

## EFFECT OF AQUEOUS EXTRACT OF *CORYNANTHE YOHIMBE* (K. SCHUM PIERRE) BARK ON SOME HAEMATOLOGICAL PARAMETERS IN ALBINO RATS

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Medicinal plant has been a source of treatment of various diseases before and after the introduction of the orthodox medicine. Traditional medicine is still being practised despite advances in modern medicine because the source of the plants is cheap and local. In Africa particularly in Nigeria, various plants which range from shrubs to trees are used in the treatment of various diseases. These plants are used to treat gastrointestinal, respiratory disorders and loss of libido among others.

*Corynanthe yohimbe* (K. Schum Pierre) is a tree indigenous to tropical West Africa. It is called "Idagbon" by the Yoruba people and "dan Cameroun" or "burantasi" by the Hausas and Kanuris, respectively in Nigeria. The plant drug has been used as an aphrodisiac (Akininyi *et al.*, 1986), and has wide patronage among the people of Borno state, as a powerful stimulant. The stem bark of the tree is either taken in a powdered form with soup or chewed to extract the juice.

Akininyi *et al.* (1986) has reported the presence of yohimbine and some other alkaloids in the stem bark of the plant. Its popular use by the local people of Borno State and some migrant workers in the Maiduguri Metropolis as aphrodisiac motivated us to conduct further investigations on the plant with particular interest in its effect on blood parameters.

### MATERIALS AND METHODS

Male albino rats of the Wistar strain (180-220g) obtained from the animal house of Department of Anatomy, College of Medical Sciences, University of Maiduguri, were used for the study. They were housed in metabolic cages at room temperature with the free access to dry pellet rat feed (Nutrifeeds, Nigeria Ltd., Kano) and water throughout the period of study.

A substantial quantity of the stem bark of *Corynanthe yohimbe* was harvested, washed and sun dried for 8 hours a day for one week. The dried material was ground in a mortar, into powder. Sixty grams of the powdered stem bark mixed with 100 ml of distilled water and then kept overnight. It was filtered the next day and the filtrate kept as the water extract which was used for the study.

The experimental animals were randomly divided into three treatment groups of 18 rats each. Each group

was allotted one of the following treatment, 200mg kg<sup>-1</sup>, 300mg kg<sup>-1</sup> and 500mg kg<sup>-1</sup> body weight of extract administration orally. The extract was administered once a day, five days a week for four weeks and blood samples were collected for analysis twice a week throughout the period of experimentation. In the dosage range used, no acute toxicity was manifested.

Blood samples were collected from the tail of each rat. The tail of the rat was completely and neatly cut at a point 2 cm from the tip using a sterile surgical blade. Blood so collected was used for various estimations. The haematological examinations performed were according to standard methods (Dacie and Lewis, 1984).

### RESULTS AND DISCUSSION

The effect of various doses of aqueous extract of *Corynanthe yohimbe* on mean haematological parameters are shown in Table 1.

There was progressive increase in the haemoglobin content of the animals in all dose levels of the extract used with days. Animals that received 500 mgkg<sup>-1</sup> body weight of the extract had significantly higher Hb values ( $P < 0.05$ ) than those that received 200 and 300 mgkg<sup>-1</sup> body weight of the extract. Animals that received 300mg kg<sup>-1</sup> also showed significant increase when compared with those that received 200 mgkg<sup>-1</sup> body weight of extract.

The mean erythrocyte count increased progressively as the dose of the extract increased from 200mgkg<sup>-1</sup> to 500mgkg<sup>-1</sup> (Table 1). At a dose of 200mgkg<sup>-1</sup> the mean RBC count was  $342.16 \pm 22.89$ , which significantly increased to  $397.05 \pm 21.03$  ( $P < 0.05$ ). This shows a percentage increase of 86%. At a dose of 500mgkg<sup>-1</sup> the mean RBC count was  $645.83 \pm 15.97$  ( $P < 0.05$ ) an increase of 61.4% when the dose was increased from 300mgkg<sup>-1</sup> to 500mgkg<sup>-1</sup>. When compared with the low dose of 200mgkg<sup>-1</sup>, increasing the dose to 500mgkg<sup>-1</sup> produced 52.9% increase in the RBC count.

There was an increase in the mean PCV values as the dose of the extract increased from 200mgkg<sup>-1</sup> to 500mgkg<sup>-1</sup> body weight. At a dose of 200mgkg<sup>-1</sup> body weight the mean PCV increased from  $33.13 \pm 1.21$  to  $35.3 \pm 1.62\%$  when the dose increased to 300mgkg<sup>-1</sup> body weight ( $P < 0.02$ ). At 500 mgkg<sup>-1</sup> body weight,

Table 1: Effect of various doses of *Corynanthe yohimbe* aqueous extract on some blood parameters in albino rats.

Parameters	Aqueous extract dose in mg/kg <sup>-1</sup> body weight		
	200	300	500
Hb concentration, g/100 ml	10.90±0.40c	11.60±0.56bc	14.23±0.43a
Erythrocyte count, 10 <sup>6</sup> /mm <sup>3</sup>	342.16±22.89c	397.05±21.03	645.83±15.97a
Packed cell volume, %	33.13±1.21c	35.3±1.62cb	43.72±1.20a
Mean corpuscular vol., fL	0.09±0.002	0.14±0.05	0.07±0.002
Mean corpuscular Hb., Pg	0.03±0.0008	0.026±0.002a	0.02±0.0009bc
Mean corpuscular Hb conc., g/dl	0.33±0.002	0.33±0.005	0.33±0.004

a bc Means in the same row with different superscripts differ significantly ( $P < 0.05$ ).

the PCV obtained was  $43.72 \pm 1.20\%$  ( $P < 0.05$ ) when compared with dose at  $300 \text{ mgkg}^{-1}$  and  $200 \text{ mgkg}^{-1}$ . The percentage increases were 62.50% and 80.74%, respectively.

Animals given  $300 \text{ mgkg}^{-1}$  of the extract had significantly higher MCV than those that were given  $200 \text{ mgkg}^{-1}$  body weight ( $P < 0.02$ ). At a dose of  $500 \text{ mgkg}^{-1}$ , the MCV obtained was lower than those obtained for other doses. The decrease was almost 50% of the value obtained for the median dose ( $300 \text{ mgkg}^{-1}$ ). There was gradual decrease in the value of MCH from levels  $200 \text{ mgkg}^{-1}$  to  $500 \text{ mgkg}^{-1}$ . The decrease was quite significant ( $P < 0.05$ ) between  $200 \text{ mgkg}^{-1}$  and  $300 \text{ mgkg}^{-1}$  and  $500 \text{ mgkg}^{-1}$  and then  $200$  and  $500 \text{ mgkg}^{-1}$  ( $P < 0.20$ ) as given in Table 1. There was no significant change in the value of MCHC at all dose levels given to the various groups of animals.

From this study, it is clearly shown that the aqueous extract of *Corynanthe yohimbe* significantly increased the Hb, erythrocyte count and packed cell volume, with the increasing doses of the extract. During the study, microscopy revealed the presence of a large number of reticulocytes. It would be conceivable that the aqueous extract of *Corynanthe yohimbe* has caused release of the reticulocytes (data not given) hence the increase in values of the Hb, RBC and PCV. Increasing the dose of the extract from  $200 \text{ mgkg}^{-1}$  to  $500 \text{ mgkg}^{-1}$  seemed to be proportional to the population of reticulocytes released as reflected in the Hb, RBC and PCV values.

The MCV values increased with the extract doses of  $200 \text{ mgkg}^{-1}$  and  $300 \text{ mgkg}^{-1}$  body weight. However, at a dose of  $500 \text{ mgkg}^{-1}$  body weight the MCV value ( $0.07 \pm 0.002$ ) was lower than the value ( $0.09 \pm 0.002$ ) obtained for an extract dose of  $200 \text{ mgkg}^{-1}$  body weight. This appears that a lower MCV (red cell volume) indicates that most of the red cells are smaller than normal (Green, 1978). This is consistent with our initial

finding of the presence of many reticulocytes in the blood. The MCH showed a gradual but significant decrease as the dose of the extract was increased but the values of the MCHC were the same at all dose levels.

The present study has indicated that the aqueous extract could stimulate and thus increase the level of Hb, PCV and erythrocyte count. Improvement in these parameters is likely to improve upon the well being of the patients thereby justify its empirical use in conditions like loss of libido. Some other factors may be also involved in this phenomenon. Therefore, further work to elucidate the exact mechanism of action of the extract and isolation of its various chemical components is yet needed to pinpoint the active principle.

## ACKNOWLEDGEMENTS

The authors wish to thank Mr. Justice Jibrin for the technical assistance. The secretarial work of Miss Sunji Nkechinyere is also acknowledged.

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