SHORT COMMUNICATION

ELEMENTAL ANALYSIS OF *ECHORNIA CRASSIPES* (MERIT.) SCHLECHT.

Fazal Hadi[1], Muhammad Ibrar[2] and Abdur Rashid[1]

[1]*Centre of Plant Biodiversity and Botanical Garden, University of Peshawar, Peshawar, Pakistan*
[2]*Department of Botany, University of Peshawar, Peshawar, Pakistan*
Corresponding author's Email: *hadibotany@yahoo.com*

ABSTRACT

Elemental analysis of *Echornia crassipes* (Merit.) Schlecht showed the presence of Al, Cr, Fe, K, Mg, Mn, Na, Ni, Pb, Sn, Sr and Zn in the leaves and rhizomes. K was in maximum and Pb in minimum quantity in the leaves while the rhizomes showed maximum concentration of Ca and minimum of Pb.

Key words: *Eichornia crassipes*, ICP-OES, Elemental analysis, Pakistan.

Echornia crassipes (Merit.) Schlecht is commonly known as Water Hyacinth belongs to family Pontederiaceae. It grows in waste water reserviuors containing various heavy metals. The plant forms beautiful green look over water and has light blue attractive flowers. The plant starts it life in septemer and flowers in January. It is free floating semi submerged hydrophyte with rhizome (roots) in site the water. Different elements play important role in medicinal values of plants. Impressive developments in the field of mineral elements have been taken place in chemical, biochemical, immunological and therapeutic roles on human health (Udayakumar & Begum, 2004). These elements play both curative and preservative role in human health (Dastagir *et al.* 2011).

Mineral elements though form a small portion of total composition of most plants materials and of total body weight yet they are of great physiological importance particularly in the body metabolism. Their effects are related to concentration and recorded observation range from a deficiency state, to role as biological essential component to imbalance created when excess of one interferes with the function of another (Munzuroglu *et al.* 2000 and Jackson and Bergeron, 2005). The present study describes that the heavy metals in various composition are found in leaves and rhizomes of *Echornia crassipes.*

Fresh leaves and rhizomes of *Echornia crassipes* (Merit.) Schlecht were collected in October 2010 from water marshes of Taru-Jabba area of District Nowshera, KPK, Pakistan. They were air-dried and crushed in grinder to obtain powders of rhizomes and leaves.

The elements analysis was done at Pakistan Institute of Nuclear Science and Technology (PINSTECH)-Islamabad by using high powered "Inductively coupled plasma optical emission spectrometer (ICP-OES)".

Mineral elements play an important role in human life (Udayakumar and Begum, 2004). The present study showed that the leaves and rhizomes of *Echornia crassipes* have different elements. In leaves K was in maximum percentage followed by Ca, Na, Mg, Ac, Fe, Mn, Sr and Sn. The Cr, Zn, Ni and Pb were present in traces. In rhizomes Ca was in greater percentage followed by K, Fe, Na, Al, Mg Mn, Sr and Sn. The Zn, Cr, Ni and Pb were present in traces (Table 1).

Table 1. Elemental analysis of leaves and rhizomes of *Echornia crassipes* by using ICP-OES technique.

S. #	Plant Part	Percentage of different elements												
		Zn	Sr	Sn	Pb	Ni	Na	Mn	Mg	K	Fe	Cr	Ca	Al`
1.	Leaves	0.01	0.23	0.06	0.005	0.009	17.71	0.37	9.31	47.17	2.36	0.02	20.87	2.41
2.	Rhizomes	0.13	0.42	0.12	0.03	0.04	16.23	5.70	1.20	19.44	17.02	0.06	40.48	1.28

The heavy metals also affect human life as if the concentration increases it may be dangerous to human liver and kidneys. The deficiency or excess of Cu, Mn, Zn, Fe, Cr, Ca, Mg and K may cause number of disorders in human and animals (Ahmad *et al.* 1994). Fe plays a pivotal role in erythropoiesis, oxygen transport in cell, cell

formation of glutamate receptor, resulting in elevated mood and improved mental functions both in humans and animals (Makhmudova *et. al.,* 1989). Cu, Cr and Zn even in traces not only decreased mental anxiety, stress and depression but are also the main constituents of many metallo-protein molecules. The trace amounts of Cr maintain the normal glucose level and protect the brain from detoxification of ammonia. K helps in the building of protein, photosynthesis, fruit quality and reduction of diseases, while Mg is part of the chlorophyll in all green plants and essential for photosynthesis. It also helps activate many plant enzymes needed for growth (Chakrabarti *et al.* 1980; Andrasi *et al.,* 1990).

REFERENCES

Andrasi, E., J. Nadashi, Z. Molnar, L. Bezur and L. Eryneil (1990). Determination of main and trace elements in human brain by Neutron Activation Analysis (NAA) and Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES) methods. *Bio Trace Elements Res.,* 1: 26-27 and 691-698.

Ahmad, S., A. Rehman, M. Qadiruddin and Y. Badar (1994). Elemental analysis of herbal drug Intellan, a neuroenergiser. *J. Pharmacy Gazi University Turkey,* 2: 83-90.

Chakrabarti, A. K., N. L. Banik, J. M. Power and E. I. Hogan (1980). The regional and sub cellular distribution of calcium activated neutral proteinases (CaNP), *Neurochem. Res.,* 14: 259-266.

Dastagir, G., M. Ibrar and F. Hussain (2011). Elemental composition of *Bischofia javanica* Blume. *Hamdard Medicus,* 54(3): 56-57.

Jackson, D. and K. Bergeron (2005). In: *Alternative nature online herbal* (Ed. K. Bergeron). http://altnature.com/gallery/voilet.htm.

Makhmudova, E. M., T. M. Linn, A. G. Khafizev and B. A. Tashmukhanedov (1989). Role of iron ions in the structure of glutamate receptors. *Dokl Akad Nvk UZSSR.* 3: 55-57.

Munzuroglu, O., F. Karataz and N. Gur (2000). A study of levels of Vitamins A, E and C and selenium in Rhubarb (*Rheum ribes* L.). *Turkish Journal of Biology*, 24: 397-404.

Udayakumar, R and V. H. Begum (2004). Elemental analysis of medicinal plants used in controlling infectious diseases. *Hamdard Medicu,.* 67: 35-36.

(*Accepted for publication December 2012*)