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## PHYTOCHEMICAL SCREENING AND THE HAEMATOLOGICAL EFFECT OF *Peristrophe bicalyculata* (RETZ) Nees DIET PREPARATION IN ALBINO RATS

<sup>1</sup>ESENOWO, G. J.; <sup>2</sup>SAM, S. M. <sup>3</sup>BALA, D. N.,  
<sup>3</sup>EKPO, B. A. J. AND <sup>1</sup>EDUNG, E. M.

*Department of Botany & Ecological Studies, University of Uyo.*

*<sup>2</sup>Department of Plant Science & Biotechnology,  
University of Port Harcourt.*

*<sup>3</sup>Department of Pharmacognosy & Natural Medicine, University of Uyo, Nigeria*

**ABSTRACT:** The phytochemical screening and haematological effect on diet preparation of *Peristrophe bicalyculata* were carried out in laboratory. The effect of the diet preparation of *P. bicalyculata* in haemoglobin concentration (Hb conc.), Red blood cell count (RBC), packed cell volume (PCV) and white blood cell count was investigated on 25 albino wister (white), rats. The diet contained 10%, 20%, 40% and 50% by weight of *P. bicalyculata*. The result of the phytochemical screening of ethanolic leaf extract revealed the presence of alkaloid, Tannins, saponnins, phlobatannins, cardiac glycosides, flavonoids and anthraquinones while terpenes and cyanogenetic glycosides were absent. The diet preparation of *P. bicalyculata* at a higher doses significantly increased the Hb concentration, PCV, and RBC as compared with the control. This study confirms the use of *P. bicalyculata* leaves to restore the lost blood during excessive bleeding.

### INTRODUCTION

*Peristrophe bicalyculata* (Retz) (Acanthaceae) is perennial herb native to warm-temperate and tropical regions of Africa and Asia (Burkill, 1968). The plant is used as a remedy for snake bite in Sudan and India. In Southern Rhodesia, a vegetable salt is extracted from the leaves. A yellow-brown essential oil can be extracted from it by steam-distillation and this shows tuberculostic activity *in-vitro* and inhibits the growth of various strains of *Mycobacterium tuberculosis*.

The plant is relished for grazing by cattle in Senegal and provides fodder in many other countries such as Zambia, southern Rhodesia and the Lake Chad. In India, the plant is cut for horse feed and it is ploughed in as green manure. Seeds of the plant have been reported to carry certain amount of mucilage which on drying can be stretched out into a fine thread. This is used in fishing out foreign bodies from the eyes and ears (Burkill, 1985).

Though an ethnobotanical record of the plant has not been found, and unnamed alkaloid has been reported present in the leaf and stem of the plant (Burkil, 1985). This prompted a personal communication with the locals of Itak Ikot Ukap in Ikono Local government Area of Akwa Ibom State of Nigeria where the infusion of the herb is taken orally by anemic patients to improve their health condition. This study is aimed at evaluating the bioactive components of the leaves of *P. bicalyculata* and to know the effect of its dietary preparation on haematological parameters.

### MATERIALS AND METHODS

#### EXTRACTION

The fresh leaves (1kg) of *P. bicalyculata* were collected in June, 2008, air-dried for a week and reduced to powder which yields 300g. About 250g of the powder was macerated in 1 litre

of ethanol (EtOH-H<sub>2</sub>O) (3:1) for 72 hours. The liquid extract obtained was concentrated in vacuo at 40°C to yield dry ethanol extract (40 – 50g).

### PHYTOCHEMICAL SCREENING

Applying the method of Sofowora (1993) and Trease and Evans (2002), the dry ethanol extracts was subjected to phytochemical screening to reveal the presence of its secondary metabolites.

### TEST ORGANISM

The organism in this study was albino rats (25) of the same strain. They were purchased from the animal house, University of Jos, Plateau State, Nigeria. They were maintained under standard animal house conditions in the animal house of the Department of pharmacology and Toxicology, University of Uyo, Uyo. The rats were allowed free access to food (layer mash) and water for 2 weeks for acclimatization.

### PREPARATION OF *Peristrophe bicalyculata*

A portion of the plant materials was pulverized. The standard animal feed was similarly powdered. 10g of the leaf powder was compounded into 90g of feed to give a 10% composition likewise, 20g was mixed with 80g feed, 40g with 60g feed and 50g of leaf powder with 50g of feed to give 20%, 40% and 50% by weight *Peristrophe bicalyculata* respectively.

### HAEMATOLOGICAL TEST

The following rats (25) were put into 5 groups (I, II, III, IV, and V) with 5 rats per group. Group 1 rats were fed with the standard diet and served as the control. Group II were fed with 10% composition of the diet, Group III received 20%, Group IV was given 40% and Group V received 50%. Tap water was given and the animals were observed for 8 days. After, blood samples were collected from the animals and taken to the University of Uyo Health Centre Laboratory for the determination of packed cell volume (PCV), haemoglobin concentration (Hb conc.). Red blood cell count (RBC count) and white blood cell count (WBC count). Analysis of variance was calculated according to method of Downie and Health (1974).

## RESULTS

The leaf extract showed various classes of compounds (Table 1) inherent in the plant. The extract contained alkaloid in high concentration

Table 1: Chemical composition of *Peristrophe bicalyculata*

Metabolites	Concentration (ug/l)
Alkaloids	+++
Saponins	++
Tannins	+++
Flavonoid	+
Cardiac glycosides	+
Cyanogenetic glycosides	-

Key:

+++	=	High concentration
++	=	Moderate concentration
+	=	trace concentration
-	=	Absent

Tannins showed high concentration with Ferric chloride but moderate with bromine water. With KOH test, phlobatanins was abundantly present but in trace amount with HCL test. Saponins and cardiac glycosides were moderately present. Flavonoids and anthraquinones were present in trace amounts, while cyanogenetic glycoside and terpenes were absent.

The volume of packed red cells (PCV) increased in groups IV and V which received treatment doses of 40% and 50% respectively likewise, there was a rise in Hb concentration in groups IV and V. A marked increase in the RB count was recorded in group V which received 50% preparation of diet. There was a rise in WBC count at 10% and 20% diet preparation but at higher concentration of 40% and 50%, the WBC count dropped to normal as compared with the control group (Table II).

Table 2: Result of the effect of *P. Bicalyculata* diet preparation on haematological parameters

Group	Treatment	PCV%	Hb Conc. G/dl	RBC count x 10 <sup>6</sup> /mm	WBC count x10 <sup>3</sup> /mm
I	Control %	38.20±0.44	10.20±0.27	7.74±0.64	14.80±3.56
II	10 Prep.	38.00±0.00	10.00±0.35	8.86 ±0.05	16.30±0.97
III	20 Prep.	39.10±0.22	10.60±0.65	8.9±0.00	17.20±0.84
IV	40 Prep.	40.70±0.44	14.00±0.50	8.43±0.44	14.90±0.74
V	50 Prep.	42.20±0.44	14.40±0.96	10.12±0.05	14.64±2.28

The Hb and RBC were significant at  $P < 0.001$

Values expressed are mean  $\pm$  SC of 5 albino rats

## DISCUSSION

The result of the haematological test significantly ( $P < 0.001$ ) increased in the haemoglobin concentration (Hb), Red Blood cell count (RBC) and packed cell volume (PCV) while the white blood cell count (WBC) did not change compared to the control group. This could be due to the abundant presence of alkaloids which has been known to exhibit pharmacological effects on humans and other animals. Conine, an alkaloid is reported to be effective in preventing blood lose during cuts and also brings about blood clot (Cluse *et al*; 1971). Alkaloids such as vinorelbine, melphalan and temozolomide are used for treatment of induced anemia (Falcone *et al*, 1997). Alkaloids are known to exhibit emetic amoebicides, expectorant, anaesthetics, antipuretics, analgesics, antileminthic and can be used for the treatment of stomach problems (Farnsworth, 1994; Etukudo, 2003).

Tubocurarine and procenbazine have used in tincture used in wounds apart from their use as neuroblockers (Clause *et.al*, 1971). The main components of tincture is the oxygen carrying capacity that increases the circulation of blood (Guyton and Hall, 2002) and its formation form the hypothalamus (Ganong, 2002).

The tannins presents in abundance and the flavonoids found in trace amount are phenolic compounds. They seem to be universally distributed in plants and have been subjected to a great number of chemical, biological, agricultural and medical studies (Zheng and Wang, 2001).

Phenolics have been used since the early twenties for the destruction of cancer cells and for neuroprotective effects of estrogen (Guyton, and Hall, 2002). These estrogens can only survive and be transported through the red blood cells. Flavonoids elicit a wide range therapeutic activities such as antihypertensive, antimicrobial, antitumour and Cardiac glycosides were

detected in the extract and this compound has been useful in the treatment of disease associated with the heart (Trease and Evans, 1989) and its use by herbalist to cure tumour in Akwa Ibom State is confirmed (Latha and Panikkar, 2000, Piett, 2000).

The flavonoids have been known for their antibiotic activities and recently for immunoregulatory functions (Haslam, 1996). Also, tannins have been reported to have antiviral, antibacterial and ant-parasitic effects (Zheng and Wang, 2001). This justifies the results of the WBC count, which has constant count. Otherwise, a marked increase in the cell count would indicate presence of infections. From the fore-going, it can be concluded that the leaves of *P. bicalyculata* are capable of increasing the red blood cell, the packed cell volume and the haemoglobin concentration thus increasing the oxygen carrying capacity of the blood in cases of anemia. The presence of the classes of compounds in the plant and the increase in haematological indices confirm its usefulness to traditional medicine practitioners in curing anemia.

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