The effect of methanolic extract of *Buchanania lanzan* Spreng seeds on hematological indices

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**Introduction**

Plant-derived traditional medicines are getting curiosity from fringe to mainstream with a great emphasis on remedies and health approaches regardless of great approach of current scientific remedy in developing countries including India. Globally, mounting number of people toward usage of alternative medicine has been on high demand with the betterment of the human health. Hence, attention seeks toward the utilization of the plant-based medicine for the prevention and treatment of diseases.[1] *Buchanania lanzan* Spreng (Chironji), *Anacardiaceae*, is a commercially useful tree found in Indian forests. Traditional knowledge reveals the value of all parts of the plant such as roots, leaves, fruits, seeds, and gum for its medicinal uses such as anti-inflammatory, antioxidant, adaptogenic, antitumor, antidiabetic, antihyperlipidemic, digestive, expectorant, purgative, and wound healing.[2,3] According to literature survey, there is a dearth of information with the hematological parameters of *B. lanzan*. Hence, the present investigation was undertaken to evaluate the effects of methanolic extract of *B. lanzan* Spreng seeds on hematological indices: Packed cell volume (PCV), hemoglobin (Hb) concentration, and red blood cell (RBC) and white blood cell (WBC) counts.

**Materials and Methods**

**Extraction Method**

The *B. lanzan* seed was dried and powdered. The dried seeds were separately extracted in soxhlet extractor (250 g powder) with petroleum ether, ethyl acetate, chloroform, and methanol.

**ABSTRACT**

**Objective:** The objective of the current study was carried out to investigate the effects of methanolic extract of *Buchanania lanzan* Spreng seeds on hematological indices.

**Materials and Methods:** Eighteen male albino Wistar rats were divided into three groups, six in each. Group I animals received distilled water, Group II and III were treated with an oral dose of 1000 mg oil/kg and 2000 mg oil/kg of extract, respectively, for 7 days. At the end of the study, blood was collected and evaluated for packed cell volume (PCV), hemoglobin (Hb) concentration, and red blood cell (RBC) and white blood cell (WBC) counts.

**Results:** There was a significant dose-dependent increase in the hematological indices such as PCV, Hb, RBC, and WBC count in the treatment group.

**Conclusions:** The improvement of PCV, Hb, and RBC values is an indication of the anti-anemic effect which may be due to the stimulation of RBC production in bone marrow. Further, stimulated production of WBC could be as a result of possible stimulus of the immune system. Hence, this study confirms that the extract of *B. lanzan* could be useful for the treatment of anemia.

**KEY WORDS:** *Buchanania lanzan*, hemoglobin concentration, packed cell volume, red blood cell, white blood cell.
The methanolic seed extract was concentrated under reduced pressure at 45–50°C. The yield of *B. lanzan* was found to be 45 g of oil (18%).[4]

**Experimental Design**

Male albino Wistar rats, body weight 100–200 g, were used in the study. The animals were housed six animals per cage and maintained under housing condition of temperature (24–27°C) and humidity (60–65%) with light and dark cycles (12 h). The study designed was performed after prior approval by the Institutional Animal Ethics Committee of B. R. Nahata College of Pharmacy, Mandla, bearing Registration number 918/AC/05/CPCSEA. Three groups of six animals were used for the study. Group I animals serve as control group received distilled water. Group II animals were treated with dose 1000 mg oil/kg of *B. lanzan*. Group III animals were treated with dose 2000 mg oil/kg.

**Analytical Procedure**

On the 7th day after 6 h of the last dose, the blood samples were collected from retro-orbital plexus in heparinized vial under mild ether anesthesia. The cyanomethemoglobin method was used to measure Hb level. Visual method was adopted for determination of RBC and WBC counts using Neubauer hemocytometer. PCV was measured using microhematocrit method.[5–8]

**Statistical Analysis**

The data were analyzed by GraphPad Prism 5.0 software (San Diego, California, USA) and all results were expressed as mean ± standard error of mean. Data were analyzed using one-way ANOVA followed by Dunnett’s multiple comparison test between treated and control groups.

**Results**

The results of the effects of methanolic extract of *B. lanzan* Spreng seeds on hematological indices of PCV, Hb conc., RBC count, and WBC count are mentioned in Table 1. The methanolic extract of *B. lanzan* (1000 mg oil/kg) caused a significant increase in the PCV and RBC count, whereas very significant increase in Hb conc. and WBC count. *B. lanzan* (2000 mg oil/kg) cause a very significant increase in PCV and Hb conc., whereas highly significant increase in RBC and WBC count was observed. The methanolic extract of *B. lanzan* seed significantly increased the PCV, Hb conc., and RBC count.

**Discussion**

In this study, the increase in the blood indices could be related to the chemical composition of seeds. The chemical compositions of *B. lanzan* seeds include lipid/fat, protein, carbohydrate, fiber, minerals such as calcium, phosphorus, iron, and vitamins such as thiamine, Vitamin C, riboflavin, niacin, and also contain fatty oil. Most of these constituents are well-known hematological factors that have a direct influence on the production of blood from the bone marrow.[9] The improvement of RBC, Hb, and PCV values of treated animals is an indication of the antianemic effect. This may be due to the stimulation of RBC production.[10] The methanolic extract of *B. lanzan* seed produced a significant increase in the WBC count. The administration of the extract at various doses stimulated the production of WBC and could be a result of possible stimulation of immune system.[11] Lymphocytosis may be primarily responsible for the increases in WBC count in this study.

**Conclusions**

The extract of *B. lanzan* could be useful for the treatment of anemia, hence the justification for its use by natives. Further studies are warranted to evaluate its immunomodulatory effect.

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Nil.

**Conflicts of Interest**

There are no conflicts of interest.

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