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Haematological Effect of Methanolic Extract of Aloe Vera in Wistar Rats

Ramesh Kumar Nirala[1]*, Preety Raj[2], K. Anjana[1], Archana[1], G.K. Chaudhary[1] and Pramod Kumar[3]
[1]*Department of Pharmacology and Toxicology, Bihar Veterinary College, Patna, Bihar*
[2]*Department of Botany, Patliputra University Bihar*
[3]*Department of Physiology, Bihar Veterinary College Patna, Bihar*
**Corresponding Authors Email : nirala.ramesh99@gmail.com*

Abstract

Aloe vera is being widely used in herbal medicine as antibacterial, antiviral, antifungal, and antiinflammatory agent. It is also used as topical application for many skin diseases; its antidiabetic effect in rats is also reported. Looking at its enormous medicinal effects, the present study was conducted to investigate the effects of oral supplements of Aloe vera extract on Haematolgical profile of Methanolic extracts of *Aloe vera* in Wistar rat at the dose rate of 200 mg.kg^{-1} following oral gavage administration and measures Haematological Parameters in wistar rats *Aloe vera* extracts caused an apparent increased of haemoglobin (12.85 0.326), which was non significantly higher than antigen control (10.21 0.222).Total leucocytes Counts was found (10213.330 626.746) higher in *Aloe vera* as compared to control (6182.7 1203.98) and found significant variation. Lymphocyte count was also increases *Aloe vera* and reveals significant with control. The above finding showed haematological booster activity of extracts and reduces oxidative stress.

Key words : *Aloe vera, wistar rats, haematology, haemoglobin, white blood cells, red blood cells.*

Introduction

Aloe vera is being widely used in herbal medicine as antibacterial, antiviral, antifungal, and antiinflammatory agent. It is also used as topical application for many skin diseases; its antidiabetic effect also reported. Looking at its enormous medicinal effects, the present study was conducted to investigate the effects of oral supplements of Aloe vera extract on hemotology in rats . The world Health Organization has approved traditional medicine as a part of treatment for primary health care needs (Goyal 2005). Among known higher plant species approximately 5000 species have specific therapeutic value. These are classified according to their botanical classification and geographical distribution (Joy *et. al.*2001). Among the all estimated plant species, only 6% have been studied for biological activity and about 15% have been investigated phytochemically (Verpoorte *et. al.* 1999). Various drugs have entered the international market through exploration of ethno pharmacology and traditional medicine (Goyal, *et. al.* 2010 and Cooper 2004). One such plant with therapeutic value amla has been explored for its role in DNA damage and repair The plant contains tannins like glucogallia, corilagin, chebulagic acid and 3, 6-digalloyl glucose. Root yields ellagic acid, lupeol, quercetin and â-sitosterol (Thakur *et. al.* 1989). The fruits of Amla are used in many medicinal preparations of Ayurvedic and Unani systems of medicine as well as food supplement (Mishra *et. al.* 2011 and Kirtikar 1935).The effect of crude amla (traditionally known as *Aloe vera*formulation) and total serum protein and its fractions was studied in rabbits and the results showed that the total protein levels and increased body weight indicating the positive nitrogen balance and having anabolic effect without affording resistance against diseases (Tiwari). As many drugs alter the physiological status in the body of any animal including human beings, it is essential to study the crucial haematological parameters. Hence, the present study was aimed at haemato-biochemical effect of *Aloe vera* in wistar rat.

Materials and Methods

Plant material and extract Preparation : The fruits of *Aloe vera*were collected from the local area and market of Patna district, Bihar as per seasonal availability.The fruits of *Aloe vera* were washed under the tap water, dried at 50°c temperature in Hot air dryer and then subjected to size reduction to a coarse powder by using Grinder and subjected for Soxhlet extraction with methanol for 8 h. The contents was filtered through Whattman filter paper no. 1 and the filtrate was evaporated to dryness. This dried extract was further powdered and then dissolved in distilled water with concentration of 50 mg/ml.

Experimental animals, Drug & Designed : 18 (Eighteen) healthy male wistar rats (150-200g) were bought from Chakrworty enterpirses Pvt. Ltd Kolkata CPSEA approved experimental animal supplier. The rats were kept for two weeks to adapt the environmental condition. They were housed in steel grill cages in a room with controlled temperature of 20 ± 22°C. The rats were

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Table-1 : Hematological profile of Aloe vera treated group (Mean ± S.E.) in Wistar Rats on 14th days of experiments.

Parameters	Saline control	Antigen control	Aloe vera + Antigen
Hb%	10.26 ± 0.256	10.29 ± 0.252	12.6 ± 0.375
RBC	6.41 ± 0.481	6.74 ± 0.272	6.92 ± 0.249
TLC	6186.7 ± 1208.98	7386.75 ± 1102.981	10086 ± 625.746*
Lymphocyte	63 ± 1.42	62 ± 1.62	84 ± 1.31*
Monocytes	1.1 ± 0.1	1.1 ± 0.1	1.2 ± 0.2
Eosinophil	0.8 ± 0.25	0.9 ± 0.26	0.6 ± 0.24
Basophil	01 ± 0.00	01 ± 0.00	0 ± 0.00
Neutrophil	14 ± 1.45	16 ± 1.69	10 ± 1.06

fed standard diet and provided with fresh water *ad libitum*. The study was approved by Institutional Animal Ethics Committee, Bihar Animal Sciences University which is registered by the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), India. For conducting immunological study, clinically healthy rats were divided into three groups consisting of six rats in each group. Details of treatment given to different groups are given below.

Group I : Saline control

Group II : Antigen control – 0. 1 ml of sheep red blood cell (SRBC) suspension ($1x10^8$) given intra peritoneal in each rat on the 1st day of Experiment (sensitizing dose) and on the 10th day of experiment (challenging dose).

Group III : Aloe vera + Antigen – Apart from antigen (SRBC) given as in Group II, methanolic extracts of *Aloe vera*was administered @ 200 mg/kg, orally daily for consecutive 7 days during sensitizing and challenge period with the help of oral gavage needle

Assessment of Haematology profile : The whole blood samples drawn from orbital plexus were collected in K2 EDTA Vacutainers and were subjected to haematological evaluation in haematology cell counter, SYSMEX-KX 21. The parameters selected for study are total white blood cell count (WBC), Red blood cell count (RBC), Haemoglobin (Hb).

Statistical analysis : Effect of methanolic extracts of *Aloe vera* on Haematology in Wistar rats various days of post treatment in all three groups and data of the parameters were subjected for statistical analysis using Ms office –excel 2010 (Savala *et al.* 2012).

Results and Discussion

Table-1 revealed the result of haematological changes in Wistar rats that simultaneous administration of *Aloe vera* of methanolic extracts caused an apparent increased of haemoglobin (12.6 0.375), which was non significantly higher than antigen control (10.29 0.252). Total leucocytes Counts was found (10086.333 625.746) higher in *Aloe vera*as compared to control (6186.7 1208.98) and found significant variation. Lymphocyte count was also increases *Aloe vera* (84 1.31) and reveals significant with control. As per finding of haematology some parameters found significant as compared to control group indicated *Aloe vera*act as booster of haematological profle.

The result of Haematological changes in Wistar rats showed that administration of *Aloe vera*methanolic extracts caused an apparent increases of Haemoglobin (12.6 0.375), which was non significant with antigen control (10.29 0.252). Patil *et al.*2015 also supported the above finding non significant variation of Hb%. Total leucocytes Counts was found (10086 625.746) higher in *Aloe vera*as compared to individual and significant variation was seen in comparison with control group. Lymphocyte count was also increased in *Aloe vera*(84 1.31) and revealed significant with other control group. The present finding was indicated haematology boost-up activity of extracts. Savala *et al.*2012 was also reported the non significant variation in haematobiochemical profile with most of the parametrs after the administration in extract of *Emblica officinalis*. Total count and Lymphocyte increases indicated immunopotentiation effects showed by extracts in rats. Godwin *et al.* 2021 also have similar finding in arsenic exposed rats in the respect of immunological and haematological parameters. Suja *et al* 2009 also supported the finding with significant variation in total leucocytes. Elaiyaraja *et al* 2016 also significant effects on haematogical parameters of *Aloe vera* extract

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