

Monitoring of the Effect of Ultrasonic Irradiation on Aquatic Lirium Plants by Means of a Photoacoustic Technique

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Aquatic Lyrium or Water Hyacinth, alternate names for this plant, is a free floating plant native of the Amazon, Brazil, which by the beauty of its flowers has been propagated to almost all the tropical and sub-tropical regions of the world. This plant is a weed, which causes many consequences extremely unfavorable for the environment and for the diverse human activities that are developed in the bodies of water. Among the most often used methods to control water hyacinth are herbicides, physical removal or drainage, and biological control, none of which has been entirely efficient or profitable. It is for these reasons that arises the need to incorporate other new technologies of control, being in this case the use of ultrasonic irradiations, with certain values of frequency and intensity, in order to induce cavitation in the aqueous structure of Aquatic Lirium, and consequently, inhibit their photosynthetic activity, causing its death. The leaves of aquatic plants are systems particularly useful for studying the effects of bubbles trapped within their structures. For this reason, in this work it was used the photoacoustic technique for monitoring the photosynthetic activity in Aquatic Lirium plant, before and after ultrasonic irradiation. Our results show that the optical absorption bands corresponding to chlorophylls *a* and *b* decrease dramatically in the case of the leaves of the irradiated plants, showing the damage in the chlorophylls and hence the photosynthesis inhibition, which have a remarkable correspondence with the structural damage in the irradiated plants, which is increased with time, in an irreversible way.