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Research Article

MACRO AND MICRO ELEMENTS DETECTION IN TWO SELECTED MEDICINAL PLANTS (*CYNODON DACTYLON AND SOLANUM SURRATTENS*) OF SOON VALLEY, KHUSHAB, PAKISTAN

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ABSTRACT
Solanum surrattens belongs to family Solanaceae. It is a large plant family covering two thousand and three hundred species, almost half of which belong to a single genus, *Solanum*. This family consists of a number of plants extensively known for the presence of variety of natural products of medicinal significance. Crude plant extract of *Solanum surrattens* is beneficial in bronchial asthma and non-specific cough, influenza, rheumatism, difficult urination, bladder stones etc. While *Cynodon dactylon* is reported to have antimicrobial and antiviral properties, and has been recommended for cure of prostatitis, urinary tract infection and dysentery. Additional research has been documented on *C. dactylon* involving its glycemic potential, which is involved in the treatment of diabeteas. It is necessary to find out the concentration of macro ((K, Na) and micro (Ni, Zn, Mn and Pb) elemental composition by atomic absorption spectrophotometer for the cure of diseases. In addition, some relevant aspects such as medicinal uses of some studied plants, diseases due to toxicity and deficiency of trace elements are also discussed.

Keywords: *Solanum Surrattens, Plant Extract, Antimicrobial, Atomic Absorption Spectrophotometer*

INTRODUCTION
All living organisms require certain metals for their growth and proper metabolism so; they evolved an appropriate uptake mechanism for metals. Plants play a key role in a man's life as they have provided man with all his needs such as clothing, food, flavors, shelter and fragrances, as well as most important medicines. Plants have formed the basis of primitive traditional medicine systems. Some plant species have potential to grow in the metal contaminated soil and accumulate high amount of heavy metals (hyper-accumulation) as an eco-physiological adaptation in metaliferous soil. Aromatic herbs and medicinal plants have been getting attention from all over the world due to their efficiency as alternative of medicines. They helped the man by curing human ailments without any known side effects. Asteraceae is medically an important family of plants.

According to the herbal practitioner *Solanum surrattens* is very important herb in system of medicines. They used *S. surrattens* for different types of ailments. With the acceptance of importance of these plants, it is very necessary to know the chemical constituent and their role in body. For this purpose; medically two important plants were collected from the areas of Soon Valley, Pakistan. These plants consist of inorganic constituents like Na^{+}, Cl^{-}, $K^{+,}$ Mg^{2+}, $CO^{2-,}$ SO_4^3 and PO_4^{3+}. The whole plant body is used especially roots and fruits as a medicines. *S. surrattens* are common medicinal plants. These are used in chemical analysis because they have economical and medicinal values and used to manifest physiological effects on human being by knowing their exact concentration (Iqbal *et al*., 2011).

Due to minimal side effects, acceptability to the majority of population and easy availability herbal products become popular in medicine communication. It is therefore, of major interest to find out the levels of some elements in common herbal plants because, at high levels, these elements can also be dangerous and toxic. It was therefore necessary to explore the present status of local plants in terms of selected heavy metals and macronutrients (Zn, Ni, K, Mn and Na). All the elements were accumulated to greater or lower extents in selected two plant species (*Cynodon dactylon and Solanum surrattens)* enlisted in Table 1.

Table 1: Two Selected Medicinal Plants with their Common Name and their Parts which are used as Disease Cure

1	***Solanm Surrattens***	**Mokri**	**Berries, Leaves**	**Used as Pain Killer, Toothache, Snake Bite, Vomiting**	**E. Sheeba 2009**
2	*Cynodon Dactylon*	Bermuda Grass	Roots, Stem, Leaves and Flowers are Useful	Emetic, Piles, Oligouria, Psychotic Disorders.	Kaffka, S. (2009).

MATERIALS AND METHODS

General Experimental Data

The research work presented in this manuscript was aimed to determine the heavy metals on selected medicinal plants of soon valley. The analysis of selected studied plants was performed in the laboratory of Pharmacy Department, University of Sargodha, Pakistan.

General Detail

This study analyzed the vegetation of Soon valley in Salt Range of Pakistan during (2010-2011). Soon Valley was extensively surveyed and the available species at selected sites were enlisted. In order to collect a comprehensive list of plant parts used for medicinal purposes, meetings were arranged with local herbalists (people curing various diseases with plant extracts).

Selection of Sites

On the basis of a preliminary survey three ecologically diverse studies sites namely Khabeki, Dape Sharif, Knotty Garden and were selected based on differences in their environmental attributes especially soil composition topography variations in elevation, slope, altitude and community attributes. Meteorological data for rain fall, maximum and minimum temperature were obtained from Horticultural Research. Station of Soon Valley for the entire study period (Ahmad *et al.*, 2008).

The plants were collected from their natural habitats from different sites of Soon Valley. The description of sites is given in Table 2.

Table 2: The Description of Sites and Time

No. of Sites	Site of Collection	Time of Collection	Names of Plants
Site 1	Knotty Garden	October, February.	*Solanum surrattens, Cyanodon dactylon,*
Site 2	Deep Sharif	October, February.	*Solanum surrattens, Cyanodon dactylon,*
Site 3	Khabi jheel	October, February.	*Solanum surrattens, Cyanodon dactylon,*

Sample Collection

Two field trips were arranged throughout the Soon valley in order to collect selected studied medicinal plants from October 2010 to February 2011. Of these plants are given in Table 3.

Table: 3 Metrological Data for the Time of Collection for the Year 2010-11

Month	Temperature (C) Max Average	Temperature (C) Min Average	Rainfall (mm)
October	28.16	16011	**27.5**
February	**12.7**	**3.03**	**49.6**

Digestion

Dried ground powder (.5g) leaf material was digested in a mixture of concentrated nitric acid and per choleric acid (3:1) on a heating block for about 1 hour by gradually raising a temperature up to 250ºC. Filter and volume made up to 50ml. The analysis of (P, Ca, and Mg) was carried out by using flame Photometer. The dried ground material (0.2g) was placed in test tubes and then added 4 ml of digestion mixture and incubated it overnight at room temperature. Placed the tubes in the digestion block and heated up to 250ºC until fumes were produced. Removed the tubes from the block after 60 minutes and cooled. Slowly added 2 ml of H_2O_2 and placed the tubes back into digestion block. Repeated the above process until the cooled material was colorless and transparent. The volume of extract was made up to 50ml in volumetric flask.

RESULTS AND DISCUSSION

Nickel

In Knotty Garden, *C. dactylon* has maximum content value 0.379 and minimum value exists in *S. surrattens* (0.159) mgg^{-1} while in Khabeki Jheel *S. surrattens* has 0.22 mgg^{-1}5 and *C. dactylon* with 0.222 mgg^{-1}, in Dape Sharif, *C. dactylon* with maximum content 0.297 mgg^{-1} and *S. surrattens* (0.219) mgg^{-1}

Zinc

The concentration of Zn^{2+} is highest (0.546) mgg^{-1} in *S. surrattens* and *C. dactylon* has lowest content value (0.473) mgg^{-1} in Knotty Garden, in Khabeki *C. dactylon* contained maximum concentration (0.477) mgg^{-1} and *S. surrattens* has (0.421) mgg^{-1}. In Dape Sharif, *C. dactylon* has (0.278) mgg^{-1} and *S. surrattens* with (0.170) mgg^{-1}

Manganese

Medicinal plants of Knotty Garden that the value for Mn^{2+} is highest (0.595) mgg^{-1} in *C. dactylon* and minimum (0.319) mgg^{-1} in *S. surratens*. Similarly, *C. dactylon* the plant collected from Khabeki Jheel has maximum value for Mn^{2+} 0.560 mgg^{-1} while minimum value (0.322) mgg^{-1} of *S. surrattens*.

Lead

C. dactylon has minimum value (0.295) mgg^{-1} and *S. surrattens* with maximum content value 0.331 mgg^{-1} in Knotty Garden same in plants taken from Khabeki and Dape Sharif that *S. surrattens* gained maximum content value as compare to *C. dactylon*

Potassium

In Knotty Garden, *C. dactylon* possess (809) mgg^{-1} and *S. surrattens* with low value (618) mgg^{-1}

In Khabeki, *C. dactylon* possesses maximum content value (648) mgg^{-1} and *S. surrattens* with low value (518) mgg^{-1}. While in Dape Sharif, *C. dactylon* possess (789) mgg^{-1} and *S. surrattens* with low value (648) mgg^{-1}

Sodium

S. surrattens with maximum content value 812 mgg^{-1} in Knotty Garden and *C. dactylon* has minimum value (472) mgg^{-1}. In Khabeki, *S. surrattens* with maximum content value 695 $mgg^{-1}$and *C. dactylon* has minimum value (372) mgg^{-1}. From the site of Dape Sharif, *S. surrattens* with 695mgg^{-1} and *C. dactylon* has (602) mgg^{-1}

Conclusion

This study shows that selected studied medicinal plants are good source of macro and micro elements. However, in some cases they carry very high concentration or sometimes very low concentration which creates toxicity and deficiency of such elements respectively, and cause different diseases in plants as well as in human beings. In accordance to seasonal differences, data reveals that studied plants collected in winter shows high content of trace elements as compare to plants collected in summer season.

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