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Help to Control Weight and Cholesterol by Rose Wine

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Abstract: Wines have been known since 1786 to produce beneficial effects on the cardiovascular system. The next question is which of the wines have the best antioxidant component? Twenty-five albino rats (weighing 191 ± 9.4g) were randomly assigned to five groups (n=5). They were painstakingly allowed to acclimatize for one month. Red Wine (12%), White wine (12%), Rose wine (12%), ethanol (12%) and distilled water (control) were administered orally to groups 1, 2, 3, 4 and 5 respectively for 14 days. The administration was done in accordance with Pedro Montilla's method, 2005 (400ml/70kg body weight, with 12hr- light/dark cycle). The rats were later sacrificed and subjected to biochemical and histological analysis. Rose wine emerged the best in significantly reducing ($P<0.05$) LDL-cholesterol, in triggering weight loss for days 8, 9, 13 and 14. HDL-cholesterol and Triglyceride was found not to be significantly different from the control for Rose wine. Histological figures, show that all the wines have no adverse effect on the brain's structural integrity. This discovery is an uplift to our scientific knowledge, it shows that rose wine cannot predispose to atherosclerosis. The wonder behind rose wine's action was explain by Ryan and Marvin in 2015 when they discovered that rose wines have both functions of white wine and red wine.

Keywords: Antioxidant, Lipid Profile, Brain, Wine, Cholesterol, Histology

1. Introduction

Undisputable, is the fact that wine is the greatest beverage of our planet! Nothing can compare to having a cup of chilled wine with some pounds of roasted chicken, or a bit of wine served with steak and pasta. Wines have been known since 1786 to produce beneficial effects on the cardiovascular system [1].

Rosé wine is made from either dark or black grapes, the skin of the grape is removed during fermentation after only brief contact. Rose wine is naturally sweet because it contains less tannin. Rosé wines are pink in color. The pink color is from the slight transference of red pigments from the skins. Rosés can also be made by blending together white and red wines. [3].

White wines are made with either white grapes or black grape. There is no contact with the skin, hence no color. Winemakers can make white wine from black grapes because the juice in most black grapes is actually clear. [2]. Red wines are also made from Black or Red grapes, the skins of the grape are added to the juice during fermentation to add pigment to the product. The main difference between red wines and others is the presence of the skin throughout the entire fermentation process. Tannins are also found in the grape skins, and are transferred into the wine while the skins are in contact with the juice [2].

Ethanol, the chemical compound present in most alcoholic drinks, is a neurotoxin, that is, a substance that can damage or destroy the nervous system. Someone who is drunk is, in fact, suffering from a form of poising. In large quantities ethanol causes coma and death [4]. For instance, among students in Japan, the practice of *ikkinomi,* or alcohol chigguing, causes deaths every year. The body is able to convert ethanol into harmless substances, but this is not accomplished immediately. If alcohol is consumed at a faster rate than the body can handle, ethanol builds up in the system and begins to interfere noticeably with brain functions [4].

This study is aimed to determine comparatively which

wine can significantly reduce weight, control bad cholesterol and explore experimentally, the effect of wine on the histological integrity of the brain of rats. Checking the brain is a matter of concern because Montoliu claimed that ethanol build up can interfere with brain functions [4].

2. Materials and Methods

2.1. Experimental Design

Twenty five (25) adult male rats weighing 191±9.4 were bought from Animal house of NVRI (National Veterinary Research Institute) Vom, Jos, Nigeria. They were painstakingly allowed to acclimatize for one month. Red Wine (12%), White wine (12%), Rose wine (12%), ethanol (12%) and distilled water (control) were administered orally to groups 1, 2, 3, 4 and 5 respectively for 14 days. The administration was done in accordance with Pedro Montilla's method, 2005 (400ml/70kg body weight, with 12hr-light/dark cycle) [5]. The animals were individually housed in wire cages in an animal house with 12h-light/dark cycle and the rats were weighed every day.

2.2. Preparation of Samples for Biochemical Analysis

The rats were sacrificed after 14 days of treatment under anesthesia with chloroform. Blood samples were obtained approximately 24 hours after the last fluid consumption. The blood samples were collected in plain plastic tubes.

The brain was carefully removed using dissecting scissors from the animal and blotted on filtered paper, weighed and stored in 10 percent formalin for further analysis. [6]

2.3. Determination of Parameters

Total Cholesterol (CHOL), Triglyceride (TG), High Density Lipoprotein (HDL) and Low Density Lipoprotein (LDL), were determined by the kit method of Randox according to the principle explained by Geetha [6].

2.4. Histology

2.4.1. Paraffin Wax Method of Tissue Processing Conventional Method [7]

Tissues were harvested and fixed in 10% formalin for 3 days, cut into thin slices of 5mmX 2mm X 1mm thick and then processed in the following order using The SPIN tissue processor, STP 120 (Thermoscientific):

10% buffered formalin	
70% Alcohol	2 hours
80% Alcohol	2 hours
90% Alcohol	2 hours
95% Alcohol	2 hours
Absoloute Alcohol I	2 hours
Absolute Alcohol II	2 hours
Absolute Alcohol III	2 hours
Xylene I	2 hours
Xylene II	2 hours
Paraffin Wax Oven I	2 hours
Paraffin Wax Oven II	2 hours [7]

2.4.2. Embedding

Tissues were embedded in molten paraffin wax using embedding moulds. The tissues were embedded using embedding cassettes on a tissue Tek Embedding Centre (SLEE MPS/P2), and cooled rapidly on the cooling component. [8]

2.4.3. Sectioning

Tissues were sectioned using a rotary microtome (MICROM HM340E ThermoScientific)) set at 4micromes, picked on slides and ready for staining.

2.5. Statistical

All the grouped data were statistically evaluated with SPSS software. Hypothesis testing methods included one way analysis of variance (ANOVA) followed by Duncan's Multiple Range Test. P values of less than 0.05 were considered to indicate statistical significance. All the results were expressed as mean ± SEM.

3. Results

3.1. Weight of Rats

Figure 1, shows that there is a significant decrease ($P<0.05$) in all the wines than control treated rats. Moreover, the lowest significant decrease in weight ($p<0.05$) is observed for the rose wine treated rats. The significant differences are determined in comparison with the control.

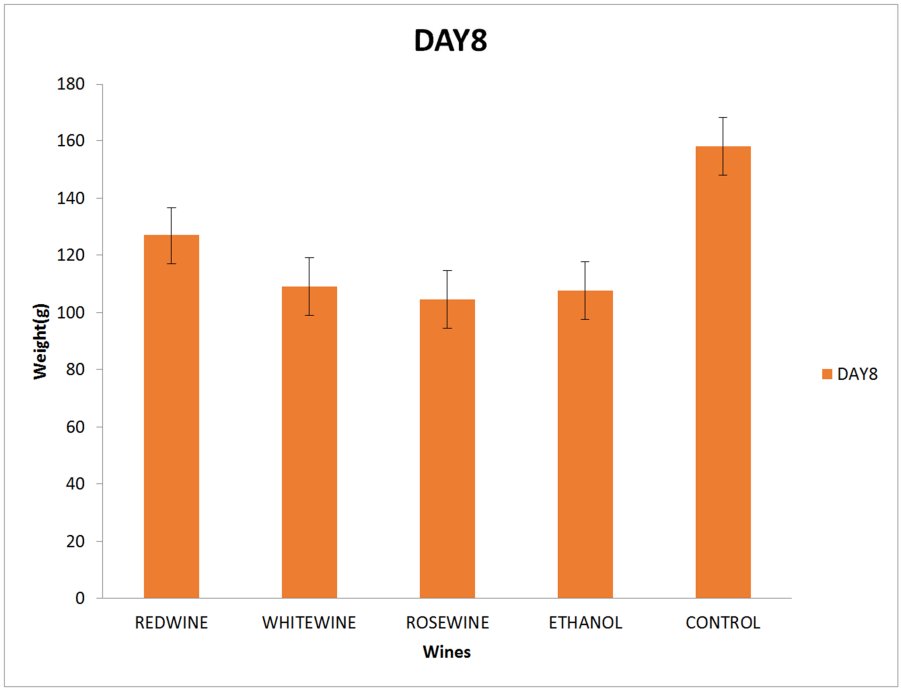

Figure 1. *Weight of rats on day 8.*

Values are expressed as mean ± SEM. Mean values are compared using One-Way ANOVA. Level of significance was evaluated using Duncan's Multiple Range Test (DMRT) at P≤ 0.05.

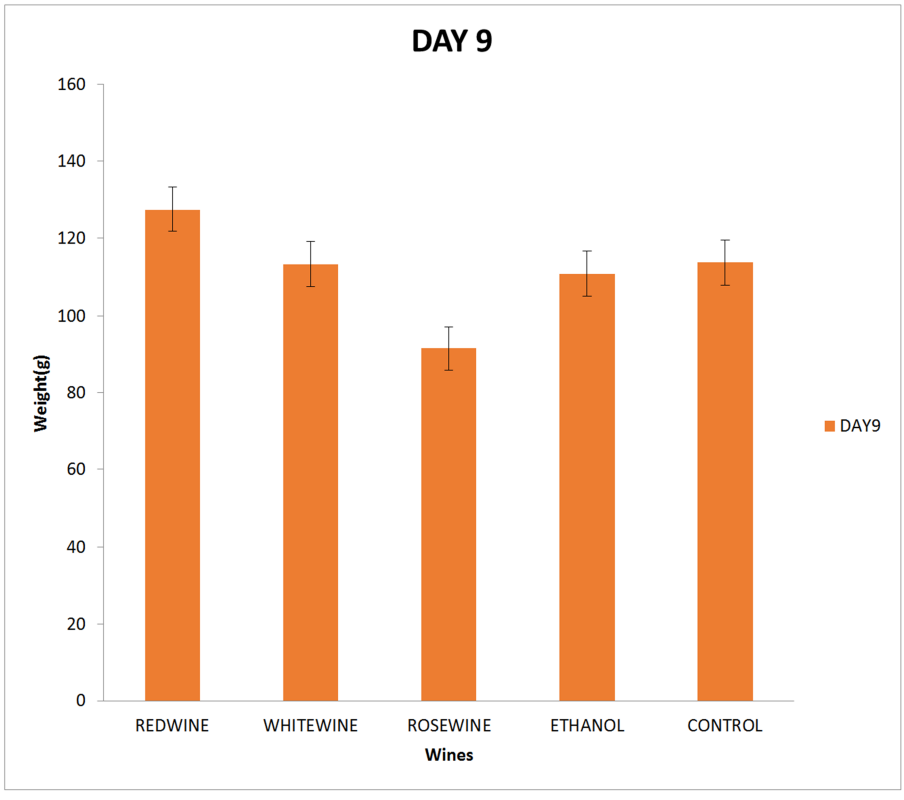

Figure 2. *Weight of rats on day 9.*

Values are expressed as mean ± SEM. Mean values are compared using One-Way ANOVA. Level of significance was evaluated using Duncan's Multiple Range Test (DMRT) at P≤ 0.05.

Figure 2: The highest significant increase in weight ($p<0.05$) was observe for Red wine treated rats, while there is significant decrease ($p<0.05$) of weight in Rose wine treated rats. The significant differences are determined in comparison with the control.

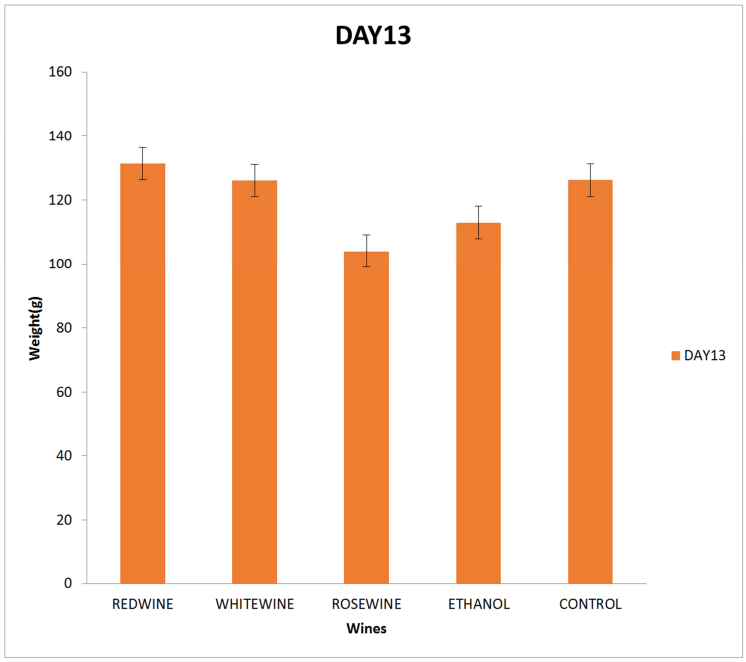

Figure 3. *Weight of rats on day 13.*

Values are expressed as mean ± SEM. Mean values are compared using One-Way ANOVA. Level of significance was evaluated using Duncan's Multiple Range Test (DMRT) at P≤ 0.05.

Figure 3, shows that there is a significant decrease (P<0.05) in weight of Rose wine treated rats. The significant differences are determined in comparison with the control.

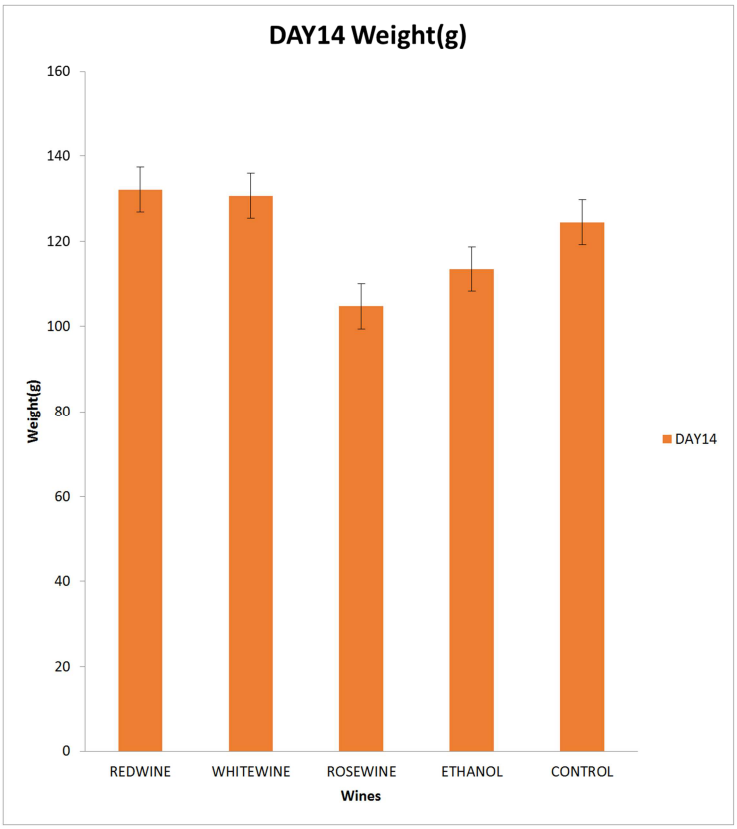

Figure 4. *Weight of rats on day 14.*

Values are expressed as mean ± SEM. Mean values are compared using One-Way ANOVA. Level of significance was evaluated using Duncan's Multiple Range Test (DMRT) at P≤ 0.05.

Figure 4, shows that there is a significant decrease (P<0.05) in Rose wine treated rats. The significant differences are determined in comparison with the control.

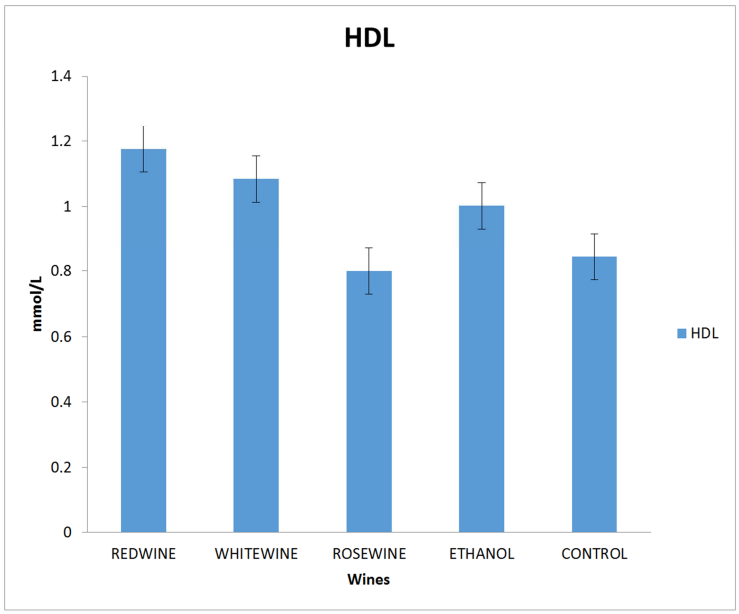

Figure 5. *High density lipoprotein (HDL).*

Values are expressed as mean ± SEM. Mean values are compared using One-Way ANOVA. Level of significance was evaluated using Duncan's Multiple Range Test (DMRT) at P≤ 0.05.

Figure 5, shows that there is a significant increase (P<0.05) in Red wine treated rats, while Rose wine treated rats is not significantly difference (p>0.05) from the control in HDL cholesterol determination.

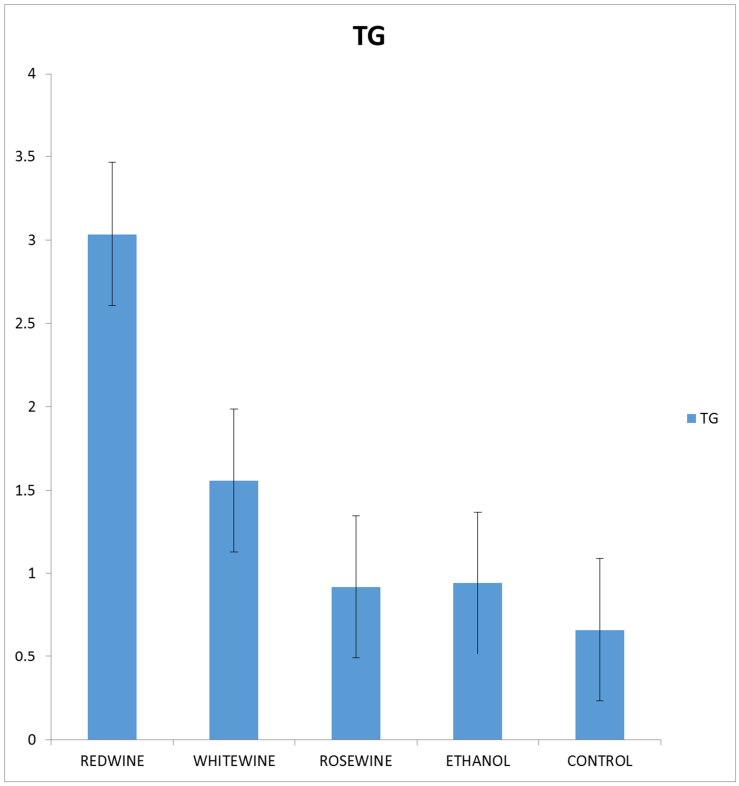

Figure 6. *Triglycerige (TG).*

Values are expressed as mean ± SEM. Mean values are compared using One-Way ANOVA. Level of significance was evaluated using Duncan's Multiple Range Test (DMRT) at P≤ 0.05.

Figure 6, shows that there was a significant increase (P<0.05) in Red wine treated rats, while Rose wine treated rats show no significant difference (p>0.05) for triglyceride determination.

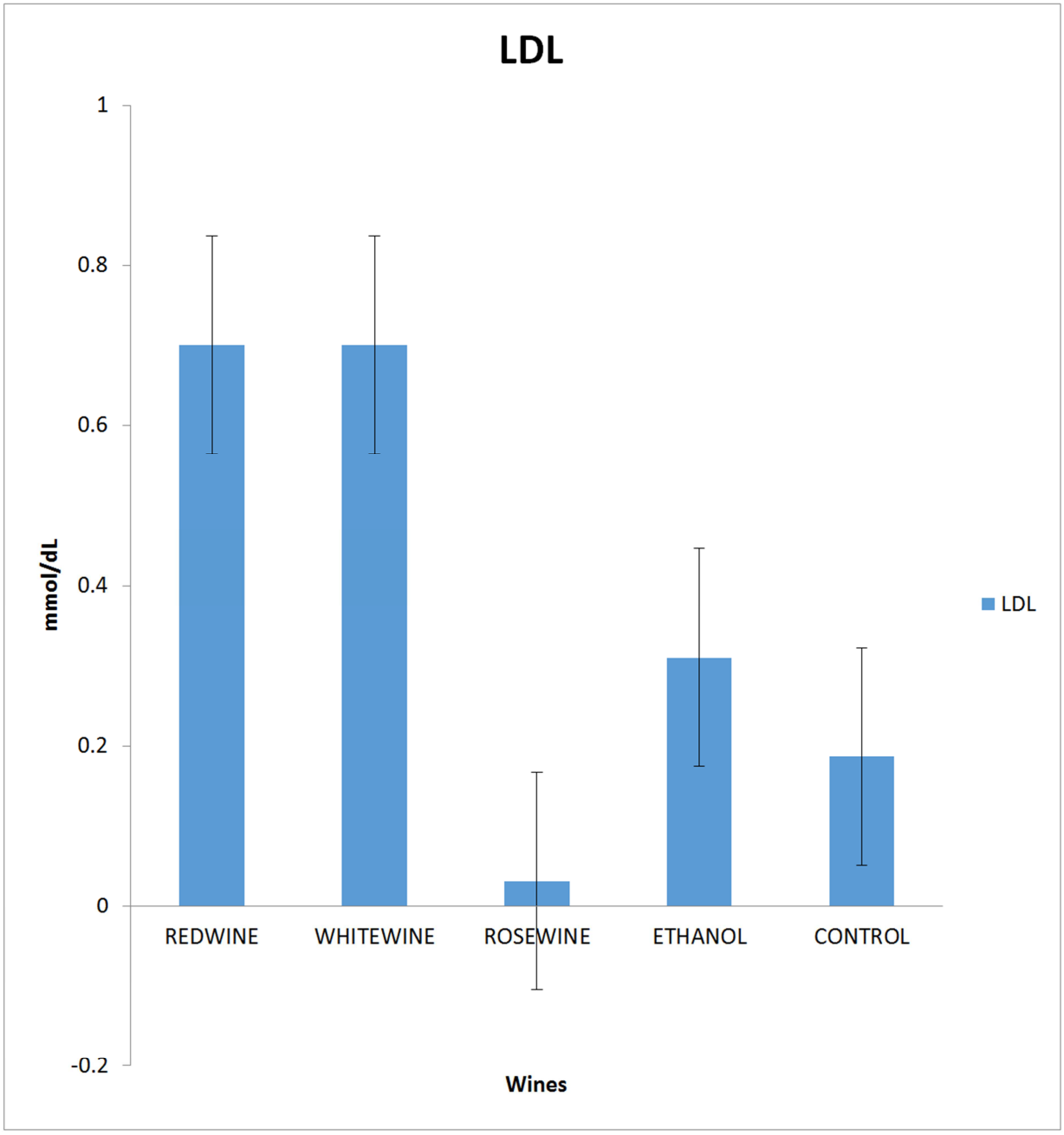

Figure 7. *Low Density Lipoprotein (LDL).*

Values are expressed as mean ± SEM. Mean values are compared using One-Way ANOVA. Level of significance was evaluated using Duncan's Multiple Range Test (DMRT) at P≤ 0.05.
Note: There was no significant difference (p>0.05) in all the wines for Total Cholesterol determination.

Figure 7, shows that there was a significant decrease (P<0.05) in Rose wine treated rats than control treated rats for LDL determination.

3.2. Histological Results

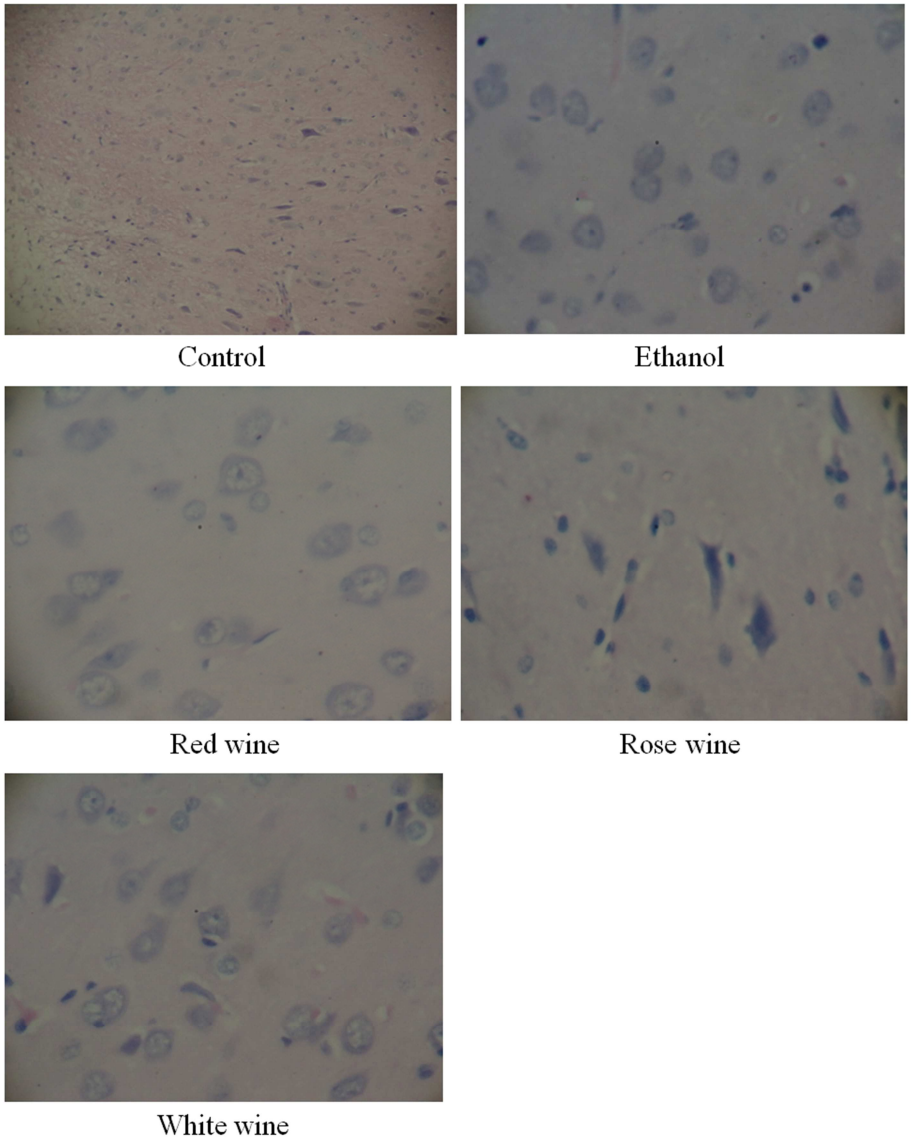

Figure 8. *Brain tissues of wistar rats administered with Ethanol, Red wine, Rose wine and White wine for 14 days, showing normal brain histology, Brain architecture is intact. It is not different from the control, no traces of Necrosis or any inflammation.*

4. Discussion

There was no significant difference ($p>0.05$) in the body weight gain for Red wine, White wine, Rose wine and ethanol during the experimental feeding periods between days (1-7). This discovery is supported by a recent review of the epidemiological studies on the effect of alcohol consumption on body weight. It says that only heavy drinking is positively related to weight gain [11], which means that acute alcohol consumption does not lead to weight gain. The significant difference discovered on days (8, 9, 13, and 14) show that Rose wine treated rat's weight are significantly lower ($p<0.05$) than the control for the four days. Rose wine may potentially help in weight control and slimming down [3]. This is in accordance what Fernandes discovery in 2017 who discovered that wine phenolics contribute to anti-obesity [10].

For HDL cholesterol and triglyceride, Rose wine was not significantly different ($p>0.05$) from the control. Rose wine is not a risk factor that can trigger atherosclerosis. Moreover, there was significant reduction in LDL cholesterol for Rose wine treated rats, this is an additional evidence that Rose wine can't trigger atherosclerosis [9]. Many research studies have suggested that consumption of 250-400ml red wine per day is beneficial in preventing many diseases, especially cardiovascular diseases [12]. Another research confirmed that Moderate wine consumption may protect against cardiovascular disease through inflammatory and clotting pathways [14].

Rose wine is a prolific wine because it combines the function of Red and white wine [3].

The histological Figures show that all the wines do not have adverse or destructive effect on the histological make-

up of the brain for acute consumption. This result is similar to a discovery on wine Resveratrol [13] It explains that Resveratrol improves memory performance in association with improved glucose metabolism and increased hippocampal Functional Connectivity in older adults. This findings offer novel strategies to maintain brain health during aging [13].

5. Conclusion

An uplift that this research contribute to our knowledge is that Rose wine is the most effective out of the table wines. Especially, when we are interested in weight loss and lipid profile. Due to the aforementioned, Rose wine is really made of components from both Red and White wines [3], it has a better effect than both. Deserving of attention is the fact that this research analysis was done within the limit of acute wine consumption. Logically a different result will be expected from chronic consumption.

Grønbaek [9] discovered that wine consumption in excess can cause atherosclerosis, diabetes and cancer. Montoliu also claimed that ethanol build up can interfere with brain functions [4]. This study is not opposing their discoveries, it is only adding a clause that consuming alcohol minimally has no adverse effect especially with the recent findings [13], alcohol becomes harmful when abused. Wine moderation the hope of healthy drinking!

Acknowledgements

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