REFERENCES

Baidya, D., Chakraborty, I., & Saha, J. (2015). Table wine from tropical fruits utilizing natural yeast isolates. *Journal Of Food Science And Technology*, *53*(3), 1663-1669. doi: 10.1007/s13197-015-2080-0

Babincev, L., Guresic, D., & Simonovic, R. (2016). Spectrophotometric characterization of red wine color from the vineyard region of Metohia. *Journal Of Agricultural Sciences, Belgrade*, *61*(3), 281-290. doi: 10.2298/jas1603281b

de la Rosa, L., Moreno-Escamilla, J., Rodrigo-García, J., & Alvarez-Parrilla, E. (2019). Phenolic Compounds. *Postharvest Physiology And Biochemistry Of Fruits And Vegetables*, 253-271. doi: 10.1016/b978-0-12-813278-4.00012-9

de Souza, A., Fernandes, A., Silva, M., Schwan, R., & Dias, D. (2018). Antioxidant activities of tropical fruit wines. *Journal Of The Institute Of Brewing*, *124*(4), 492-497. doi: 10.1002/jib.511

du Toit, W., & Oberholster, A. (2014). Antioxidants in Wine during Fermentation. *Processing And Impact On Antioxidants In Beverages*, 59-67. doi: 10.1016/b978-0-12-404738-9.00007-6

Escudero-López, B., Cerrillo, I., Gil-Izquierdo, Á., Hornero-Méndez, D., Herrero-Martín, G., & Berná, G. et al. (2016). Effect of thermal processing on the profile of bioactive compounds and antioxidant capacity of fermented orange juice. *International Journal Of Food Sciences And Nutrition*, *67*(7), 779-788. https://doi.org/10.1080/09637486.2016.1204428

Gan, R., Chan, C., Yang, Q., Li, H., Zhang, D., & Ge, Y. et al. (2019). Bioactive compounds and beneficial functions of sprouted grains. *Sprouted Grains*, 191-246. doi: 10.1016/b978-0-12-811525-1.00009-9

Genc, M., Genc, S., & Goksungur, Y. (2017). Exergy Analysis of Wine Production: Red Wine Production Process as a Case Study. doi: http://dx.doi.org/10.1016/j.applthermaleng.2017.02.009

He, F., Liang, N., Mu, L., Pan, Q., Wang, J., Reeves, M., & Duan, C. (2012). Anthocyanins and Their Variation in Red Wines I. Monomeric Anthocyanins and Their Color Expression. *Molecules*, *17*(2), 1571-1601. https://doi.org/10.3390/molecules17021571

Hur, S., Lee, S., Kim, Y., Choi, I., & Kim, G. (2014). Effect of fermentation on the antioxidant activity in plant-based foods. *Food Chemistry*, *160*, 346-356. doi: 10.1016/j.foodchem.2014.03.112

Jiménez-González, O., & Guerrero-Beltrán, J. Á. (2021). *Diospyros digyna (black sapote), an Undervalued Fruit: A Review. ACS Food Science & Technology, 1(1), 3–11.* doi:10.1021/acsfoodscitech.0c00103

Kumar, S., & Singh, J. (2021). Fruit Wine and Its Therapeutic Potential: A Mini Review. *Journal Of Pharmaceutical Research International*, 3-9. doi: 10.9734/jpri/2021/v33i64a35292

Lasik, M. (2013). The application of malolactic fermentation process to create good-quality grape wine produced in cool-climate countries: a review. *European Food Research And Technology*, *237*, 843-850. doi: https://doi.org/10.1007/s00217-013-2083-x

Lee, J., Choi, K., Park, K., Park, S., Kim, J., & Kang, S. et al. (2013). Physicochemical characteristics and electric conductivity of various fruit wines. *International Food Research Journal*, *20*(6), 2987-2993.

Lingua, M., Fabani, M., Wunderlin, D., & Baroni, M. (2016). From Grape to Wine: Changes in Phenolic Composition and its Influence on Antioxidant Activity. *Food Chemistry*. doi: http://dx.doi.org/10.1016/j.foodchem.2016.04.009

Malta, L., & Liu, R. (2014). Analyses of Total Phenolics, Total Flavonoids, and Total Antioxidant Activities in Foods and Dietary Supplements. *Encyclopedia Of Agriculture And Food Systems*, 305-314. doi: 10.1016/b978-0-444-52512-3.00058-9

Mapelli-Brahm, P., Barba, F., Remize, F., Garcia, C., Fessard, A., & Mousavi Khaneghah, A. et al. (2020). The impact of fermentation processes on the production, retention and bioavailability of carotenoids: An overview. *Trends In Food Science &Amp; Technology*, *99*, 389-401. https://doi.org/10.1016/j.tifs.2020.03.013

Martín-Gómez, J., García-Martínez, T., Varo, M., Mérida, J., & Serratosa, M. (2021). Phenolic compounds, antioxidant activity and color in the fermentation of mixed blueberry and grape juice with different yeasts. *LWT*, *146*, 111661. doi: 10.1016/j.lwt.2021.111661

Mitrevska, K., Grigorakis, S., Loupassaki, S., & Calokerinos, A. C. (2020). Antioxidant activity and polyphenolic content of North Macedonian wines. Applied Sciences, 10(6), 2010.

Morata, A. (2018). *Red wine technology* (1st ed.). Academic Pres.

Morata, A., & Loira, I. (2016). Influence of Yeasts in Wine Colour. https://doi.org/10.5772/65055

Morata, A., Loira, I., Heras, J., Callejo, M., Tesfaye, W., González, C., & Suárez-Lepe, J. (2016). Yeast influence on the formation of stable pigments in red winemaking. *Food Chemistry*, *197*, 686-691. doi: 10.1016/j.foodchem.2015.11.026

Naczk, M., & Shahidi, F. (2006). Phenolics in cereals, fruits and vegetables: Occurrence, extraction and analysis. *Journal Of Pharmaceutical And Biomedical Analysis*, *41*(5), 1523-1542. https://doi.org/10.1016/j.jpba.2006.04.002

Ng, C., Wang, C., Wang, Y., Tzeng, W., & Shyu, Y. (2011). Lactic acid bacterial fermentation on the production of functional antioxidant herbal Anoectochilus formosanus Hayata. *Journal Of Bioscience And Bioengineering*, *111*(3), 289-293. doi: 10.1016/j.jbiosc.2010.11.011

Panda, S. K., Sahu, U. C., Behera, S. K., & Ray, R. C. (2014). Fermentation of sapota (Achras sapota Linn.) fruits to functional wine. Nutrafoods, 13(4), 179-186.

Patil, N. & Ramswamy, B. (2016). Gas Chromatography Mass Spectrometry: Basic Principle, Technique and Applications.

Reis, B., Kosińska-Cagnazzo, A., Schmitt, R., & Andlauer, W. (2014). Fermentation of Plant Material – Effect on Sugar Content and Stability of Bioactive Compounds. *Polish Journal Of Food And Nutrition Sciences*, *64*(4), 235-241. https://doi.org/10.2478/pjfns-2013-0017

Saranraj, P., & Ray, R. (2019). Tropical Fruit Wines: Health Aspects. doi: 10.5829/idosi.ijmr.2019.94.110.

Silaen, A., Ginting, S., & Suhaidi, I. (2013). The Effect Of Acidity And Concentration Of Yeast Starter On Quality Of Alcoholic Drink From Soursop. *Jurnal Rekayasa Pangan Dan Pertanian*, *1*(4), 8-13.

Swami, S., Thakor, N., & Divate, A. (2014). Fruit Wine Production: A Review. *Journal Of Food Research And Technology*, *2*(3), 93-100.

Tena, N., Martin, J., & Asuero, A. (2020). State of the Art of Anthocyanins: Antioxidant Activity, Sources, Bioavailability, and Therapeutic Effect in Human Health. *Antioxidants (Basel)*, *9*(5), 451. doi: 10.3390/antiox9050451

Trinovani, E., Wahdah, H., & Fauziyah, R. (2020). THE EFFECT OF DIFFERENCES YEAST'S CONCENTRATION ON TOTAL ANTHOCYANIN CONTENT,AND ANTIOXIDANT ACTIVITIES OF BLACK TAPE EXTRACT (ORYZA SATIVA L VAR FORMA GLUTINOSA). *International Medical Journal*, *25*(8).

Tyl, C., & Sadler, G. (2017). pH and Titratable Acidity. *Food Science Text Series*, 389-406. doi: 10.1007/978-3-319-45776-5_22

Walker, G., & Stewart, G. (2016). Saccharomyces cerevisiae in the Production of Fermented Beverages. *Beverages*, *2*(30). doi: 10.3390/beverages2040030

Waterhouse, A. (2019). Folin-Ciocalteau Micro Method for Total Phenol in Wine. Retrievednfrom https://waterhouse.ucdavis.edu/folin-ciocalteau-micro-method-total-phenol-wine

Xiao, F., Xu, T., Lu, B., & Liu, R. (2020). Guidelines for antioxidant assays for food components. *Food Frontiers*, *1*(1), 60-69. doi: 10.1002/fft2.10

Yahia, E., Gutierrez-Orozco, F., & Leon, C. (2011). Phytochemical and antioxidant characterization of the fruit of black sapote (Diospyros digyna Jacq.). *Food Research International*, *44*(7), 2210-2216. doi: 10.1016/j.foodres.2010.11.025

Zhang, P., Ma, W., Meng, Y., Zhang, Y., Jin, G., & Fang, Z. (2021). Wine phenolic profile altered by yeast: Mechanisms and influences. *Comprehensive Reviews In Food Science And Food Safety*, *20*(4), 3579-3619. doi: 10.1111/1541-4337.12788

Zou, B., Wu, J., Yu, Y., Xiao, G., & Xu, Y. (2017). Evolution of the antioxidant capacity and phenolic contents of persimmon during fermentation. *Food Science And Biotechnology*, *26*(3), 563-571. doi: 10.1007/s10068-017-0099-x

APPENDIX A

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Day0	.365	3	.	.797	3	.107
Day7	.250	3	.	.967	3	.652

a. Lilliefors Significance Correction

Appendix 1. Normality Test Result of Day 0 and Day 7 %RSA of Samples with 0% Inoculum

Paired Samples Test

		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			One-Sided p	Two-Sided p
Pair 1	Day0 - Day7	6.84333	20.33652	11.74130	-43.67539	57.36206	.583	2	.309	.619

Appendix 2 T-test Result of Day 0 and Day 7 %RSA of Samples with 0% Inoculum

Test Statistics[a]

	Day7 - Day0
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Appendix 3. Wilcoxon Test Result of Day 0 and Day 7 %RSA of Samples with 0.5% Inoculum

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Day0	.356	3	.	.817	3	.156
Day7	.224	3	.	.984	3	.760

a. Lilliefors Significance Correction

Appendix 4. Normality Test Result of Day 0 and Day 7 %RSA of Samples with 1% Inoculum

Paired Samples Test

		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			One-Sided p	Two-Sided p
Pair 1	Day0 - Day7	13.30000	16.34999	9.43967	-27.31564	53.91564	1.409	2	.147	.294

Appendix 5. T-test Result of Day 0 and Day 7 %RSA of Samples with 1% Inoculum

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Day0	.273	3	.	.945	3	.548
Day7	.226	3	.	.983	3	.754

a. Lilliefors Significance Correction

Appendix 6. Normality Test Result of Day 0 and Day 7 GAE of Samples with 0% Inoculum

Paired Samples Test

		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			One-Sided p	Two-Sided p
Pair 1	Day0 - Day7	.17537	.13876	.08011	-.16933	.52006	2.189	2	.080	.160

Appendix 7. T-test Result of Day 0 and Day 7 GAE of Samples with 0% Inoculum

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Day0	.306	3	.	.905	3	.401
Day7	.296	3	.	.918	3	.447

a. Lilliefors Significance Correction

Appendix 8. Normality Test Result of Day 0 and Day 7 GAE of Samples with 0.5% Inoculum

Paired Samples Test

		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			One-Sided p	Two-Sided p
Pair 1	Day0 - Day7	.03351	.11173	.06450	-.24403	.31105	.519	2	.328	.655

Appendix 9. T-test Result of Day 0 and Day 7 GAE of Samples with 0.5% Inoculum

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Day0	.353	3	.	.822	3	.169
Day7	.302	3	.	.910	3	.417

a. Lilliefors Significance Correction

Appendix 10. Normality Test Result of Day 0 and Day 7 GAE of Samples with 1% Inoculum

Paired Samples Test

		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			One-Sided p	Two-Sided p
Pair 1	Day0 - Day7	-.06981	.03658	.02112	-.16068	.02107	-3.305	2	.040	.081

Appendix 11. T-test Result of Day 0 and Day 7 GAE of Samples with 1% Inoculum

Test Statistics[a]

N	3
Chi-Square	5.400
df	3
Asymp. Sig.	.145

a. Friedman Test

Appendix 12. Friedman Test Result of Color Intensity of Samples with 0%, 0.5%, and 1% Inoculum Throughout the Fermentation Period

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Day0	.193	3	.	.997	3	.890
Day1	.372	3	.	.783	3	.073
Day3	.253	3	.	.964	3	.637
Day5	.227	3	.	.983	3	.747
Day7	.328	3	.	.871	3	.298

a. Lilliefors Significance Correction

Appendix 13. Normality Test Result of GAE of Samples with 0%, 0.5%, and 1% Inoculum Throughout the Fermentation Period

Mauchly's Test of Sphericity[a]

Measure: Inoculumconcentration

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Fermentationdays	.000	.	9	.	.326	.683	.250

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept
Within Subjects Design: Fermentationdays

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Appendix 14. Homogeneity Test Result of GAE of Samples with 0%, 0.5%, and 1% Inoculum Throughout the Fermentation Period

Tests of Within-Subjects Effects

Measure: Inoculumconcentration

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Fermentationdays	Sphericity Assumed	.068	4	.017	1.645	.254
	Greenhouse-Geisser	.068	1.302	.052	1.645	.320
	Huynh-Feldt	.068	2.731	.025	1.645	.283
	Lower-bound	.068	1.000	.068	1.645	.328
Error(Fermentationdays)	Sphericity Assumed	.083	8	.010		
	Greenhouse-Geisser	.083	2.604	.032		
	Huynh-Feldt	.083	5.462	.015		
	Lower-bound	.083	2.000	.041		

Appendix 15. Repeated Measure ANOVA Test Result of GAE of Samples with 0%, 0.5%, and 1% Inoculum Throughout the Fermentation Period

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Day0	.223	3	.	.985	3	.764
Day1	.253	3	.	.965	3	.639
Day3	.282	3	.	.936	3	.510
Day5	.351	3	.	.827	3	.182
Day7	.355	3	.	.820	3	.162

a. Lilliefors Significance Correction

Appendix 16. Normality Test Result of %RSA of Samples with 0%, 0.5%, and 1% Inoculum Throughout the Fermentation Period

Mauchly's Test of Sphericity[a]

Measure: Inoculumconcentration

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Fermentationdays	.000	.	9	.	.276	.368	.250

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept
Within Subjects Design: Fermentationdays

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Appendix 17. Homogeneity Test Result of %RSA of Samples 0%, 0.5%, and 1% Inoculum Throughout the Fermentation Period

Tests of Within-Subjects Effects

Measure: Inoculumconcentration

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Fermentationdays	Sphericity Assumed	605.595	4	151.399	2.367	.139
	Greenhouse-Geisser	605.595	1.106	547.682	2.367	.257
	Huynh-Feldt	605.595	1.473	411.137	2.367	.236
	Lower-bound	605.595	1.000	605.595	2.367	.264
Error(Fermentationdays)	Sphericity Assumed	511.717	8	63.965		
	Greenhouse-Geisser	511.717	2.211	231.391		
	Huynh-Feldt	511.717	2.946	173.702		
	Lower-bound	511.717	2.000	255.858		

Appendix 18. Repeated Measures ANOVA Test Result of %RSA of Samples with 0%, 0.5%, and 1% Inoculum Throughout the Fermentation Period

APPENDIX B

Table 1. Antioxidant Analysis Results of Black Sapote Wine

Fermentation Days	Inoculum Concentration								
	0%			0.50%			1%		
	%RSA	Average %RSA	Std Dev	%RSA	Average %RSA	Std Dev	%RSA	Average %RSA	Std Dev
Day 0	92.43	84.9633	14.350	89.21	86.9300	3.794	90.45	81.9067	7.423
	68.42			82.55			77.03		
	94.04			89.03			78.24		
Day 1	94.82	82.2967	16.689	91.9	87.9200	5.395	70.37	71.0967	3.193
	88.72			90.08			74.59		
	63.35			81.78			68.33		
Day 3	71.16	83.6200	10.791	97	94.3867	2.610	92.63	91.4467	1.559
	89.82			91.78			89.68		
	89.88			94.38			92.03		
Day 5	86.5896	84.8399	9.576	56.944	81.3406	21.149	37.32	51.3133	12.267
	93.42			92.6042			60.21		
	74.51			94.4737			56.41		
Day 7	88.15	78.1205	11.413	69.28	77.2267	7.263	70.76	68.6067	14.897
	80.51			78.88			82.31		
	65.7016			83.52			52.75		

Table 2. TPCC Analysis Results of Black Sapote Wine

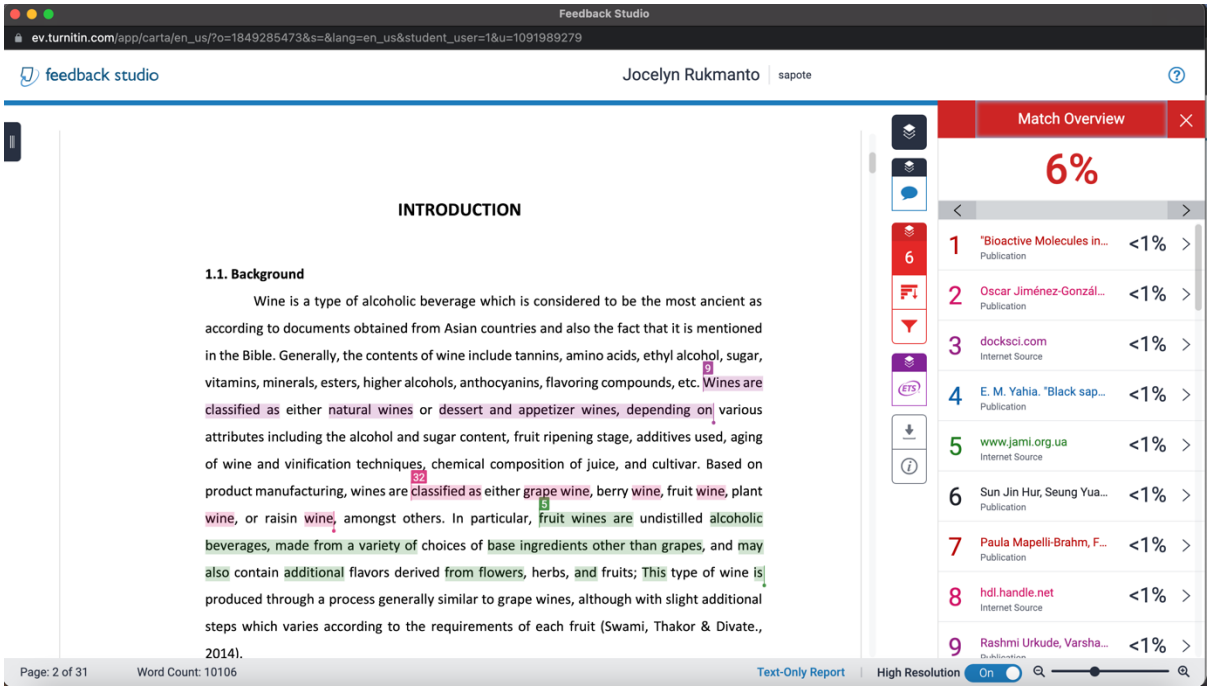
Fermentation Days	Inoculum Concentration								
	0%			0.50%			1%		
	GAE	Average GAE	Std Dev	GAE	Average GAE	Std Dev	GAE	Average GAE	Std Dev
Day 0	0.03786	0.2272	0.171	0.21715	0.1410	0.067	0.05086	0.0296	0.018
	0.27355			0.11696			0.01738		
	0.37025			0.08885			0.02065		

Day 1	0.05186	0.2044	0.134	0.27452	0.2099	0.059	0.03461	0.0431	0.011
	0.30163			0.19584			0.05594		
	0.25973			0.15935			0.03871		
Day 3	0.059	0.1634	0.091	0.25936	0.1979	0.056	0.05748	0.1434	0.195
	0.20343			0.18452			0.00639		
	0.22791			0.14971			0.3662		
Day 5	0.10094	0.1979	0.084	0.14977	0.0922	0.064	0.01465	0.0634	0.044
	0.23894			0.10431			0.0998		
	0.25367			0.0226			0.07586		
Day 7	0.01727	0.0519	0.032	0.06825	0.1075	0.049	0.13433	0.1220	0.011
	0.05667			0.09118			0.11497		
	0.08162			0.163			0.11677		

Table 3. Color Intensity Analysis Results of Black Sapote Wine

Fermentation Days	**Inoculum Concentration**								
	0%			**0.50%**			**1%**		
	Color Intensity	**Average CI**	**Std Dev**	**Color Intensity**	**Average CI**	**Std Dev**	**Color Intensity**	**Average CI**	**Std Dev**
Day 0	13.2626	19.1845	5.129	20.104	18.4200	1.458	14.784	14.7487	0.036
	22.049			17.581			14.75		
	22.242			17.575			14.712		
Day 3	13.8733	19.9435	5.259	23.3106	21.9460	1.335	15.306	15.2315	1.057
	22.8413			21.884			14.1393		
	23.116			20.6433			16.2493		
Day 5	21.666	21.6644	0.669	23.92	21.6953	1.944	14.333	14.3232	0.942
	22.3326			20.8393			13.3763		
	20.9946			20.3266			15.2603		
Day 7	14.376	19.3786	4.332	19.384	19.7055	1.488	12.4723	12.1814	0.462
	21.8833			21.328			12.4233		
	21.8766			18.4046			11.6486		

APPENDIX C



Appendix 19. Plagiarism Check of This Thesis Document