

BIO CHEMICAL STUDIES ON VIOLA ODORATA

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Preliminary investigation have been carried out upon the different organic and inorganic ingredients of the aqueous extract of *Violata odorata* which is an important medicinal plant in the Ayurvedic and Unani system of medicine for use against the ailments of the naso-pharyngeal tract.

INTRODUCTION

Viola odorata is an important indigenous medicinal plant which is used in the Unani and Ayurvedic Systems of medicines against various diseases. [1, 2]. The occurrence of salicylic acid, violen and violenic acid, have been reported in the alcoholic and the ether extracts of the plant [3-5]. The plant or its flowers are administered in the form of aqueous extracts. *Viola odorata* has long been used against cough, coryza, pharyngitis, tonsillitis, cheek spells, etc. for certain nerve disorders and swollen bladder. The plant has also been shown an astringent, demulcent, diaphoretic and diuretic. An aqueous extract, cold or hot, is usually administered to patients. The present investigations, therefore, have been carried out to highlight the different organic and inorganic ingredients of the aqueous extract of the plant flowers and to study its antibiotic activity.

The aqueous extract of the flowers obtained by soaking in water for two days showed the presence of reducing sugars. These sugars were estimated using the usual procedure [6] and were found to be 3.62% on the dry-weight basis of the flowers.

The aqueous extracts of the flowers which had been exhaustively extracted with benzene, ether and chloroform, showed the presence of proteins as tested with Millons Reagent [7]. These proteins can be of low molecular weight and may belong to the albumin group.

Another constituent of the flowers is vitamin C which is of biological importance. Vitamin C was extracted with 5% metaphosphoric acid. The content of vitamin C

was found to be 0.025% on the dry weight basis [8]. Vitamin A and its precursors are found in the Plant Kingdom. The aqueous extract did not show any blue coloration with antimony trichloride in chloroform which indicates the absence of vitamin A in this extract.

Among the inorganic constituents phosphorus is less abundantly found in plants. *Viola odorata* flowers were found to contain phosphorus. The flowers were heated with 2N sulphuric acid and the procedure described by Piere and Holden was followed [9]. A calibration curve was plotted and the concentration of phosphorus in the flowers was found to be 0.18%.

For the study of antibiotic properties the extract was evaporated *in vacuo* and gave an orange red semisolid mate-

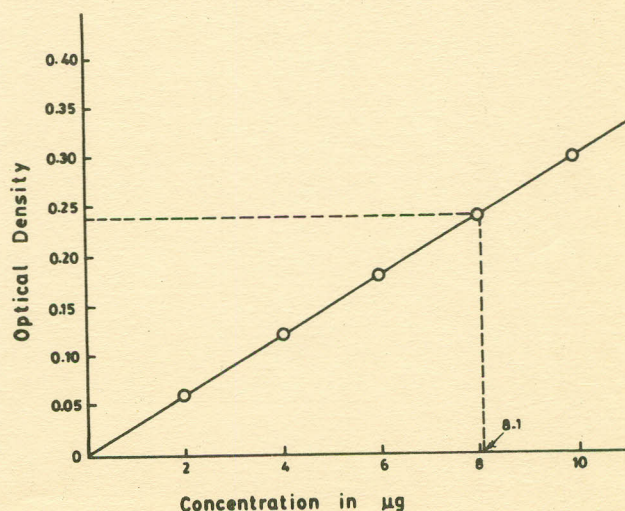


Fig. 1. Calibration curve for the determination of phosphorus.

rial. This material was macerated with water which left dark brown monoclinic crystals undissolved. The clear aqueous extract was studied for antibiotic activity against the strains of pathogenic bacteria. The results of antibiotic activity [10] are reported in Table I. The antibiotic activity against *Mycobacterium tuberculosis* was found to be negative. The other results are quite encouraging and further

Table 1. Determination of antibiotic activity

Sr. No.	Bacterial species	2 g sample/25 ml water minimum inhibition zone (mm)
1.	<i>E. Coli</i>	4
2.	<i>Staphylococcus aureus</i>	2
3.	<i>Streptomyces viridans</i>	2
4.	<i>Bacillus proteus</i>	5
5.	<i>Streptomyces hemolyticus</i>	2
6.	<i>Mycobacterium tuberculosis</i>	Nil

study on these lines could be a significant contribution of national importance in the field of medicine.

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