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Molecular cloning of genes induced under cadmium stress in Water hyacinth

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Water hyacinth(*Eichhornia crassipes*) has demonstrated its ability to remove nutrients and chemical element from sewage, also accumulate phytotoxic materials such as heavy metal. We noticed that about 5mg of cadmium was incorporated per g root when the plants were exposed to 150μM $CdCl_2$ for 48hrs. This study attempts to study genes in response to stress induced by the heavy metal cadmium. Water hyacinth grown in the presence or absence of sublethal concentration of cadmium were isolated to purify total RNAs. Induced RNA Random Fishing(IRRF)method where random oligonucleotides were used as primers have been applied to the identification of expression of cadmium-induced genes. PCR-DNA products of 550bp was cloned and sequenced. We will discuss about the structure and expression of this gene.

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Studies on the *Trans*-acting Factor of Maize(*Zea mays* L.) *rbcL* gene

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Transcriptional control of gene expression commonly depends on an interaction between sequence-specific DNA binding proteins and their cognate promoter elements. A chloroplast protein that binds to the 5'-region of maize *rbcL* gene was identified. It was found that chloroplast proteins bind to DNA fragment R2 (from-33 to -229) and DNA fragment R3 (from -230 to -418) of *rbcL* promoter. From the result of competitive binding assays, it was demonstrated that the bindings are specific. Interactions between dark-adapted maize chloroplast extract and DNA fragments R2 and R3 were studied, but no DNA-protein complex formed. According to the above results, it could be concluded that *rbcL* 5'-region, -33 to -418 upstream from ATG codon, has two specific recognition sites for the same chloroplast proteins and that the binding of the chloroplast protein is probably regulated by light.