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SURAT IZIN PENELITIAN

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Nomor : 02773/UN4.13/PT.01.04/2024   30 Mei 2024
Hal   : **Izin Penelitian**

Yth.
1. Dekan Fakultas Kedokteran Gigi Universitas Hasanuddin
2. Dekan Fakultas Teknik Universitas Muslim Indonesia
3. Direktur Politeknik Negeri Ujung Pandang
4. Direktur Politeknik Pertanian Negeri Pangkajene Kepulauan
di -
   Tempat

Dengan hormat kami sampaikan bahwa mahasiswa **Program Studi Pendidikan Dokter Gigi Spesialis (PPDGS) Kedokteran Gigi Anak** Fakultas Kedokteran Gigi Universitas Hasanuddin bermaksud untuk melakukan penelitian.

Sehubungan dengan hal tersebut, mohon kiranya dapat diberikan **izin penelitian** kepada peneliti di bawah ini:

Nama / NIM   : **Zia Nurul Zahbia / J065211001**
Waktu Penelitian   : Maret s.d. Mei 2024
Tempat Penelitian   : Politeknik Pertanian Negeri Pangkajene Kepulauan, Laboratorium Konservasi Fakultas Kedokteran Gigi Universitas Hasanuddin, Politeknik Negeri Ujung Pandang, dan Laboratorium Mikrosturktur Fakultas Teknik Universitas Muslim Indonesia
Pembimbing   : 1. Prof. Dr. Sherly Horax, drg., M.S.
                      2. Prof. Seno Pradopo, drg., SU, Ph.D., Sp.KGA., Subsp.KKA (K).
Judul Penelitian   : Efek Pemberian Kitosan dari Limbah Cangkang Kepiting Bakau (*Sycilla serrata*) pada Kekuatan Kompresif *Glass Ionomer Cement* dan *Resin Modified Glass Ionomer Cement*

Demikian permohonan kami, atas perhatian dan kerjasama yang baik diucapkan terima kasih.

a.n. Dekan,
Wakil Dekan Bidang Akademik dan Kemahasiswaan

Acing Habibie Mude, drg., Ph.D., Sp.Pros., Subsp.OGST(K).
NIP 198102072008121002

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2. Penanggung Jawab Laboratorium Konservasi FKG Unhas;
3. Kepala Laboratorium Mikrosturktur Fakultas Teknik UMI.

SURAT PERSETUJUAN ETIK PENELITIAN

KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET, DAN TEKNOLOGI
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RSGMP

REKOMENDASI PERSETUJUAN ETIK
Nomor: 0079/PL.09/KEPK FKG-RSGM UNHAS/2024

Tanggal: 13 Maret 2024

Dengan ini menyatakan bahwa protokol dan dokumen yang berhubungan dengan protokol berikut ini telah mendapatkan persetujuan etik:

No. Protokol	UH 17121093	No Protokol Sponsor	
Peneliti Utama	drg. Zia Nurul Zahbia	Sponsor	Pribadi
Judul Peneliti	EFEK PEMBERIAN KITOSAN DARI LIMBAH CANGKANG KEPITING BAKAU (SYCILLA SERRATA) PADA KEKUATAN KOMPRESIF GLASS IONOMER CEMENT DAN RESIN MODIFIED GLASS IONOMER		
No. Versi Protokol	1	Tanggal Versi	12 Maret 2024
No. Versi Protokol		Tanggal Versi	
Tempat Penelitian	1. Politeknik Pertanian Negeri Pangkep 2. Laboratorium Konservasi Fakultas Kedokteran Gigi Universitas Hasanuddin Makassar 3. Laboratorium Teknik Politeknik Negeri Makassar.		
Dokumen Lain			
Jenis Review	[x] Exempted [ ] Expedited [ ] Fullboard	Masa Berlaku 13 Maret 2024-13 Maret 2025	Frekuensi Review Lanjutan
Ketua Komisi Etik Penelitian	Nama: Dr. drg. Marhamah, M.Kes	Tanda Tangan	Tanggal 13 Maret 2024
Sekretaris Komisi Etik Penelitian	Nama: drg. Muhammad Ikbal, Sp.Pros	Tanda Tangan	Tanggal 13 Maret 2024

Kewajiban peneliti utama:
* Menyerahkan Amandemen Protokol untuk persetujuan sebelum diimplementasikan
* Menyerahkan laporan SAE ke Komisi Etik dalam 24 Jam dan dilengkapi dalam 7 hari dan lapor SUSAR dalam 72 jam setelah peneliti utama menerima laporan.
* Menyerahkan laporan kemajuan (*progress report*) setiap 6 bulan untuk penelitian resiko tinggi dan setiap setahun untuk penelitian resiko rendah.
* Menyerahkan laporan akhir setelah penelitian berakhir.
* Melaporkan penyimpangan dari protokol yang disetujui (*protocol deviation/violation*)
* Mematuhi semua aturan yang berlaku.

DOKUMENTASI KEGIATAN PENELITIAN

Pembuatan kitosan dari cangkang kepiting bakau

Modifikasi kitosan dengan *Glass Ionomer Cement* dan *Resin Modified Glass Ionomer*
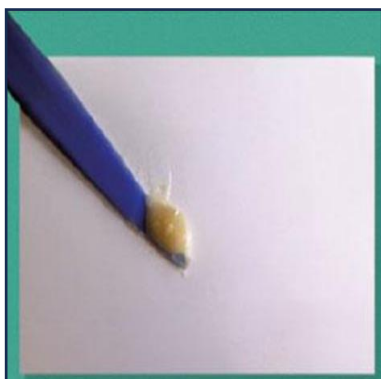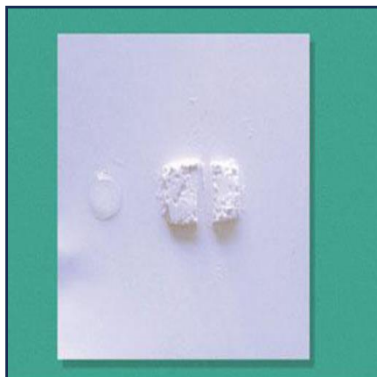
Uji Kekuatan Kompresif dengan menggunakan *Universal Testing Machine*
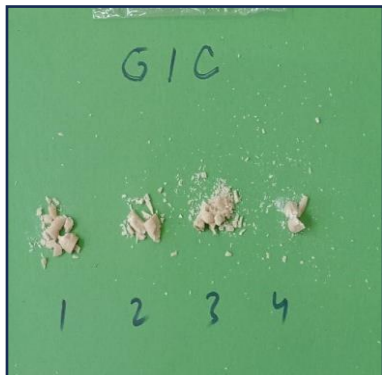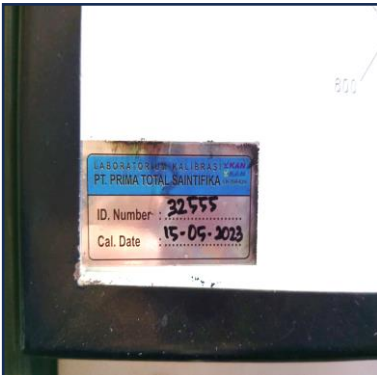
HASIL DAN ANALISIS DATA SPSS

Penelitian Pendahuluan

Hasil Uji Kekuatan Tekan

Material	: -
Jumlah sampel	: 24 sampel
Tanggal diterima	: 27 April 2024
Tanggal pengujian	: 27 - 28 April 2024
Pengirim	: Zia Nurul Zahbia
Mesin Pengujian	: Universal Testing Machine (UTM), Type PM 100 Galdabini

Kelompok Material	Sampel	Diameter (D) (mm)	Gaya Tekan (Fp) (N)	Kekuatan Tekan (Compressive Strength) (MPa)
Kelompok Sampel I	1	7,75	1720	36,480
GIC	2	7,8	1500	31,407
	3	7,6	1480	32,641
				33,510
Kelompok Sampel II	1	7,8	1540	32,245
GIC + 5% Ch	2	7,8	1610	33,711
	3	7,75	1710	36,268
				34,075
Kelompok Sampel III	1	7,8	1300	27,220
GIC + 25% Ch	2	7,8	1320	27,639
	3	7,8	1240	25,963
				26,941
Kelompok Sampel IV	1	7,75	720	15,271
GIC + 50% Ch	2	7,75	760	16,119
	3	7,8	700	14,657
				15,349
Kelompok Sampel VII	1	7,7	1160	24,923
RMGI	2	7,7	1520	32,658
	3	7,8	980	20,520
				26,034
Kelompok Sampel VIII	1	7,75	1100	23,330
RMGIC + 5% Ch	2	7,75	1500	31,814
	3	7,75	1430	30,329
				28,491
Kelompok Sampel IX	1	7,6	1060	23,378
RMGIC + 25% Ch	2	7,8	820	17,169
	3	7,6	700	15,438
				18,662
Kelompok Sampel X	1	7,85	720	14,884
RMGIC + 50% Ch	2	8	600	11,943
	3	7,7	740	15,899
				14,242

Penelitian dengan menggunakan kitosan cair

Hasil Uji Kekuatan Tekan

Material	: -
Jumlah sampel	: 26 sampel
Tanggal diterima	: 18 s.d 19 April 2024
Tanggal pengujian	: 18 s.d 19 April 2024
Pengirim	: FKG UNHAS
Mesin Pengujian	: Universal Testing Machine (UTM), Type PM 100 Galdabini

Kelompok Material	Sampel	Diameter (D) (mm)	Gaya Tekan (Fp) (N)	Kekuatan Tekan (Compressive Strength) (MPa)
Kelompok Sampel I	1	7,75	1720	36,480
GIC	2	7,8	1500	31,407
	3	7,6	1480	32,641
	4	7,6	1400	30,877
				32,851
Kelompok Sampel V	1	7,8	1300	27,220
GIC + 25% Ch	2	7,8	1320	27,639
	3	7,8	1240	25,963
	4	7,8	1440	30,151
				27,743
Kelompok Sampel VI	1	7,8	1400	29,314
GIC + 15% Ch	2	7,7	1420	30,510
	3	7,7	1340	28,791
	4	7,8	1510	31,617
				30,058
Kelompok Sampel III	1	7,75	1470	31,178
GIC + 10% Ch	2	7,75	1380	29,269
	3	7,75	1360	28,845
	4	7,75	1500	31,814
				30,276
Kelompok Sampel VII	1	7,7	1160	24,923
RMGI	2	7,7	1520	32,658
	3	7,8	980	20,520
	4	7,8	1780	37,270
				28,843
Kelompok Sampel XI	1	7,75	1740	36,904
RMGIC + 10% Ch	2	7,9	580	11,839
	3	7,75	800	16,967
	4	7,8	1080	22,613
				22,081
Kelompok Sampel XII	1	7,7	1000	21,486
RMGIC + 15% Ch	2	7,8	960	20,101
	3	7,5	800	18,117

	4	7,6	400	8,822
				17,131
Kelompok Sampel IX	1	7,6	1060	23,378
RMGIC + 25% Ch	2	7,8	820	17,169
	3	7,6	700	15,438
	4	7,8	520	10,888
				16,718

Penelitian menggunakan kitosan bubuk

Hasil Uji Kekuatan Tekan

Material	: -
Jumlah sampel	: 24 sampel
Tanggal diterima	: 13 Juni 2024
Tanggal pengujian	: 14 Juni 2024
Pengirim	: dr. Zia Nurul Zahbia (FKG UNHAS)
Mesin Pengujian	: Universal Testing Machine (UTM), Type PM 100 Galdabini

Kelompok Material	Sampel	Diameter (D) (mm)	Gaya Tekan (Fp) (N)	Kekuatan Tekan (Compressive Strength) (MPa)
GCI+10%CH	1	7,9	1860	37,965
	2	8	1830	36,425
	3	8,3	1820	33,655
	4	7,75	1795	38,071
				36,529
RMG1+15%	1	8,2	3850	72,940
	2	8,5	4020	70,879
	3	7,8	3700	77,472
	4	7,6	3680	81,162
				75,613
GIG+15%CH	1	7,75	2560	54,296
	2	8,4	2850	51,454
	3	7,6	2560	56,460
	4	8,2	2700	51,152
				53,341
RMGI+10%CH	1	7,75	1800	38,177
	2	8,5	2150	37,908
	3	8	1620	32,245
	4	7,9	1520	31,026
				34,839
GIC+25%CH	1	7,8	1540	32,245
	2	8,5	1680	29,621
	3	7,8	1650	34,548
	4	8,3	1620	29,956
				31,593
RMGI+25%CH	1	7,9	900	18,370
	2	8,7	1650	27,770
	3	8,5	1450	25,566
	4	8	1080	21,497
				23,301

Hasil Uji Statistik

Penelitian GIC Pendahuluan

Descriptives

Kekuatan Kompresif

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
GIC	3	33.5093	2.64563	1.52745	26.9372	40.0814	31.41	36.48
GIC+5% kitosan	3	34.0747	2.03601	1.17549	29.0169	39.1324	32.25	36.27
GIC+25% kitosan	3	26.9407	.87222	.50358	24.7740	29.1074	25.96	27.64
GIC+50% kitosan	3	15.3490	.73411	.42384	13.5254	17.1726	14.66	16.12
Total	12	27.4684	8.01573	2.31394	22.3755	32.5614	14.66	36.48

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Bahan Uji	Statistic	df	Sig.	Statistic	df	Sig.
Kekuatan Kompresif	GIC	.295	3	.	.919	3	.450
	GIC+5% kitosan	.238	3	.	.976	3	.703
	GIC+25% kitosan	.292	3	.	.923	3	.463
	GIC+50% kitosan	.209	3	.	.992	3	.824

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

Kekuatan Kompresif

Levene Statistic	df1	df2	Sig.
2.482	3	8	.135

ANOVA

Kekuatan Kompresif

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	681.882	3	227.294	73.059	.000
Within Groups	24.889	8	3.111		
Total	706.771	11			

Multiple Comparisons

Dependent Variable: Kekuatan Kompresif

Tukey HSD

(I) Bahan Uji	(J) Bahan Uji	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
GIC	GIC+5% kitosan	-.56533	1.44016	.978	-5.1772	4.0466
	GIC+25% kitosan	6.56867*	1.44016	.008	1.9568	11.1806
	GIC+50% kitosan	18.16033*	1.44016	.000	13.5484	22.7722
GIC+5% kitosan	GIC	.56533	1.44016	.978	-4.0466	5.1772
	GIC+25% kitosan	7.13400*	1.44016	.005	2.5221	11.7459
	GIC+50% kitosan	18.72567*	1.44016	.000	14.1138	23.3376
GIC+25% kitosan	GIC	-6.56867*	1.44016	.008	-11.1806	-1.9568
	GIC+5% kitosan	-7.13400*	1.44016	.005	-11.7459	-2.5221
	GIC+50% kitosan	11.59167*	1.44016	.000	6.9798	16.2036
GIC+50% kitosan	GIC	-18.16033*	1.44016	.000	-22.7722	-13.5484
	GIC+5% kitosan	-18.72567*	1.44016	.000	-23.3376	-14.1138
	GIC+25% kitosan	-11.59167*	1.44016	.000	-16.2036	-6.9798

*. The mean difference is significant at the 0.05 level.

Kekuatan Kompresif

Tukey HSD[a]

Bahan Uji	N	Subset for alpha = 0.05 1	2	3
GIC+50% kitosan	3	15.3490		
GIC+25% kitosan	3		26.9407	
GIC	3			33.5093
GIC+5% kitosan	3			34.0747
Sig.		1.000	1.000	.978

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3,000.

Penelitian RMGI Pendahuluan

Descriptives

Kekuatan Kompresif

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
RMGIC	3	26.0337	6.14475	3.54767	10.7693	41.2981	20.52	32.66
RMGIC+5% kitosan	3	28.4910	4.53081	2.61586	17.2358	39.7462	23.33	31.81
RMGIC+25% kitosan	3	18.6617	4.17516	2.41053	8.2900	29.0333	15.44	23.38
RMGIC +50% kitosan	3	14.2420	2.05465	1.18626	9.1380	19.3460	11.94	15.90
Total	12	21.8571	7.06360	2.03908	17.3691	26.3451	11.94	32.66

Tests of Normality

	Bahan Uji	Kolmogorov-Smirnov[a] Statistic	df	Sig.	Shapiro-Wilk Statistic	df	Sig.
Kekuatan Kompresif	RMGIC	.238	3	.	.975	3	.700
	RMGIC+5% kitosan	.324	3	.	.877	3	.314
	RMGIC+25% kitosan	.306	3	.	.904	3	.399
	RMGIC +50% kitosan	.289	3	.	.927	3	.477

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

Kekuatan Kompresif

Levene Statistic	df1	df2	Sig.
1.181	3	8	.376

ANOVA

Kekuatan Kompresif

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	388.959	3	129.653	6.488	.016
Within Groups	159.879	8	19.985		
Total	548.838	11			

Multiple Comparisons

Dependent Variable: Kekuatan Kompresif

Tukey HSD

(I) Bahan Uji	(J) Bahan Uji	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
RMGIC	RMGIC+5% kitosan	-2.45733	3.65011	.904	-14.1463	9.2316
	RMGIC+25% kitosan	7.37200	3.65011	.257	-4.3169	19.0609
	RMGIC +50% kitosan	11.79167*	3.65011	.048	.1027	23.4806
RMGIC+5% kitosan	RMGIC	2.45733	3.65011	.904	-9.2316	14.1463
	RMGIC+25% kitosan	9.82933	3.65011	.103	-1.8596	21.5183
	RMGIC +50% kitosan	14.24900*	3.65011	.019	2.5601	25.9379
RMGIC+25% kitosan	RMGIC	-7.37200	3.65011	.257	-19.0609	4.3169
	RMGIC+5% kitosan	-9.82933	3.65011	.103	-21.5183	1.8596
	RMGIC +50% kitosan	4.41967	3.65011	.638	-7.2693	16.1086
RMGIC +50% kitosan	RMGIC	-11.79167*	3.65011	.048	-23.4806	-.1027
	RMGIC+5% kitosan	-14.24900*	3.65011	.019	-25.9379	-2.5601
	RMGIC+25% kitosan	-4.41967	3.65011	.638	-16.1086	7.2693

*. The mean difference is significant at the 0.05 level.

Kekuatan Kompresif

Tukey HSD[a]

Bahan Uji	N	Subset for alpha = 0.05	
		1	2
RMGIC +50% kitosan	3	14.2420	
RMGIC+25% kitosan	3	18.6617	18.6617
RMGIC	3		26.0337
RMGIC+5% kitosan	3		28.4910
Sig.		.638	.103

Means for groups in homogeneous subsets are displayed.

Penelitian menggunakan GIC dan kitosan cair

Descriptives

Kekuatan Kompresif

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
GIC	4	32.8513	2.52953	1.26476	28.8262	36.8763	30.88	36.48
GIC+10% kitosan	4	30.2765	1.44232	.72116	27.9814	32.5716	28.85	31.81
GIC+15% kitosan	4	30.0580	1.26407	.63203	28.0466	32.0694	28.79	31.62
GIC+25% kitosan	4	27.7433	1.75606	.87803	24.9490	30.5375	25.96	30.15
Total	16	30.2323	2.47424	.61856	28.9138	31.5507	25.96	36.48

Tests of Normality

	Bahan Uji	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Kekuatan Kompresif	GIC	.283	4	.	.857	4	.250
	GIC+10% kitosan	.258	4	.	.891	4	.387
	GIC+15% kitosan	.222	4	.	.956	4	.756
	GIC+25% kitosan	.274	4	.	.939	4	.651

Test of Homogeneity of Variances

Kekuatan Kompresif

Levene Statistic	df1	df2	Sig.
.557	3	12	.653

ANOVA

Kekuatan Kompresif

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	52.346	3	17.449	5.303	.015
Within Groups	39.481	12	3.290		
Total	91.828	15			

Multiple Comparisons

Dependent Variable: Kekuatan Kompresif

Tukey HSD

(I) Bahan Uji	(J) Bahan Uji	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
GIC	GIC+10% kitosan	2.57475	1.28260	.239	-1.2331	6.3826
	GIC+15% kitosan	2.79325	1.28260	.185	-1.0146	6.6011
	GIC+25% kitosan	5.10800*	1.28260	.009	1.3001	8.9159
GIC+10% kitosan	GIC	-2.57475	1.28260	.239	-6.3826	1.2331
	GIC+15% kitosan	.21850	1.28260	.998	-3.5894	4.0264
	GIC+25% kitosan	2.53325	1.28260	.250	-1.2746	6.3411
GIC+15% kitosan	GIC	-2.79325	1.28260	.185	-6.6011	1.0146
	GIC+10% kitosan	-.21850	1.28260	.998	-4.0264	3.5894
	GIC+25% kitosan	2.31475	1.28260	.318	-1.4931	6.1226
GIC+25% kitosan	GIC	-5.10800*	1.28260	.009	-8.9159	-1.3001
	GIC+10% kitosan	-2.53325	1.28260	.250	-6.3411	1.2746
	GIC+15% kitosan	-2.31475	1.28260	.318	-6.1226	1.4931

*. The mean difference is significant at the 0.05 level.

Kekuatan Kompresif

Tukey HSD[a]

Bahan Uji	N	Subset for alpha = 0.05	
		1	2
GIC+25% kitosan	4	27.7433	
GIC+15% kitosan	4	30.0580	30.0580
GIC+10% kitosan	4	30.2765	30.2765
GIC	4		32.8513
Sig.		.250	.185

Means for groups in homogeneous subsets are displayed.

Penelitian menggunakan RMGI dan kitosan cair

Descriptives

Kekuatan Kompresif

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
RMGIC	4	28.8428	7.53231	3.76616	16.8572	40.8283	20.52	37.27
RMGIC+10% kitosan	4	22.0808	10.81752	5.40876	4.8677	39.2938	11.84	36.90
RMGIC+15% kitosan	4	17.1315	5.70960	2.85480	8.0463	26.2167	8.82	21.49
RMGIC +25% kitosan	4	16.7183	5.16999	2.58499	8.4916	24.9449	10.89	23.38
Total	16	21.1933	8.49530	2.12383	16.6665	25.7201	8.82	37.27

Tests of Normality

	Bahan Uji	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Kekuatan Kompresif	RMGIC	.199	4	.	.962	4	.794
	RMGIC+10% kitosan	.230	4	.	.940	4	.654
	RMGIC+15% kitosan	.319	4	.	.834	4	.180
	RMGIC +25% kitosan	.215	4	.	.982	4	.911

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

Kekuatan Kompresif

Levene Statistic	df1	df2	Sig.
.879	3	12	.479

ANOVA

Kekuatan Kompresif

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	383.304	3	127.768	2.193	.142
Within Groups	699.248	12	58.271		
Total	1082.552	15			

Multiple Comparisons

Dependent Variable: Kekuatan Kompresif

Tukey HSD

(I) Bahan Uji	(J) Bahan Uji	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
RMGIC	RMGIC+10% kitosan	6.76200	5.39772	.608	-9.2633	22.7873
	RMGIC+15% kitosan	11.71125	5.39772	.187	-4.3140	27.7365
	RMGIC +25% kitosan	12.12450	5.39772	.166	-3.9008	28.1498
RMGIC+10% kitosan	RMGIC	-6.76200	5.39772	.608	-22.7873	9.2633
	RMGIC+15% kitosan	4.94925	5.39772	.796	-11.0760	20.9745
	RMGIC +25% kitosan	5.36250	5.39772	.756	-10.6628	21.3878
RMGIC+15% kitosan	RMGIC	-11.71125	5.39772	.187	-27.7365	4.3140
	RMGIC+10% kitosan	-4.94925	5.39772	.796	-20.9745	11.0760
	RMGIC +25% kitosan	.41325	5.39772	1.000	-15.6120	16.4385
RMGIC +25% kitosan	RMGIC	-12.12450	5.39772	.166	-28.1498	3.9008
	RMGIC+10% kitosan	-5.36250	5.39772	.756	-21.3878	10.6628
	RMGIC+15% kitosan	-.41325	5.39772	1.000	-16.4385	15.6120

Kekuatan Kompresif

Tukey HSD[a]

Bahan Uji	N	Subset for alpha = 0.05
		1
RMGIC +25% kitosan	4	16.7183
RMGIC+15% kitosan	4	17.1315
RMGIC+10% kitosan	4	22.0808
RMGIC	4	28.8428
Sig.		.166

Means for groups in homogeneous subsets are displayed

Penelitian menggunakan GIC dan kitosan bubuk

Descriptives

Kekuatan Kompresif

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
GIC	4	32.8513	2.52953	1.26476	28.8262	36.8763	30.88	36.48
GIC+10% kitosan	4	36.5290	2.05836	1.02918	33.2537	39.8043	33.66	38.07
GIC+15% kitosan	4	53.3405	2.51613	1.25806	49.3368	57.3442	51.15	56.46
GIC+25% kitosan	4	31.5930	2.28904	1.14452	27.9506	35.2354	29.62	34.55
Total	16	38.5784	9.24295	2.31074	33.6532	43.5037	29.62	56.46

Tests of Normality

	Bahan Uji	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Kekuatan Kompresif	GIC	.283	4	.	.857	4	.250
	GIC+10% kitosan	.257	4	.	.852	4	.233
	GIC+15% kitosan	.273	4	.	.894	4	.402
	GIC+25% kitosan	.262	4	.	.903	4	.444

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

Kekuatan Kompresif

Levene Statistic	df1	df2	Sig.
.163	3	12	.919

ANOVA

Kekuatan Kompresif

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1214.863	3	404.954	72.945	.000
Within Groups	66.618	12	5.551		
Total	1281.481	15			

Multiple Comparisons

Dependent Variable: Kekuatan Kompresif

Tukey HSD

(I) Bahan Uji	(J) Bahan Uji	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
GIC	GIC+10% kitosan	-3.67775	1.66606	.176	-8.6241	1.2686
	GIC+15% kitosan	-20.48925*	1.66606	.000	-25.4356	-15.5429
	GIC+25% kitosan	1.25825	1.66606	.873	-3.6881	6.2046
GIC+10% kitosan	GIC	3.67775	1.66606	.176	-1.2686	8.6241
	GIC+15% kitosan	-16.81150*	1.66606	.000	-21.7579	-11.8651
	GIC+25% kitosan	4.93600	1.66606	.051	-.0104	9.8824
GIC+15% kitosan	GIC	20.48925*	1.66606	.000	15.5429	25.4356
	GIC+10% kitosan	16.81150*	1.66606	.000	11.8651	21.7579
	GIC+25% kitosan	21.74750*	1.66606	.000	16.8011	26.6939
GIC+25% kitosan	GIC	-1.25825	1.66606	.873	-6.2046	3.6881
	GIC+10% kitosan	-4.93600	1.66606	.051	-9.8824	.0104
	GIC+15% kitosan	-21.74750*	1.66606	.000	-26.6939	-16.8011

*. The mean difference is significant at the 0.05 level.

Kekuatan Kompresif

Tukey HSD[a]

Bahan Uji	N	Subset for alpha = 0.05	
		1	2
GIC+25% kitosan	4	31.5930	
GIC	4	32.8513	
GIC+10% kitosan	4	36.5290	
GIC+15% kitosan	4		53.3405
Sig.		.051	1.000

Means for groups in homogeneous subsets are displayed.

Penelitian menggunakan RMGI dan kitosan bubuk

Descriptives

Kekuatan Kompresif

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
RMGI	4	28.8428	7.53231	3.76616	16.8572	40.8283	20.52	37.27
RMGI+10% kitosan	4	34.8390	3.73402	1.86701	28.8973	40.7807	31.03	38.18
RMGI+15% kitosan	4	75.6133	4.61169	2.30584	68.2750	82.9515	70.88	81.16
RMGI+25% kitosan	4	23.3008	4.19012	2.09506	16.6333	29.9682	18.37	27.77
Total	16	40.6489	21.77908	5.44477	29.0437	52.2542	18.37	81.16

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Bahan Uji	Statistic	df	Sig.	Statistic	df	Sig.
Kekuatan Kompresif	RMGI	.199	4	.	.962	4	.794
	RMGI+10% kitosan	.294	4	.	.820	4	.143
	RMGI+15% kitosan	.219	4	.	.959	4	.771
	RMGI+25% kitosan	.206	4	.	.967	4	.823

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

Kekuatan Kompresif

Levene Statistic	df1	df2	Sig.
2.391	3	12	.120

ANOVA

Kekuatan Kompresif

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6786.417	3	2262.139	82.633	.000
Within Groups	328.510	12	27.376		
Total	7114.927	15			

Multiple Comparisons

Dependent Variable: Kekuatan Kompresif

Tukey HSD

(I) Bahan Uji	(J) Bahan Uji	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
RMGI	RMGI+10% kitosan	-5.99625	3.69972	.404	-16.9804	4.9879
	RMGI+15% kitosan	-46.77050*	3.69972	.000	-57.7546	-35.7864
	RMGI+25% kitosan	5.54200	3.69972	.468	-5.4421	16.5261
RMGI+10% kitosan	RMGI	5.99625	3.69972	.404	-4.9879	16.9804
	RMGI+15% kitosan	-40.77425*	3.69972	.000	-51.7584	-29.7901
	RMGI+25% kitosan	11.53825*	3.69972	.039	.5541	22.5224
RMGI+15% kitosan	RMGI	46.77050*	3.69972	.000	35.7864	57.7546
	RMGI+10% kitosan	40.77425*	3.69972	.000	29.7901	51.7584
	RMGI+25% kitosan	52.31250*	3.69972	.000	41.3284	63.2966
RMGI+25% kitosan	RMGI	-5.54200	3.69972	.468	-16.5261	5.4421
	RMGI+10% kitosan	-11.53825*	3.69972	.039	-22.5224	-.5541
	RMGI+15% kitosan	-52.31250*	3.69972	.000	-63.2966	-41.3284

*. The mean difference is significant at the 0.05 level.

Kekuatan Kompresif

Tukey HSD[a]

Bahan Uji	N	Subset for alpha = 0.05		
		1	2	3
RMGI+25% kitosan	4	23.3008		
RMGI	4	28.8428	28.8428	
RMGI+10% kitosan	4		34.8390	
RMGI+15% kitosan	4			75.6133
Sig.		.468	.404	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 4,000.

Hasil Pemeriksaan Rendemen Kitosan

KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET DAN TEKNOLOGI
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RENDEMEN KITOSAN PADA BAHAN BAKU CANGKANG KEPITING BAKAU DAN KULIT UDANG WINDU

BAHAN BAKU	RENDEMEN KITOSAN			RATA-RATA
	ULANGAN 1	ULANGAN II	ULANGAN III	
Cangkang kepiting bakau	25,22	25,2	25,15	25,19
Kulit udang windu	11,65	11,63	11,6	11,63

Pangkep, 5 Maret 2024

Mengetahui
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