

## No, Orally Administered Hemolymph Of *Limicolaria Aurora* Does Not Reduce Blood Pressure In Wistar Rats.

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**ABSTRACT:** The oral administration of the hemolymph of *Limicolaria aurora* at doses of 22.8 and 45.6 mg/kg body wt did not result in any significant difference in the systolic, diastolic, pulse pressure, mean arterial pressure and heart rate of both normotensive and adrenaline induced hypertensive wistar rats. The data from this study show the lack of antihypertensive potential associated with the oral ingestion of *Limicolaria aurora* hemolymph.

**KEYWORDS** - adrenaline, hemolymph, hypertension, *Limicolaria aurora*, polygraph.

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### I. Introduction

Many different types of food commonly consumed in different parts of the world are also alleged, and in some cases known to possess medicinal (pharmacological) actions. In some parts of Nigeria, common in this category of foods are vegetables like *Vernonia amygdalina* [1-3], *Ocimum gratissimum* [4-6] etc. Another group of medicinal food includes snails like *Archachatina marginata* [7-9] and *Limicolaria aurora* [10, 11].

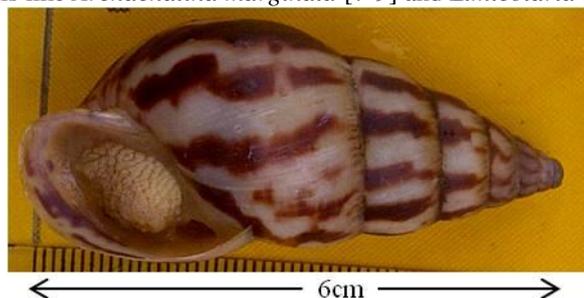


Figure 1:, An image of *Limicolaria aurora* (drawn to scale)

These snails and others, though consumed as delicacies, they are also purportedly antihypertensive amongst those who consume them. The incidence of high blood pressure, precisely hypertension is on the rise in the African continent [12-18], with Nigeria not being an exception. Consequent upon the rising incidence of hypertension along with its associated ailments and fatalities like myocardial infarction, renal failure and others, there is also an upsurge in the search for alternate therapy for the management of hypertension. Presently, there are different modes of treatment for hypertension, viz; lifestyle changes, using different drugs, such as nifedipine [19], etc. Even though there are orthodox management methods for hypertension, quite a number of the indigenous population still resort to alternate (traditional or cultural) methods of managing the ailment citing amongst others the side effects [20], costs etc. associated with some antihypertensives.

The proximate composition of *Limicolaria aurora* has been reported [11]. Besides the meat [21] of these snails, the hemolymph is also orally ingested to counteract high blood pressure [22] among the Yorubas of South West Nigeria. This is a continuation of our studies at finding scientific justification in the use of hemolymph of snails in the management of high blood pressure.

### Materials and methods

The design of this study and methods used are as described [23].

## II. Results

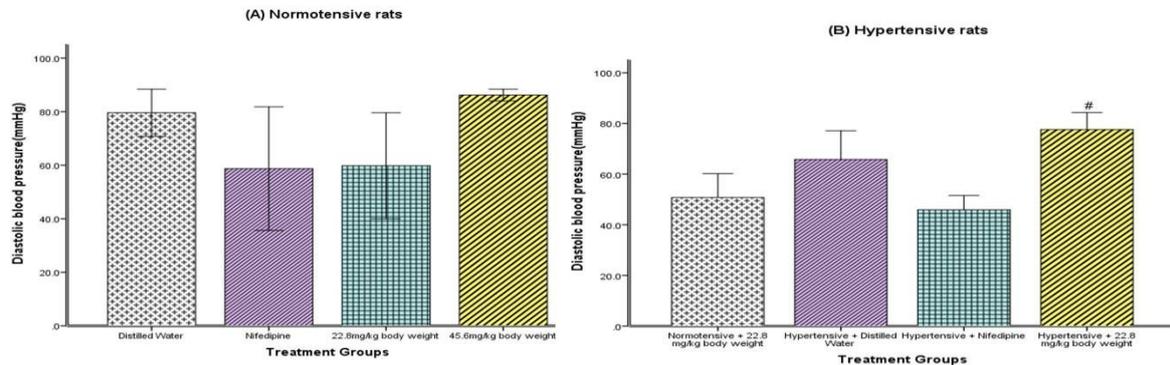


Figure 2; Bar chart showing the effects of oral administration of *Limicolaria aurora* hemolymph on diastolic blood pressure of normotensive and adrenaline induced hypertensive rats. Each bar represents the means±S.E.M. of 6 rats. Bars with # are significantly different compared to nifedipine, #p < 0.05 while bar with \* are significantly different compared to distilled water, \*p < 0.05

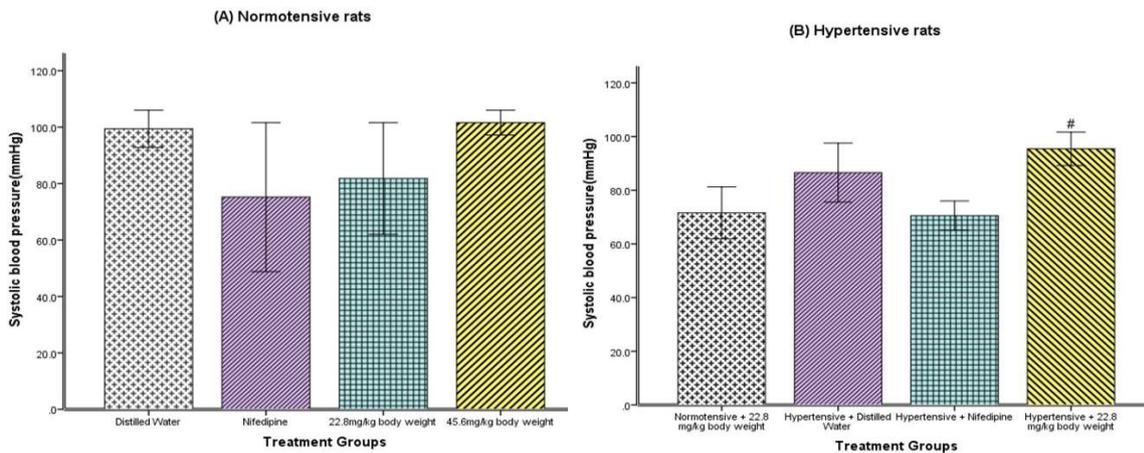


Figure 3; Bar chart showing the effects of oral administration of *Limicolaria aurora* hemolymph on systolic blood pressure of normotensive and adrenaline induced hypertensive rats. Each bar represents the means±S.E.M. of 6 rats. Bars with # are significantly different compared to nifedipine, #p < 0.05 while bar with \* are significantly different compared to distilled water, \*p < 0.05

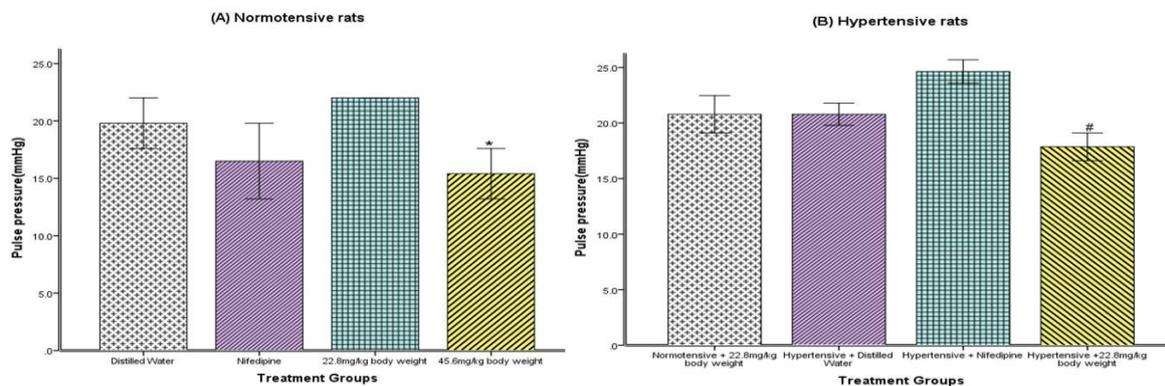


Figure 4; Bar chart showing the effects of oral administration of *Limicolaria aurora* hemolymph on pulse pressure of normotensive and adrenaline induced hypertensive rats. Each bar represents the means±S.E.M. of 6 rats. Bars with # are significantly different compared to nifedipine, #p < 0.05 while bar with \* are significantly different compared to distilled water, \*p < 0.05

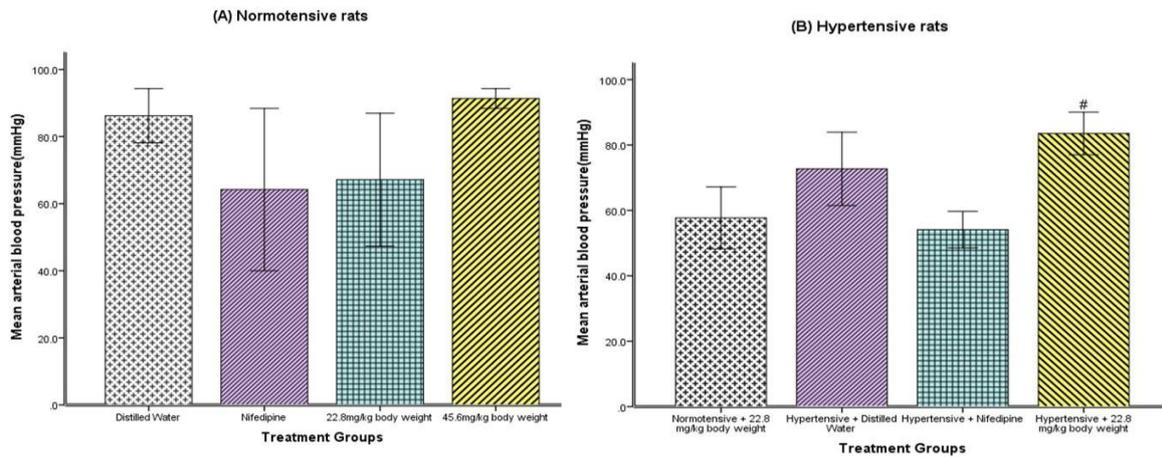


Figure: 5:, Bar chart showing the effects of oral administration of *Limicolaria aurora* hemolymph on mean arterial blood pressure of normotensive and adrenaline induced hypertensive rats. Each bar represents the means±S.E.M. of 6 rats. Bars with # are significantly different compared to nifedipine, #p < 0.05 while bar with \*are significantly different compared to distilled water, \*p < 0.05

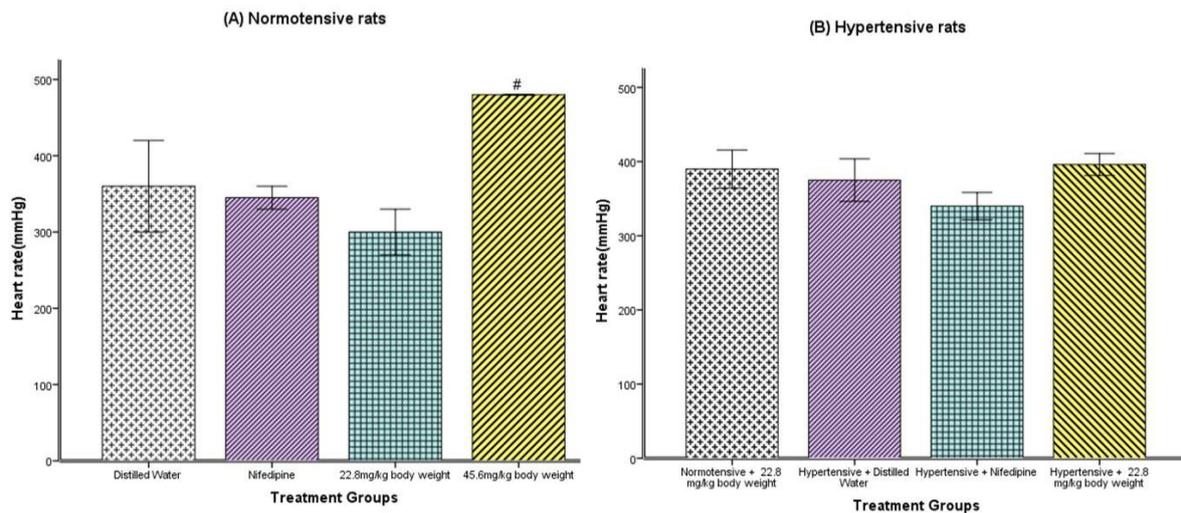


Figure: 6:, Bar chart showing the effects of oral administration of *Limicolaria aurora* hemolymph on heart rate of normotensive and adrenaline induced hypertensive rats. Each bar represents the means±S.E.M. of 6 rats. Bars with # are significantly different compared to nifedipine, #p < 0.05 while bar with \*are significantly different compared to distilled water, \*p < 0.05

### III. Discussion.

The use of alternate and complementary therapy for the cure (or management) of diseases (ailment) is an age old and popular practise globally. The Yorubas in South West Nigeria have employed the use of the meat and hemolymph of snails as an antihypertensive and a general cure for toxins (poisons) of various types. There are conflicting reports on the efficacy of the use of hemolymph and or meat of snails as antihypertensives [24]. Amongst this is a recent which reported that using the hemolymph from *Archachatina marginata* failed to reduce adrenaline induced high blood pressure in wistar rats. [23].

The results from this study (fig 2 – 6) where the hemolymph of *Limicolaria aurora* was used, corroborates the earlier study [23], in its inability to reduce blood pressure. Using two different concentrations as the previous study, did not result in a significant reduction in the systolic, diastolic, mean arterial pressure, pulse pressure and heart rate of the animals used in this study (fig 2 – 6). This study result raises germane questions as to why the people still continue to use this, while there is no apparent justification going by the findings of this study, and the earlier one where the hemolymph of *Archachatina marginata* was used [23]. Does the hemolymph in any

way protect the body from the effects of hypertension like honey [25, 26], or could it be that the hemolymph of snails exerts it pharmacological and or physiological effect indirectly to ameliorate the effects of hypertension.

The data emanating from this study indicates the absence of any blood pressure lowering capability as alluded by the people who orally ingest the hemolymph of *Limicolaria aurora*.

## References

- [1] Adaramoye, O.A., et al., *Lipid-lowering effects of methanolic extract of Vernonia amygdalina leaves in rats fed on high cholesterol diet*. Vascular health and risk management, 2008. **4**(1): p. 235.
- [2] Mensah, J., et al., *Phytochemical, nutritional and medical properties of some leafy vegetables consumed by Edo people of Nigeria*. African Journal of Biotechnology, 2008. **7**(14).
- [3] Saliu, J., et al., *In vitro antidiabetes and antihypertension properties of phenolic extracts from bitter leaf (Vernonia amygdalina Del.)*. Journal of Food Biochemistry, 2012. **36**(5): p. 569-576.
- [4] Interaminense, L.F.L., et al., *Pharmacological evidence of calcium-channel blockade by essential oil of Ocimum gratissimum and its main constituent, eugenol, in isolated aortic rings from DOCA-salt hypertensive rats*. Fundamental & clinical pharmacology, 2007. **21**(5): p. 497-506.
- [5] Awah, F.M. and A.W. Verla, *Antioxidant activity, nitric oxide scavenging activity and phenolic contents of Ocimum gratissimum leaf extract*. Journal of Medicinal Plants Research, 2010. **4**(24): p. 2479-2487.
- [6] Galindo, L.A., A. de Moraes Pultrini, and M. Costa, *Biological effects of Ocimum gratissimum L. are due to synergic action among multiple compounds present in essential oil*. Journal of natural medicines, 2010. **64**(4): p. 436-441.
- [7] Baruwa, O., P. Abogan, and R. Kassali, *Economics of raising African Giant Land Snail (Archachatina marginata) in Osun State, Nigeria*. Editorial Board, 2012: p. 46.
- [8] Busari Ahmed, O., K. Idris-Adeniyi, and J. Filani, *Determinants of snail meat (Archachatina marginata) consumption in Ilesha and Oshogbo metropolis, Osun state, Nigeria*.
- [9] Ebenso, I., *Nutritive potentials of white snails Archachatina marginata in Nigeria*. Discovery and Innovation, 2003. **15**(3/4): p. 156-158.
- [10] Sogbesan, O.A. and A.A.A. Ugwumba, *Culture and nutrient values of Limicolaria aurora (Jay, 1989)(Mollusca: Achatinidae) raised in two different substrates*. Revista Científica UDO Agrícola, 2012. **12**(2): p. 479-485.
- [11] Udoh, A.P., E.O. Akpanyung, and I.E. Igiran, *Nutrients and anti-nutrients in small snails (< i> Limicolaria aurora</i>)*. Food chemistry, 1995. **53**(3): p. 239-241.
- [12] Ogah, O.S., *Hypertension in Sub-Saharan African populations: the burden of hypertension in Nigeria*. Ethnicity and Disease, 2006. **16**(4): p. 765.
- [13] Okpala, N.C. and A.M. Okpala, *Incidence of hypertension in Taura, Northern Nigeria: Lessons for our health care*. International Journal of Medicine and Medical Sciences, 2010. **2**(10): p. 281-284.
- [14] Jain, P., S. Gera, and C. Abengowe, *Incidence of hypertension in Ahmadu Bello University Hospital Kaduna--Nigeria*. The Journal of tropical medicine and hygiene, 1977. **80**(5): p. 90-94.
- [15] Adedoyin, R.A., et al., *Prevalence and pattern of hypertension in a semiurban community in Nigeria*. European Journal of Cardiovascular Prevention & Rehabilitation, 2008. **15**(6): p. 683-687.
- [16] Ulasi, I.I., et al., *High prevalence and low awareness of hypertension in a market population in Enugu, Nigeria*. International journal of hypertension, 2011. **2011**.
- [17] Erhun, W., et al., *Prevalence of hypertension in a university community in south west Nigeria*. African Journal of Biomedical Research, 2006. **8**(1): p. 15-19.
- [18] Opie, L.H. and Y.K. Seedat, *Hypertension in sub-Saharan African populations*. Circulation, 2005. **112**(23): p. 3562-3568.
- [19] Olivari, M., et al., *Treatment of hypertension with nifedipine, a calcium antagonistic agent*. Circulation, 1979. **59**(5): p. 1056-1062.
- [20] Grimm, R.H., et al., *Long-term effects on sexual function of five antihypertensive drugs and nutritional hygienic treatment in hypertensive men and women treatment of mild hypertension study (TOMHS)*. Hypertension, 1997. **29**(1): p. 8-14.
- [21] Odebode, S. and O. Ogunsusi, *Snail Rearing Extension for Food Security among Rural Women in Nigeria*. Bulgarian Journal of Agricultural Science, 2006. **12**(3): p. 363.
- [22] Barwa, E., *Increasing Household Protein Consumption Through Minilivestock Production In Nigeria*. Information Manager (The), 2009. **9**(2).
- [23] Ojekale, A., et al., *Adrenaline Induced Elevated Blood Pressure in Wistar Rats is not Reversed by Oral Administration of Archachatina marginata Hemolymph*. British Journal of Medicine & Medical Research, 2015. **7**(4): p. 318 -326.
- [24] Mabadeje, A., *The ineffectiveness of the snail diet in the treatment of hypertension*. West African Journal of Pharmacology and Drug Research, 1974. **1**: p. 40-44.
- [25] Erejuwa, O.O., et al., *Honey supplementation in spontaneously hypertensive rats elicits antihypertensive effect via amelioration of renal oxidative stress*. Oxidative medicine and cellular longevity, 2012. **2012**.
- [26] Romero-Silva, S., et al., *Effects of honey against the accumulation of adipose tissue and the increased blood pressure on carbohydrate-induced obesity in rat*. Letters in Drug Design & Discovery, 2011. **8**(1): p. 69-75.