Estimation of Phytochemical Components of Leaf Aqueous Extract of *Aloe Vera* and its Acute Effect on Biochemical Parameters of Liver in Mammalian System

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Abstract - The present study was conducted to estimate the phytochemical component of aqueous leaf extract of *Aloe vera* and its acute effect on biochemical parameter of liver in mammalian system swiss albino mice. The phytochemical screening and qualitative estimation of plant material showed that *Aloe vera* comprises of tannins, terpenoids, alkaloids, flavonoids, oils and phenols. No significant alteration were recorded in mice at a dose 2000 mg/kg/b.wt but mice showed marked toxicity effect of the leaf aqueous extract at dose of 6000 mg/ kg/b.wt and 7500 mg/b.wt. On liver function test. (LFT) The result provided information for the safe use of this herbal plant *Aloe vera* for remedial purpose.

Key words: *Aloe vera*, Liver, LFT, Biochemical, Phytochemical, Mice.

I.INTRODUCTION

Aloe vera is the gift of nature, it is a miracle been used medicinally for centuries. *Aloe vera* is a perennial evergreen and succulent plant species of the genus *Aloe* [1]. The species is also used for decorative purpose and grows successfully indoors as a potted plant [2].*Aloe vera* leaves contain phytochemicals under study for possible bioactivity, such acetylated, Mannans, Polymannans, Anthraquinones, Flavonoids, Terpenoids and various Lectins[3,4].The herb is utilized inside the battle most stomach related issues including obstruction, poor hunger, colitis, Irritable entrail disorder just as Asthma, Diabetes, Immune framework improvement, Peptic ulcers[5]. It is used in Ayurvedic formulation as appetite, stimulant, purgative, emmenagogue and anthelminthic. For treating cough, cold, piles, debility, dyspnoea, asthma and jaundice[6]. *Aloe vera* tincture and melatonin administration was studied as standard therapy against metastatic solid tumour[7,8,9] and also increase energy level and maintain a healthy body weight [10,11]. The anthraquinone *Aloin* also inactivates various enveloped virus such as herps, simplex and influenza [12].Medicinal plant has been used since time immemorial as constituents of human diet and it is assumed that they do not have many side effects. However chronic consumption for remedies must always be taken with caution. Liver is the primary site of biotransformation and detoxification of xenobiotics.

II. METHODOLOGY

2.1 Plant Materials: The leaf of *Aloe vera* was collected from the campus of BMD College Dayalpur, and was classified according to plant taxonomy or plant classification references related to medicinal plants.

2.2 Preparation of Aqueous Leaf extract: The leaf extract of the plant was prepared by grinding fresh leaf of *Aloe vera* for 10 minutes using a blender, sufficient amount of water was added then filtered through the glass wool. Aqueous leaf extract of *Aloe vera* mix in10 ml of distilled water to obtain the different concentration (2000 mg/kg/b.wt to 7500 mg/kg/b,wt.) to be used for the experiment.

2.3 Animals: All the experiments was carried out using swiss albino mice (25 -30 gram) at animal house of Mahavir Cancer Sansthan Patna. The animal was given normal diet and water *ad libtum* throughout the period of experiment they were house in cage and kept in a room were 12 hours light/dark was maintained. The

experimental protocol was as per the norms of institutional animal ethics committee (IAEC) and the care of the laboratory animals was taken as per CPCSEA regulation and approval number is -1129/BC/07/CPCSEA.

2.4Acute Oral Toxicity Studies: Acute toxicity was carried out using swiss albino miles (20-30 gram) as per CPCSEA guideline the aqueous herbal leaf extract was only administrated by gavages to different group of mice (n= 6)at the doses of 2000 mg/kg/b.wt for 7 successive days. During the experimental period the toxicological effect were observed in term of mortality expressed as LD_{50}. Animal death during the study period was observed and recorded. Acute oral LD_{50} of the aqueous leaf extract of *Aloe vera* were calculated by using software for probit analysis program used for calculating LC/EC value version 1.5.

2.5 Blood Sample Collection: Blood sample was collected by the orbital sinus puncture. It was centrifuged at 1500 rpm and serums were used for analysis of liver function test (LFT).

III. RESULT AND DISCUSSION

3.1Phytochemical Studies: The phytochemical screening and qualitative estimation of plant material showed that *Aloe vera* comprises tannins, terpenoids, alkaloid, flavonoids, oils and phenols (Table No-1). Through these bioactive components are very good for healthy well-being but excess dose resulted toxic effect on physiology of various vital organs in mammalian system.

Table No-1: Phytochemical screening of *Aloe vera.*

Phytochemical constituents	Aqueous leaf extract of *Aloe Vera*
Alkaloids	+ve
Amino Acids and Proteins	+ve
Carbohydrates	+ve
Fats and oils	+ve
Flavonoids	+ve
Glycosides	+ve
Phenols	+ve
Quinones	+ve
Saponins	+ve
Steroids and Sterols	-ve
Tannins	+ve
Terpenoids	-ve

3.2 Acute Oral Toxicity Study: No signs of toxicity, behavioural changes or mortality were observed in the course of this test at dose of 2000 mg/kg/b.wt. during 7 constitutive days experimentation. Also, no significant alteration was recorded in mice at a dose 4000 mg/kg/b.wt. But mice showed marked toxicity effect of the aqueous extract at dose of 6000 mg/kg/b.wt. and 7500 mg/kg/b.wt.

3.3Body and Liver Weight Parameters : The administration of aqueous extract at a dose 7500 mg/kg/b.wt (Group-V) elicited a highly significant ($P<0.001$) reduction in body weight after one week significant($P<0.05$) reduction was observed in the 6000 mg/kg/b.wt (Group- IV) whereas no significant changes were observed in other group of mice which were treated with 2000 mg/kg/b.wt. to 4000 mg/kg/b.wt.

3.4Biochemical Study.

The labels of serum SGPT in aqueous extract treated mice of Group-I showed no alteration, while serum SGPT level significantly increase (P<0.05) in treated Group-II whereas levels of serum SGPT increased and was statistically significant(P<0.05) for the treated Group-V (Table- 2)only. Total protein albumin level increased and was statistically significantly (P<0.05) in treated Group-IV and Group-V. ALP showed no significant changes in all the treated group as compared to normal and control (Group-I).

Table-2: Biochemical parameter of liver of swiss albino mice after acute treatment with different concentration of aqueous leaf extract of *Aloe vera.*

Biochemical Parameters	(Group-I) (Control-mice)	(Group-II) (2000mg/kg b. wt)	(Group-III) (4000mg/kg b. wt)	(Group-IV) (6000mg/kg b.wt)	(Group-V) (7500mg/kg b.wt)
SGPT(IU/l)	28.04±0.85	28.0±0.46	84.35±4.04	95.20±0.32**	95.20±0.32**
SGOT (IU/I)	89.02±0.06	92.02±0.06	95.05±0.04	92.20±0.32	98.20±0.32*
ALP (IU/l)	237.0±5.54	234.23±0.35	235.67±0.23	228.25± 0.56	231.25± 0.56
Total Protein (gm/dL)	6.12±0.11	6.3±0.32	5.7±0.238	6.90±0.65**	6.40±0.65*
Albumin (gm/dL)	3.96±0.12	3.24±0.27	3.15±0.13	2.96±0.57**	3.42±0.57**

Values are mean ± SEM*** (P<0.001) (S), ** (P<0.01) (S),* (P<0.05) (S) compared to control, S-Significant, N=6.

IV. CONCLUSION

Liver is the primary site of biotransformation and detoxification of xenobiotics. Damage of these organ often result in elevation in clinical biochemistry parameters such a serum enzyme; ASAT and ALAT [13].

LD_{50} value of 5000 mg/kg/b.wt. of aqueous extract of *Aloe vera* may useful in preparing doses for therapeutic purpose against a variety of hepatotoxicity agents.

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