Direct Research Journal of Health and Pharmacology

Vol. 12(2), Pp. 1-4, May 2025,

https://journals.directresearchpublisher.org/index.php/drjhp/issue/archive

Research Article
ISSN: 2449-0814

Comparative analysis of *Justicia carnea* and *Telfaria occidentalis* leaf extract as blood boosters in male wistar rats

Piriye C. Jesse-Abraham and Udeme Jude Ogoloma

Department of Department of Science Laboratory Technology, School of Science and Technology, Captain ElechiAmadi Polytechnic, Rumuola, Port Harcourt, Rivers State, Nigeria.
Corresponding author email: piriye.jesse-abraham@portharcourtpoly.edu.ng

ABSTRACT

This study compared the efficacy Justicia carnea and Telfaria occidentalis leaf extract as blood boosters in Male Wistar Rats. Justicia carnea is a medicinal plant widely used as a blood tonic in Nigeria. The leaves of the plant are boiled and the crimson liquid consumed mostly by Anaemic patients, women who want to replenish their blood after their menstrual cycle and pregnant women. Nine male Wistar rats were weighed and randomly grouped into three with Group one (1) -control, group two (2) J. carnea leaf extract group, and group three- T. occidentalis group. Group one were given animal feed pellets and water ad libitum, group 2 were administered 100mg/Kg Body weight of J. carnea extract while group 3 were given 100mg/Kg Body weight of T. occidentalis by gavage for 7 days. The results show packed cell volume for T. occidentalis (50%) and J. carnea (47.5%) which was higher than the PCV of the control group (40.67%). The Red Blood Cell Count for T. occidentalis showed the highest value (18 million/mm^3) and 15 million/mm^3 for the J. carnea when compared to the control (12 million/mm^3). This shows that adding T. occidentalis to the diet can stimulate red blood cell production, due to the presence of Iron and B vitamins that can boost health and vitality.

Keywords: *Justicea carnea, telfaria occidentalis, blood boosters, green vegetables*

Article information
Received 8 April 2025
Accepted 25 May 2025
Published 4 June 2025
DOI: https://doi.org/10.26765/DRJHP9028810563

Citation: Jesse-Abraham, P. C., and Ogoloma, U. J. (2025). Comparative analysis of Justicia carnea and Telfaria occidentalis leaf extract as blood boosters in male wistar rats. Direct Research Journal of Health and Pharmacology Vol. 12(2), Pp. 1-4. This article is published under the terms of the Creative Commons Attribution License 4.0.

INTRODUCTION

Justicea carnea was named after the 18th century Scottish botanist James Justice. It is a flowering plant in the family of Acanthaceae. *Justicia carnea* is a medicinal plant widely used as a blood tonic in Nigeria. The leaves of the plant are boiled and the crimson liquid consumed mostly by Anaemic patients, women who want to replenish their blood after their menstrual cycle and pregnant women. It is generally considered as an ornamental plant and it is widely distributed in various parts of Africa. *Justicea carnea* is commonly called 'Hospital too far' or 'Blood of Jesus' and it is alleged to be more effective to restore blood levels to normally within a short period even better than normal blood tonics. It is known as 'ogwu obara' by the Igbos and "ewe eje" (blood leaf) or 'ewe ajeri' (Jehovah witness leaf), by the yorubas. It is commonly called Jehovah witness leaf because it is a substitute for blood transfusion for Jehovah witnesses, (Olufunke, 2021). The plant *Justicea carnea* contains bioactive compounds like phonols and flavonoids that bestows anti-microbial, ana oxidant, hypochoiesterolemic and anti-cancerous

properties. The leaf extract is also rich in the supply iron, riboflavin, vitamin A, C, E, B_1, B_2, B_9, and B_{12}. They are rich in calcium and iron. Several species of *Juticea* are used in the management of inflammation, gastrointestinal disorders, respiratory tract infection, fever, pain, diabetes, diarrhea, liver disease, rheumatism and arthritis. They also possess anti-inflammatory, anti—tumoral, antiviral and analgesic activities. Species of *Justicea* found in India such as *Justicea tranquebarienns* and *Justicea nynadensis* have been reported to possess cardio protective properties and antioxidant activity in various parts of Africa , several species of *Justicea* are used in traditional medicine for the treatment of anaemia, inflammation, fever, diarrhea, liver diseases, arthritis, respiratory and GIT (gastro intestinal tract) disorder. The leaves of *Justicea carnea* are cooked with edible vegetables to make soup or boiled separately in water to make tea or prepared by cooking with other medicinal plants for therapeutic purposes. In some localities in Nigeria the raw leaves are chewed while some use it together with *Ocimum gratissimum* (efinrin) as culinary vegetables to garnish yam porridge, (Olufunke, 2021).

Justicea carnea is a perennial plant native to the Atlantic Forest eco-regions of eastern Brazil. It is cultivated and sold as a decorative potted plant and is planted in landscaping as a feature plant in warm temperate and subtropical climates (USDA/NRC., 2023). Fluted pumpkin *(Telfaria occidentalis*) is a vegetable locally known as, ugwu in Igbo and eweroko in Yoruba language of Nigeria. This leaf is a tropical vine grown in West Africa as a leafy vegetable. It is a vegetable shrub that creeps low across the ground with large lobed leaves and long twisting tendrils. *T. occidentalis* is a vegetable which is an important source of vitamins in diets in Nigeria mostly in southern part of Nigeria. The leaf is used primarily in soups and herbal medicines, they are believed to help reduce blood pressure, improve digestion and enhance healthy metabolism (Nwufo, 1994). Young leaves of *T. occidentalis* sliced and mixed with coconut water and salt are used to treat convulsion in ethno medicine and the root are used as rodenticides (Nwufo**,** 1994). *T. occidentalis* is traditionally used by an estimated 30 to 53 million indigenous people in Nigeria, including the Efik, Ibibio, and Urhobo; however, it is predominantly used by the Igbo tribe, who continue to cultivate the gourd for food sources and traditional medicine (Nwufo, 1994). The fluted gourd is noted to have healing properties and is used as a blood tonic, administered to the weak or ill (Akoroda *et al*., 1990). They are also a source of vitamins, minerals and phytochemicals. *T. occidentalis* contain high level of potassium and iron, while the seed are composed of 53% fat. A significant percentage of Nigerian populations consume this vegetable regularly.

Blood

Blood is made up of red blood cells, white blood cells, platelets and plasma.

Red blood cells (RBC)

Red blood cells (RBCs) are the round shape, biconcave discs, present in the blood that helps in the transport of gases throughout the body. The biconcave shape helps the RBCs in rendering the red cells quite flexible so that they can easily pass through the capillaries. On an average, the size of the Red Blood Cells (RBCs) is 7.2 – 7.4 mm (microns). The mature RBCs are non-nucleated cells with an Iron-containing pigment known as Hemoglobin which helps in the transport of oxygen from the lungs to tissues and carbon dioxide from tissues back to the lungs for excretion. The Average lifespan of Red Blood Cells (RBCs) is 100 – 120 days.

Packed cell volume

A Packed Cell Volume (PCV) Test is a general blood screening done to diagnose dehydration (low body fluids or blood volume), Anaemia (Low levels of Red Blood Cells) or polycythemia (high levels of Red Blood Cells) in patients. PCV estimates the amount of blood made up of cells. It is done generally with a full blood count test that is conducted to estimate the need for any blood transfusion treatment; these procedures are recommended by a physician after examination and the observation of certain signs, A lower number of the PCV means that the red blood cell count is low, which can be due to many reasons such as blood loss, cell destruction, and less bone marrow production. An increased PCV generally means that the person is dehydrated, and there is a higher number of RBC productions. The PCV is a measurement of the proportion of blood that is made up of cells. The value is expressed as a percentage. A PCV of 40% for instance means that there are 40 millilitres of cells in 100 millitres of blood. A normal PCV blood test value is either expressed as a percentage or fraction.

The use of herbal medicine has drastically increased over the past three decades with not less than 80% of people worldwide relying on them for some part of primary healthcare. Studies have shown promising potential with the efficacy of a good number of herbal remedies but many of them still need further research and public sensitization on their usage is necessary. This study intends to compare the efficacy of *Justicea carnea* as a blood booster and compare the results to that of pumpkin leaves: a known blood booster in male Wistar rats.

MATERIALS AND METHODS

Research design

Nine male Wistar rats weighing about 100g were bought from the animal house of the Faculty of Basic Medical Sciences, University of Port Harcourt and housed in conducive cages for about 14 days to allow for acclimatization. They were then weighed and randomly grouped into three with Group one (1) serving as control,

group two (2) served as *Justicea carnea* leaf extract group, and group three served as *Telfaria occidentalis* group. Group one were given animal feed pellets and water *ad libitum*, group 2 were administered 100mg/Kg Body weight of *Justicea carnea* leaf extract while group 3 were given 100mg/Kg Body weight of *Telfaria occidentalis* by gavage for 7 days (Fowler M.E., 1981).

Extract preparation

Fresh leaves of *Telfaria occidentalis* and *Justicea carnea* were bought from the local market (Rumuokwuta market), and transported in cellophane bags to the microbiology laboratory of Captain Elechi Amadi Polytechnic, Rumuola Port Harcourt. The *T. Occidentalis* leaves were washed thoroughly to get rid of dirt and sand particles. The leaves were sliced and blended with about 100mls of distilled water and sieved with a fine mesh cloth to extract the juice. The extract was then stored in a refrigerator. J. carnea leaves were also washed thoroughly and boiled for agout 20minutes until the leaf extract was bright red in colour. The extract when then allowed to cool and then stored in the refrigerator.

Study area

The study area was the animal house of the Faculty of Basic Medical Sciences, University of Port Harcourt.

Population of the study

Nine (9) male Wistar rats were used for this study.

Sample collection

After seven days of aqueous extract administration to the experimental animals, the animals were sacrificed by anaesthetizing them with chloroform in a dessicator. The anaesthetized rats were laid in the anatomical position and their limbs pinned. Blood samples were collected by laceration of the jugular vein into EDTA bottles. The blood samples were then shaken to help the EDTA in the bottle mix well with the blood. The blood samples were then transported to the laboratory for Red blood cell count and packed cell volume tests.

Data analysis

Data was analysed using simple mean.

Ethical standards

This research was carried out in accordance with the National Institute of Health Guide for the Care and Use of Laboratory Animals and standards approved by the Institute of Laboratory Animal Resources Council.

RESULT AND DISCUSSIONS

The results in (Table 1) show Pack Cell Volume for *Telfaria occidentalis* (50%) and *Justicea carnea* (47.5%) which was higher than the PCV of the control group (40.67%) (Table 1).

Table 1 Results for the Pack Cell Volume for *Telfaria occidentalis* and *Justicia carnea* fed to Male Wistar rats.

S/N	N	Groups	PCV (%)
1	3	Control	40.67
2	3	TC	50.00
3	3	JC	47.50

Values are expressed as mean. TC- *Telfaria occidentalis,* JC – *Justicea carnea.*

Table 2 Results for Red blood Cell count for *Telfaria occidentalis* and *Justicia carnea* fed to Male Wistar rats.

S/N	N	Groups	RBC (million/mm^3)
1	3	Control	12
2	3	TC	18
3	3	JC	15

Values are expressed as mean. TC- *Telfaria occidentalis,* JC – *Justicea carnea.*

The Red Blood Cell Count for *Telfaria occidentalis* showed the highest value (18 million/mm^3) and 15 million/mm^3 for the *Justicea carnea* when compared to the control (12 million/mm^3) (Table 2).

The results of this present study in (Table 2) showed an increase in Pack Cell Volume for *Telfaria Occidentalis* (50%) when compared to the control (40.67%). The Red Blood Cell Count for *Telfaria Occidentalis* also showed the higher value (18 million/mm^3) when compared to the control (12 million/mm^3). These results are agreement with a study done Lawal *et al*., (2015) on the blood boosting properties of *T. occidentalis* leaves in Wister rats, which also showed an increase in red blood cell concentration. The increase became statistically significant ($p< 0.05$) after 7 days of administration, In the same study there was also an increase in the erythrocyte count, due to a stimulation of the production of red blood cells (Lawal *et al*., 2015).

Anaemia can result when Iron and B vitamins are not available in our daily diet of taken in as supplements. *T. occidentalis* ids very rich in Iron and B vitamins (B_{12} and B_9), and these are essential for erythropoeisis. This study has shown that daily dietary intake of *T.occidentalis* can help meet the required Daily intake of Iron, B_{12} and B_9.

The PCV for *Justicea carnea* group (47.5%) also recorded an increase when compared to control group (40.67%), RBC values of J*. carnea* (12 million/mm^3) also increased when compared to control. This agrees with work carried out by Isichei-Ukah *et al*. (2024), they recorded increase in the PCV, RBC and Haemoglobin count. This is also agrees with Orjiakor *et al*. (2019), who buttressed the fact that the blood-stimulating effect of this

plant could be responsible for the boost. Similarly, Onyeabo *et al*. (2017) worked on the reversed effect of *J. carnea* leaf extract leaf on anaemia-induced experimental rats as well as Orjiakor *et al.* (2019). This shows that adding *T. occidentalis* and *Justicea carnea* in the diet can stimulate red blood cell production, due to the presence of Iron and B vitamins that can boost health and vitality.

Conclusion

The findings from this study compared the efficacy of the blood boosting properties of *Telfaria occidentalis* and *Justicea carnea* on Male Wister rats and found that *T. occidentalis* had a higher blood boosting capacity than *J. Carnea*. Therefore this study concludes that both *Telfaria occidentalis* and *Justicea carnea* are efficacious blood boosters but *Telfaria occidentalis* is more efficacious and therefore has faster effect on blood cells.

Recommendations

1. Combination studies should be carried out to investigate whether or not they would be work faster when combined.
2. Further studies should be carried out to investigate the effect on vital tissues like the liver and kidneys also further toxicological studies.
3. Further phytochemical studies should be carried out to know the different phytochemicals present in the extracts and if they would be efficacious for cancer studies.
4. Oxidative stress biomarkers should be investigated as well.

REFERENCES

Isichei-Ukah, O.B., Igho-Daro O. B., & Onaiwu, I. E., (2024). Haematological and Histopathological Effects of *Justicia carnea* (Jehovah's Witness plant).*African Scientist* 25 (1): 1595-6881.

Lawal B., Shittu O.K., Rotimi A.A., Olalekan I.A., Kamooru A.A., Ossai P.C., (2015). Effect of methanol extract of telfaria occidentalis on haematological parameters in Wistar rats. *Journal of Medical Science* (Faisalabad). 15: 246-50.

Martins Ekor, (2013). The growing use of herbal medicines: issues relating to adverse reactions and challenges in monitoring safety. *Front Pharmacol*. 4: 177.

Ojimelukwe P.C. (2022). *Telfaria occidentalis:* A blood booster, an antioxidant and an antihyperglycaemic agent. *International Journal of Food Science and Nutrition*. 7(3); 1-9.

Olufunke F., (2021). Nigeria's medicinal plant: *Justicea carnea* (Ewe eje). Punch Newspaper.

Onyeabo, C., Achi N., Ekeleme-Egedigwe C., Ebere c., Okoro C., (2017).Haematological and biochemical studies on Justicia carnea leaf extract in phenylhydrazine induced-anaemia in albino rats. *Acta Science Pol Technol Aliment,* (16)2: 217-230.

Orjiakor C.A., Uroko R.I., Njoku O.U., and Ezeanyika L.U.S., (2019). Nutritive properties of aqueous extract of *Justicia carnea* leaves and its effects on haematological and some biochemical indices of anaemia induced male Wistar albino rats. *Biomedical Research*. 30(6).

Shahil Batra, (2018). Haematology Practicals: Total Red Blood cell (RBC) count using Heamocytometer/ Neubauer,s Chamber (Microdilution and Macrodilution method).

USDA, NRC (n.d.) (2023). *Justicea carnea*". The plants Database (plants.USDA.gov). Greensboro, North Carolina. National plant Data team. Retrieved 20th October 2023, 12:08pm.