CHANGES IN HEAMATOLOGICAL PARAMETERS FOLLOWING ORAL ADMINISTRATION OF BLOOD PLUM (Haematostaphis barteri) FRUIT EXTRACT IN ALBINO RATS

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ABSTRACT: The study was conducted to investigate the possible effect of Haematostaphis barteri on the parameters. The result of admistration of H-barteri (blood plum) juice on albino rats reveals increase in haematological parameters; Hb concentration, packed cell volume, erythrocytes count, with significance difference when compared with the control experiment. This shows that the H-barteri juice can be used as blood tonic when taken in sufficient amount. The total leucocytes count (TLC) and differential leucocytes count (TLC) were within the normal range similar to that of control. The erythrocytes concentration (EC) obtained ranged from a mean of 7.68 million cells per micro litre(mcpml) of blood in Experimental Design I 32.23±3.47(mcpml) EDII, 29.66±1.15(mcpml), EDIII 29.26±1.55(mcpml) and 28.60±1.900 (mcpml) control respectively. (table 1) .. When compared the ED and control there was no significance differences in EDI and EDIII. The Hb recorded are highest in rats of EDI group (16.17±1.70g/dl) EDIII group (14.63±0.6g/dl) and EDII group (14.83±0.5g/dl) after the third week (table 1).

Keywords: Blood plum, Erythrocytes, Leucocytes, packed cell volume, blood tonic and ascorbic acid

INTRODUCTION

Haematostaphis barteri (blood plum) Is a tree popularly known as “Ginin Kafiri” in Hausa language it belong to the family of the Shrubs anacardiacea. It is a savannah tree of rocky area (Bokhari,1979). In Nigeria the tree grow almost in all states of Federation, northern part of the country inclusive, especially in Taraba, Adamawa, Borno, Bauchi, Kaduna, Kano, and Sokoto state.

A stem bark decoction is orally taken mostly by northern Nigeria people to cure disease such as haptis and decoction along with food for sleeping sickness (trypanosomiasis).The fruit is red purple drupes. The pulp is thin and eatable (Akubugwo, 2007) in Adamawa state the Kernel are somewhat oily. The flower are produced during the dry season. The fruit grown in bunch, hanging in perils-smooth-red- purple or deep drops nearly 2-5cm long like the temperate plum, also edible with an acid (potash) due to resinous taste (Tapsell, et al, 2006). In Adamawa state the fruit also available between the month of March and September.

Haematostaphis bartari is a perennial tree crop which normally grow wildy in the forest and usually among savannah. A tree of about 8m high, 65cm girth from Upper Volta, Nigeria, Cameroun and Sudan. A tree with a crooked bark, and spread branches. The bark is grey, rough slash brownish yielding a clear gum, the leaves are troupes at the end of the branch and are of OX-blood in colour. The leaves are glabrous 6-12 pairs same size, 1-inches (2.5, 7.5cm), broad elongated elliptic or slightly wide below the middle blunt or rounded at the base.
HAEMATOLOGY:

is the study of blood in a routine hospital laboratory and is concerned largely with abnormalities of the blood one of the primary functions is to detect anaemia and assist in the diagnosis of the exact size of anaemia to enable the right treatment to be given. Other important aspect of the haematology is the identification of disorders associated with abnormal proliferation of cell precursors (lyeukaemia) the identification of inherited blood disorders (e.g haemophilia) and monitoring and control of patients treatments.

Essentially blood consists of plasma a fluid medium in which erythrocyte (red blood cells) leucocytes (platelets) are suspended. Specialized organs of the body. As blood passes through the intestinal circulation, nutrients are absorbed into the plasma and carries to the liver and other tissues. As the blood passes through the kidneys, waste products of metabolism are filtered off into the urine. Many of the plasma proteins such as the blood clothing factors antibodies (immunoglobulin) and enzymes have specialised functions. The majority of cells are erythrocytes. They contain a high concentration of haemoglobin the oxygen carrying pigments, and several different forms exist each different but complementary roles and associated with them are blood clothing process. (Dominguez, et al; 1981 and Li, D.et al., 2013.)

NUTRITIONAL AND PHARMACOLOGICAL POTENTIAL

The fruit Haematostaphis barteri contain 26.7mg of ascorbic acid per 100g of the fruit (Summar et al., 2001) The leaves are used for seasoning soup in some local government of Adamawa state as well as animal feed. It is also used in large number of ways. According to (Gokce,2007 and Amoo,2004). Stated that Haematostaphis barteri fruit is an excellent sources of nutrient. They show that dry Haematostaphis barteri fruit has moisture content (5.6%), crude protein (1.5%) ash content (2.3%), Fat (5.3%), negligible acidity ,reducing sugar more glucose (69.5mg/g), fructose (71.8mg/g), mannose (76.6mg/g) and galactose (66.9mg/g), Vitamin A, 22,401,osp/2g and Vitamin B. 46mg/100ml.

H-barteri is an excellent sources of nutrient (Amoo,2004). This is revealed by the analysis carried by them on proximal composition of the dry fruit H-barteri. The fruit of H-barteri can be used in producing drugs for the treatment of sickle cell, toothache, pile and the flower can be used for manufacturing drugs for skin disease (Lichterman, 2004). Past work on H-barteri stem bark had revealed a wide array of secondary metabolites, flavonoids, Allen quinones, alkaloids, Cardiac glycoside and reducing sugar (Jatau, 2010).

MATERIAL AND METHODS

COLLECTION AND PREPARATION OF SAMPLE

African H-barteri was collected from Nigeria in Hong Local Government of Adamawa state. The H-barteri fruit was wash with distilled water and squeeze with mortar and pestle then filtered, residue was discarded and the filtrate was administer orally on daily bases.

EXPERIMENTAL DESIGN(ED)

20 Albino Wister rats were obtained from University of Maiduguri Animal House and divided into four groups:- Group one(EDI), Group two(EDII), Group three(EDIII) , were administered orally with fresh extract daily 5ml/body weight,10ml/body weight and 15ml/body weight respectively. Group four were kept as normal control group. All the rats were fed with finisher feed daily with distil water. During administration, packed cell volume was estimated for all groups for three weeks to assess the H-barteri level or changes following the administration of the blood plum.

After three weeks of administration the rats were sacrificed by suffocate in a desiccator containing 5ml of chloroform for 1-2mins and blood was collected into an EDTA bottle (coagulant) for analysis of full blood count which comprises of haemoglobin, packed cell volume, total white blood cell count, differential (leucocytes) white blood cell count, red blood cell count, morphology of red cell. (CLSI. 2000 and Olasunkanmi et al., 2013).

RESULTS AND DISCUSSION

RESULT

Table 1. Haematological indices of experimental animals

<table>
<thead>
<tr>
<th>Group</th>
<th>Hb conc.g/dl</th>
<th>RBC (x10^6/mm³)</th>
<th>WBC (x10^3/mm³)</th>
<th>PCV%</th>
<th>PCV%</th>
<th>PCV%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>At zero week</td>
<td>first week</td>
<td>second weeks</td>
</tr>
<tr>
<td>A (EDI)</td>
<td>16.17b± 1.7</td>
<td>32.33b± 3.47</td>
<td>238.66b± 70.46</td>
<td>44.33b± 4.9</td>
<td>44.66b± 4.61</td>
<td>45.00b± 4.35</td>
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</tbody>
</table>
Result of PCV determination showed that for EDI, EDII, were however within normal range at zero and increased successively with administration of Barteri juice after 1 to 2 weeks and then deduced after the third week as a result of over bleeding from the tail which was used to carry out the PCV and control group PCV remained steady from the zero week up till after third with little variation after week one. The EC obtained ranged from a mean of 7.68 millions cells per micro litre of blood in EDI 32.23 millions cells EDII, 29.66 EDIII and 29.26 millions cells control respectively. (table 1). This result of H. barteri juice compared favourably was in agreement with finding of (Samuel et al., 2011) who reported that mean erythrocytes numbers of SD rats increased with age from an average of 5.25 million cells in female at 6 months of age and other.

When compared between the ED and control there was no significance differences in EDI and EDIII with control. The Hb recorded in this study also highest in rats of EDI group (16.17g/dl) EDIII group (14.63g/dl) and EDII group (14.83g/dl) after the third week (table 1) the mean Hb recorded after week three (3) were higher than that reported by Coles, (1986) which were significantly higher (P<0.05) with EDII when compared with control. Result of PCV determination showed that significant difference between the varying ED administered at EDI (after week one) EDII (after week two) EDIII (at week zero, after week one and after week two).

Reflects the system status of an animal in relation to its response a disease processes (Baker and Silverton, 1985). Result of total leucocytes count (TLC) differential leucocytes count (DLC) and morphology of the administered rats were similar or not different from that of the controls the significant decreases in RBC, TLC and morphology of the administered rats, may suggest that the H-barteri juice dependant dose (EDI, EDII, EDIII) are tolerant to the body with no toxic effect. The result of this study indicates that the administration of H-barteri juice cause an increase in Hb concentration PCV with normal RBC, TLC, WLC and morphology may suggest that the H-barteri juice could be used as a blood tonic actively and safe for the body when not abused.

**DISCUSSION**

Erythrocyte indices such as erythrocytes counts (EC), packed cell volume (PCV), and haemoglobin concentration (Hb) are important indicator of functional state of the erython (Coles, 1986 and Samuel et al., 2011). Erythrocyte counts reflect the total number of red blood, while Hb concentrations. Indicates the oxygen carrying capacity of blood and PCV determinations show the proportion of blood that is made up of cellular element and the proportion that is, plasma (Samuel et al., 2011, Gokce, 2007 and Coles, 1986). Result of PCV showed that for EDI, EDII, were however within normal range at zero and increased successively with administration of Barteri juice after 1 to 2 weeks and then deduced after the third week as a result of over bleeding from the tail which was used to carry out the PCV and control group PCV remained steady from the zero week up till after third with little variation after week one.

**RESULTS**

<table>
<thead>
<tr>
<th>B (EDI)</th>
<th>14.83 ± 0.5</th>
<th>29.66 ± 1.15</th>
<th>376.00 ± 29.46</th>
<th>42.33 ± 2.5</th>
<th>44.33 ± 1.52</th>
<th>45.68 ± 2.08</th>
<th>46.00 ± 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>C (EDI)</td>
<td>14.63 ± 0.6</td>
<td>29.26 ± 1.55</td>
<td>294.66 ± 157.09</td>
<td>41.66 ± 2.88</td>
<td>43.33 ± 1.52</td>
<td>45 ± 1</td>
<td>45.33 ± 1.52</td>
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<tr>
<td>D (Control)</td>
<td>14.3 ± 0.9</td>
<td>28.6 ± 1.90a</td>
<td>430.66 ± 53.29</td>
<td>42.33 ± 2.88</td>
<td>42.66 ± 2.88</td>
<td>42.66 ± 3.2</td>
<td>44.33 ± 2.88</td>
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</table>

Note: differential leucocytes count are not significant that is, all the test groups, and the significance difference from corresponding pairs. (P < 0.05), and control (P <0.05).

<table>
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<th>EC</th>
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<td>A (EDI)</td>
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**CONCLUSION**

In conclusion the result obtained for H-barteri (blood plum) juice in albino rats reveals increase in Hb concentration, packed cell volume, erythrocytes count, with significance difference when compared with the control showing that the H-barteri juice was good sources of blood tonic actively when taken in sufficient amount.

The total leucocytes count (TLC) and differential leucocytes count (TLC) were within the normal range (Paramjit et al., 2012). similar to that of control meaning that the juice is safe and friendly to the body with no toxic effect, that is, when not abused.

**RECOMMENDATIONS**

►► Haematostaphis barteri juice has the ability to increase haemoglobin level and this is reasons while the herbalist used it for treatment of anaemia

►► Recommend that the most dependent dose of H-barteri juice is 80mg/kgbw
Recommend that H-barteri has no toxic effect, but may be when taken at high concentration or at long term period may exhibit toxic actively, so users are advised not to abused the plant.

REFERENCES


