
EFFECT OF *Prosopis africana* ETHANOLIC LEAF EXTRACTS ON PACKED CELL VOLUME OF *Rattus norvegicus*

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ABSTRACT

This research sort to find out if Prosopis africana ethanolic leaf extract can help in fighting against anaemia in animals which is among the major causes of death in animals in developing countries. Seventy-five albino rats of 90 days old and approximately 200g were used. The rats were randomly selected and placed into five cages representing five different treatments. The extract of Prosopis africana was given to the rats in solution as daily water. Group A rats (cage A) received 0 ml of the extract per 100 ml of distilled water and served as control group. Group B rats (cage B) received 1 ml of extract in 100 ml of distilled water, group C rats (cage C) received 2 ml of extract in 100 ml of distilled water, and group D rats (cage D) received 3 ml of extract in 100ml of distilled water, while group E rats (cage E) received 4ml of the extract in 100 ml of distilled water. Blood samples were collected weekly for eight weeks using capillary tubes and centrifuged with haematocrit centrifuge at 10,000 rpm for 5 minutes. At the end of the experiment, it was discovered that rats in cage E had the highest level of PCV (45.70%), followed by rats in cage D (42.93%) and those in cage C (41.97%). Rats in cage B had the lowest PCV among the treated groups, while rats in cage A had the lowest PCV among the treated and untreated groups.

Keywords: *Prosopis africana*, *Rattus norvegicus*, Packed cell volume, Anaemia

INTRODUCTION

Prosopis africana is a genus of flowering plant in pea family Fabaceae. It contains about forty-five species of spiny trees and shrubs. It is found in sub tropical and tropical regions of America, Africa, West Asia and South Asia. It is known to contain a myriad of complex chemical compounds which is health wise beneficial to humans and animals (Edeoga *et al.*, 2005). This plant has been used traditional in the treatment of various types of ailments (Adewumi *et al.*, 2001; Tagboto and Townson, 2001; Aderbauer *et al.*, 2008). The tree, *Prosopis africana* is commonly called iron wood. It provides nutritional service whereby people use it as

special spices in local relishes. The seed is used as food condiments. *Prosopis africana* has been reported to be of medicinal value, its gum is used in pharmaceutical industries as gel in tablets formation (Attama *et al.*, 2000; Adikwu *et al.*, 2001). It is also used as an anti-tyrosine and because of that, the plant may be useful in preventing skin whitening or as anti-browning agent (Baurin *et al.*, 2002). This plant is listed among the plants used by local farmers in the treatment of trypanosomiasis in Northern Nigeria (Atawodi *et al.*, 2002). Almost all the parts of *Prosopis africana* are used in medicine; the leaves are used for treatment of headache and toothache; the bark is used for eyewashes; the roots are used for treatment of gonorrhoea,

tooth and stomach ache (Tagboto and Townson, 2001).

Thus, this study sort to find out if *Prosopis africana* leaf extract can help in building up the packed cell volume of rats and as such an agent in fighting against anaemia in animals which is among the major causes of death in animals in developing countries.

MATERIALS AND METHODS

Extract: The leaves of *Prosopis africana* plant were collected and sun dried for seven days. The dried leaves were blended into powder. 70% ethanol was added to the power and mechanically shake for five minutes. The alcoholic content of the extract was evaporated using a vacuum evaporator. The extract was bottled and kept in refrigerator pending use.

Animal: Seventy-five albino rats of 90 days old and approximately 200 g were used. The rats were kept in stainless wire rat cages for one week to acclimatize before the commencement of the experiment. Five rats were randomly assigned to each cage that represents different experimental design.

Treatments: The rats were divided into five groups; A, B, C, D and E. Group A in cage A, received 0 ml of the extract and serve as control group. Group B in cage B received 1ml of the extract dissolved in 100ml of distilled water, group C in cage C received 2ml dissolved in 100ml of distilled water, group D in cage D received 3 ml dissolved in 100 ml of distilled water while group E in cage E received 4ml dissolved in 100ml of distilled water. The solution was given to the rats in drinkers which serve as their daily water. All rats were fed (Guinea Feed Growers Mesh) and water *ad libitum*. The experiment was replicated three times.

Analysis: The blood samples of the experimental animals were collected before the commencement of the experiment, then after one week, administration of the extract started. The blood samples were collected weekly for eight weeks. The blood samples were collected

using capillary tubes and centrifuged with haematocrit centrifuge at 10,000 rpm for 5 minutes. The data were obtained using haematocrit reader.

The data collected were subjected to descriptive statistics at 95% confidence limit and the output presented in percentages (Steel and Torrie, 1990).

RESULTS

From the analysis of the data, it was observed that there was significant difference ($P < 0.05$) between the rats in different cages which received different dosage of the leaf extract and the control. There was progressive increase in the PCV levels as the week progressed (Figure 1). Rats in cage E had the highest PCV, followed by rats in cages D, C and B sequentially, while rats in cage A had the lowest PCV (Figure 2). This showed that *Prosopis africana* boosted the PCV level in rats.

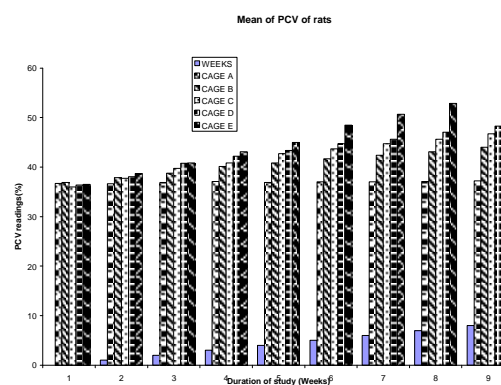


Figure 1: Weekly increase in packed cell volume of *Rattus norvegicus* treated with *Prosopis africana* ethanolic leaf extracts

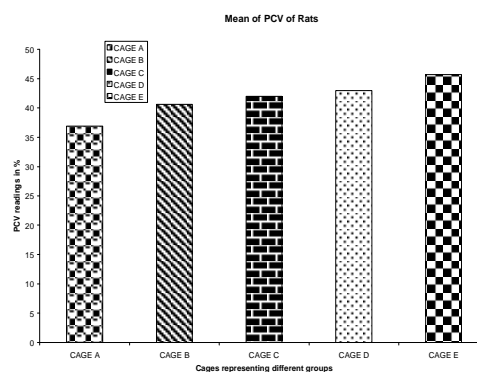


Figure 2: Dose dependent increase in packed cell volume of *Rattus norvegicus* treated with *Prosopis africana* ethanolic leaf extracts

DISCUSSION

It was observed that the extract of *Prosopis africana* has positive influence in the PCV of rats. Edeoga *et al.* (2005) reported that the *Prosopis africana* contains a myriad of complex chemical compounds which health wise is beneficial to humans and animals. *Prosopis africana* extracts in this study boosted PCV in animals. At the end of the experiment, it was discovered that rats in cage E had the highest level of PCV while the control group had the lowest level of PCV. It has been reported that this plant is used traditional in the treatment of various types of ailments (Adewumi *et al.* 2001; Tagboto and Townson, 2001; Aderbaner *et al.*, 2008). The result obtained in this study indicated that this plant can help fight anaemia in animals because it increases the level of PCV.

Conclusion: *Prosopis africana* has positive influence on the PCV of rats. We therefore suggest that this plant can be used in the treatment of anaemia. The extract can also serve as blood tonic for animals. Interest in further research may include adapting the findings to humans.

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