

The Effect on Antibacterial Activities of Stem, Leaf, Berries and Flower Parts Extract of *Solanum Virginianum*

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Abstract: *Solanum virginianum* L is known as Indian night shade or yellow Berried Night Shade plant. Leaves, stems, flowers and fruits are useful parts of Ayurvedic medicinal herb. To find out antibacterial activities of *S.virgininum* plant parts extracted with chloroform. All the plant extracts tested, exhibited different degrees of antibacterial activity against the tested microorganisms. *Salmonella typhi* was recorded as most significant growth inhibitory activity against all the parts extracts of *S. virginianum*.

Keywords: *Solanum virginianum*, Antibacterial, Chloroform

INTRODUCTION:

Herbalism is a traditional medicinal or folk medicine practice based on the use of plants and plant extract. Herbalism is also known as botanical medicine, medical herbalism, herbal medicine, herbology and phytotherapy Medical herbalism is today a sophisticated system of natural medicine using plant extracts and herbs to help treat physical and mental disorders. Medical Herbalism is the modern version of traditional herbal medicine which has been used throughout the world for thousands of years. Herbalists use concentrated whole plant extracts, in the form of tinctures, infusions, salves, creams and pills, as part of a holistic treatment plan to address the underlying causes of your condition (Kennedy *et al.*, 2009; Tapsell *et al.*, 2006; Fabricant 2001; Erci 2012). Many plants synthesize substances that are useful to the maintenance of health in humans and other animals. In many cases, substances such as alkaloids serve as plant defence mechanisms against predation by microorganisms, insects and herbivores. Many of the herbs and spices used by humans to season food yield useful medicinal compounds. About 80% of individuals from developed countries use traditional medicines which has bioactive compounds derived from medicinal plants hence such plants should be investigated further for better understanding of their properties, safety, efficacy and efficiency (Gavimath *et al.*, 2012).

Solanum virginianum L is known as Indian night shade or yellow Berried Night Shade plant. The common name is Kantakari synonym *Solanum surattense* and belongs to family Solanaceae. The plant is rich in many ingredients like alkaloids, phenolics, flavonoids, sterols, saponins and their glycosides and also carbohydrates, fatty acids, tannins and amino acids. The plant is known for its medicinal benefits since time memorial. Roots, leaves, stems, flowers and fruits are useful parts of Ayurvedic medicinal herb. Its roots are one of the important constituents of well known Ayurvedic preparation “Dasmula Ashva” (Amir 2004). Studies indicate that *Solanum virginianum* possesses antifertility, antipyretic, anticancer, antiallergy, anti-inflammatory, antihistamine, hypoglycemic, antibacterial, antioxidant, antifungal properties (Yoshida *et al.*, 2006).In the present work, it is aimed to find out antibacterial activities of *Solanum virgininum*.

Materials and Methods:

Collection of Sample:

Fresh samples of *Solanum virginianum* Leaves, Stem, Berries and Flower were collected from Anna Siddha Hospital Herbal Garden, Anna Nagar, Chennai, Tamil Nadu. The plants were identified by Botanist and they identified as *Solanum virginianum*. The collected samples were brought to the

laboratory, washed thoroughly in running tap water to remove adherent particles if any and used for further analysis.

Preparation of Chloroform extracts of *Solanum virginianum*:

25g of each fresh samples of *Solanum virginianum* Leaves, Stem, Berries and Flower were taken and subjected to cold extraction with 300ml of solvent (Chloroform). The flasks were covered with aluminium foil and allowed to stand for 3-5 days for extraction. The extracts were concentrated under reduced pressure in rotatory vacuum evaporator. The concentrated extracts obtained were reconstituted with respective solvent to obtain a stock of 100mg ml⁻¹ and were stored in a refrigerator.

Screening the antibacterial activity of chloroform extracts of *Solanum virginianum*:

Antibacterial activity of extracts were determined by disc diffusion method on Muller Hinton agar (MHA) medium. Muller Hinton Agar (MHA) medium was poured in to the petriplate. After the medium was solidified, the inoculums were spread on the solid plates with sterile swab moistened with the bacterial suspension. The discs were placed in MHA plates and add 20 µl of samples were placed in the disc. The plates were incubated at 37°C for 24 hrs. Then the antimicrobial activity were determined by measuring the diameter of zone of inhibition.

Result

The stem, Leaf, Berries and Flower samples were extracted separately with Chloroform. The Crude extracts were used for the antimicrobial, antioxidant and anti cancer studies. Results on antibacterial activity of Chloroform extract *S. virginianum* revealed that, it had significant antagonistic activity against both gram positive and gram negative bacterial strains. The antimicrobial activities of chloroform extract of different plant parts of *S. Virginianum* were presented in (Table -1 and Fig 1). All the plant extracts tested, exhibited different degrees of antibacterial activity against the tested microorganisms.

Discussion

Salmonella typhi was recorded as most significant growth inhibitory activity against all the parts extracts of *S. virginianum* (Stem- 15mm, Leaf- 17mm, Berries- 16mm and Flower- 14mm). However, *S. aureus* and *Bacillus* sp. were found to be the moderate susceptible bacterial strains which recorded growth inhibitory activity of 8 mm in leaf, 4mm in stem, 5mm in berries and flower and 8mm in berries, 6mm in stem, 7 mm in leaf and flower respectively. Shelly Rana *et al.*, 2016 reported that methanolic as well as acetone leaf extracts of *S. xanthocarpum* were quite effective in inhibiting the growth of *Staphylococcus aureus* which is a serious human pathogen causing infections in wounds. Possible reason for this antibacterial activity of *S. xanthocarpum* are presence of alkaloids, phenolics and flavanoids in its leaves.

Table: 1: The antibacterial activity result for the *Solanum virginianum* plant parts extracts:

Name of the Samples	<i>S. aureus</i>				<i>B. subtilis</i>				<i>E.coli</i>				<i>S. typhi</i>				<i>P. aeruginosa</i>			
	Con.			Ab	Con.			Ab	Con.			Ab	Con.			Ab	Con.			Ab
	1	2	3		1	2	3		1	2	3		1	2	3		1	2	3	
Stem	4	3	3	4	6	3	-	8	4	2	-	7	15	12	9	19	-	-	-	9
Leaf	8	7	5	4	7	5	3	8	7	5	2	7	17	16	12	19	4	-	-	9
Berries	5	4	3	4	8	4	-	8	5	4	-	7	16	14	11	19	-	-	-	9
Flower	5	3	-	4	7	3	-	8	5	3	2	7	14	12	10	19	-	-	-	9

Con.: Concentration; 1-1000µg/ml; 2-750µg/ml; 3-500µg/ml; Ab-Antibiotic

Fig: 1: The antibacterial activity result for the *Solanum virginianum* Stem extracts:



The antibacterial activity result for the *Solanum virginianum* –Leaf extract



The antibacterial activity result for the *Solanum virginianum* –Berries extracts



The antibacterial activity result for the *Solanum virginianum* –Flower extracts



Conclusion

S.virginianum plant reported as an important medicinal plant used in folk medicine to treat various diseases and thus it serves as an encouragement towards development of new drugs for the benefit of mankind.

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