata kunci: Teh Hitam, Resin komposit *nanofiller*, Lama perendaman, Kekasaran permukaan

ABSTRACT

Nanofiller composite resins are widely used as restoration materials because they have high aesthetic value as well as high physical and mechanical properties. Nanofiller composite resins are highly water-absorbent and can be degraded by acids. Black tea has acid content in the form of theaflavin which can cause roughness in nanofiller composite resins. The purpose of this study was to determine the effect of black tea soaking time on the surface roughness of nanofiller composite resin.

Samples of 3M ESPE FILTEK Z250 nanofiller composite resin in the shape of a disk with a diameter of 10 mm and a thickness of 2 mm ($n=12$) were immersed in distilled water at 37°C for 24 hours and then the initial surface roughness was measured using a surface roughness tester. The samples were divided into three groups based on the length of immersion in black tea (3 days, 5 days, and 7 days). Soaking was carried out in black tea solution with a concentration of 1% and placed in an incubator to maintain a temperature of 37°C. All samples were measured for final surface roughness using a surface roughness tester. Data on the difference between initial and final surface roughness were analyzed using One Way ANOVA test and post hoc LSD ($\alpha=0.05$).

The mean surface roughness values were $0.1350 \pm 0.0858 \mu\text{m}$ (3 days), 0.1675 ± 0.1237 (5 days), and 0.4250 ± 0.1814 (7 days). The One Way ANOVA test results showed a significant effect ($p<0.05$). The LSD test results showed a significant difference in the mean roughness between all groups ($p<0.05$) except between the 3-day and 5-day groups. The conclusion of this study is that immersion time in black tea has an effect on the roughness of nanofiller composite resin.

Keywords: Black tea, Nanofiller composite resin, Immersion time, Surface roughness