

Bactericidal property of *Andrographis paniculata* and aloe vera extracts on *Salmonella typhi* species

A. Zahir Hussain and S. Kumaresan

PG and Research Department of Chemistry, Jamal Mohamed College(Autonomous), Tiruchirapalli, Tamil Nadu, India

ABSTRACT

*The present study deals with the phytochemical investigation and therapeutic use importance of two plants *Andrographis paniculata* and *Aloe vera*. It is an important medicinal plant worldwide trend towards the utilization of natural plant remedies has created an enormous need for the use of medicinal plants. The methanol extract of same plants were subjected to analysis the antimicrobial activity by disc method. The extracts of the plant leaves showed antimicrobial activity against both gram(+) and gram(-) bacteria, Maximal antibacterial activity was observed against streptococcus faecalis. The maximal antimicrobial activity was against Diameter of zone inhibition exhibited by *Andrographis paniculata* and *Aloe vera* methanol extract in various concentrations.*

Key words: *Andrographis paniculata* and *Aloe vera*, Antibacterial activity, Therapeutic use,

INTRODUCTION

Today natural products derived from plants are being tested for presence of new drugs with new modes of pharmacological action [1]. The medicinal use of herbs is said to be as old as mankind itself. Primitive tribes still use their traditional knowledge of plants and their healing properties, which has been passed on from generation to generation for thousands of years. The Indian sub – continent abounds as it was in a variety of health traditions. We have with us the longest unbroken health tradition, which has not only a stream of practitioners but also a textual and theoretical backing in terms of the Ayurvedic and Siddha systems of medicine[2]. According to world health Organization medicinal plants would be the best source to obtain a variety of drugs. In developed countries about 80% of plants are used in traditional medicine. Therefore, such plants have been investigated for better understanding their medicinal properties[3]. The antimicrobial properties of many plants have been investigated by number of researcher's in worldwide (Adamu et al., 2005). Artificial drugs have unpleasant side effects, on the other hand, the number of drug resistant micro organisms is increasing, so researches are trying to pay more attention to herbal drugs[4]. Synthetic fungicides are currently used as primary means for the control of plant disease. However, the alternative control methods are needee because of the negative public perceptions about the use of synthetic chemicals, resistance to fungicide among fungal pathogens, and high development cost of new chemicals [10].

Here two herbals namely *Andrographis paniculata* and *Aloe Vera* where chosen for their bactericidal property against *Salmonella typhi*. *Andrographis paniculata* is reported to possess astringent, anodyne, tonic and alexipharmic properties and is helpful in dysentery, cholera, diabetes, influenza, bronchitis, piles, gonorrhoea, hepatomegaly, skin disorders, fever and worm infestation. The plant is bitter, acrid, cooling, laxative, vulnerary, , anti-inflammatory, expectorant, depurative, digestive and stomachic. It is useful in burning sensation, wounds, ulcers, chronic bronchitis, leprosy, pruritis, flatulence, colic and diarrhoea [3-4]. *Aloe Vera* in small doses acts as a

tonic and in large doses acts as a purgative. Aloe Vera is very frequently prescribed in combination with other drugs as tonic and stomachic in chronic dyspepsia. Salmonella cause diseases in a wide range of species of vertebrates; most of the serotypes pathogenic in mammals and birds. Typhimurium, generally associated with enteritis in man, may give rise to more severe diseases in other hosts. Again the typhoid bacillus, often considered to cause mild and typical infection in children, will give rise to severe infections with high mortality in children whose previous health and nutrition have been poor (Scragg et.al.1969).

MATERIALS AND METHODS

Andrographis paniculata collected from wild is washed shade dried and powdered. Plant Powder was extracted successively with petroleum ether, di ethyl ether, chloroform and alcohol using a soxhlet apparatus [6]. Treating with methanol for overnight 80%, 40%, 20% leaf extract was prepared. Similarly Aloe Vera collected from wild is washed and peeled. The fleshy part is used for the preparation of 80%, 40% and 20% extract using methanol.

Salmonella Typhimurium was cultured in the mediums like Macconkey and BSA mediums. They are confirmed for their presence by culturing on TSI agar and urea agar base and tested for H₂S production and pink color formation in TSI and negative result for urease activity in urea agar medium.

The growing concern about food safety has recently led to the development of natural antimicrobials to control food borne and spoilage microorganisms [10]. Antibiotics such as Chloramphenicol, Neomycin, Gentamycin, Doxycycline and Entroflaxacin were introduced into S.Typhi culture, along with the 80%, 40% and 20% extract of *Andrographis paniculata* and Aloe Vera. The diameter of inhibition zone produced by different antibiotics and *Andrographis paniculata* and Aloe Vera on S.typhi culture was studied[6].

RESULTS AND DISCUSSION

Out of the five antibiotics tested Endroflaxacin was very effective. The Aloe Vera and *Andrographis paniculata* leaf extracts at all concentration exhibited positive results.

The increase in concentration of Andrographic and Aloe Vera proportionately increased the inhibition of S.typhi out of all individuals tested.

The Andrographic has little amount of tannic acid and large amount of chloride and sodium. Generally tannic acid has the capacity to combine with both organic matter and minerals. The resulting complexes produce microbial attack (Haslamin 1981 and Subash Chandra data in 1994). Due to the presence of sodium and chloride it may increase the bactericidal property of *Andrographis paniculata* and Aloe Vera.

The principle constituent of Aloe Vera and the one, to which its properties are essentially due, is the volatile oil, which contains aloin and resin. It is these two that imparts the anti microbial properties to plants[7].

Table: 1 Diameter of inhibition zone produced by antibiotics and leaf extracts.

Material tested	Diameter of inhibition zone in mm
Chloramphenicol (30 mcg/disc)	2.9
Neomycin (30 mcg/disc)	1.9
Gentamycin (30 mcg/disc)	2.8
Doxycycline (10 mcg/disc)	1.6
Endoflaxacin (5 mcg/disc)	3.0
<i>Andrographis paniculata</i>	
20%	0.6
40%	1.0
80%	1.4
Aloe Vera	
20%	0.5
40%	0.8
80%	1.3

CONCLUSION

The present study concluded that the Aloe Vera and *Andrographis paniculata* are more a preventive medicine than a curative one. So these herbs can be used against salmonella infection. When compared to various concentrations the bactericidal effect is high in 80% concentration. Compared to Aloe Vera *Andrographis paniculata* has high inhibitory effect on salmonella.

REFERENCES

- [1] Charles A, Leo Stanly A, Joseph M, Alex Ramani V., *Asian J.Plant Sci.rec.*,**2011**, 1(4):5 – 32.
- [2] The Wealth of Asia, P.I.D., C.S.I.R., New Delhi, **1996**,
- [3] Alo MN, Anyim C, Igwe JC, Elom M and Uchenna DS. *Adv.appl.sci.rec.*, **2012**, 3(2) : 844 – 848
- [4] Anitha Rani A, Mary Josephine Punitha S and Sangeetha G.,*Adv.Appl.Sci.Res.*,**2013**,4(2):15–18.
- [5] Thamaraiselvi, Lalitha P and Jayanthi P. preliminary. *Asian.J.Plant Sci.Res.*,**2012**, 2(2):115– 122.
- [6] Sathyaprabha G. Kumaravel S. Ruffina D and Praveen kumar P.,*Journal of Pharmacy Research* **2010**, 3(12), 2970 - 2973
- [7] Zahir Hussain A and Aruna Ignatiust. *Asian Journal of Chemistry* Vol. 22, No. 5 **2010**,359-3595
- [8] Sunita Dalal and Sudhir Kataria K. *Asian Journal of Chemistry* vol.22.No.9 **2010**.
- [9] Amit Pandey, Parul Singh., *Asian J. Plant Sci. Res.*, **2011**, 1(2): 69 – 80.
- [10] Prince L and Prabakaran P., *Asian J. Plant Sci. Res.*, **2011**, 1(1) : 84 – 87.