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Phytochemical study of *Eichhornia crassipes* in Sri Ganganagar District of Rajasthan, India.

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Abstract

To study the biochemical profile of *Eichhornia crassipes* (water hyacinth) in three different site of Sri Ganganagar District on four parameters, carbohydrate, protein, fiber and chlorophyll. The data analysed statistically showed that three different site for crude protein were significantly different at 0.005 level of significance, highest crude protein is reported in Site-C and lowest in site-A but there were no significant difference in Carbohydrate, crude fiber and total chlorophyll.

Keywords: Water Hyacinth; *Eichhornia crassipes*; Phytochemical.

1. Introduction

Eichhornia crassipes is distributed throughout the world; the plant was recorded in Egypt, India, Australia and Java (Gopal, 1987) [3]. *E. crassipes* proliferation at neutral pH and it can tolerate pH4-pH10; high light intensities and certain spectral composition and nutrient-rich water (Methy *et al.* 1990). Growth is directly correlated with nutrient concentration (Gopal, 1987) [3].

The aim of the present study is to investigate the phytochemical parameters of *E. crassipes* at different site of the Sri Ganganagar district of Rajasthan, India.

2. Material and Methods**2.1 Plant material**

The plant of *Eichhornia crassipes* was collected from the sample site along the Gang Canal in Sri Ganganagar District, Rajasthan, India. The three sites were located along the stretch of canal. After collection, the plant washed thoroughly in running tap water to avoid surface contamination and plant materials were oven dried at 35° C for 72 hours and the dried material powdered and stored in small polythene bags for the estimation of phytochemical characters.

2.2 Total carbohydrate estimation

The phenol sulphuric acid method described by Dubois *et al.* (1956) [2] was followed for the estimation of total carbohydrate. The absorbance was recorded at 620 nm using a UV-spectrophotometer. Distilled water was used as blank and standard curve was prepared by using known concentration of glucose. The quantity of sugar was expressed as mg/g fresh weight of tissue.

2.3 Protein estimation

The Kjeldahl Nitrogen method is used for the protein estimation in plant material, in this method the ammonia nitrogen is oxidized by sulfuric acid in the presence of catalyst to (NH₄) SO₄. The ammonium ion is converted to NH₃ by NaOH and collected by distillation. The NH₃ is then quantitatively titrated against standard acid (H₂SO₄) of known strength and nitrogen in the sample is computed. The crude protein is obtained by multiplying the nitrogen content with the factor 6.25.

2.4 Fiber estimation

The moisture and fat free sample are successively refluxed with sulphuric acid and alkali (NaOH), each followed by filtration and repeated hot water washing. The remaining residue comprising of lingo-cellulose and cellulose, is oven dried and ashed. The loss in weight is expressed as crude fiber.

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2.5 Chlorophyll estimation

The various chlorophyll pigments differ in their aliphatic side chains attached to the porphyrin nucleus. The quantity of chlorophyll *a* and chlorophyll *b* was estimated spectrophotometrically by Arnon's (1949)^[1] method.

3. Result and Discussion

The results of the phytochemical investigation of *E. crassipes* in three different site of Sri Ganganagar district are presented in Table 1. The data analysed statistically showed

that three different zones for crude protein were significantly different at 0.005 level of significance, highest crude protein is reported in Site-C and lowest in site-A and there were no significant difference in Carbohydrate, crude fiber and total chlorophyll.

Previous reports by Pramod C. Mane *et al* (2011)^[6] indicated higher concentration of protein and carbohydrate. The high percentage of total organic matter and crude protein also helped to explain why the *E. crassipes* used as a valuable source of animal feed. (Nyananyo BL. 2007)^[5].

Table 1: Table showing phytochemical parameters of *Eichhornia crassipes* in three different study sites in Sri Ganganagar District, Rajasthan, India.

Phytochemical study of <i>Eichhornia crassipes</i> in three different study sites (value in Mean \pm SE)				
Parameters	Carbohydrate (mg/g)	Crude Protein%	Crude Fiber %	Total Chlorophyll
Site A	7.18 \pm 0.21	23.71 \pm 0.43	14.61 \pm 0.40	0.13 \pm 0.005
Site B	7.18 \pm 0.20	24.57 \pm 0.36	13.93 \pm 0.31	0.15 \pm 0.005
Site C	7.26 \pm 0.19	25.22 \pm 0.21	13.95 \pm 0.31	0.13 \pm 0.004
Significant	-	*	-	-

* Significant at 5 % level. Site A = Gang Canal, Site B= Sadhuwali head Canal, Site C= Z minor Canal

4. Conclusion

Eichhornia crassipes was found to be rich in crude protein and crude fiber. This study proved *E. crassipes* has a potential for uptake organic material and it is also useful traditionally in making ropes, production of fiber boards, as animal fodders and fish feed, green manure, compost and as ornamental plants.

5. References

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