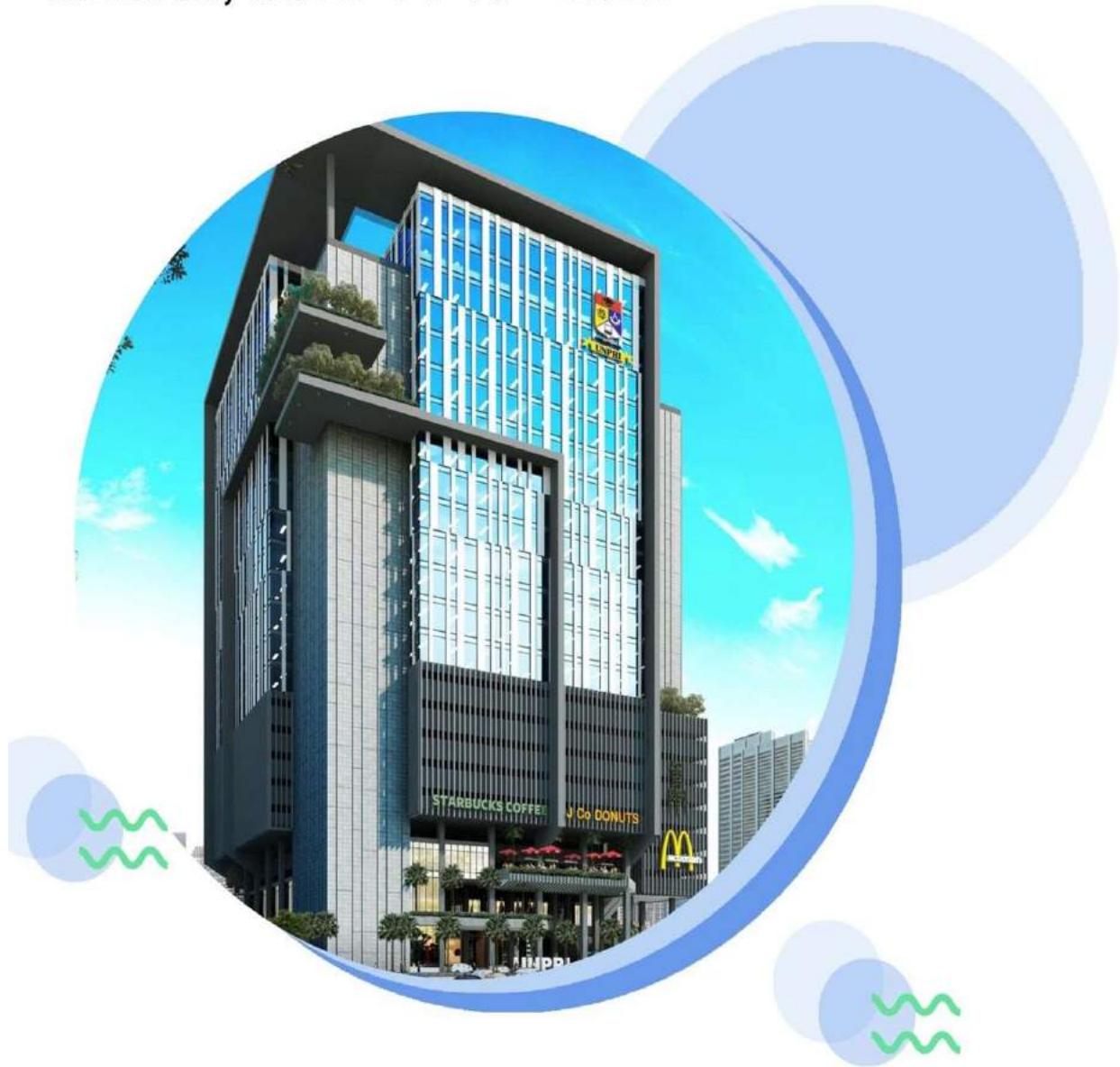


InHeNce INTERNATIONAL 2021 CONFERENCE

ON HEALTH, INSTRUMENTATION & MEASUREMENT, AND NATURAL SCIENCES

MEDAN, JULY 14-16TH 2021



Organized by :



Co-organized by :



Effects of Chili Sauce on the Absorbency and Diametral Tensile Strength of Nanocomposite

Joanna Nadia Sumaji
Undergraduate Program Faculty of
Dentistry
Universitas Trisakti
Jakarta, Indonesia
joannanadia.su@gmail.com

Esa Bella
Undergraduate Program Faculty of
Dentistry
Universitas Trisakti
Jakarta, Indonesia
bellaguooo@gmail.com

Rosalina Tjandrawinata*
Dental Material Departement Faculty of
Dentistry
Universitas Trisakti
Jakarta, Indonesia
rosalina@trisakti.ac.id
*Corresponding author

Abstract—Absorbency and solubility of nanofilled resin composite (nanocomposite) affect its strength and durability. Furthermore, exposure to acids in the oral cavity such as chili sauce also reduces the mechanical and physical properties of composite resin restoration. Therefore, this study aims to evaluate the effect of chili sauce on nanocomposite absorbency and diametral tensile strength. Thirty-three nanocomposite samples in cylindrical shape were divided into 3 groups (n=11); immediate control (1), control (2) immersed for 24 hours in distilled water and treated (3) soaked for 8 hours in distilled water and 16 hours in chili sauce solution. All samples were immersed for 4 days in a 37°C incubator. Absorbency was measured according to the difference of weight before and after immersion, while the diametral tensile strength was measured using Universal Testing Machine. There was a significant difference ($p < 0.05$) in diametral tensile strength among groups; group 1 and 3 were stronger than group 2 by 10.8% and 13.4%, but group 1 was not significantly (1.2%) weaker than group 3. No significant difference was found ($p > 0.05$) in the absorbency test, although group 3 is 16% higher than group 2. Therefore, chili sauce affects the diametral tensile strength of nanocomposite significantly, but not its absorbency.

Keywords—nanocomposite, chili sauce, absorbency, diametral tensile strength

I. INTRODUCTION

Dental caries is one of the most common human diseases [1] and is a pathological process that is caused by several etiological factors which leads to tissue damage in the oral cavity [2]. When the carbohydrates, that is fermented by *Streptococcus mutans*, are exposed to the oral cavity, lactic acid is formed by *Lactobacillus* which lowers the oral cavity pH and triggers demineralization. Therefore, when this process continuously occurs without remineralization, it leads to caries formation [3] [4].

As stated in 2018 Basic Health Research (*Riset Kesehatan Dasar*) [5], most Indonesians have dental cavity problems, with an average caries prevalence of approximately 88.8% [6]. One of several ways to restore a carious lesion is by using dental filling material such as composite resin, which has become popular recently due to its good strength and high aesthetic value as tooth-colored restoration [7].

The composition of composite resin consists of matrix, inorganic filler, and coupling agent. Based on the particle size of the filler, composite resins are divided into macrofilled, microfilled, hybrid, microhybrid, and nanofilled. The nanocomposite, also known as nanofilled resin composite, has the smallest and finest filler size in the range of 5-100 nm [8][9]. This material, which is developed using nanotechnology, has better physical properties than others,

especially its polishing result and strength. Meanwhile, fillers in nanocomposite combine individual nanoparticles and nanocluster particles that are easily bond each other to form groups. This combination improves its physical properties and gives better polishing results compared to other composite resins. Furthermore, the nanocomposite becomes non-sticky which makes it easier for dentists to manipulate [10].

Despite all these advantages, nanocomposites are easily degraded by acids due to some unstable bonds in their polymer. Similarly, the absorption of acidic materials causes the composite resin to undergo polymer and filler degradation which softens its biomaterial and causes a reduction in its mechanical and physical properties [11]. A previous study conducted by Borges et al. [12], stated that exposure to acidic substances reduces the diametral tensile strength of composite resin.

Food is one of the etiological factors causing caries and is also a basic human need [2]. For most Indonesians, chili sauce consumption as a food additive is widespread. This sauce contains chilies (*Capsicum, sp.*), sugar, salt, vinegar, garlic (*Allium sativum L.*), water, monosodium glutamate (MSG), and sodium benzoate as preservatives. These ingredients function in assembling the sauce's texture, taste, color, and durability.

Chili contains capsaicin and pungency that has antimicrobial properties and vitamin C, which keep the gums and oral tissue healthy [13]. Similarly, garlic also has antimicrobial properties that are contained in its allicin [14]. Meanwhile, sugar has an important role in caries formation which affects restoration's durability and leads to secondary caries [2]. The vinegar makes chili sauce acidic which degrade the surface and lead to microleakage of restoration and reduces its physical and mechanical properties [11]. One of the quality requirements of chili sauce, based on the Indonesian National Standard (INS) or *Standar Nasional Indonesia (SNI)* [15], is to have a maximum pH of 4 which is a critical value for caries formation. Therefore, chili sauce is assumed to have an antimicrobial effect that causes dental cavities and affects the physical and mechanical properties of restoration. Previous studies evaluated composite resin's mechanical and physical properties after immersed in acidic solution [16], mouth rinse [17], hydrogen peroxide [18], ethanol and anthocyanin pigment [19], also water absorbency which indicates its capability to absorb any fluids that cause discoloration [20]. Therefore, this study aims to examine the effect of chili sauce on the absorbency and diametral tensile strength of nanocomposites restorative material, which has not been examined in previous studies.

II. RESEARCH METHODOLOGY

This experimental laboratory study was conducted at the Dental Materials and Testing Center of Research (DMT Core) Laboratory in the Faculty of Dentistry, Universitas Trisakti, Jakarta, Indonesia.

A. Materials

The materials used include Filtek™ Z350 XT nanocomposite (shade A2, LOT NA79689, 3M ESPE, USA), Dua Belibis chili sauce (LOT 256331082017, PT. Anggana Catur, Indonesia), and distilled water (Klin's Laboratory, Indonesia).

B. Samples

The samples in this study were 33 cylindrical nanocomposites made in stainless steel molds with a diameter of 6 ± 0.1 mm and a height of 3 ± 0.1 mm. The number of samples was determined by the Lemeshow formula [21], which leads to 11 samples for each group. The formula is as follows:

$$n = \left(\frac{(Z\alpha + Z\beta)S}{x_1 - x_2} \right)^2 \quad (1)$$

with n is total of samples, $Z\alpha$ is alpha standard deviation (1.96), $Z\beta$ is beta standard deviation (0.84), S is standard deviation (0.026), and $(x_1 - x_2)$ is minimum significant mean difference.

Polymerization was carried out after the sample was coated with a celluloid strip using a light-curing unit for 2×20 seconds at the top of the mold. The curing distance was set at approximately 1 mm between the tip of the unit and the composite, and the beam direction was placed perpendicularly to the sample. After setting, the sample was removed from the mold and ensured that the surface is smooth, even, without porosity and fracture lines based on the American Dental Association (ADA) Specification No. 27 [22].

C. Methods

Immediately after manufacture, all samples were measured using a caliper and weighed on an analytical balance, before being tested for diametral tensile strength. Each sample was measured 3 times and averaged into a single value. The 11 control samples (group 1) were immediately tested for diametral tensile strength, while group 2 samples were immersed in distilled water and stored in an incubator (37°C) for 4×24 hours. Furthermore, as shown in Fig. 1, the 11 treated samples (group 3) were immersed in distilled water for 8 hours and continued in chili sauce solution for 16 hours and were repeated for 4 days in an incubator (37°C) [16]. The overall steps taken in this study are shown in Fig. 2.

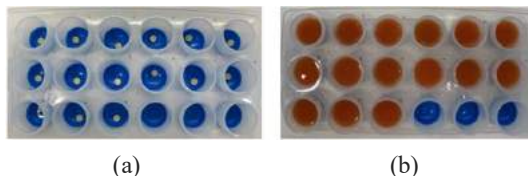


Fig. 1. Nanocomposite's immersion in: (a) distilled water), (b) chili sauce solution

Before changing solution, all samples were cleaned and rinsed with distilled water for 10 seconds. Meanwhile, the solution was made by mixing chili sauce into distilled water with a ratio of 1:1 (Fig. 3) and was measured (Fig. 4). After

the immersion, a total of 22 samples (groups 2 and 3) were tested for absorbency and diametral tensile strength (Fig. 5).

A total of 22 control and treated samples were weighed after completion of immersion to test their absorbency, which was calculated using the following equation [23]:

$$M_t(\%) = \frac{mt - m_0}{m_0} \times 100 \quad (2)$$

with M_t is absorbency (%), mt is mass after immersion (g), and m_0 is mass before immersion (g).

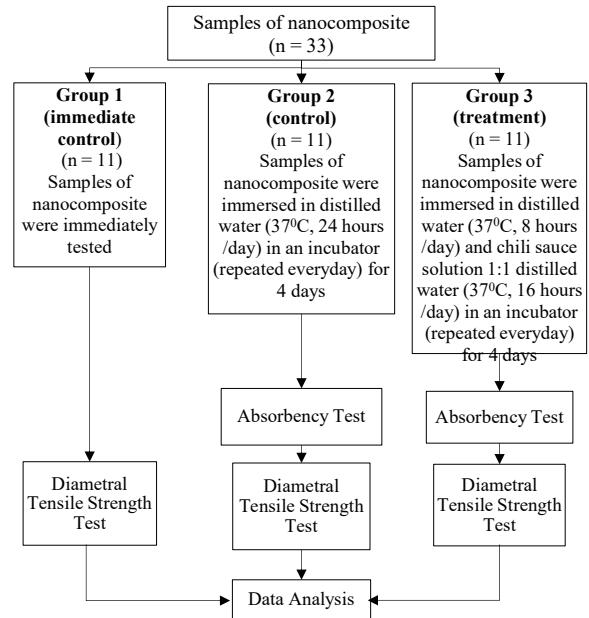


Fig. 2. Research steps



Fig. 3. Chili sauce solution (chili sauce : distilled water is 1:1)

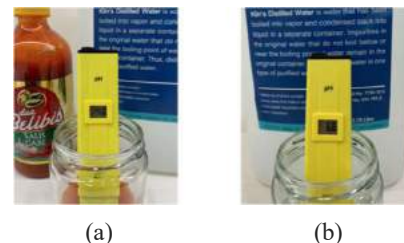


Fig. 4. Measurement of pH: (a) chili sauce solution, (b) distilled water

D. Data Analysis

The data obtained were tested for normality with the Shapiro-Wilk and homogeneity with Levene's test. Furthermore, the data were analyzed using an independent t-test on the absorbency, while the diametral tensile strength was conducted using the ANOVA statistical test. Since there was

a significant difference, the analysis was continued with the post hoc Tukey test. All data were tested using SPSS 23.

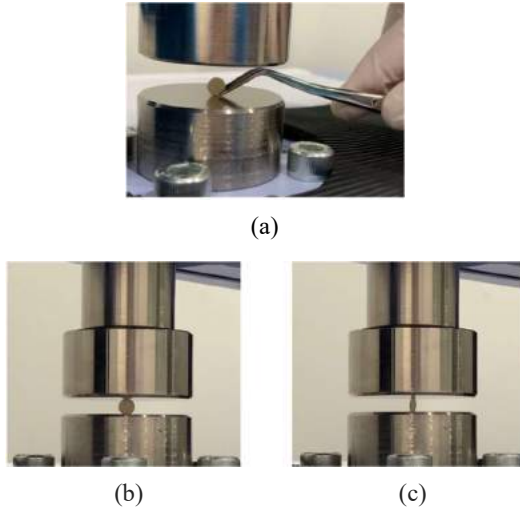


Fig. 5. Diametral tensile strength test using a Universal Testing Machine: (a) placing sample with cotton pliers, (b) sample position, (c) result

III. RESULT AND DISCUSSION

The pH value of distilled water and chili sauce solution in ratio 1:1 was measured using a pH meter. The chili sauce solution was 4.0, while the distilled water was 6.6.

A. Absorbency

Absorbency is the ability of a material or an object to absorb liquids. The absorption of acidic materials leads to the degradation and softening of the composite resin, so that the mechanical properties such as surface roughness, tensile strength, wear resistance, and others are reduced.

TABLE I. ABSORBENCY DATA RESULTS

Sample	Group 2 (Control)		Group 3 (Treated)	
	Absorbency (%)	Absorption ($\mu\text{g}/\text{mm}^3$)	Absorbency (%)	Absorption ($\mu\text{g}/\text{mm}^3$)
1	0.51	10.5	0.67	12.7
2	0.23	4.6	0.73	13.8
3	0.76	15.0	0.64	12.8
4	0.81	16.1	0.48	9.4
5	0.69	13.6	0.47	9.3
6	0.30	5.8	0.52	10.3
7	0.77	15.2	0.29	5.8
8	0.34	7.0	0.36	7.2
9	0.31	6.0	0.47	9.3
10	0.41	8.1	0.41	8.1
11	0.42	8.1	0.35	6.9
Mean	0.50 ± 0.22	10.0	0.49 ± 0.14	8.4

The absorbency differences of the control group and treated group was measured by weighing the samples before and after immersion using an analytical balance and were calculated using the mass gain percentage formula. Meanwhile, the test was not conducted in the immediate control group, which was directly tested for diametral tensile strength after manufacturing without immersion. The average value of the absorbency is shown in Table I. Levene's and Shapiro-Wilk's methods were used to test the homogeneity

and normality data ($n \leq 50$). The significant value (p) of the homogeneity test was 0.200 and normality test for nanocomposites absorbency was 0.224 for group 2 and 0.614 for group 3. Both were $p \geq 0.05$, which showed that the data were homogenous and normally distributed. Furthermore, data were analyzed using an independent t-test to determine the difference in the average of groups 2 and 3, which showed that the absorbency test between the two groups was not significantly different ($p \geq 0.05$) with the value of $p = 0.844$, yet the value of treated group ($8.4 \mu\text{g}/\text{mm}^3$) is 16% less in comparison with the control group ($10.0 \mu\text{g}/\text{mm}^3$).

B. Diametral Tensile Strength

Diametral tensile strength test is an indirect measurement used to measure the strength of brittle materials by applying a perpendicular pressure which makes the material become tense and eventually break. These samples were tested using Universal Testing Machine with a crosshead speed of 1 mm/minute until the sample broke. The result of diametral tensile strength is shown in Table II.

TABLE II. DATA AND STATISTICAL TEST OF DIAMETRAL TENSILE STRENGTH

Sample	Diametral Tensile Strength (MPa)		
	Group 1 (Immediate)	Group 2 (Control)	Group 3 (Treated)
1	46.97	33.83	46.03
2	46.03	33.92	42.50
3	54.96	43.97	49.60
4	44.13	44.68	47.47
5	54.28	39.00	51.50
6	45.19	37.67	42.88
7	45.48	47.03	50.82
8	42.50	46.38	39.35
9	42.43	39.13	49.60
10	41.63	42.25	38.33
11	50.19	35.01	47.53
Mean	45.44 ± 4.72^a	40.55 ± 5.09^b	45.98 ± 4.59^a

*.b Different alphabet shows significant difference with Tukey test ($p < 0.05$)

Data obtained in this study were analysed using Levene's test for homogeneity and Shapiro-Wilk for normality which showed all the data were homogenous and normally distributed ($p \geq 0.05$). The reliability data was also good with the coefficient of variance in group 1 was 10.4%, group 2 was 12.6%, and group 3 was 10%. Therefore, analysis was continued with a one-way ANOVA statistical test which showed significant difference ($p < 0.05$) among groups. Then, the data analysis was continued using post hoc Tukey test with significance value (p) of group 1 towards 2 was 0.019, while group 2 towards 3 was 0.033. This showed that there was significant difference ($p < 0.05$) in group 2 towards group 1 and 3.

After immersion in distilled water for 4x24 hours, the diametral tensile strength of nanocomposite samples were reduced by 5.90 MPa. On the contrary, the value of chilli sauce treated nanocomposite samples was not significantly different in comparison with immediate samples.

C. Analysis

Different environmental exposures such as humidity, water, chemicals, and acids cause changes in the nanocomposite matrix polymer's microstructure and chemical composition, which affect its mechanical and physical properties. In this study, methods used for determining the physical and mechanical properties of restorative material are absorbency and diametral tensile strength tests.

Group 1 was conducted as a comparison for groups 2 and 3. This group was used as the control without treatment; therefore, it was taken as the pre-test value. Meanwhile, group 2 was the comparison after 24 hours of immersion in distilled water (pH 6.6). The chili sauce was dissolved 1:1 in distilled water in group 3 (pH 4) to adjust the actual conditions of the oral cavity. Assuming a person eats chili sauce daily and being exposed for 5 minutes per day, 16 hours immersion of nanocomposite samples in chili sauce solution for 4 days is equivalent to 2 years, 1 month, and 18 days (25.6 months) in vivo.

Based on ISO 4049, the maximum absorption value of polymer-based restorations is $40 \mu\text{g}/\text{mm}^3$ [24]. Therefore, the average result of absorption values in group 2 ($10.0 \mu\text{g}/\text{mm}^3$) and group 3 ($8.4 \mu\text{g}/\text{mm}^3$) were lower than the standard maximum absorption value for polymer-based restorations. The average absorbency result of group 3 was lower than group 2, which was affected by the water content and molecule size of chili sauce solution. Chili sauce has a higher viscosity than distilled water, which makes it harder for the sauce molecules to enter the polymer chain and more difficult to absorb. Despite the values differences, after an independent t-test, the absorbency value between the two groups was not significantly different. This condition occurs because the Filtek™ Z350 XT nanocomposite filler is densely filled and has a good bond with the matrix so the space and pathways for water molecules to diffuse in the polymer structure are very limited.

In the diametral tensile strength test, the final values of the three groups as shown in Table II are within the normal average 30-55 MPa [25]. The post hoc Tukey test showed there was significant differences of 10.8% in group 2 towards 1, while there was no significant difference in group 3 towards 1 even though group 3 was higher than group 1. The value of group 3 is 13.4% significantly higher than group 2.

The value of group 3, which is higher than group 2 in the diametral tensile strength test, is assumed due to the content of calcium from chili and garlic in the sauce [26] [27]. When the composite is exposed to chili sauce with an acidic pH of 4.0, surface degradation occurs and the Ca^{2+} ions contained in the chili sauce solution enter the composite. Furthermore, when the sample is immersed in distilled water, a layer is formed and covered the surface of the composite to finally neutralizes the pH and stops the corrosive action. The free ion of Ca^{2+} is one of the factors that strengthen the composite to reduce microcracking issues [28].

Although it is assumed that higher absorbency will decrease diametral tensile strength, in this study it is quite interesting that the three highest absorbency values in group 2 (samples no. 3, 4, and 7) and 3 (samples no. 1, 2, and 3) do not show the lowest diametral tensile strength values. This exact inverted condition is also showed in group 2 (samples 2, 6, and 9) and group 3 (samples no. 7, 8, and 11) which shows the lowest value in absorbency but do not show the

highest diametral tensile strength values. Porosity is not one of the issues for these phenomena since internal porosity will result in higher absorbency and lower diametral tensile strength. There must be other reasons e.g., composition of nanofiller or hydrophilicity of resin matrix, that may cause these phenomena and should be evaluated in further study.

Despite all the possible reasons and phenomena, nanocomposite group that is immersed in chili sauce shows less absorbency and consequently stronger diametral tensile strength in comparison with group that is immersed in distilled water. Moderate consumption of chili sauce does not give harmful effect towards the diametral tensile strength of nanocomposites. However, people are advised not to consume this food excessively, due to the presence of preservatives, MSG, and sugar in chili sauce which causes various diseases. Drinking or rinsing with water and brushing teeth after consuming chili sauce are suggested, to prevent discoloration of the composite resin restoration as shown in Fig. 6.

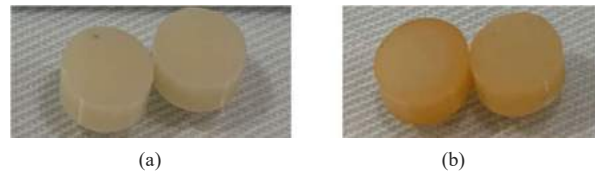


Fig. 6. Nanocomposite sample: (a) before immersion, (b) after immersion in chili sauce for 4 days

The staining susceptibility of composite resins is attributed to their degree of water sorption and hydrophilicity of the resin matrix. Clinically, composite color stability depends upon factors such as the type of cavity design, etching and bonding procedures, degree of conversion, surface roughness, and thermal stresses, which are not analyzed in this study. Therefore, further study on the side effects of food colorant from chili sauce is recommended.

IV. CONCLUSION

In comparison with the immersion in distilled water, immersion in chili sauce increases nanocomposite's diametral tensile strength by 13.4%. However, there is no significant difference ($p \geq 0.05$) in its absorbency after 4x24 hours of immersion. Therefore, immersion of the nanocomposite in chili sauce is not worse than in distilled water.

ACKNOWLEDGMENT

The authors are grateful to the Dental Materials and Testing Center of Research (DMT Core) Laboratory of the Faculty of Dentistry, Universitas Trisakti, Jakarta for providing the facilities.

REFERENCES

- [1] C. Sicca, E. Bobbio, N. Quartuccio, G. Nicolò, and A. Cistaro, "Prevention of dental caries: A review of effective treatments," *Journal of Clinical Experimental Dentistry*, vol. 8, no. 5, pp. e604-610, 2016, Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5149099/>.
- [2] N. Vegia, D. Aires, and F. Douglas, "Dental caries: a review," *Science Open Access*, vol. 2, no. 5, pp. 1-3, 2016, Available: <https://www.semanticscholar.org/paper/Dental-Caries-%3A-A-Review-Veiga-Aires/f12a8ceb378b333372b4e3e131f8e26f8aee9c55>.
- [3] F. V. Zohoori FV and R. M. Duckworth, The impact of nutrition and diet on oral health (Monograph in Oral Science), vol 28, pp 68-76, 2020.

- [4] D. A. Young DA, B. B. Nový, G. G. Zeller, R. Hale, T. C. Hart, E. L. Truelove, et al., "The american dental association caries classification system for clinical practice: a report of the american dental association council on scientific affairs," *Journal of the American Dental Association*, vol. 146, no. 2, pp. 79-86, 2015, Available: <https://pubmed.ncbi.nlm.nih.gov/25637205/>.
- [5] BPPK, "Standard health research (riset kesehatan dasar / RISKESDAS)," Jakarta: Badan Penelitian dan Pengembangan Kesehatan, pp. 93-96, 2018, Available: <https://www.litbang.kemkes.go.id/hasil-utama-riskesdas-2018/>.
- [6] E. S. Sakti, "National dental health (kesehatan gigi nasional)," Indonesia: KemKes RI, pp. 2-6, 2019, Available: <https://pusdatin.kemkes.go.id/download.php?file=download/pusdatin/infodatin/infodatin-gigi.pdf>.
- [7] X. Zhou, X. Huang, M. Li, X. Peng, S. Wang, X. Zhou, et al., "Development and status of resin composite as dental restorative materials," *Journal of Applied Polymer Science*, vol. 133, no. 44, pp. 1-12, 2019, Available: <https://onlinelibrary.wiley.com/doi/10.1002/app.48180>.
- [8] K. J. Anusavice, C. Shen, and H. R. Rawls, Philip's dental material, 13th ed., St. Louis: Elsevier, 2021, pp. 275-286.
- [9] G. J. Mount and W. R. Hume, Preservation and restoration of tooth structure, 3rd ed., Chichester: Wiley Blackwell, 2016, pp. 22-27, 200-206.
- [10] S. Cangül, Ö. Adigüzel, S. Tekin, F. Öztekin, and Ö. Satici, "A comparison of the water absorption and water solubility values of four different composite resin materials," *Cumhuriyet Dental Journal*, vol. 21, no. 4, pp. 335-342, 2018, Available: <https://dergipark.org.tr/en/pub/cumudj/issue/39823/449340>.
- [11] R. L. Sakaguchi and J. M. Powers, Craig's restorative dental materials, 13th ed., vol. 14, St. Louis: Elsevier, 2019, pp. 46, 71, 139-152.
- [12] M. G. Borges, C. J. Soares, T. S. Maia, A. A. Bicalho, T. P. Barbosa, H. L. Costa, et al., "Effect of acidic drinks on shade matching, surface topography, and mechanical properties of conventional and bulk-fill composite resins," *The Journal of Prosthetic Dentistry*, vol. 121, no. 5, p. 868.e1-868.e8, 2019, Available: <https://pubmed.ncbi.nlm.nih.gov/31010591/>.
- [13] A. Orobíyí, H. Ahissou, F. Ggaguidi, F. Sanoussi, A. Houngbè, A. Dansi, et al., "Capsaicin and ascorbic acid content in the high yielding chili pepper (*capsicum annum l.*) landraces of northern benin," *International Journal of Current Microbio and Applied Science*, vol. 4, no. 9, pp. 394-403, 2015.
- [14] M. Nakamoto, K. Kunimura, J. Suzuki, and Y. Koderá, "Antimicrobial properties of hydrophobic compounds in garlic: allicin, vinylidithiin, ajoene and diallyl polysulfides (review)," *Experimental and Therapeutic Medicine*, vol. 19, no. 2, pp. 1550-1553, 2020, Available: <https://www.spandidos-publications.com/10.3892/etm.2019.8388>.
- [15] X. Zhou, X. Huang, M. Li, X. Peng, S. Wang, X. Zhou, et al., "Development and status of resin composite as dental restorative materials," *Journal of Applied Polymed Science*, vol. 133, no. 44, pp. 1-12, 2019.
- [16] BSN, "Indonesian national standard of chili sauce (standar nasional indonesia saus cabai)," Jakarta: Badan Standarisasi Nasional, 2006.
- [17] V. A. D. Silva, S. A. D. Silva, and O. E. Pecho, "Influence of composite type and light irradiance on color stability after immersion in different beverages," *Journal of Esthetic Restoration Dent*, vol. 30, no. 5, pp. 1-7, 2018.
- [18] L. C. Kepler and S. Rodrigues-Junior, "Effect of whitening mouth rinse on the chemical and physical properties of a nanofilled composite," *Brazilian Journal of Oral Science*, vol. 20, no. 00, p. e219320, 2021.
- [19] O. E. Pecho and J. Martos, "Effect of hydrogen peroxide on color and whiteness of resin-based composites," *Journal of Esthetic and Restorative Dentistry*, vol. 31, no. 2, pp. 132-139, 2018, Available: <https://onlinelibrary.wiley.com/doi/abs/10.1111/jerd.12443>.
- [20] S. Hwang, S. H. Chung, J. T. Lee, Y. T. Kim, Y. J. Kim, S. Oh, et al., "Influence of acid, ethanol, and anthocyanin pigment on the optical and mechanical properties of a nanohybrid dental composite resin," *Journal of Materials Science*, vol. 11, no. 7, pp. 1-12, 2018, Available: <https://www.mdpi.com/1996-1944/11/7/1234>.
- [21] J. Chittem, G. S. Sajjan, and M. V. Kanumuri, "Spectrophotometric evaluation of colour stability of nano hybrid composite resin in commonly used food colourants in asian countries," *Journal of Clinical and Diagnostic Research*, vol. 11, no. 1, pp. 61-65, 2017.
- [22] S. A. Ogston, S. Lemeshow, D. W. Hosmer, J. Klar, and S. K. Lwanga, "Adequacy of sample size in health studies," USA, 1998.
- [23] R. Ali and I. A. Aubi, "Composite diametral tensile strength," *World Journal of Dentistry*, vol. 9, no. 6, pp. 458, 2018.
- [24] BS EN ISO 4049, "Polymer-based filling, restorative, and lutting materials," Belgium: International Organization for Standardization, 2019.
- [25] A. Shahawi and M. Batanony, "Comparative evaluation of mechanical properties of three resin composite materials with different filler particle sizes," *Egypt Dental Journal*, vol. 66, pp. 2715-2720, 2020, Available: https://edj.journals.ekb.eg/article_120888.html.
- [26] M. Kumar, "Morphological characterization of garlic (*Allium sativum L.*) germplasm," *Malaysian Journal of Halal Research*, vol. 2, no. 2, pp. 46-52, 2020, Available: <https://sciendo.com/article/10.2478/mjhr-2019-0014>.
- [27] R. S. Ferniah, S. Pujiyanto, and H. P. Kusumaningrum, "Indonesian red chili (*Capsicum annum L.*) capsaicin and its correlation with their responses to pathogenic *Fusarium oxysporum*," *NICHE Journal of Tropical Biology*, vol. 1, no. 2, pp. 1-7, 2018, Available: <https://ejournal2.undip.ac.id/index.php/niche/article/view/3669>.
- [28] M. Seifan, Z. Sarabadani, and A. Berenjian, "Microbially induced calcium carbonate precipitation to design a new type of bio self-healing dental composite," *Appl Microbiology Biotechnology*, vol. 104, no. 5, pp. 2029-2037, 2020, Available: <https://link.springer.com/article/10.1007/s00253-019-10345-9>.

Editorial Board

The Proceedings of the IEEE 2022 Editorial Board



David J. Allstot
Oregon State University, USA



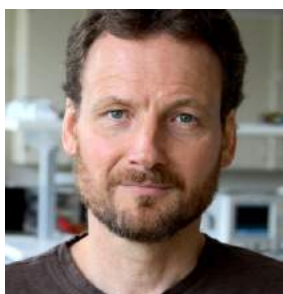
Moeness Amin
Villanova University, USA



John B. Anderson
Lund University, Sweden



John Baillieul
Boston University, USA



Gert Cauwenberghs
UC San Diego, USA





Raja Chatila

Sorbonne University, France



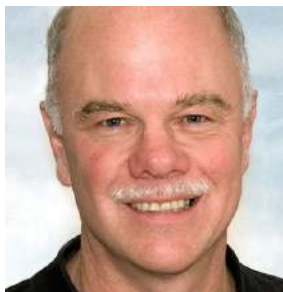
Hsiao-Hwa Chen

National Cheng Kung University, Taiwan



Jack Dongarra

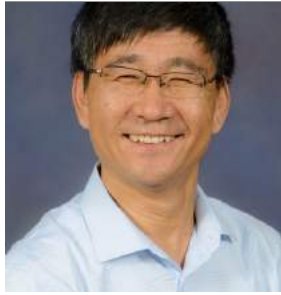
University of Tennessee and Oak Ridge National Lab, USA



James S. Duncan

Yale University, USA





Yuguang (Michael) Fang
University of Florida, USA



Gerhard P. Fettweis
TU Dresden, Germany



Cynthia Furse
University of Utah, USA



Georges Gielen
KU Leuven, Belgium



Maya Gokhale
Lawrence Livermore National Laboratory, USA





Christofer Hierold
ETH Zurich, Switzerland



Ian A. Hiskens
University of Michigan, Ann Arbor, USA



Adrian Ionescu
Ecole Polytechnique Fédérale de Lausanne, Switzerland

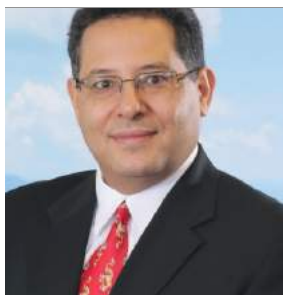


Pramod Khargonekar
University of California, Irvine, USA





Agnieszka Konczykowska
ADesign, France



Khaled Letaief
Hong Kong University of Science and Technology, Hong Kong



Dalma Novak
Octane Wireless, USA



Manish Parashar
University of Utah, USA



Marios M. Polycarpou
University of Cyprus, Cyprus





Zoya Popovic

University of Colorado Boulder, USA



Jerry L. Prince

Johns Hopkins University, USA



Robert Schober

Friedrich-Alexander University of Erlangen-Nuremberg,
Germany



Mohammad Shahidehpour

Illinois Institute of Technology, USA





Aleksandar Stankovic
Tufts University, USA



Manos Tentzeris
Georgia Institute of Technology, USA



Isabel Trancoso
University of Lisbon, Portugal



Chi Kong (Michael) Tse
City University of Hong, Hong Kong



Edward Tunstel
Motiv Space Systems, Inc., USA





Hoi-Jun Yoo

Korea Advanced Institute of Science and Technology, Republic of Korea



C. Patrick Yue

Hong Kong University of Science and Technology, Hong Kong



[Home](#)

[Subscribing](#)

[Contact *Proceedings of the IEEE*](#)

[Media Inquiries and Press Releases](#)

[View *Proceedings of the IEEE* on IEEE Xplore](#)

**Keep up-to-date with the latest news from
*Proceedings of the IEEE***

[NEWSLETTER SIGN UP](#)

[Accessibility](#) | [Nondiscrimination Policy](#) | [IEEE Ethics Reporting](#)
| [IEEE Privacy Policy](#) | [Terms](#)

© Copyright 2022 IEEE – All rights reserved.

A not-for-profit organization, IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.



Editor-In-Chief



Gianluca Setti

Polytecnic of Turin, Italy

Gianluca Setti received a Dr. Eng. degree (honors) and a Ph.D. degree in Electronic Engineering from the University of Bologna, Bologna, Italy, in 1992 and in 1997, respectively. From 1997 to 2017 he was with the Department of Engineering, University of Ferrara, Italy, as an Assistant Professor (1998-2000), Associate Professor (2001-2008), and as a Professor (2009-2017) of Circuit Theory and Analog Electronics. Since December 2017 he is a Professor of Electronics, Signal and Data Processing at the Department of Electronics and Telecommunications (DET) of Politecnico di Torino, Italy. He held several positions as Visiting Professor/Scientist at EPFL (2002, 2005), UCSD (2004), IBM (2004, 2007) and at the University of Washington (2008, 2010), and he is also a permanent (in-kind) faculty member of ARCES, University of Bologna.

His research interests include nonlinear circuits, recurrent neural networks, statistical signal processing, electromagnetic compatibility, compressive sensing and statistical signal processing, biomedical circuits and systems, power electronics, design and implementation of IoT nodes, and circuits and systems for machine learning.

Dr. Setti was the recipient of the 2013 IEEE CAS Society Meritorious Service Award and co-recipient of the 2004 IEEE CAS Society Darlington Award, the 2013 IEEE CAS Society Guillemin-Cauer Award, the best paper award at ECCTD2005, and the best student paper awards at EMCZurich2005 and ISCAS2011. He also received the 1998 Caianiello prize for the best Italian Ph.D. thesis on Neural Networks. He is a Fellow of the IEEE (since 2006).

He served as an Associate Editor for the *IEEE Transactions on Circuits and Systems – Part I* (1999-2002 and 2002-2004) and for the *IEEE Transactions on Circuits and Systems – Part II* (2004-2007), as the Deputy Editor-in-Chief of the *IEEE Circuits and Systems Magazine* (2004-2007), as well as the Editor-in-Chief of the *IEEE Transactions on Circuits and Systems – Part II* (2006-2007) and *IEEE Transactions on Circuits and Systems –*



Part I (2008-2009). He also served on the Editorial Board of *IEEE Access* (2013-2015) and of the *Proceedings of the IEEE* (2015-2018). Since 2019 he is serving as the first non-US Editor-in-Chief of the *Proceedings of the IEEE*, the flagship journal of the Institute.

He was a Distinguished Lecturer of the IEEE CAS Society (2004-2005 and 2013-2014), a member of the CAS Board of Governors (2005-2008), and served as the 2010 CAS Society President.

In 2012, he was the Chair of the IEEE Strategic Planning Committee of the Publication Services and Products Board (PSPB-SPC). In 2013-2014, he was the first non-North American Vice President of the IEEE for Publication Services and Products.

Dr. Setti served on the program committee of many conferences and was, in particular, the Special Sessions Co-Chair of ISCAS2005 (Kobe) and ISCAS2006 (Kos), the Technical Program Co-Chair of NDES2000 (Catania), ISCAS2007 (New Orleans), ISCAS2008 (Seattle), ICECS2012 (Seville), BioCAS2013 and (Rotterdam), as well as the General Co-Chair of NOLTA2006 (Bologna) and ISCAS2018 (Florence).

He is coeditor of the books, *Chaotic Electronics in Telecommunications* (CRC Press, Boca Raton, 2000), *Circuits and Systems for Future Generation of Wireless Communications* (Springer, 2009), and *Design and Analysis of Biomolecular Circuits* (Springer, 2011), coauthor of the book, *Adapted Compressed Sensing for Effective Hardware Implementations*, as well as one of the guest editors of the May 2002 special issue of the *Proceedings of the IEEE* on "Applications of Non-Linear Dynamics to Electronic and Information Engineering."



[Home](#)

[Subscribing](#)

[Contact *Proceedings of the IEEE*](#)

[Media Inquiries and Press Releases](#)

[View *Proceedings of the IEEE* on IEEE Xplore](#)

**Keep up-to-date with the latest news from
*Proceedings of the IEEE***

[NEWSLETTER SIGN UP](#)

[Accessibility](#) | [Nondiscrimination Policy](#) | [IEEE Ethics Reporting](#)
| [IEEE Privacy Policy](#) | [Terms](#)

© Copyright 2022 IEEE – All rights reserved.

A not-for-profit organization, IEEE is the world's largest technical professional organization
dedicated to advancing technology for the benefit of humanity.

Senior Editors



John Baillieul

Boston University, USA



Jón Atli Benediktsson

University of Iceland, Iceland



[Home](#)

[Subscribing](#)

[Contact *Proceedings of the IEEE*](#)

[Media Inquiries and Press Releases](#)

[View *Proceedings of the IEEE* on IEEE Xplore](#)

**Keep up-to-date with the latest news from
*Proceedings of the IEEE***

[NEWSLETTER SIGN UP](#)

[Accessibility](#) | [Nondiscrimination Policy](#) | [IEEE Ethics Reporting](#)
| [IEEE Privacy Policy](#) | [Terms](#)

© Copyright 2022 IEEE - All rights reserved.

A not-for-profit organization, IEEE is the world's largest technical professional organization
dedicated to advancing technology for the benefit of humanity.



Scheduled Maintenance: On Tuesday, February 8, IEEE Xplore will undergo scheduled maintenance from 7:00-9:00pm ET. During this time, there may be intermittent impact on performance. We apologize for any inconvenience. ✕

[IEEE.org](#) [IEEE Xplore](#) [IEEE-SA](#) [IEEE Spectrum](#) [More Sites](#)

[Cart](#) [Create Account](#) [Personal Sign In](#)



IEEE Xplore®

[Browse](#) [My Settings](#) [Help](#)

Access provided by:
Universitas Indonesia

[Sign Out](#)



Access provided by:
Universitas Indonesia

[Sign Out](#)

All ▼

Search within Publication



ADVANCED SEARCH

Quick Links

[Search for Upcoming Conferences](#)
[Browse Conferences > Health, Instrumentation & Meas... > 2021 IEEE International Confer...](#) ?
[IEEE Publication Recommender](#)

[IEEE Author Center](#)

Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), IEEE Proceedings

The proceedings of this conference will be available for purchase through Curran Associates.

Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021 IEEE International Conference on

Print on Demand **Purchase at Partner**

[Copy Persistent Link](#) [Browse Title List](#) [Sign up for Conference Alerts](#)

Proceedings

[All Proceedings](#)

[Popular](#)

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences

(InHeNce) [doi](#)

14-16 July 2021

DOI:

10.1109/InHeNce52833.2021

Search within results



[Download PDFs](#) | [Per Page: 1](#) [Per Page 25](#) | [Export](#) | [Email Selected Results](#)

Showing **1-25** of **89**

Filter

sort: [1](#) Sort Sequence ▼

[Email](#)

Refine

[Author](#) ▼

[Affiliation](#) ▼

[Conference Location](#) ▼

- Antioxidant Activity of Green Tea Extract and Myricetin** 🔒
Didik Priyandoko; Wahyu Widowati; Hanna Sari Widya Kusuma; Ervi Affah; Cahyaning Riski Wijayanti; Cintani Dewi Wahyuni; Amannah Mutmainnah Idris; Rizka Amelia Putdayani; Rizal Rizal
Publication Year: 2021 , Page(s): 1 - 5

[▶ Abstract](#) [HTML](#) [📄](#) [©](#)

Quick Links

[Search for Upcoming](#)

Conferences
IEEE Publication
Recommender
IEEE Author Center


Proceedings

The proceedings of this conference will be available for purchase through Curran Associates.


Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021 IEEE International Conference on


Print on Demand **Purchase at Partner**

- Antioxidant Activity of Green Tea Extract and Myricetin** 
- Didik Priyandoko; Wahyu Widowati; Hanna Sari Widya Kusuma; Ervi Afifah; Cahyaning Riski Wijayanti; Cintani Dewi Wahyuni; Amannah Mutmainnah Idris; Rizka Amelia Putdayani; Rizal Rizal
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


- Phytochemical and Hypoglycemia Effect Test Using Extract of Barangan Banana Peel with OGTT in Male White Rats Induced with Sucrose** 
- Richard Gunawan; I Nyoman Enrich Lister; Edy Fachrial; Chrismis Novalinda Ginting
Publication Year: 2021 , Page(s): 1 - 5


► Abstract **HTML**  

- Phytochemical and Hypoglycemia Effect Test Using Extract of Barangan Banana Peel with OGTT in Male White Rats Induced with Sucrose** 
- Richard Gunawan; I Nyoman Enrich Lister; Edy Fachrial; Chrismis Novalinda Ginting
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021













- Isolation and Molecular Identification of Inulinase Producing Thermophilic Bacteria from Geothermal Hot Spring** 
- Edy Fachrial; Raynald Ignasius Ginting; Harmileni Harmileni; I Nyoman Ehrich Lister; Saryono Saryono; Titania T Nugroho
Publication Year: 2021 , Page(s): 1 - 6


► Abstract **HTML**  


- Isolation and Molecular Identification of Inulinase Producing Thermophilic Bacteria from Geothermal Hot Spring** 
- Edy Fachrial; Raynald Ignasius Ginting; Harmileni Harmileni; I Nyoman Ehrich Lister; Saryono Saryono; Titania T Nugroho
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Analysis of Mosquito Genetic with PCR-RAPD Approach** 
- Farah Nuriessa Aputri; Laila Hanum; Rahmat Pratama; Yuanita Windusari
Publication Year: 2021 , Page(s): 1 - 6

► Abstract **HTML**  


- Analysis of Mosquito Genetic with PCR-RAPD Approach** 
Farah Nuriessa Aputri; Laila Hanum; Rahmat Pratama; Yuanita Windusari
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-
- Aloe vera Protective Effect on Lipopolysaccharide-Induced RAW 264.7 Inflamed Cells** 
Ervina Angelia; Shieny Lokanata; Wahyu Widowati; Steven Wijaya; Zulfan Muttaqin; Florenly Florenly
Publication Year: 2021 , Page(s): 1 - 6
- ▶ Abstract **HTML**  
- Aloe vera Protective Effect on Lipopolysaccharide-Induced RAW 264.7 Inflamed Cells** 
Ervina Angelia; Shieny Lokanata; Wahyu Widowati; Steven Wijaya; Zulfan Muttaqin; Florenly Florenly
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-
- The Effectiveness of Red Spinach Extract Ointment (Amaranthus tricolor L.) against Healing Second Degree Burns in Wistar Rat** 
Tri Oktarina Safitri; Ali Napih Nasution; Chrismis Novalinda Ginting; Ermi Girsang
Publication Year: 2021 , Page(s): 1 - 6
- ▶ Abstract **HTML**  
- The Effectiveness of Red Spinach Extract Ointment (Amaranthus tricolor L.) against Healing Second Degree Burns in Wistar Rat** 
Tri Oktarina Safitri; Ali Napih Nasution; Chrismis Novalinda Ginting; Ermi Girsang
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-
- Antioxidant Potency of Kaempferia galanga Linn and Zingiber officinale var. Rubra rhizomes** 
Dian Ratih Laksmiawati; Wahyu Widowati; Hana Sari Widya Kusuma; Diah Kartika Pratami; Cahyaning Riski Wijayanti; Cintani Dewi Wahyuni; Ervi Afifah; Rizal Rizal
Publication Year: 2021 , Page(s): 1 - 6
- ▶ Abstract **HTML**  

- Antioxidant Potency of Kaempferia galanga Linn and Zingiber officinale var. Rubra rhizomes** 
Dian Ratih Laksmiawati; Wahyu Widowati; Hana Sari Widya Kusuma; Diah Kartika Pratami; Cahyaning Riski Wijayanti; Cintani Dewi Wahyuni; Ervi Afifah; Rizal Rizal
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


-
- Effect of Andaliman Fruit Extract on Cervical Cancer Rat's Histology** 
Rostime Hermayerni Simanullang; Syafruddin Ilyas; Salomo Hutahaeen; Rosidah; Risma Dumiri Manurung; Putri Cahaya Situmorang
Publication Year: 2021 , Page(s): 1 - 5


▶ Abstract **HTML**  

- Effect of Andaliman Fruit Extract on Cervical Cancer Rat's Histology** 
Rostime Hermayerni Simanullang; Syafruddin Ilyas; Salomo Hutahaeen; Rosidah; Risma Dumiri Manurung; Putri Cahaya Situmorang
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


-
- The Effect of Extract Ethanol Rosa damascena to the Interleukin-6 Level of Obese Rats** 
M. Andriady Saidi Nasution; Chrismis Novalinda Ginting; Linda Chiuman; I Nyoman Ehrich Lister
Publication Year: 2021 , Page(s): 1 - 5


▶ Abstract **HTML**  




- The Effect of Extract Ethanol Rosa damascena to the Interleukin-6 Level of Obese Rats** 
M. Andriady Saidi Nasution; Chrismis Novalinda Ginting; Linda Chiuman; I Nyoman Ehrich Lister
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


-
- Improvement of Liver Function from Lemon Pepper Fruit Ethanol Extract in Streptozotocin-Induced Wistar Rats** 
Linda Chiuman; Chrismis Novalinda Ginting; Ok Yulizal; Suhartomi; Veranyca Chiuman
Publication Year: 2021 , Page(s): 1 - 5




▶ Abstract **HTML**  


- Synthesis of Photocatalyst Fe₃O₄-CuO/activated carbon for removal of Aniline in water** 
Allwar Allwar; Hasna Putri Wibawanti; Rina Maulina; Septianti Putri Shopiar; Rizky Frio Abimanyu; Feby Rahmawati
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021




- Liver Protection Activity of Sunkist Orange (*Citrus sinensis* L. Osbeck) Peels in Cyclophosphamide Induced Male Wistar Rat** 
Yolanda Eliza Putri Lubis; Maya Sari Mutia
Publication Year: 2021 , Page(s): 1 - 5


▶ Abstract **HTML**  
 Liver Protection Activity of Sunkist Orange (*Citrus sinensis* L. Osbeck) Peels in Cyclophosphamide Induced Male Wistar Rat 
Yolanda Eliza Putri Lubis; Maya Sari Mutia
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Relationship between Cervical Vertebrae Maturity Levels with Mandibular Growth at the Age of 8 – 20 Years in Batak Tribe** 
Hilda Fitria Lubis; Christine Lumban Gaol
Publication Year: 2021 , Page(s): 1 - 5

▶ Abstract **HTML**  
 Relationship between Cervical Vertebrae Maturity Levels with Mandibular Growth at the Age of 8 – 20 Years in Batak Tribe 
Hilda Fitria Lubis; Christine Lumban Gaol
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Potential Polymorphism of BMP-2 rs235768 in North Sumatra sub-population with Mandibular Asymmetry** 
Felicia; Ervina Sofyanti; Trelia Boel; Denny Satria; Donny Nauphar
Publication Year: 2021 , Page(s): 1 - 5

▶ Abstract **HTML**  
 Potential Polymorphism of BMP-2 rs235768 in North Sumatra sub-population with Mandibular Asymmetry 
Felicia; Ervina Sofyanti; Trelia Boel; Denny Satria; Donny Nauphar
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Scheduling for Healthcare Centre for COVID-19: Deep** 


Learning and Genetic Algorithmic Approach

Rasmika Billa; Mohammad Abdul Razzaq; Indranil

Mukhopadhyay; Santanu Mandal

Publication Year: 2021 , Page(s): 1 - 5

▶ Abstract **HTML**  

-
- Scheduling for Healthcare Centre for COVID-19: Deep Learning and Genetic Algorithmic Approach**
- 

Rasmika Billa; Mohammad Abdul Razzaq; Indranil

Mukhopadhyay; Santanu Mandal

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)

Year: 2021

-
- Potential of Human Wharton's Jelly Mesenchymal Stem Cells (hWJMSCs) Secretome for COVID-19 Adjuvant Therapy Candidate**
- 

Wahyu Widowati; Teresa Liliana Wargasetia; Fanny


Rahardja; Rimonta F Gunanegara; Tri Handayani; Hanna Sari

Widya Kusuma; Seila Arumwardana; Cahyaning Riski

Wijayanti; Rizal Rizal

Publication Year: 2021 , Page(s): 1 - 6

▶ Abstract **HTML**  

-
- Potential of Human Wharton's Jelly Mesenchymal Stem Cells (hWJMSCs) Secretome for COVID-19 Adjuvant Therapy Candidate**
- 

Wahyu Widowati; Teresa Liliana Wargasetia; Fanny

Rahardja; Rimonta F Gunanegara; Tri Handayani; Hanna Sari

Widya Kusuma; Seila Arumwardana; Cahyaning Riski

Wijayanti; Rizal Rizal

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)

Year: 2021


-
- Animals and Technology in Space: A Perspective from Aerospace Engineering to Veterinary Medicine**
- 

Andrés D. Reina; José Cornejo; Sergio Galvis-Forero; Eduardo

Guzman; Reynaldo Oliva-Hernández

Publication Year: 2021 , Page(s): 1 - 6

▶ Abstract **HTML**  

-
- Animals and Technology in Space: A Perspective from Aerospace Engineering to Veterinary Medicine**
- 

Andrés D. Reina; José Cornejo; Sergio Galvis-

Forero; Eduardo Guzman; Reynaldo Oliva-Hernández

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)












Year: 2021


-
- Stronger Antibacterial Efficacy of Red Beetroots Compared to Red Dragon Fruit Peels Extract on Streptococcus mutans**
- 

Winda Khosasi; Jevon Felim; Shavilla Lukita; Mellisa

Sim; Steven Wijaya; Florenly

Publication Year: 2021 , Page(s): 1 - 5

- ▶ Abstract **HTML**   
- Stronger Antibacterial Efficacy of Red Beetroots Compared to Red Dragon Fruit Peels Extract on Streptococcus mutans**
- Winda Khosasi; Jevon Felim; Shavilla Lukita; Mellisa Sim; Steven Wijaya; Florenly
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-
- HIPAA-based Analysis on the Awareness Level of Medical Personnel in Indonesia to Secure Electronic Protected Health Information (ePHI)** 
- Hidayah; Kalamullah Ramli
Publication Year: 2021 , Page(s): 1 - 6
- ▶ Abstract **HTML**   
- HIPAA-based Analysis on the Awareness Level of Medical Personnel in Indonesia to Secure Electronic Protected Health Information (ePHI)**
- Hidayah; Kalamullah Ramli
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-
- Measurement of Gas Bubbles Distribution on Electroflotation Process Using Titanium and Stainless Steel Electrode with DinoCapture 2.0** 
- Rudy Syah Putra; Desi Arrunillah; Farikhatul Fitria; Nadia Ripki
Publication Year: 2021 , Page(s): 1 - 5
- ▶ Abstract **HTML**   
- Measurement of Gas Bubbles Distribution on Electroflotation Process Using Titanium and Stainless Steel Electrode with DinoCapture 2.0**
- Rudy Syah Putra; Desi Arrunillah; Farikhatul Fitria; Nadia Ripki
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-

Artificial Intelligence in Medicine: A review of challenges in implementation and disparity 

Alwin Kumar Rathinam; Yunli Lee; David Ngo Chek Ling; Rajesh Singh; Lakshmi Selvaratnam; Narendra Pamidi

Publication Year: 2021 , Page(s): 1 - 6


IEEE Personal Account

CHANGE USERNAME/PASSWORD

Purchase Details   **Profile Information** 

Need Help?

Follow

Artificial Intelligence in Medicine: A review of challenges in implementation and disparity 

VIEW PURCHASED DOCUMENTS

Alwin Kumar Rathinam; Yunli Lee; David Ngo Chek Ling; Rajesh Singh; Lakshmi Selvaratnam; Narendra Pamidi

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)

Year: 2021

US & CANADA: +1 800 678 4333

WORLDWIDE: +1 732 981 0060

CONTACT & SUPPORT

About IEEE Xplore | Contact Us | Help | Accessibility | Terms of Use | Nondiscrimination Policy | IEEE Ethics Reporting  | Sitemap | Privacy & Opting Out of Cookies 

Antioxidant, Total Phenol, Total Flavonoid, and LC-MS/MS 


Analysis of Pometia Pinnata Ethanol Extract

Adrian; Rony Abdi Syahputra; Sukirman Lie; Steven Theo; Sony Eka Nugraha




Publication Year: 2021 , Page(s): 1 - 5



© Copyright 2022 IEEE - All rights reserved.

Abstract   



Antioxidant, Total Phenol, Total Flavonoid, and LC-MS/MS 



Analysis of Pometia Pinnata Ethanol Extract

Purchase Details   **Profile Information** 

Payment Options   **Communications Preferences**

Adrian; Rony Abdi Syahputra; Sukirman Lie; Steven Theo; Sony Eka Nugraha

Order History   **Profession and Education**

View Purchased Documents   **Technical Interests**

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)

Year: 2021

Need Help?

» **US & Canada:** +1 800 678 4333

» **Worldwide:** +1 732 981 0060

» **Contact & Support**

IEEE Account

» Change Username/Password

» Update Address

About IEEE Xplore | Contact Us | Help | Accessibility | Terms of Use | Nondiscrimination Policy | Sitemap | Privacy & Opting Out of Cookies

A not-for-profit organization, IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.

© Copyright 2022 IEEE - All rights reserved. Use of this web site signifies your agreement to the terms and conditions.

Scheduled Maintenance: On Tuesday, February 8, IEEE Xplore will undergo scheduled maintenance from 7:00-9:00pm ET. During this time, there may be intermittent impact on performance. We apologize for any inconvenience. ✕

IEEE.org [IEEE Xplore](#) IEEE-SA IEEE Spectrum More Sites

Cart [Create Account](#) [Personal Sign In](#)



IEEE Xplore®

[Browse](#) [My Settings](#) [Help](#)

Access provided by:
Universitas Indonesia

[Sign Out](#)



Access provided by:
Universitas Indonesia

[Sign Out](#)

All

Search within Publication



ADVANCED SEARCH

Quick Links

[Search for Upcoming Conferences](#)
[Browse Conferences > Health, Instrumentation & Meas... > 2021 IEEE International Confer...](#) [?](#)
[IEEE Publication Recommender](#)

[IEEE Author Center](#)

Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), IEEE Proceedings

The proceedings of this conference will be available for purchase through Curran Associates.

Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021 IEEE International Conference on

Print on Demand **Purchase at Partner**

[Copy Persistent Link](#) [Browse Title List](#) [Sign up for Conference Alerts](#)

Proceedings

[All Proceedings](#)

[Popular](#)

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences

(InHeNce) [doi](#)

14-16 July 2021

DOI:

10.1109/InHeNce52833.2021

Search within results



Download PDFs [▼](#) | Per Page: [1](#) Per Page [25](#) [▼](#) | Export [▼](#) | Email Selected Results [▼](#)

Showing **26-50** of **89**

Filter

sort: [1](#) Sort Sequence [▼](#)

| [✉](#) Email

Refine

[Author](#) [▼](#)

[Affiliation](#) [▼](#)

[Conference Location](#) [▼](#)

Extracted Passiflora edulis Pulp to Reduce Inflammation in LPS-activated Macrophage Cell Line: RAW 264.7 [🔒](#)

Lily Widjaja; Cindy Denhara Wijaya; Mellisa Sim; Wahyu

Widowati; Lina Hadi; Florenly

Publication Year: 2021 , Page(s): 1 - 5

[▶ Abstract](#) [HTML](#) [📄](#) [©](#)

Quick Links

[Search for Upcoming](#)


Conferences
IEEE Publication
Recommender
IEEE Author Center


Proceedings

The proceedings of this conference will be available for purchase through Curran Associates.


Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021 IEEE International Conference on


Print on Demand **Purchase at Partner**

- Extracted Passiflora edulis Pulp to Reduce Inflammation in LPS-activated Macrophage Cell Line: RAW 264.7** 
- Lily Widjaja; Cindy Denhara Wijaya; Mellisa Sim; Wahyu Widowati; Lina Hadi; Florenly
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


- Analysis of Bubbles Size Produced in Electroflotation Using Graphite and Stainless Steel Electrode With DinoCapture 2.0** 
- Rudy Syah Putra; Muhammad Sarkawi; Farokhatul Faikha; Ludfi Fitmoko
Publication Year: 2021 , Page(s): 1 - 5


► Abstract **HTML**  

- Analysis of Bubbles Size Produced in Electroflotation Using Graphite and Stainless Steel Electrode With DinoCapture 2.0** 
- Rudy Syah Putra; Muhammad Sarkawi; Farokhatul Faikha; Ludfi Fitmoko
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


- Development of a heart wave transmitter between android devices using iLBC coding over the internet** 
- Alexander Diaz Maldonado; Juan Ludwing-Bryam Alfaro Gonzales
Publication Year: 2021 , Page(s): 1 - 4





► Abstract **HTML**  





- Development of a heart wave transmitter between android devices using iLBC coding over the internet** 
- Alexander Diaz Maldonado; Juan Ludwing-Bryam Alfaro Gonzales
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021




- Anti-Aging Effectiveness of Red Spinach Extract Ointment (Amaranthus Tricolor L.) Against Collagen, Elasticity, Hydration, Sebum, and Pigment Levels in Wistar Rats** 
- Amelia; Ermi Girsang; Ali Napiah Nasution; Chrismis Novalinda Ginting
Publication Year: 2021 , Page(s): 1 - 6

► Abstract **HTML**  

- Anti-Aging Effectiveness of Red Spinach Extract Ointment (*Amaranthus Tricolor* L.) Against Collagen, Elasticity, Hydration, Sebum, and Pigment Levels in Wistar Rats** 
Amelia; Ermi Girsang; Ali Napiah Nasution; Chrismis Novalinda Ginting
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Potential of *Gnetum gnemon* L. Seed Extract Against Insulin Levels and PDX-1 Expression in Diabetes Mellitus Rats Model** 
Rosni Rosni; I Nyoman Ehrich Lister; Edy Fachrial; Sahna Ferdinand Ginting; Wahyu Widowati; Cintani Dewi Wahyuni
Publication Year: 2021 , Page(s): 1 - 5
- ▶ Abstract **HTML**   
- Potential of *Gnetum gnemon* L. Seed Extract Against Insulin Levels and PDX-1 Expression in Diabetes Mellitus Rats Model**
Rosni Rosni; I Nyoman Ehrich Lister; Edy Fachrial; Sahna Ferdinand Ginting; Wahyu Widowati; Cintani Dewi Wahyuni
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Antioxidant Properties of Soybean (*Glycine max* L.) Extract and Isoflavone** 
Wahyu Widowati; Didik Pryandoko; Cintani Dewi Wahyuni; Meganita Marthania; Hanna Sari Widya Kusuma; Tri Handayani; Rizal
Publication Year: 2021 , Page(s): 1 - 6
- ▶ Abstract **HTML**   
- Antioxidant Properties of Soybean (*Glycine max* L.) Extract and Isoflavone**
Wahyu Widowati; Didik Pryandoko; Cintani Dewi Wahyuni; Meganita Marthania; Hanna Sari Widya Kusuma; Tri Handayani; Rizal
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Syzygium polyanthum* Ethanol Extract Ameliorates Benzene-induced Nephrotoxicity in Rats** 
Rimin; I Nyoman Ehrich Lister; Sukirman Lie; Ali Napiah Nasution
Publication Year: 2021 , Page(s): 1 - 6
- ▶ Abstract **HTML**  

- Syzygium polyanthum Ethanol Extract Ameliorates Benzene-induced Nephrotoxicity in Rats**
Rimin; I Nyoman Ehrich Lister; Sukirman Lie; Ali Napiah Nasution
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

-
- Information Systems Of School Financial Management With Digital Signature Recognition Using MobileNet Algorithm**
Dwi Sunaryono; Chaniyah Zulfa Mukhlisah; Siti Rochimah; Irzal Ahmad Sabilla
Publication Year: 2021 , Page(s): 1 - 6

▶ Abstract **HTML**  

- Information Systems Of School Financial Management With Digital Signature Recognition Using MobileNet Algorithm**
Dwi Sunaryono; Chaniyah Zulfa Mukhlisah; Siti Rochimah; Irzal Ahmad Sabilla
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

-
- The Protective Effect of Ethanolic Extract of Syzygium Polyanthum on the Pancreas of Benzene-Induced Rats**
Rosmerry Simanjuntak; I Nyoman Ehrich Lister; Sukirman Lie
Publication Year: 2021 , Page(s): 1 - 6

▶ Abstract **HTML**  

- The Protective Effect of Ethanolic Extract of Syzygium Polyanthum on the Pancreas of Benzene-Induced Rats**
Rosmerry Simanjuntak; I Nyoman Ehrich Lister; Sukirman Lie
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

-
- Hematological Profiles of Benzene-Induced Rats Treated with Ethanolic Extract of Syzygium Polyanthum**
Robert Komaria; I Nyoman Ehrich Lister; Sukirman Lie
Publication Year: 2021 , Page(s): 1 - 6

▶ Abstract **HTML**  

- Hematological Profiles of Benzene-Induced Rats Treated with Ethanolic Extract of Syzygium Polyanthum**
Robert Komaria; I Nyoman Ehrich Lister; Sukirman Lie
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

-
- Role of Platelet-Rich Plasma to Sperm Quality in Male Partners Undergoing Infertility Treatment**
Jesselyn Angellee; Chrismis Novalinda Ginting; Linda

Chiuman; Binarwan Halim
Publication Year: 2021 , Page(s): 1 - 5

► Abstract **HTML**  


- Role of Platelet-Rich Plasma to Sperm Quality in Male Partners Undergoing Infertility Treatment** 

Jesselyn Angellee; Chrismis Novalinda Ginting; Linda Chiuman; Binarwan Halim
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Antioxidant Activity, Total Phenol, and Total Flavonoid of Syzygium Polyanthum** 

Loudfy Eka Widyawaty; I Nyoman Ehrich Lister; Sukirman Lie
Publication Year: 2021 , Page(s): 1 - 5

► Abstract **HTML**  


- Antioxidant Activity, Total Phenol, and Total Flavonoid of Syzygium Polyanthum** 

Loudfy Eka Widyawaty; I Nyoman Ehrich Lister; Sukirman Lie
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Anti-hyperuricemia of Avocado Leaves Ethanol Extract in Potassium Oxonate Induced-Rats** 

Riska Tini Amis; Chrismis Novalinda Ginting; Sahna Ferdinand; Refi Ikhtiari
Publication Year: 2021 , Page(s): 1 - 5

► Abstract **HTML**  


- Anti-hyperuricemia of Avocado Leaves Ethanol Extract in Potassium Oxonate Induced-Rats** 

Riska Tini Amis; Chrismis Novalinda Ginting; Sahna Ferdinand; Refi Ikhtiari
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


- Evaluation of Honey Effectivity on Burned-Wound Contraction in Rattus Norvegicus** 

Nur Aidah; I Nyoman Ehrich Lister; Chrismis Novalinda Ginting; Refi Ikhtiari
Publication Year: 2021 , Page(s): 1 - 5


► Abstract **HTML**  


- Evaluation of Honey Effectivity on Burned-Wound Contraction in Rattus Norvegicus** 

Nur Aidah; I Nyoman Ehrich Lister; Chrismis Novalinda Ginting; Refi Ikhtiari
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


- The Hepatoprotective Effect of White Turmeric Ethanol Extract on Cyclophosphamide-Induced Male Wistar Rats** 
- Timbul M Panjaitan; Chrismis Novalinda Ginting; Linda Chiuman; Adrian Khu
Publication Year: 2021 , Page(s): 1 - 5


▶ Abstract **HTML**  

- The Hepatoprotective Effect of White Turmeric Ethanol Extract on Cyclophosphamide-Induced Male Wistar Rats** 
- Timbul M Panjaitan; Chrismis Novalinda Ginting; Linda Chiuman; Adrian Khu
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

-
- Identification of Chemical Compounds to Predict In Silico Toxicity using Syzygium polyanthum Ethanol Extract** 
- Focoriyena Mendrofa; I Nyoman Ehrich Lister; Sukirman Lie
Publication Year: 2021 , Page(s): 1 - 4


▶ Abstract **HTML**  

- Identification of Chemical Compounds to Predict In Silico Toxicity using Syzygium polyanthum Ethanol Extract** 
- Focoriyena Mendrofa; I Nyoman Ehrich Lister; Sukirman Lie
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


-
- The Impact of Red Dragon Fruit (Hylocereus polyrhizus) Consumption on Improving Cell Function in Mitochondria in Delaying Fatigue during Strenuous Exercise** 
- Gusbakti Rusip; Syafruddin Ilyas; Chrismis Novalinda Ginting
Publication Year: 2021 , Page(s): 1 - 5






▶ Abstract **HTML**  






- The Impact of Red Dragon Fruit (Hylocereus polyrhizus) Consumption on Improving Cell Function in Mitochondria in Delaying Fatigue during Strenuous Exercise** 
- Gusbakti Rusip; Syafruddin Ilyas; Chrismis Novalinda Ginting
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021






-
- Ethanollic Extract of Syzygium polyanthum Effect in Reduce Biomarkers Levels to Prevent Rats Liver Damage** 
- Norma Elmawati Nindy Sari; I Nyoman Ehrich Lister; Sukirman Lie
Publication Year: 2021 , Page(s): 1 - 5


▶ Abstract **HTML**  

-
- Ethanollic Extract of Syzygium polyanthum Effect in Reduce Biomarkers Levels to Prevent Rats Liver Damage** 
Norma Elmawati Nindy Sari; I Nyoman Ehrich Lister; Sukirman Lie
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


 - Reduction of Tropinin Levels in Rats through Cardioprotective Activity of Syzygium Polyanthum Ethanol Extract** 
Daniel Agustinus Teddy Soemijarto; I Nyoman Ehrich Lister; Sukirman Lie
Publication Year: 2021 , Page(s): 1 - 5
 - ▶ Abstract **HTML**   
 - Reduction of Tropinin Levels in Rats through Cardioprotective Activity of Syzygium Polyanthum Ethanol Extract** 
Daniel Agustinus Teddy Soemijarto; I Nyoman Ehrich Lister; Sukirman Lie
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


 - Papaya Latex for Healing the Second Degree of Burn Wound in Male Mice** 
Kuning Eny Surya; Adrian Khu; Ahmad Raif; Refi Ikhtiari
Publication Year: 2021 , Page(s): 1 - 6
 - ▶ Abstract **HTML**   
 - Papaya Latex for Healing the Second Degree of Burn Wound in Male Mice** 
Kuning Eny Surya; Adrian Khu; Ahmad Raif; Refi Ikhtiari
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

 - The Effect of Administration Fig Leaf Tea to Reduce Blood Glucose Levels In Diabetes Mellitus Patients** 
Agreyes Ganika br Bangun; Dameria; Arini Setiawaty Pardede; Masryna Siagian
Publication Year: 2021 , Page(s): 1 - 5
 - ▶ Abstract **HTML**   
 - The Effect of Administration Fig Leaf Tea to Reduce Blood Glucose Levels In Diabetes Mellitus Patients** 
Agreyes Ganika br Bangun; Dameria; Arini Setiawaty Pardede; Masryna Siagian
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-


- Pancreas Protective Effect Ethanol Extract of Curcuma on Rats Induced Doxorubicin** 
- Rizki Ramadani Lubis; Sahna Ferdinand Ginting; Chrismis Novalinda Ginting; Linda Chiuman
Publication Year: 2021 , Page(s): 1 - 5


► Abstract **HTML**  

- Pancreas Protective Effect Ethanol Extract of Curcuma on Rats Induced Doxorubicin** 
- Rizki Ramadani Lubis; Sahna Ferdinand Ginting; Chrismis Novalinda Ginting; Linda Chiuman
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


- Neuroprotective Effect of Syzygium Polyanthum Extract on TNF Alpha and Dopamine Levels in Benzene-induced Rats** 
- Steven Theo; Sahna Ferdinand Ginting; Linda Chiuman; Chrismis Novalinda Ginting
Publication Year: 2021 , Page(s): 1 - 5

► Abstract **HTML**  

- Neuroprotective Effect of Syzygium Polyanthum Extract on TNF Alpha and Dopamine Levels in Benzene-induced Rats** 
- Steven Theo; Sahna Ferdinand Ginting; Linda Chiuman; Chrismis Novalinda Ginting
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Anti-diabetic Activity of The Rose Petal Methanolic Extract in Alloxan-Diabetic Rats** 
- Linda Wati; Linda Chiuman; Ali Napih Nasution; Chrismis Novalinda Ginting
Publication Year: 2021 , Page(s): 1 - 5


► Abstract **HTML**  

- Anti-diabetic Activity of The Rose Petal Methanolic Extract in Alloxan-Diabetic Rats** 
- Linda Wati; Linda Chiuman; Ali Napih Nasution; Chrismis Novalinda Ginting
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

IEEE Personal Account

CHANGE
USERNAME/PASSWORD

Purchase Details

- Exploration of Analgesic-Antipyretic Effect from Lemon Peppers Methanolic Extract** 
- Rutra Jaya Salim; Linda Chiuman; Ali Napih Nasution; Chrismis Novalinda Ginting
Publication Year: 2021 , Page(s): 1 - 5

► Abstract **HTML**  

Profile Information

COMMUNICATIONS
PREFERENCES
PROFESSION AND
EDUCATION

TECHNICAL INTERESTS

Need Help?

 US & CANADA: +1 800 678
4333
WORLDWIDE: +1 732 981
0060
CONTACT & SUPPORT

Follow

About IEEE Xplore | Contact Us | Help | Accessibility | Terms of Use | Nondiscrimination Policy | Sitemap | Privacy & Opting Out of Cookies

Exploration of Artificial Intelligence in Antimicrobial Effectiveness Reporting Method and Extract

Putra Jaya Salim; Linda Chiuman; Ali Napih Nasution; Chrismis Novalinda Ginting

A not-for-profit organization, IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeM)

Year: 2021

© Copyright 2022 IEEE - All rights reserved.

IEEE Account

» Change Username/Password

» Update Address

Purchase Details

» Payment Options

» Order History

» View Purchased Documents

Profile Information

» Communications Preferences

» Profession and Education

» Technical Interests

Load More

Need Help?

» **US & Canada:** +1 800 678 4333

» **Worldwide:** +1 732 981 0060

» Contact & Support

< 1 2 3 4 >

About IEEE Xplore | Contact Us | Help | Accessibility | Terms of Use | Nondiscrimination Policy | Sitemap | Privacy & Opting Out of Cookies

A not-for-profit organization, IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.

© Copyright 2022 IEEE - All rights reserved. Use of this web site signifies your agreement to the terms and conditions.

Scheduled Maintenance: On Tuesday, February 8, IEEE Xplore will undergo scheduled maintenance from 7:00-9:00pm ET. During this time, there may be intermittent impact on performance. We apologize for any inconvenience. ✕

IEEE.org [IEEE Xplore](#) IEEE-SA IEEE Spectrum More Sites

Cart [Create Account](#) [Personal Sign In](#)



IEEE Xplore®

[Browse](#) [My Settings](#) [Help](#)

Access provided by:
Universitas Indonesia

[Sign Out](#)



Access provided by:
Universitas Indonesia

[Sign Out](#)

All ▼
 Search within Publication

[ADVANCED SEARCH](#)

Quick Links

[Search for Upcoming Conferences](#)
[Browse Conferences > Health, Instrumentation & Meas... > 2021 IEEE International Confer...](#) ?
[IEEE Publication Recommender](#)

[IEEE Author Center](#)

Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), IEEE Proceedings

The proceedings of this conference will be available for purchase through Curran Associates.

Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021 IEEE International Conference on

Print on Demand **Purchase at Partner**

[Copy Persistent Link](#) [Browse Title List](#) [Sign up for Conference Alerts](#)

Proceedings

[All Proceedings](#)

[Popular](#)

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences

(InHeNce) [doi](#)

14-16 July 2021

DOI:

10.1109/InHeNce52833.2021

Search within results



[Download PDFs](#) | [Per Page: 1 Per Page 25](#) | [Export](#) | [Email Selected Results](#)

Showing **51-75** of **89**

Filter

sort: [Sort Sequence](#)

[Email](#)

Refine

[Author](#)

[Affiliation](#)

[Conference Location](#)

Anti-Dyslipidemia Activity from Lemon Pepper in PTU and High Fat Diet Induced Rats

Laura Enika; Linda Chiuman; Ali Napiyah Nasution; Chrismis

Novalinda Ginting

Publication Year: 2021 , Page(s): 1 - 6

[Abstract](#)

[HTML](#)



Quick Links

[Search for Upcoming](#)


Conferences
IEEE Publication
Recommender
IEEE Author Center


Proceedings

The proceedings of this conference will be available for purchase through Curran Associates.


Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021 IEEE International Conference on


Print on Demand **Purchase at Partner**

- Anti-Dyslipidemia Activity from Lemon Pepper in PTU and High Fat Diet Induced Rats** 
Laura Enika; Linda Chiuman; Ali Napiyah Nasution; Chrismis Novalinda Ginting
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


- Association between Body Mass Index (BMI) and DNA Fragmentation Index** 
Kendy Gunawan; Edy Fachrial; Adek Amansyah; Binarwan Halim
Publication Year: 2021 , Page(s): 1 - 6


▶ Abstract **HTML**  

- Association between Body Mass Index (BMI) and DNA Fragmentation Index** 
Kendy Gunawan; Edy Fachrial; Adek Amansyah; Binarwan Halim
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Microencapsulation of Lemongrass Leaves Effect on Reactive Oxygen Species (ROS) Fibroblasts** 
Gisca Veronica; Komariah; Ln Gabriella Clara Maria
Publication Year: 2021 , Page(s): 1 - 5


▶ Abstract **HTML**  

















- Microencapsulation of Lemongrass Leaves Effect on Reactive Oxygen Species (ROS) Fibroblasts** 
Gisca Veronica; Komariah; Ln Gabriella Clara Maria
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Synthesis of Silver Nanoparticles from Lemongrass Leaves Induced Wound Healing by Reduction ROS Fibroblasts** 
Ln Gabriella Clara Maria; Komariah; Gisca Veronica
Publication Year: 2021 , Page(s): 1 - 5

▶ Abstract **HTML**  


- Synthesis of Silver Nanoparticles from Lemongrass Leaves Induced Wound Healing by Reduction ROS Fibroblasts** 
Ln Gabriella Clara Maria; Komariah; Gisca Veronica
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Effectiveness of reducing lead levels on feather shells with various types of filtrates** 
Putri Yunita Pane; Eti Rotua Baruto; Rizki Aulia
Riwanda; Hartono; Victor Trimanjaya Hulu; Ermi Girsang
Publication Year: 2021 , Page(s): 1 - 5

- Abstract** **HTML**   
- Effectiveness of reducing lead levels on feather shells with various types of filtrates**
- Putri Yunita Pane; Eti Rotua Baruto; Rizki Aulia
Riwanda; Hartono; Victor Trimanjaya Hulu; Ermi Girsang
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-
- Antibiofilm Activity of Parabiotic Reuterin on Acrylic Resin Plates** 
- Armelia Sari Widyarman; Thalia Venessa Maukar; Rosalina Tjandrawinata; Citra Fragrantia Theodora
Publication Year: 2021 , Page(s): 1 - 6
- Abstract** **HTML**   
- Antibiofilm Activity of Parabiotic Reuterin on Acrylic Resin Plates**
- Armelia Sari Widyarman; Thalia Venessa Maukar; Rosalina Tjandrawinata; Citra Fragrantia Theodora
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-
- Goji Berry Extract (*Lycium barbarum* L.) Efficacy on Oral Pathogen Biofilms** 
- Sheila Soesanto; Ricky Chandra Jaya Soen; Reynalda Oktaviani; Armelia Sari Widyarman
Publication Year: 2021 , Page(s): 1 - 6
- Abstract** **HTML**   
- Goji Berry Extract (*Lycium barbarum* L.) Efficacy on Oral Pathogen Biofilms**
- Sheila Soesanto; Ricky Chandra Jaya Soen; Reynalda Oktaviani; Armelia Sari Widyarman
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-
- A Comparison of Commercial Mouthwashes Towards Oral Pathogens Biofilms in vitro** 
- Rahmi Amtha; Yohana Dela Derinda; Armelia Sari Widyarman
Publication Year: 2021 , Page(s): 1 - 5
- Abstract** **HTML**   
- A Comparison of Commercial Mouthwashes Towards Oral Pathogens Biofilms in vitro**
- Rahmi Amtha; Yohana Dela Derinda; Armelia Sari Widyarman
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-
- Association Rules Analysis Using Algorithm Apriori And Fuzzy Normalization** 
- Meri Nova Marito Br.Sipahutar; Opim Salim Sitompul; Sutarman

Publication Year: 2021 , Page(s): 1 - 5

► Abstract **HTML**  


- Association Rules Analysis Using Algorithm Apriori And Fuzzy Normalization** 

Meri Nova Marito Br.Sipahutar; Opim Salim

Sitompul; Sutarman

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)


Year: 2021

-
- Adaboost Hybrid Algorithm with Color Space Transformation and Lighting Compensation Method to Detect Face Based on Emotion** 

Ade Linhar P; Tulus; Muhammad Zarlis

Publication Year: 2021 , Page(s): 1 - 6

► Abstract **HTML**  

- Adaboost Hybrid Algorithm with Color Space Transformation and Lighting Compensation Method to Detect Face Based on Emotion** 

Ade Linhar P; Tulus; Muhammad Zarlis

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)


Year: 2021

-
- Effects of Chili Sauce on the Absorbency and Diametral Tensile Strength of Nanocomposite** 

Joanna Nadia Sumaji; Esa Bella; Rosalina Tjandrawinata

Publication Year: 2021 , Page(s): 1 - 5

► Abstract **HTML**  

- Effects of Chili Sauce on the Absorbency and Diametral Tensile Strength of Nanocomposite** 

Joanna Nadia Sumaji; Esa Bella; Rosalina Tjandrawinata

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)


Year: 2021

-
- Effect of Moringa oleifera Leaves on Human Blood Coagulation Process** 

Yoshua Sander; Yessy Ariesanti; M. Orliando Roeslan

Publication Year: 2021 , Page(s): 1 - 5


► Abstract **HTML**  

- Effect of Moringa oleifera Leaves on Human Blood Coagulation Process** 

Yoshua Sander; Yessy Ariesanti; M. Orliando Roeslan

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)

Year: 2021


-
- Increase of Fibroblast Proliferation by Composite Membrane (Polyvinyl Alcohol - Collagen - Hydroxyapatite)** 

Yessy Ariesanti; Wiwiek Poedjiastoeti; Gilma Ayu Sriyanto; Yenni

Angraini

Publication Year: 2021 , Page(s): 1 - 5

► Abstract **HTML**  

- Increase of Fibroblast Proliferation by Composite Membrane (Polyvinyl Alcohol - Collagen - Hydroxyapatite)** 

Yessy Ariesanti; Wiwiek Poedjastoeti; Gilma Ayu Sriyanto; Yenni Angraini

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)

Year: 2021

-
- Smart Container Design for Transporting Virus Sample in Remote Areas** 

Henry Candra; Tjhwa Endang Djuana; Kuat Rahardjo Ts; Monica Dwi Hartanti; Rifai Chai

Publication Year: 2021 , Page(s): 1 - 6

► Abstract **HTML**  

- Smart Container Design for Transporting Virus Sample in Remote Areas** 

Henry Candra; Tjhwa Endang Djuana; Kuat Rahardjo Ts; Monica Dwi Hartanti; Rifai Chai

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)


Year: 2021

-
- Performance of Spectral, Autocorrelation and Peak Count Based PR Estimation Methods Under Normal/Abnormal PPG for Wearable Devices** 

Gangireddy Narendra Kumar Reddy; M. Sabarimalai Manikandan; N. V. L. Narasimha Murty

Publication Year: 2021 , Page(s): 1 - 6


► Abstract **HTML**  

- Performance of Spectral, Autocorrelation and Peak Count Based PR Estimation Methods Under Normal/Abnormal PPG for Wearable Devices** 

Gangireddy Narendra Kumar Reddy; M. Sabarimalai Manikandan; N. V. L. Narasimha Murty

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)


Year: 2021





-
- Nephroprotective Effect from Rose Petals (*Rosa damascena*) Extract Against Cadmium Toxicity** 





Suherman; Chrismis Novalinda Ginting; Linda Chiuman; Ali Napiyah Nasution





Publication Year: 2021 , Page(s): 1 - 6




► Abstract **HTML**  


- Nephroprotective Effect from Rose Petals (*Rosa damascena*) Extract Against Cadmium Toxicity** 
Suherman; Chrismis Novalinda Ginting; Linda Chiuman; Ali Napiah Nasution
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


- in silico Automatic Annotation of Phenolamides in Plants by Tandem Mass Spectra** 
Anker Zhao; Wanyang Sun
Publication Year: 2021 , Page(s): 1 - 5
- ▶ Abstract **HTML**  
- in silico Automatic Annotation of Phenolamides in Plants by Tandem Mass Spectra** 
Anker Zhao; Wanyang Sun
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

- Analysis Accuracy of Complementary Label for Multi-Class Classification: Case Study on Chest X-Ray Images** 
Muhammad Fadli Faiz; Hendri Murfi
Publication Year: 2021 , Page(s): 1 - 5
- ▶ Abstract **HTML**  
- Analysis Accuracy of Complementary Label for Multi-Class Classification: Case Study on Chest X-Ray Images** 
Muhammad Fadli Faiz; Hendri Murfi
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


- Demographic Factors and Total Muscle Mass are Associated with Handgrip Strength in Selected Indonesian Adults** 
Ayu Oktaviana; Elly Herwana
Publication Year: 2021 , Page(s): 1 - 5
- ▶ Abstract **HTML**  
- Demographic Factors and Total Muscle Mass are Associated with Handgrip Strength in Selected Indonesian Adults** 
Ayu Oktaviana; Elly Herwana
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


- The Effectiveness of Pelvic Rocking and Birthing Ball Exercise on Labor Pain during First Stage of Active Phase** 
Irna Nursanti; Diah Oktaviani; Dewi Anggraini; Toha Muhaimin
Publication Year: 2021 , Page(s): 1 - 4
- ▶ Abstract **HTML**  

- The Effectiveness of Pelvic Rocking and Birthing Ball Exercise on Labor Pain during First Stage of Active Phase** 
Irna Nursanti; Diah Oktaviani; Dewi Anggraini; Toha Muhaimin
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-


- Phaleria Macrocarpa Crude Extract as Antidote for Cd (II) Contamination in Kidney Organs** 
Ali Napiyah Nasution; Rahmiana Zein; Refi Ikhtiari
Publication Year: 2021 , Page(s): 1 - 5


▶ Abstract **HTML**  

- Phaleria Macrocarpa Crude Extract as Antidote for Cd (II) Contamination in Kidney Organs** 
Ali Napiyah Nasution; Rahmiana Zein; Refi Ikhtiari
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-

- Phytochemical and Antibacterial Analysis of Mangkokan Leaf Extract Against Salmonella typhimurium Bacteria** 
Sri Wahyuni Nasution; Stepfany Monica Helmin; Jessyca Sembiring S; Daniel Arswendo; Novia Fransiska Br S; Ronel Polin Sihombing
Publication Year: 2021 , Page(s): 1 - 5


▶ Abstract **HTML**  

- Phytochemical and Antibacterial Analysis of Mangkokan Leaf Extract Against Salmonella typhimurium Bacteria** 
Sri Wahyuni Nasution; Stepfany Monica Helmin; Jessyca Sembiring S; Daniel Arswendo; Novia Fransiska Br S; Ronel Polin Sihombing
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021
-


Lightweight Compressed Sensing (CS) and Partial DCT Based Compression Schemes for Energy-Efficient Wearable PPG Monitoring Devices 

Gangireddy Narendra Kumar Reddy; M. Sabarimalai Manikandan; N. V. L. Narasimha Murty
 Publication Year: 2021 , Page(s): 1 - 6

▶ Abstract **HTML**  


Lightweight Compressed Sensing (CS) and Partial DCT Based Compression Schemes for Energy-Efficient Wearable PPG Monitoring Devices 

Gangireddy Narendra Kumar Reddy; M. Sabarimalai Manikandan; N. V. L. Narasimha Murty
 2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
 Year: 2021

Coexistence of Hemoglobin E Beta Thalassemia and Southeast Asian Ovalocytosis & RBC Changes Conferring Malarial Protection 

Azizon Othman; Muhammad Khairil Azizi Che Omar; Hafizah Hashim
 Publication Year: 2021 , Page(s): 1 - 5

▶ Abstract **HTML**  

Coexistence of Hemoglobin E Beta Thalassemia and Southeast Asian Ovalocytosis & RBC Changes Conferring Malarial Protection 


Azizon Othman; Muhammad Khairil Azizi Che Omar; Hafizah Hashim
 2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
 Year: 2021

IEEE Personal Account

CHANGE USERNAME/PASSWORD


Purchase Details

VIEW PURCHASED DOCUMENTS

Performance of True Transfer Learning using CNN DenseNet121 for COVID-19 Detection from Chest X-Ray Images 

Endang Tri Hastuti; Alhadi Bustamam; Prasnurzaki Anki Rizka Amalia; Amnia Salma
 Publication Year: 2021 , Page(s): 1 - 5

▶ Abstract **HTML**  

Performance of True Transfer Learning using CNN DenseNet121 for COVID-19 Detection from Chest X-Ray Images 

Endang Tri Hastuti; Alhadi Bustamam; Prasnurzaki Anki Rizka Amalia; Amnia Salma
 2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
 Year: 2021

Profile Information

COMMUNICATIONS PREFERENCES

PROFESSION AND EDUCATION

TECHNICAL INTERESTS

Need Help?

US & CANADA: +1 800 678 4333

WORLDWIDE: +1 732 981 0060

CONTACT & SUPPORT

Follow

About IEEE Xplore | Contact Us | Help | Accessibility | Terms of Use | Privacy & Opting Out of Cookies
 A not-for-profit organization, IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.

© Copyright 2022 IEEE - All rights reserved.

Purchase Details

Year: 2021
 ▶ Payment Options
 ▶ Order History
 ▶ View Purchased Documents

Profile Information

▶ Communications Preferences
 ▶ Profession and Education
 ▶ Technical Interests

Need Help?

▶ **US & Canada:** +1 800 678 4333
 ▶ **Worldwide:** +1 732 981 0060
 ▶ Contact & Support

Load More

Scheduled Maintenance: On Tuesday, February 8, IEEE Xplore will undergo scheduled maintenance from 7:00-9:00pm ET. During this time, there may be intermittent impact on performance. We apologize for any inconvenience. ✕

IEEE.org [IEEE Xplore](#) IEEE-SA IEEE Spectrum More Sites

Cart [Create Account](#) [Personal Sign In](#)



IEEE Xplore®

[Browse](#) [My Settings](#) [Help](#)

Access provided by:
Universitas Indonesia

[Sign Out](#)



Access provided by:
Universitas Indonesia

[Sign Out](#)

All

Search within Publication



ADVANCED SEARCH

Quick Links

[Search for Upcoming Conferences](#)
[Browse Conferences > Health, Instrumentation & Meas... > 2021 IEEE International Confer...](#) [?](#)
[IEEE Publication Recommender](#)

[IEEE Author Center](#)

Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), IEEE Proceedings

The proceedings of this conference will be available for purchase through Curran Associates.

Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021 IEEE International Conference on

Print on Demand **Purchase at Partner**

[Copy Persistent Link](#) [Browse Title List](#) [Sign up for Conference Alerts](#)

Proceedings

[All Proceedings](#)

[Popular](#)

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences

(InHeNce) [doi](#)

14-16 July 2021

DOI:

10.1109/InHeNce52833.2021

Search within results



[Download PDFs](#) | [Per Page: 1 Per Page 25](#) | [Export](#) | [Email Selected Results](#)

Showing **76-89** of **89**

Filter

sort: [1 Sort](#) Sequence

| [Email](#)

Refine

[Author](#)

[Affiliation](#)

[Conference Location](#)

Wound Healing Activity of Avocado Peel Ointment against Second Degree Burn Wound

Ma I Yang; Ermi Girsang; Ali Napiyah Nasution; Chrismis

Novalinda Ginting

Publication Year: 2021, Page(s): 1 - 6

[Abstract](#) [HTML](#) [PDF](#) [©](#)



Quick Links

[Search for Upcoming](#)


Conferences
IEEE Publication
Recommender
IEEE Author Center

Proceedings


The proceedings of this conference will be available for purchase through Curran Associates.

Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021 IEEE International Conference on

Print on Demand **Purchase at Partner**


Wound Healing Activity of Avocado Peel Ointment against Second Degree Burn Wound 

Ma I Yang; Ermi Girsang; Ali Napiyah Nasution; Chrismis Novalinda Ginting
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021


Antihyperlipidemia Activity of Syzygium Polyanthum Ethanol Extract on Benzene Induced Rats 

Tondy Tondy; I Nyoman Ehrich Lister; Ali Napiyah Nasution; Sukirman Lie
Publication Year: 2021 , Page(s): 1 - 5

► Abstract **HTML**  

Antihyperlipidemia Activity of Syzygium Polyanthum Ethanol Extract on Benzene Induced Rats 

Tondy Tondy; I Nyoman Ehrich Lister; Ali Napiyah Nasution; Sukirman Lie
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

Sentiment Analysis of Public Reaction to COVID19 in Twitter Media using Naïve Bayes Classifier 

Nur Iksan; Djoko Adi Widodo; Budi Sunarko; Erika Devi Udayanti; Etika Kartikadharna
Publication Year: 2021 , Page(s): 1 - 4

► Abstract **HTML**  


Sentiment Analysis of Public Reaction to COVID19 in Twitter Media using Naïve Bayes Classifier 

Nur Iksan; Djoko Adi Widodo; Budi Sunarko; Erika Devi Udayanti; Etika Kartikadharna
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

Adaptive Land Management for Climate-Smart Agriculture 

I. P. Handayani; N. Folz
Publication Year: 2021 , Page(s): 1 - 7

► Abstract **HTML**  

Adaptive Land Management for Climate-Smart Agriculture 


I. P. Handayani; N. Folz
2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)
Year: 2021

Automatic Vertebra Fracture & Classification using Dual Energy X-Ray Absorptiometry 

Tayyaba Faisal; Sumaira Kausar; Maryam K. Multani; Mehwish Parevez

Publication Year: 2021 , Page(s): 1 - 4

► Abstract **HTML**  

- Automatic Vertebra Fracture & Classification using Dual Energy X-Ray Absorptiometry** 

Tayyaba Faisal; Sumaira Kausar; Maryam K. Multani; Mehwish Parevez

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)


Year: 2021

- Development of Medical Robot Covid-19 based 2D mapping LIDAR and IMU Sensors** 

Arjon Turnip; George Michael Tampubolon; Sami Fauzan Ramadhan; Adhi Viari Nugraha; Agus Trisanto; Dessy Novita

Publication Year: 2021 , Page(s): 1 - 4

► Abstract **HTML**  

- Development of Medical Robot Covid-19 based 2D mapping LIDAR and IMU Sensors** 

Arjon Turnip; George Michael Tampubolon; Sami Fauzan Ramadhan; Adhi Viari Nugraha; Agus Trisanto; Dessy Novita

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)


Year: 2021

- Classification of Brain Signal Activities Before and After Consuming Soy Peptide Using Fuzzy Logic** 

Arjon Turnip; Gilbert F. Y. Sihombing; Giraldo F. J. Sihombing; George Michael Tampubolon; Peri Turnip; Dwi Esti Kusumandari

Publication Year: 2021 , Page(s): 1 - 6


► Abstract **HTML**  

- Classification of Brain Signal Activities Before and After Consuming Soy Peptide Using Fuzzy Logic** 

Arjon Turnip; Gilbert F. Y. Sihombing; Giraldo F. J. Sihombing; George Michael Tampubolon; Peri Turnip; Dwi Esti Kusumandari

2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)

Year: 2021


- InHeNce 2021 Welcome Message** 

Publication Year: 2021 , Page(s): i - i

- InHeNce 2021 Welcome Message** 






















2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce)

Year: 2021

- InHeNce 2021 List of Committee** 

Publication Year: 2021 , Page(s): i - ii

- | | | |
|--------------------------|---|---|
| <input type="checkbox"/> | InHeNce 2021 List of Committee
2021 IEEE International Conference on Health,
Instrumentation & Measurement, and Natural Sciences
(InHeNce)
Year: 2021 |  |
| <hr/> | | |
| <input type="checkbox"/> | List of Reviewer [sic]
Publication Year: 2021 , Page(s): i - i |  |
| <input type="checkbox"/> |  
List of Reviewer [sic]
2021 IEEE International Conference on Health,
Instrumentation & Measurement, and Natural Sciences
(InHeNce)
Year: 2021 |  |
| <hr/> | | |
| <input type="checkbox"/> | Review Sample
Publication Year: 2021 , Page(s): i - ii |  |
| <input type="checkbox"/> |  
Review Sample
2021 IEEE International Conference on Health,
Instrumentation & Measurement, and Natural Sciences
(InHeNce)
Year: 2021 |  |
| <hr/> | | |
| <input type="checkbox"/> | Table of Contents
Publication Year: 2021 , Page(s): i - vi |  |
| <input type="checkbox"/> |  
Table of Contents
2021 IEEE International Conference on Health,
Instrumentation & Measurement, and Natural Sciences
(InHeNce)
Year: 2021 |  |
| <hr/> | | |
| <input type="checkbox"/> | [InHeNce 2021 Front cover]
Publication Year: 2021 , Page(s): c1 - c1 |  |
| <input type="checkbox"/> |  
[InHeNce 2021 Front cover]
2021 IEEE International Conference on Health,
Instrumentation & Measurement, and Natural Sciences
(InHeNce)
Year: 2021 |  |
| <hr/> | | |
| <input type="checkbox"/> | InHeNce 2021 Index of Author [sic]
Publication Year: 2021 , Page(s): i - iii |  |
| <input type="checkbox"/> |  
InHeNce 2021 Index of Author [sic]
2021 IEEE International Conference on Health,
Instrumentation & Measurement, and Natural Sciences
(InHeNce)
Year: 2021 |  |
| <hr/> | | |


CHANGE
USERNAME/PASSWORD

PAYMENT OPTIONS
VIEW PURCHASED
DOCUMENTS

COMMUNICATIONS
PREFERENCES
PROFESSION AND
EDUCATION
TECHNICAL INTERESTS

< 1 2 3 4
US & CANADA: +1 800 678
4333
WORLDWIDE: +1 732 981
0060
CONTACT & SUPPORT



[About IEEE Xplore](#) | [Contact Us](#) | [Help](#) | [Accessibility](#) | [Terms of Use](#) | [Nondiscrimination Policy](#) | [IEEE Ethics Reporting](#)  | [Sitemap](#) | [Privacy & Opting Out of Cookies](#)

A not-for-profit organization, IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.

© Copyright 2022 IEEE - All rights reserved.

IEEE Account

» [Change Username/Password](#)
» [Update Address](#)

Purchase Details

» [Payment Options](#)
» [Order History](#)
» [View Purchased Documents](#)

Profile Information

» [Communications Preferences](#)
» [Profession and Education](#)
» [Technical Interests](#)

Need Help?

» **US & Canada:** +1 800 678 4333
» **Worldwide:** +1 732 981 0060
» [Contact & Support](#)

[About IEEE Xplore](#) | [Contact Us](#) | [Help](#) | [Accessibility](#) | [Terms of Use](#) | [Nondiscrimination Policy](#) | [Sitemap](#) | [Privacy & Opting Out of Cookies](#)

A not-for-profit organization, IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.

© Copyright 2022 IEEE - All rights reserved. Use of this web site signifies your agreement to the terms and conditions.

A

Abdi Dharma
Adang Bachtiar
Akim Pardede
Albert Hutapea
Ali Napiyah Nasution
Ario Betha Juanssilfero
Arjon Turnip
Azizon Binti Othman

C

Chrismis Novalinda Ginting

D

Deni Rahmat
Dessy Novita
Dian Ratih Laksmiawati
Didik Priyandoko

E

Edmi Edison
Endra Joeliyanto
Ermi Girsang
Ermita Isfandiary Ibrahim Ilyas
Erwin Handoko

F

Florenly Florenly
Fotarisman Zaluchu
Fotarisman Zalukhu

G

Gusbakti Rusip

H

Hairus Abdullah
Haripin Togap Sinaga
Hartono Hartono
Hwee Ming Cheng

I

I Nyoman Lister
Ihsan Iswaldi

J

José Aranguren

K

Kiki Kurniawan
Kuwat Triyana

L

Lakshmi Selvaratnam
Lee Yun Li
Linda Chiuman

M

Masteria Yunovilsa Putra
Meilinah H

Mhd Furqan

Monica Dwi Hartanti

Muhammad Hadi

N

Narendra Pamidi

Nurul Taufiqu Rochman

P

Pahala Sirait

Patricia Budihartanti Liman

R

R Buaton

Rahmiana Zein

Refi Ikhtiari

Riski Ginting

Rudy Syah Putra

S

Santy Deasy Siregar

Sovia Lenny

Sri Wahyuni Nasution

Sutikno

Suyitno

T

Titania Tjandrawati Nugroho

W

Wahyu Widowati

Wen-Tao Liu

Y

Yenny Yenny

Young Ho Kim

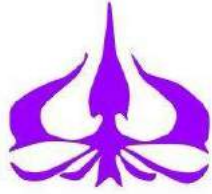
ORGANIZING COMMITTEE (OC)

Advisory Council	: Nyoman Ehrich Lister, Florenly, Chrismis Novalinda Ginting, Arjon Turnip, Endra Joelianto
General Chair	: Refi Ikhtiari
Secretary1	: Abdi Dharna
Secretary2	: Santy Deasy Siregar
Finance Chair	: Ermi Girsang
Technical Program Chair	: Florenly
Session Panel Chair	: Linda Chiuman
Publication Chair	: Arjon Turnip

INTERNATIONAL PROGRAM COMMITTEE (IPC)

José Aranguren	: University of Madrid, Spain
Young Ho Kim	: Chungnam National University
Wen-Tao Liu	: Nanjing Medical University, China
Kuwat Triyana	: Universitas Gadjah Mada, Indonesia
Hwee Ming Cheng	: University of Malaya, Malaysia
Azizon Binti Othman	: Sultanah Maliha Hospital, Langkawi, Malaysia
Adang Bachtiar	: Universitas Indonesia, Indonesia
Muhammad Hadi	: Universitas Muhammadiyah Jakarta, Indonesia
Ermita Isfandiary Ibrahim Ilyas	: Universitas Indonesia, Indonesia
Gusbakti Rusip	: Universitas Muhammadiyah Sumatera Utara, Indonesia
Rahmiana Zein	: Universitas Andalas, Indonesia
Titania Tj. Nugroho	: Universitas Riau, Indonesia
Nurul Taufiqu Rochman	: Lembaga Ilmu Pengetahuan Indonesia, Indonesia
Wahyu Widowati	: Universitas Kristen Maranatha, Indonesia
Arjon Turnip	: Universitas Padjajaran, Indonesia
Endra Joelianto	: Institut Teknologi Bandung Indonesia

Refi Ikhtiari	: Universitas Prima Indonesia, Indonesia
Hairus Abdullah	: National Taiwan University Science & Technology, Taiwan
Dessy Novita	: Universitas Padjadjaran, Indonesia
Erwin Handoko	: Universitas Prima Indonesia, Indonesia
Ihsan Iswaldi	: Universitas Prasetya Mulya, Indonesia
Masteria Yunovilsa Putra	: Lembaga Ilmu Pengetahuan Indonesia, Indonesia
Ario Betha Juanssilfero	: Lembaga Ilmu Pengetahuan Indonesia, Indonesia
Rudy Syahputra	: Universitas Islam Indonesia, Indonesia
Fotarisman Zalukhu	: Dinas Kesehatan Kota Gunungsitoli, Indonesia
Haripin Togap Sinaga	: Poltekkes Medan GIzi Lubuk Pakam, Indonesia
Edmi Edison	: Universitas Muhammadiyah Prof. Dr. HAMKA, Indonesia
Albert Hutapea	: Universitas Advent Indonesia, Indonesia
Suyitno	: Universitas Sebelas Maret, Indonesia
Sutikno	: Universitas Negeri Semarang, Indonesia
Sovia Lenny	: Universitas Sumatera Utara, Indonesia
Lee Yun Li	: Sunway University, Malaysia
Lakshmi Selvaratnam	: Monash University Malaysia
Narendra Pamidi	: Monash University Malaysia



UNIVERSITAS TRISAKTI
FAKULTAS KEDOKTERAN GIGI

Jl. Kyai Tapa (Grogol) – Jakarta Barat 11440 – (Kampus B)
Telp. 5672731 (Hunting), Fax. 5655787

SURAT TUGAS

No. 0983A/AU.00.02/Usakti/FKG-Dek/VII/2021

Dekan Fakultas Kedokteran Gigi Universitas Trisakti

Dasar : Kegiatan Seminar Inhence 2021 yang diselenggarakan pada 14 – 16 Juli 2021 oleh Universitas Prima Indonesia.

M E N U G A S I :

Kepada : Para Dosen dengan nama – nama sebagai berikut :

Drg. Wiwiek Poedjiastoeti, M.Kes, Sp.BM, PhD

Drg. Rosalina Tjandrawinata, MSi, PhD

Prof. drg. Rahmi Amtha, MDS, Sp.PM, PhD

Dr. drg. Armelia Sari, M.Kes

Dr. Komariah, S.Si, MBiomed

Drg. Yessy Ariesanti, Sp.BM

Drg. Sheila Soesanto, MKG

Untuk : Mengikuti pelaksanaan kegiatan seminar Inhence 2021 yang dilaksanakan secara daring pada 14 – 16 Juli 2021.

Demikian Surat Tugas ini dibuat untuk dilaksanakan sebagaimana mestinya dengan penuh rasa tanggung jawab dan melaporkan hasilnya kepada Pimpinan Fakultas.

Jakarta, 8 Juli 2021

Dekan,



Prof. Dr. drg. Tri Erri Astoeti, M.Kes.

Tembusan :
Para Wakil Dekan

CERTIFICATE

This Certificate is awarded to :

drg. Rosalina Tjandrawinata, M.Si., Ph.D.

for the contribution as a Presenter in :



July, 14-16th 2021
Medan - Indonesia

Refi Ikhtiari, Ph.D
General Chair

Organized by :



Co-organized by :



Effects of Chili Sauce on the Absorbency and Diametral Tensile Strength of Nanocomposite

by Drg. Rosalina Tjandrawinata 02

Submission date: 28-Sep-2021 10:26AM (UTC+0700)

Submission ID: 1659429035

File name: e_Absorbency_and_Diametral_Tensile_Strength_of_Nanocomposite.pdf (2.96M)

Word count: 4418

Character count: 23454

Effects of Chili Sauce on the Absorbency and Diametral Tensile Strength of Nanocomposite

¹⁴ Joanna Nadia Sumaji
Undergraduate Program Faculty of
Dentistry
Universitas Trisakti
Jakarta, Indonesia
joannanadia.su@gmail.com

² Esa Bella
Undergraduate Program Faculty of
Dentistry
Universitas Trisakti
Jakarta, Indonesia
bellaguoo@gmail.com

⁹ Rosalina Tjandrawinata*
Dental Material Departement Faculty of
Dentistry
Universitas Trisakti
Jakarta, Indonesia
rosalina@trisakti.ac.id
*Corresponding author

Abstract—Absorbency and solubility of nanofilled resin composite (nanocomposite) affect its strength and durability. Furthermore, exposure ¹¹ acids in the oral cavity such as chili sauce also reduces the mechanical and physical properties of composite resin rest ⁴ ation. Therefore, this study aims to evaluate the effect of chili sauce on nanocomposite absorbency and diametral tensile strength. Thirty-three nanocomposite samples in cylindrical shape were divided into 3 groups (n=11); immediate control (1), control (2) immersed for 24 hours in distilled water and treated (3) soaked for 8 hours in distilled water and 16 hours in chili sauce solution. All samples were immersed for 4 days in a 37°C incubator. Absorbency was measured according to the difference of ³ ight before and after immersion, while the diametral tensile strength ¹⁸ measured using Universal Testing Machine. There was a significant difference ($p<0.05$) in diametral tensile strength among groups; group 1 and 3 were stronger than group 2 by 10.8% and 13.4%, ²⁹ group 1 was not significantly (1.2%) weaker than group 3. No significant difference was found ($p>0.05$) in the absorbency test, although group 3 is 16% higher than group 2. Therefore, chili sauce affects the diametral tensile strength of nanocomposite significantly, but not its absorbency.

Keywords—nanocomposite, chili sauce, absorbency, diametral tensile strength

I. INTRODUCTION

Dental caries is one of the most common human diseases [1] and is a pathological process that is caused by several etiological factors which leads to tissue damage in the oral cavity [2]. When the carbohydrates, that is fermented by *Streptococcus mutans*, are exposed to the oral cavity, lactic acid is formed by *Lactobacillus* which lowers the oral cavity pH and triggers demineralization. Therefore, when this process continuously occurs without remineralization, it leads to caries formation [3] [4].

As stated in 2018 Basic Health Research (*Riset Kesehatan Dasar*) [5], most Indonesians have dental cavity problems, with an average caries prevalence of approximately 88.8% [6]. One of several ways to restore a carious lesion is by using dental filling material such as composite resin, which has become popular recently due to its good strength and high aesthetic value as tooth-colored restoration [7].

The composition of composite resin consists of matrix, inorganic filler, and coupling agent. Based on the particle size of the filler, composite resins are divided into macrofilled, microfilled, hybrid, microhybrid, and nanofilled. The nanocomposite, also known as nanofilled resin composite, has the smallest and finest filler size in the range of 5-100 nm [8][9]. This material, which is developed using nanotechnology, has better physical properties than others,

especially its polishing result and strength. Meanwhile, fillers in nanocomposite combine individual nanoparticles and nanocluster particles that are easily bond each other to form groups. This combination improves its physical properties and gives better polishing results compared to other composite resins. Furthermore, the nanocomposite becomes non-sticky which makes it easier for dentists to manipulate [10].

Despite all these advantages, nanocomposites are easily degraded by acids due to some unstable bonds in their polymer. Similarly, the absorption of acidic materials causes the composite resin to undergo polymer and filler degradation which softens its biomaterial and causes a reduction in its mechanical and physical properties [11]. A previous study conducted by Borges et al. [12], stated that exposure to acidic substances reduces the diametral tensile strength of composite resin.

Food is one of the etiological factors causing caries and is also a basic human need [2]. For most Indonesians, chili sauce consumption as a food additive is widespread. This sauce contains chilies (*Capsicum, sp.*), sugar, salt, vinegar, garlic (*Allium sativum L.*), water, monosodium glutamate (MSG), and sodium benzoate as preservatives. These ingredients function in assembling the sauce's texture, taste, color, and durability.

Chili contains capsaicin and pungency that has antimicrobial properties and vitamin C, which keep the gums and oral tissue healthy [13]. Similarly, garlic also has antimicrobial properties that are contained in its allicin [14]. Meanwhile, sugar has an important role in caries formation which affects restoration's durability and leads to secondary caries [2]. The vinegar makes chili sauce acidic which degrade the surface and lead to microleakage of restoration and reduces its physical and mechanical properties [11]. One of the quality requirements of chili sauce, based on the Indonesian National Standard (INS) or *Standar Nasional Indonesia (SNI)* [15], is to have a maximum pH of 4 which is a critical value for caries formation. Therefore, chili sauce is assumed to have an antimicrobial effect that causes dental cavities and affects the physical and mechanical properties of restoration. Previous studies evaluated composite resin's mechanical and physical properties after immersed in acidic solution [16], mouth rinse [17], hydrogen peroxide [18], ethanol and anthocyanin pigment [19], also water absorbency which indicates its ² ability to absorb any fluids that cause disc ⁴ ation [20]. Therefore, this study aims to examine the effect of chili sauce on the absorbency and diametral tensile strength of nanocomposites restorative material, which has not been examined in previous studies.

II. RESEARCH METHODOLOGY

This experimental laboratory study was conducted at the Dental Materials and Testing Center of Research (DMT Core) Laboratory in the Faculty of Dentistry, Universitas Trisakti, Jakarta, Indonesia.

A. Materials

The materials used include Filtek™ Z350 XT nanocomposite (shade A2, LOT NA79689, 3M ESPE, USA), Dua Belibis chili sauce (LOT 256331082017, PT. Anggana Catur, Indonesia), and distilled water (Klin's Laboratory, Indonesia).

B. Samples

The samples in this study are 33 cylindrical nanocomposites made in stainless steel molds with a diameter of 6 ± 0.1 mm and a height of 3 ± 0.1 mm. The number of samples was determined by the Lemeshow formula [21], which leads to 11 samples for each group. The formula is as follows:

$$n = \left(\frac{(Z\alpha + Z\beta)S}{x_1 - x_2} \right)^2 \quad (1)$$

with n is total of samples, $Z\alpha$ is alpha standard deviation (1.96), $Z\beta$ is beta standard deviation (0.84), S is standard deviation (0.026), and $(x_1 - x_2)$ is minimum significant mean difference.

Polymerization was carried out after the sample was coated with a celluloid strip using a light-curing unit for 2 x 20 seconds at the top of the mold. The curing distance was set at approximately 1 mm between the tip of the unit and the composite, and the beam direction was placed perpendicularly to the sample. After setting, the sample was removed from the mold and ensured that the surface is smooth, even, without porosity and fracture lines based on the American Dental Association (ADA) Specification No. 27 [22].

C. Methods

Immediately after manufacture, all samples were measured using a caliper and weighed on an analytical balance, before being tested for diametral tensile strength. Each sample was measured 3 times and averaged into a single value. The 11 control samples (group 1) were immediately tested for diametral tensile strength, while group 2 samples were immersed in distilled water and stored in an incubator (37°C) for 4 x 24 hours. Furthermore, as shown in Fig. 1, the 11 treated samples (group 3) were immersed in distilled water for 8 hours and continued in chili sauce solution for 16 hours and were repeated for 4 days in an incubator (37°C) [16]. The overall steps taken in this study are shown in Fig. 2.

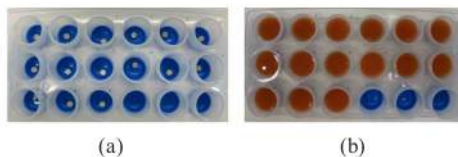


Fig. 1. Nanocomposite's immersion in: (a) distilled water, (b) chili sauce solution

Before changing solution, all samples were cleaned and rinsed with distilled water for 10 seconds. Meanwhile, the solution was made by mixing chili sauce into distilled water with a ratio of 1:1 (Fig. 3) and was measured (Fig. 4). After

the immersion, a total of 22 samples (groups 2 and 3) were tested for absorbency and diametral tensile strength (Fig. 5).

A total of 22 control and treated samples were weighed after completion of immersion to test their absorbency, which was calculated using the following equation [23]:

$$M_t(\%) = \frac{mt - m_0}{m_0} \times 100 \quad (2)$$

with M_t is absorbency (%), mt is mass after immersion (g), and m_0 is mass before immersion (g).

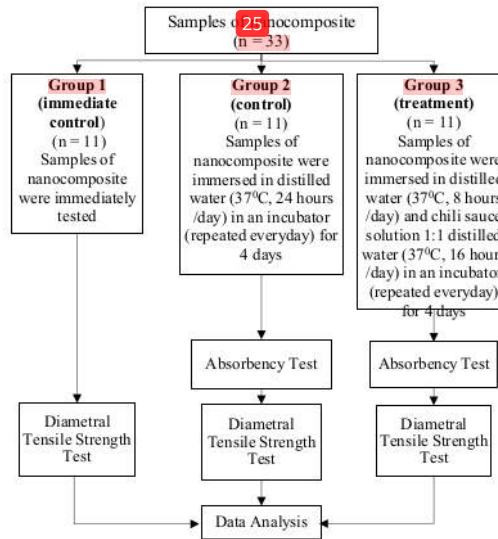


Fig. 2. Research steps



Fig. 3. Chili sauce solution (chili sauce : distilled water is 1:1)

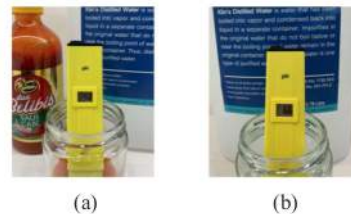


Fig. 4. Measurement of pH (a) chili sauce solution, (b) distilled water

D. Data Analysis

The data obtained were tested for normality with the Shapiro-Wilk and homogeneity with Levene's test. Furthermore, the data were analyzed using an independent t-test on the absorbency while the diametral tensile strength was conducted using the ANOVA statistical test. Since there was

a significant difference, the analysis was continued with the post hoc Tukey test. All data were tested using SPSS 23.

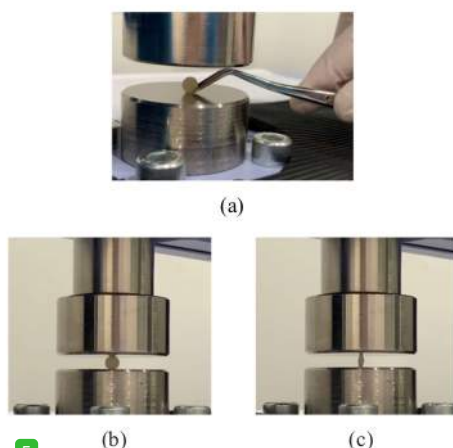


Fig. 5. Diametral tensile strength test using a Universal Testing Machine: (a) placing sample with cotton pliers, (b) sample position, (c) result

III. RESULT AND DISCUSSION

The pH value of distilled water and chili sauce solution in ratio 1:1 was measured using a pH meter. The chili sauce solution was 4.0, while the distilled water was 6.6.

A. Absorbency

Absorbency is the ability of a material or an object to absorb liquids. The absorption of acidic materials leads to the radiation and softening of the composite resin, so that the mechanical properties such as surface roughness, tensile strength, wear resistance, and others are reduced.

TABLE I. ABSORBENCY DATA RESULTS

Sample	Group 2 (Control)		Group 3 (Treated)	
	Absorbency (%)	Absorption ($\mu\text{g}/\text{mm}^2$)	Absorbency (%)	Absorption ($\mu\text{g}/\text{mm}^2$)
1	0.51	10.5	0.67	12.7
2	0.23	4.6	0.73	13.8
3	0.76	15.0	0.64	12.8
4	0.81	16.1	0.48	9.4
5	0.69	13.6	0.47	9.3
6	0.30	5.8	0.52	10.3
7	0.77	15.2	0.29	5.8
8	0.34	7.0	0.36	7.2
9	0.31	6.0	0.47	9.3
10	0.41	8.1	0.41	8.1
11	0.42	8.1	0.35	6.9
Mean	0.50 ± 0.22	10.0	0.49 ± 0.14	8.4

The absorbency differences of the control group and treated group was measured by weighing the samples before and after immersion using an analytical balance and were calculated using the mass gain percentage formula. Meanwhile, the test was not conducted in the immediate control group, which was directly tested for diametral tensile strength after manufacturing without immersion. The average value of the absorbency is shown in Table I. Levene's and Shapiro-Wilk's methods were used to test the homogeneity

and normality data ($n \leq 50$). The significant value (p) of the homogeneity test was 0.200 and normality test for nanocomposites absorbency was 0.224 for group 2 and 0.614 for group 3. Both were $p \geq 0.05$, which showed that the data were homogenous and normally distributed. Furthermore, data were analyzed using an independent t-test to determine the difference in the average of groups 2 and 3, which showed that the absorbency test between the two groups was not significantly different ($p \geq 0.05$) with the value of $p = 0.844$, yet the value of treated group ($8.4 \mu\text{g}/\text{mm}^2$) is 16% less in comparison with the control group ($10.0 \mu\text{g}/\text{mm}^2$).

B. Diametral Tensile Strength

Diametral tensile strength test is an indirect measurement used to measure the strength of brittle materials by applying a perpendicular pressure which makes the material become brittle and eventually break. These samples were tested using Universal Testing Machine with a crosshead speed of 1 mm/minute until the sample broke. The result of diametral tensile strength is shown in Table II.

TABLE II. DATA AND STATISTICAL TEST OF DIAMETRAL TENSILE STRENGTH

Sample	Diametral Tensile Strength (MPa)		
	Group 1 (Immediate)	Group 2 (Control)	Group 3 (Treated)
1	46.97	33.83	46.03
2	46.03	33.92	42.50
3	54.96	43.97	49.60
4	44.13	44.68	47.47
5	54.28	39.00	51.50
6	45.19	37.67	42.88
7	45.48	47.03	50.82
8	42.50	46.38	39.35
9	42.43	39.13	49.60
10	41.63	42.25	38.33
11	50.19	35.01	47.53
Mean	45.44 ± 4.72^a	40.55 ± 5.09^b	45.98 ± 4.59^a

^{a,b} Different alphabet shows significant difference with Tukey test ($p < 0.05$)

Data obtained in this study were analysed using Levene's test for homogeneity and Shapiro-Wilk for normality which showed all the data were homogenous and normally distributed ($p \geq 0.05$). The reliability data was also good with the coefficient of variance in group 1 was 10.4%, group 2 was 12.6%, and group 3 was 10%. Therefore, analysis was continued with a one-way ANOVA statistical test which showed significant difference ($p < 0.05$) among groups. Then, the data analysis was continued using post hoc Tukey test with significance value (p) of group 1 towards 2 was 0.019, while group 2 towards 3 was 0.033. This showed that there was significant difference ($p < 0.05$) in group 2 towards group 1 and 3.

After immersion in distilled water for 4x24 hours, the diametral tensile strength of nanocomposite samples were reduced by 5.90 MPa. On the contrary, the value of chili sauce treated nanocomposite samples was not significantly different in comparison with immediate samples.

C. Analysis

Different environmental exposures such as humidity, water, chemicals, and acids cause changes in the nanocomposite matrix polymer's microstructure and chemical composition, which affect its mechanical and physical properties. In this study, methods used for determining the physical and mechanical properties of restorative material are absorbency and diametral tensile strength tests.

Group 1 was conducted as a comparison for groups 2 and 3. This group was used as the control without treatment; therefore, it was taken as the pre-test value. Meanwhile, group 2 was the comparison after 24 hours of immersion in distilled water (pH 6.6). The chili sauce was dissolved 1:1 in distilled water in group 3 (pH 4) to adjust the actual conditions of the oral cavity. Assuming a person eats chili sauce daily and being exposed for 5 minutes per day, 16 hours immersion of nanocomposite samples in chili sauce solution for 4 days is equivalent to 2 years, 1 month, and 18 days (25.6 months) in vivo.

Based on ISO 4049, the maximum absorption value of polymer-based restorations is $40 \mu\text{g}/\text{mm}^3$ [24]. Therefore, the average result of absorption values in group 2 ($10.0 \mu\text{g}/\text{mm}^3$) and group 3 ($8.4 \mu\text{g}/\text{mm}^3$) were lower than the standard maximum absorption value for polymer-based restorations. The average absorbency result of group 3 was lower than group 2, which was affected by the water content and molecule size of chili sauce solution. Chili sauce has a higher viscosity than distilled water, which makes it harder for the sauce molecules to enter the polymer chain and more difficult to absorb. Despite the values differences, after an independent t-test, the absorbency value between the two groups was not significantly different. This condition occurs because the Filtek™ Z350 XT nanocomposite filler is densely filled and has a good bond with the matrix so the space and pathways for water molecules to diffuse in the polymer structure are very limited.

In the diametral tensile strength test, the final values of the three groups as shown in Table II are within the normal average 30-55 MPa [25]. The post hoc Tukey test showed there was significant differences of 10.8% in group 2 towards group 1, while there was no significant difference in group 3 towards group 1 even though group 3 was higher than group 1. The value of group 3 is 13.4% significantly higher than group 2.

The value of group 3, which is higher than group 2 in the diametral tensile strength test, is assumed due to the content of calcium from chili and garlic in the sauce [26] [27]. When the composite is exposed to chili sauce with an acidic pH of 4.0, surface degradation occurs and the Ca^{2+} ions contained in the chili sauce solution enter the composite. Furthermore, when the sample is immersed in distilled water, a layer is formed and covered the surface of the composite to finally neutralizes the pH and stops the corrosive action. The free ion of Ca^{2+} is one of the factors that strengthen the composite to reduce microcracking issues [28].

Although it is assumed that higher absorbency will decrease diametral tensile strength, in this study it is quite interesting that the three highest absorbency values in group 2 (samples no. 3, 4, and 7) and 3 (samples no. 1, 2, and 3) do not show the lowest diametral tensile strength values. This exact inverted condition is also showed in group 2 (samples 2, 6, and 9) and group 3 (samples no. 7, 8, and 11) which shows the lowest value in absorbency but do not show the

highest diametral tensile strength values. Porosity is not one of the issues for these phenomena since internal porosity will result in higher absorbency and lower diametral tensile strength. There must be other reasons e.g., composition of nanofiller or hydrophilicity of resin matrix, that may cause these phenomena and should be evaluated in further study.

Despite all the possible reasons and phenomena, nanocomposite group that is immersed in chili sauce shows less absorbency and consequently stronger diametral tensile strength in comparison with group that is immersed in distilled water. Moderate consumption of chili sauce does not give harmful effect towards the diametral tensile strength of nanocomposites. However, people are advised not to consume this food excessively, due to the presence of preservatives, MSG, and sugar in chili sauce which causes various diseases. Drinking or rinsing with water and brushing teeth after consuming chili sauce are suggested, to prevent discoloration of the composite resin restoration as shown in Fig. 6.

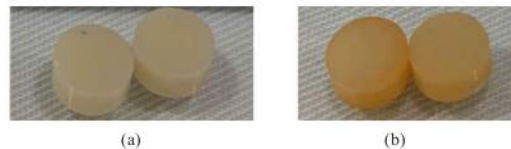


Fig. 6. Nanocomposite sample: (a) before immersion, (b) after immersion in chili sauce for 4 days

The staining susceptibility of composite resins is attributed to their degree of water sorption and hydrophilicity of the resin matrix. Clinically, composite color stability depends upon factors such as the type of cavity design, etching and bonding procedures, degree of conversion, surface roughness, and thermal stresses, which are not analyzed in this study. Therefore, further study on the side effects of food colorant from chili sauce is recommended.

IV. CONCLUSION

In comparison with the immersion in distilled water, immersion in chili sauce increases nanocomposite's diametral tensile strength by 13.4%. However, there is no significant difference ($p \geq 0.05$) in its absorbency after 4x24 hours of immersion. Therefore, immersion of the nanocomposite in chili sauce is not worse than in distilled water.

ACKNOWLEDGMENT

The authors are grateful to the Dental Materials and Testing Center of Research (DMT Core) Laboratory of the Faculty of Dentistry, Universitas Trisakti, Jakarta for providing the facilities.

REFERENCES

- [1] C. Sicca, E. Bobbio, N. Quartuccio, G. Nicolò, and A. Cistaro, "Prevention of dental caries: A review of effective treatments," *Journal of Clinical Experimental Dentistry*, vol. 8, no. 5, pp. e604-610, 2016, Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5149099/>.
- [2] N. Vegia, D. Aires, and F. Douglas, "Dental caries: a review," *Science Open Access*, vol. 2, no. 5, pp. 1-3, 2016, Available: <https://www.semanticscholar.org/paper/Dental-Caries-%3A-A-Review-Veiga-Aires/fl2a8ceb378b333372b4e3e131f8e26f8ace9c55>.
- [3] F. V. Zohoori FV and R. M. Duckworth, The impact of nutrition and diet on oral health (Monograph in Oral Science), vol 28, pp 68-76, 2020.

- [4] D. A. Young DA, B. B. Nový, G. G. Zeller, R. Hale, T. C. Hart, E. L. Trulove, et al., "The american dental association caries classification system for clinical practice: a report of the american dental association council on scientific affairs," *Journal of the American Dental Association*, vol. 146, no. 2, pp. 79-86, 2015, Available: <https://pubmed.ncbi.nlm.nih.gov/25637205/>.
- [5] BPPK, "Standard health research (riset kesehatan dasar / RISKESDAS)," Jakarta: Badan Penelitian dan Pengembangan Kesehatan, pp. 93-96, 2018, Available: <https://www.litbang.kemkes.go.id/hasil-utama-riskesdas-2018/>.
- [6] E. S. Sakti, "National dental health (kesehatan gigi nasional)," Indonesia: KemKes RI, pp. 2-6, 2019, Available: <https://pusdatin.kemkes.go.id/download.php?file=download/pusdatin/infodatin/infodatin-gigi.pdf>.
- [7] X. Zhou, X. Huang, M. Li, X. Peng, S. Wang, X. Zhou, et al., "Development and status of resin composite as dental restorative materials," *Journal of Applied Polymer Science*, vol. 133, no. 44, pp. 1-12, 2019, Available: <https://onlinelibrary.wiley.com/doi/10.1002/app.48180>.
- [8] K. J. Anusavice, C. Shen, and H. R. Rawls, Philip's dental material, 13th ed., St. Louis: Elsevier, 2021, pp. 275-286.
- [9] G. J. Mount and W. R. Hume, Preservation and restoration of tooth structure, 3rd ed., Chichester: Wiley Blackwell, 2016, pp. 22-27, 200-206.
- [10] S. Cangül, Ö. Adigüzel, S. Tekin, F. Öztekin, and Ö. Satici, "A comparison of the water absorption and water solubility values of four different composite resin materials," *Cumhuriyet Dental Journal*, vol. 21, no. 4, pp. 335-342, 2018, Available: <https://dergipark.org.tr/en/pub/cumudji/issue/39823/449340>.
- [11] R. L. Sakaguchi and J. M. Powers, Craig's restorative dental materials, 13th ed., vol. 14, St. Louis: Elsevier, 2019, pp. 46, 71, 139-152.
- [12] M. G. Borges, C. J. Soares, T. S. Maia, A. A. Bicalho, T. P. Barbosa, H. L. Costa, et al., "Effect of acidic drinks on shade matching, surface topography, and mechanical properties of conventional and bulk-fill composite resins," *The Journal of Prosthetic Dentistry*, vol. 121, no. 5, p. 868.e1-868.e8, 2019, Available: <https://pubmed.ncbi.nlm.nih.gov/31010591/>.
- [13] A. Orobiyi, H. Ahissou, F. Ggaguidi, F. Sanoussi, A. Hounbèbè, A. Dansi, et al., "Capsaicin and ascorbic acid content in the high yielding chili pepper (capsicum annum L.) landraces of northern benin," *International Journal of Current Microbio and Applied Science*, vol. 4, no. 9, pp. 394-403, 2015.
- [14] M. Nakamoto, K. Kunimura, J. Suzuki, and Y. Koderu, "Antimicrobial properties of hydrophobic compounds in garlic: allicin, vinylidithiin, ajoene and diallyl polysulfides (review)," *Experimental and Therapeutic Medicine*, vol. 19, no. 2, pp. 1550-1553, 2020, Available: <https://www.spandidos-publications.com/10.3892/etm.2019.8388>.
- [15] X. Zhou, X. Huang, M. Li, X. Peng, S. Wang, X. Zhou, et al., "Development and status of resin composite as dental restorative materials," *Journal of Applied Polymed Science*, vol. 133, no. 44, pp. 1-12, 2019.
- [16] BSN, "Indonesian national standard of chili sauce (standar nasional indonesia saus cabai)," Jakarta: Badan Standarisasi Nasional, 2006.
- [17] V. A. D. Silva, S. A. D. Silva, and O. E. Pecho, "Influence of composite type and light irradiance on color stability after immersion in different beverages," *Journal of Esthetic Restoration Dent*, vol. 30, no. 5, pp. 1-7, 2018.
- [18] L. C. Kepler and S. Rodrigues-Junior, "Effect of whitening mouth rinse on the chemical and physical properties of a nanofilled composite," *Brazilian Journal of Oral Science*, vol. 20, no. 00, p. e219320, 2021.
- [19] O. E. Pecho and J. Martos, "Effect of hydrogen peroxide on color and whiteness of resin-based composites," *Journal of Esthetic and Restorative Dentistry*, vol. 31, no. 2, pp. 132-139, 2018, Available: <https://onlinelibrary.wiley.com/doi/abs/10.1111/jerd.12443>.
- [20] S. Hwang, S. H. Chung, J. T. Lee, Y. T. Kim, Y. J. Kim, S. Oh, et al., "Influence of acid, ethanol, and anthocyanin pigment on the optical and mechanical properties of a nanohybrid dental composite resin," *Journal of Materials Science*, vol. 11, no. 7, pp. 1-12, 2018, Available: <https://www.mdpi.com/1996-1944/11/7/1234>.
- [21] J. Chittam, G. S. Sajjan, and M. V. Kanumuri, "Spectrophotometric evaluation of colour stability of nano hybrid composite resin in commonly used food colourants in asian countries," *Journal of Clinical and Diagnostic Research*, vol. 11, no. 1, pp. 61-65, 2017.
- [22] S. A. Ogston, S. Lemeshow, D. W. Hosmer, J. Klar, and S. K. Lwanga, "Adequacy of sample size in health studies", USA, 1998.
- [23] R. Ali and I. A. Aubi, "Composite diametral tensile strength," *World Journal of Dentistry*, vol. 9, no. 6, pp. 458, 2018.
- [24] BS EN ISO 4049, "Polymer-based filling, restorative, and luting materials," Belgium: International Organization for Standardization, 2019.
- [25] A. Shahawi and M. Batanony, "Comparative evaluation of mechanical properties of three resin composite materials with different filler particle sizes," *Egypt Dental Journal*, vol. 66, pp. 2715-2720, 2020, Available: https://edj.journals.ekb.eg/article_120888.html.
- [26] M. Kumar, "Morphological characterization of garlic (Allium sativum L.) gemplasm," *Malaysian Journal of Halal Research*, vol. 2, no. 2, pp. 46-52, 2020, Available: <https://sciendo.com/article/10.2478/mjhr-2019-0014>.
- [27] R. S. Femiah, S. Pujiyanto, and H. P. Kusumaningrum, "Indonesian red chili (Capsicum annum L.) capsaicin and its correlation with their responses to pathogenic Fusarium oxysporum," *NICHE Journal of Tropical Biology*, vol. 1, no. 2, pp. 1-7, 2018, Available: <https://ejournal2.undip.ac.id/index.php/niche/article/view/3669>.
- [28] M. Seifan, Z. Sarabadani, and A. Berenjian, "Microbially induced calcium carbonate precipitation to design a new type of bio self-healing dental composite," *Appl Microbiology Biotechnology*, vol. 104, no. 5, pp. 2029-2037, 2020, Available: <https://link.springer.com/article/10.1007/s00253-019-10345-9>.

Effects of Chili Sauce on the Absorbency and Diametral Tensile Strength of Nanocomposite

ORIGINALITY REPORT

14%

SIMILARITY INDEX

8%

INTERNET SOURCES

9%

PUBLICATIONS

3%

STUDENT PAPERS

PRIMARY SOURCES

- 1 Submitted to National University of Singapore 2%

Student Paper
- 2 Yoshua Sander, Yessy Ariesanti, M. Orliando Roeslan. "Effect of Moringa oleifera Leaves on Human Blood Coagulation Process", 2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021 1%

Publication
- 3 worldwidescience.org 1%

Internet Source
- 4 "Table of Contents", 2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021 1%

Publication
- 5 D Ismayanti, S Triaminingsih, Y K Eriwati. "The effect of salivary pH on diametral tensile strength of resin modified glass ionomer 1%

cement coated with coating agent", Journal of Physics: Conference Series, 2017

Publication

6

A Nurlatifah, Y K Eriwati, D J Indrani. "The effect of the curing time of an ultra-high intensity LED curing unit on diametral tensile strength of packable composite resin", Journal of Physics: Conference Series, 2018

Publication

1 %

7

www.scielo.br

Internet Source

1 %

8

etd.repository.ugm.ac.id

Internet Source

<1 %

9

Armelia Sari Widyarman, Thalia Venessa Maukar, Rosalina Tjandrawinata, Citra Fragrantia Theodora. "Antibiofilm Activity of Parabiotic Reuterin on Acrylic Resin Plates", 2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021

Publication

<1 %

10

TH Sulaiman, YK Eriwati, DJ Indrani. "Effect of temperature on tensile force of orthodontics power chain in artificial saliva solution", Journal of Physics: Conference Series, 2018

Publication

<1 %

11

Submitted to University of Mosul

Student Paper

<1 %

12

de.scribd.com

Internet Source

<1 %

13

www.jcdr.net

Internet Source

<1 %

14

Yessy Ariesanti, Wiwiek Poedjiastoeti, Gilma Ayu Sriyanto, Yenni Angraini. "Increase of Fibroblast Proliferation by Composite Membrane (Polyvinyl Alcohol - Collagen - Hydroxyapatite)", 2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021

Publication

<1 %

15

Chie Furihata, Taijiro Matsushima, Byron E. Butterworth. "Use of in Vivo/In Vitro Unscheduled Dna Synthesis for Identification of Organ-Specific Carcinogens", CRC Critical Reviews in Toxicology, 2008

Publication

<1 %

16

Gu, Y.W.. "Zirconia-glass ionomer cement--a potential substitute for Miracle Mix", Scripta Materialia, 200501

Publication

<1 %

17

ejournal.undip.ac.id

Internet Source

<1 %

18

insights.ovid.com

Internet Source

<1 %

19

D Adisty, Krisnawati, F Hoesin. "Shear bond strength of the metal bracket on the porcelain surface using three silane coupling agents: a laboratory-based experimental study", Journal of Physics: Conference Series, 2018

Publication

<1 %

20

Rosalind Levačić, Derek Glover. "Relationship between Efficient Resource Management and School Effectiveness: Evidence from OFSTED Secondary School Inspections", School Effectiveness and School Improvement, 1998

Publication

<1 %

21

Tondy Tondy, I Nyoman Ehrich Lister, Ali Napiyah Nasution, Sukirman Lie.

"Antihyperlipidemia Activity of Syzygium Polyanthum Ethanol Extract on Benzene Induced Rats", 2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021

Publication

<1 %

22

"Full Issue PDF", Operative Dentistry, 2019

Publication

<1 %

23

Ln Gabriella Clara Maria, Komariah, Gisca Veronica. "Synthesis of Silver Nanoparticles

<1 %

from Lemongrass Leaves Induced Wound Healing by Reduction ROS Fibroblasts", 2021 IEEE International Conference on Health, Instrumentation & Measurement, and Natural Sciences (InHeNce), 2021

Publication

24

mdpi.com

Internet Source

<1 %

25

www.esim2012.org

Internet Source

<1 %

26

www.jurnal.stikvinc.ac.id

Internet Source

<1 %

27

www.myfoodresearch.com

Internet Source

<1 %

28

www.science.gov

Internet Source

<1 %

29

www.thescipub.com

Internet Source

<1 %

30

Christine Nagel BACKES, Fabiana Mantovani Gomes FRANÇA, Cecilia Pedroso TURSSI, Flávia Lucisano Botelho do AMARAL et al. "Color stability of a bulk-fill composite resin light-cured at different distances", Brazilian Oral Research, 2020

Publication

<1 %

Exclude quotes On

Exclude matches Off

Exclude bibliography On