

Biochemical study of *Aloe vera* (L.) Burm

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Abstract

Extractions of *Aloe vera* chloroform and water were processed to measure the biochemical yields to identify their main constituents of active compounds. By using soxhlet obtained yields for chloroform extraction was 8.4% while the aqueous extract was 5.5%. The phytochemical screening showed the presence of flavonoids, terpenoids, tannins, carbohydrates and alkaloids while saponins, antiquinones, glycosides and steroids been absent. The occurrence of these biologically active chemicals in *A. vera* may justify their wide usage in traditional and advanced medicine.

Keywords: *Aloe vera*, extraction yields, Biochemicals, bioactive compounds

1. Introduction

Plants have been an important source of medicine for thousands of years. Even today, the World Health Organization estimates that up to 80% of people still rely mainly on traditional remedies such as herbs for their medicines. Its civilization is very ancient and the country as a whole has long been known for its rich resources of medical plants. Now a days Ayurvedic, Hoemoeo and Unani physicians utilize numerous species of medicinal plants that found their way a long time ago into the Hindu Material Media ^[1]. A semi tropical plant *Aloe vera* (L.) Burm. (Liliaceae) is as old as civilization and throughout history it has been used as a popular folk medicine. The name was derived from the aeabic 'alloch' meaning 'bitter' because of bitter liquid found in the leaves. It is also known as 'lily of the desert'. The plant is made up of fibrous roots, short stem and a spiral greenish leaves. The leaf is made of a colourless gel which is bitter in taste and consisting primarily water and polysaccharides ^[2].

It has been used by herbalists for the treatment of different human diseases such as stomach ailments, gastrointestinal problems, skin diseases, constipation, for radiation injury for its anti-inflammatory effect, for wound healing and burns, as an anti-ulcer and diabetes ^[3-5]. The plant is widely used in skin care, cosmetics and as nutraceuticals ^[6].

Different chemical constituent viz. amino acids, lipids, sterols, tannins, flavonoids and mannose-6-phosphate are present in this plant ^[2-3]. Therefore, this plant has been found useful in the treatment of wound, burns, skin disorders and anti-inflammatory activity ^[3-5].

The aim of the study was to quantify the chloroform and water extracts of *Aloe vera* and to identify their constituents of bioactive compounds (viz. glycosides, antiquinones,

carbohydrates, alkaloids, terpenes, saponins, tannins, steroids, flavonoids) which believed to be responsible for their medicinal uses.

2. Materials and methods

The plant materials were collected from local area. To remove dirt and impurities samples were washed using tap water. The gel was removed from the leaves and kept in the refrigerator. Some of the leaves were dried for two weeks under low sun intensity and crushed in a mortar and further ground into a coarse powder by using an automated grinder. They were stored in polythene bag and kept in the oven to be used as samples for the extraction. Soxlet extraction method using chloroform as the Solvent and Aqueous extraction method using water as the solvent were adopted for the extraction ^[7-8].

Phytochemical screening for alkaloids, steroids, triterpenoids, glycosides, carbohydrates, flavonoids, tannins, antiquinones and saponins were carried out by following standard methods ^[8-10].

Table 1: Qualitative analysis of phytochemical components of *Aloe vera*

Sr. No.	Phytochemical components of qualitative analysis	<i>Aloe vera</i>
1.	Alkaloids	+
2.	Tannins	+
3.	Steroids	-
4.	Flavonoids	+
5.	Saponins	-
6.	Glycosides	-
7.	Terpenoids	+
8.	Carbohydrates	+
9.	Antiquinones	-

+ = Present, - = Absent

3. Results and discussion

The soxhlet extraction procedure using the chloroform solvent showed 8.4% crude extract. On the other hand, the aqueous extraction method gave a value of 5.5%. The chloroform extraction gave superior yields because of the organic solvent easily evaporated than water, the high temperature used (heating) and most components of this plant are organic compounds which easily dissolves in an organic solvent. Chloroform extracts gave higher yield percentages than water extracts. The phytochemical screening results show that the plant contains alkaloids, tannins, flavonoids, carbohydrates, and terpenoids (Table No. 1). These compounds may be responsible for their medicinal uses.

4. Conclusion

During the present investigation *Aleo vera* plant was studied for biochemical estimation. Bioactive compounds such as alkaloids, flavonoids, terpenoids carbohydrates and tannins were detected to be present. The medicinal roles of this plant could be related to such identified bioactive compounds. For full utilization of the bioactive agents present in the plant efforts should be geared up to their entire characterization.

5. Reference

1. Rao N, Thammanna K. Medicinal Plants of Ritual Hills, Department of Garden, Tirupati Devasthanams, Tirupati, India. 1987.
2. Brinelon J. Pharmacognosy Phytochemistry. Medicinal Plants Paris lavoisier. 1995.
3. Davis PH, Robson MC. Anti-inflammatory and wound healing of growth substances in Aloe vera. J. Ame. Pediatric Med. Assoc. 1999; 84:77-81.
4. Mccouley R Possible Methods to Minimize Tissue Loss. Postgraduate Medicine Melinc. 1990; 88:67-70.
5. Shellon RM. Aloe vera Its Chemical Properties. Int. J. Dermatol. 1996; 30:679-683.
6. Klein AD, Penneys NS. Aloe vera. Journal of the American Academy of Dermatology. 1988; 18(1):714-720.
7. Ojo OO, Tella IO, Ademola-Aremu OO. Effect of Azadirachta Indica, Tamarindus indica and Eucalyptus calmandulensis on Paracetal induced lipid peroxidation in rats. J. Sustainable Develop. Agric. Environ. 2005.
8. Sofowora A. Medicinal Plants and Traditional Medicine in African Spectrum. Book Ltd. University of Ife Press Nigeria. 1993, 119.
9. Harborne JB. Phytochemical Methods, a guide to modern techniques of plant analysis 4th ed. 1973; 1-5:182-91.
10. Thimmaiah SR. Standard methods of biochemical analysis. Kalyani Publishers. 2012.