

**EVALUATION OF THE ANTI-HYPERTENSIVE ACTIVITY OF ETHANOLIC LEAVES
EXTRACT OF TRICHOSANTHES DIOICA ROXB ON EXPERIMENTAL ANIMAL****Kalyani Singh*, Praveen Kumar and Dr. Shamim Ahmad**

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ABSTRACT

Hypertension, also known as high blood pressure, is a serious and widespread disorder that may result in significant health issues. Hypertension is strongly correlated with a higher likelihood of death and cardiovascular illness. The occurrence of stroke, myocardial infarction (MI), angina, heart failure, renal failure, or premature death caused by heart disease is strongly associated with blood pressure (BP). According to the World Health Organisation, high blood pressure is the third most common cause of death globally, resulting in the death of nearly one out of every eight persons. Hypertension causes the deaths of four million persons every year, and there are billions of people worldwide who are affected by the ailment. Cardiovascular problems provide a significant contribution to illness and death in the Eastern Mediterranean area. Presently, the proportion of individuals in the District with high blood pressure is at 26%, and they make up 31% of all deaths. The increase in these figures may be linked to reasons such as a growing elderly population, higher rates of smoking, and changes in food and behavioural habits. There is a wide range of antihypertensive drugs available for purchase. Nevertheless, they do exhibit detrimental consequences, such as renal and gastrointestinal problems. Herbal treatment and other approaches of controlling hypertension use a diverse range of plants. The investigation is centred on assessing the effectiveness of herbal medications that are utilised in traditional medicine because of their low cost, side effects, and the fact that around 80% of the worldwide population still heavily depends on herbal treatments, as indicated by the World Health Organisation. *Trichosanthes dioica roxb* is used in outdated medications to address several disorders connected to hypertension. The aim of this study is to analyse the therapeutic benefits of an ethanolic leaf extract obtained from *Trichosanthes dioica roxb* in relation to hypertension. Rats were given ethanol orally at a dose of 5 g/kg/day for 5 weeks to increase their blood pressure. The rats were segregated into two cohorts: the first cohort consisted of five rats that were administered an extra quantity of normal saline (10mL/kg), while the second cohort comprised of twenty rats that were given ethanol. After five weeks of administering ethanol, the animals were categorised into four groups, each consisting of five rats. One cohort of hypertensive rats received a dosage of advanced marine substance at a rate of 10mL per kilogramme of body weight. Another cohort received Nifedipine at a dosage of 10mg per kilogramme of body weight. Additionally, two cohorts of hypertensive rats were given *Trichosanthes dioica roxb* at concentrations of 150mg per kilogramme of body weight and 300mg per kilogramme of body weight, respectively. The findings demonstrated that the introduction of ethanol led to a significant elevation in the heart rate and arterial pressure of healthy rats. The animals who were treated with blood-derived therapy showed a significant rise in mean artery pressure (MAP) compared to those that received excretion of 150mg and 300mg per kilogramme of Nifedipine. The antioxidant status, liver and kidney function, and cholesterol levels were dramatically improved in hypertensive rats after the injection of *Trichosanthes dioica roxb* or Nifedipine. The therapeutic effect of *Trichosanthes dioica roxb* extract on hypertension may be related to its antihypertensive, hypolipidemic, and antioxidant qualities, making it suitable for treating high blood pressure.

KEYWORDS: *Trichosanthes dioica roxb* is used in outdated medications to address several disorders connected to hypertension.

1. INTRODUCTION

High blood pressure may be a sign of a chronic condition and may come with first symptoms that are not evident. The patients are in excellent health and are required to attend an outstanding concert. Clinical reasons and

subsequent concerns occur after vascular alterations that affect several parts of patients' lives. This illness mainly impacts many organs throughout the body as a separate and identifiable risk factor. Various medical conditions are categorised as health disorders, including as cardiac

failure, chronic kidney disease, cerebrovascular disorders, coronary artery disease, and anomalies in the eyes.^[1]

The detrimental effects of hypertension on the cognitive abilities and functional limitations of these individuals lead to the development of psychological disorders such as anxiety and sadness. Given the significance of recognising and controlling the factors that lead to hypertension, it is clear that doing so may help in managing and preventing this illness and its related problems. The World Wellbeing Association has underscored the need of prioritising the prevention, management, and treatment of hypertension in order to promote public health. The term for hypertension in the indigenous Ghanaian Twi language is "Mogya Mboroso". The term "flood of blood" is often used to denote Hypertension. Hypertension is categorised into two primary classifications. These clutters may include conditions such as renal failure or renal vascular disease. This kind of hypertension is seen in around 5 to 10% of patients. The aetiology of elevated blood pressure is not completely understood. Nevertheless, age, elevated salt consumption, inadequate potassium in the diet, lack of physical activity, stress, and genetic susceptibility have been recognised as significant variables. Due to its chronic nature, high blood pressure needs continuous management.^[2]

By 2020, it is estimated that the global prevalence of high blood pressure will reach 1.2 billion individuals.^[3] The Eastern Mediterranean area has a significant frequency of elevated average blood pressure levels. The rate is at 26% and affects around 125 million persons. Recent evidence indicates that those who have normal blood pressure at the age of 55 have a 90% chance of having high blood pressure over their lives.^[4] The correlation between high blood pressure and the likelihood of cerebrovascular disease occurrences is stable, reliable, and not influenced by other risk variables. Elevated blood pressure raises the likelihood of experiencing myocardial infarction, cardiac failure, stroke, and kidney illness.^{[5] [6]} High blood pressure may hinder the heart's capacity to perform optimally and decrease its efficiency. Hypertension may lead to the impairment of blood vessels, causing them to become fragile, weak, or constricted. Extended hypertension may result in harm to several vital organs, such as the heart,

kidneys, brain, and eyes. Variations in blood pressure during the day are a frequent phenomenon. Hypertension is influenced by several factors such as the time of day, physical activity, dietary habits, stress, and other variables. Complications may occur if blood pressure is persistently high for a prolonged duration, regardless of other factors. The number 18 is encapsulated between square brackets.

2. MATERIALS AND METHODS

Preparation of Ethanolic extracts of *Trichosanthes dioica roxb* leaves.

The desiccated and pulverised leaves of *Trichosanthes dioica roxb* were inserted into the thimble of a Soxhlet device. A total of 150 grammes of powdered leaves were obtained and subjected to extraction using petroleum ether (50-55°C) to remove the fat content. The remaining residue was then extracted using a Ethanolic solvent for duration of 72 hours. The process involves extracting Ethanolic from the substance by using a rotating evaporator to eliminate any surplus solvent. The Ethanolic extracts were then transferred to empty beakers and evaporated to form a hot water paste, which was then held at a temperature of 50°C for Ethanolic extraction. The ultimate resolution was thoroughly air-drying to eliminate all traces of the solvent. After drying, the pieces are kept in a high-capacity air vessel to preserve their anti-hypertensive properties. **Effects of the Ethanolic leaves extract of *Trichosanthes dioica roxb* leaves on Hemodynamic parameters in hypertensive rats.**

In comparison to normotensive rats (NTR), hypertensive rats (SBP), DBP, and MBP will suggestively rise ($p < 0.001$) when they drink filtered water made from ethanol. Treatment with *Trichosanthes dioica roxb* leaf extract at dosages of 150 mg/kg and 300 mg/kg, as well as Nifedipine (10mg/kg), occasioned into a significant reduction ($p < 0.001$) in SBP and MBP compared to the control group (HTR). The study found that administering a dose of 300mg/kg of Nifedipine effectively decrease the levels of SBP, DBP, and mean blood pressure in normotensive rat, bringing them closer to normal levels. The administration of the plant extract at dosages of 150 mg/kg and 300 mg/kg, as well as Nifedipine at a dose of 10mg/kg, did not cause any changes in heart rate in rats with hypertensive rat.

Table 3.7: Results of Ethanolic Extract of *Trichosanthes dioica roxb* leaves on hemodynamic parameters in HTR.

Parameter	N T R	H T R	Nif 10	TDRLE 150	TDRLE 300
SBP (mmHg)	119.33± 0.82	189.10± 256	126.08±2.35*	106.45±2.68*	118.09±1.33*
DBP (mmHg)	105.44± 2.10	160.23± 2.90	108.55±2.88*	96.34 ± 2.77*	110.22±3.54*
MBP (mmHg)	109.45± 1.43	170.67± 2.68	116.78±0.49*	99.09± 2.78*	112.56±1.03*
HR (BPM)	334.59±2.89	346.33± 2.78	348.90±2.67*	349.93±2.67*	348.91±2.66*

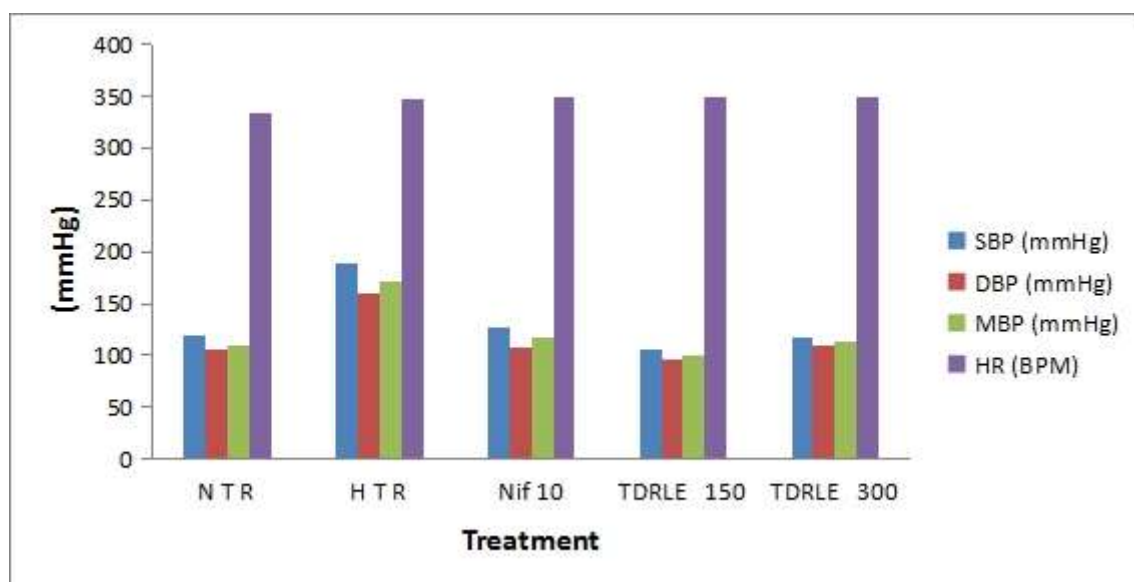


Figure 3.1: Results of Ethanolic extract of *Trichosanthes dioica roxb* leaves on hemodynamic parameters in HTR.

For a given number of $n = 5$, each value reflects the mean plus or minus the standard error of the mean (SEM). Heart rate (HR), measured in beats per minute (BPM), and blood pressure, consisting of diastolic blood pressure (DPM) and systolic blood pressure (SBP) The study included hypertensive rats that were administered alcohol (5 g/kg) and distilled water (10 ml/kg), and normotensive rats that are assumed just distilled water (10 ml/kg). The statistical analysis revealed a significant difference ($*P < 0.05$) between the two groups, indicating that the effects of alcohol were more pronounced in the hypertensive rats compared to the normotensive rats. E. O. 150 refers to a group of hypertension rats that were given *Trichosanthes dioica roxb* leaves extract at a dosage of 150 mg/kg. E. O. 300 refers to another group of hypertensive rats that were given *Trichosanthes dioica roxb* leaves extract at a dose of 300 mg/kg. Nif 10 refers to a group of hypertensive rats that were given Nifedipine at a dose of 10 mg/kg.

3.8 Results of Ethanolic leave extract of *Trichosanthes dioica roxb* leaves on Lipid Parameters in HTR

The effects of the Ethanolic leave extract of *Trichosanthes dioica roxb* leaves on the blood levels of triglyceride, HDL-cholesterol, and LDL-cholesterol. The results show a significant increase ($p < 0.001$) in LDL cholesterol, triglyceride, and LDL cholesterol in untreated rats with high blood pressure associated to normotensive rats. Additionally, a substantial decrease ($p < 0.001$) in HDL cholesterol is detected. Administering *Trichosanthes dioica roxb* leaf extract at appropriate dosages of 150 and 300 milligrams per kilogramme, or Nifedipine at a dose of 10 milligrams per kilogramme, caused in a substantial decrease in LDL saturated fat associated to untreated HTRs. Treatment with extracts of *Trichosanthes dioica roxb* leaves (150 mg/kg and 300 mg/kg) or Nifedipine (10mg/kg) effect in a substantial reduction in TG levels associated to the untreated HTR. The extract of *Trichosanthes dioica roxb* leaves, at doses

of 150 and 300 milligrams per kilogramme, as well as Nifedipine at a dose of 10 milligrams per kilogramme, expressively decrease the level of LDL cholesterol associated to the control group getting distilled water. Treating hypertensive rats by either a dosage of 300 milligrams per kilogramme of *Trichosanthes dioica roxb* leaves or 10 milligrams per kilogramme of Nifedipine results in a substantial growth into the amount of HDL-ldl cholesterol associated to untreated rats.

CONCLUSION

An in-depth examination of the morphological, chemical, and phytochemical characteristics of *Trichosanthes dioica roxb* leaves, as well as their impact on rats with hypertension, sheds insight on the potential therapeutic use of this plant. The macroscopic study highlighted several physical characteristics that aid in leaf identification and use, including size, colour, surface attributes, odour, and taste.

The chemical analysis identified many components that contribute to the plant's medicinal properties, including as proteins, cellulose, chitin, fixed oils, lipids, tannins, starch, mucilage, and calcium crystals. The plant's potential for medical application was confirmed by phytochemical screening, which revealed the presence of alkaloids, glycosides, proteins, amino acids, carbohydrates, saponins, flavonoids, and phenols.

The experiment on hemodynamic parameters in hypertensive rats revealed that the ethanolic extracts of *Trichosanthes dioica roxb* leaves had a notable effect in reducing blood pressure. These findings suggest that the plant is as efficacious as conventional drugs such as nifedipine in managing hypertension. In addition, the extracts had a notable impact on lipid indicators, increasing HDL cholesterol and reducing LDL cholesterol and triglycerides, all of which have positive implications for cardiovascular well-being.

The study demonstrated that *Trichosanthes dioica* roxb leaves has antioxidant properties, as shown by the significant decrease in malondialdehyde (MDA) levels and the increase in glutathione (GSH) and superoxide dismutase (SOD) activities in the hypertensive rats who received treatment. The findings indicate that the plant has the ability to decrease oxidative stress and protect cells from damage caused by the metabolism of ethanol.

The leaves of *Trichosanthes dioica* roxb exhibit notable antioxidant, lipid-lowering, and antihypertensive properties, making them a promising natural remedy for hypertension and its associated complications. Further research must focus on identifying and defining the active components responsible for these effects, as well as conducting clinical trials to validate their potential for human therapy.

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