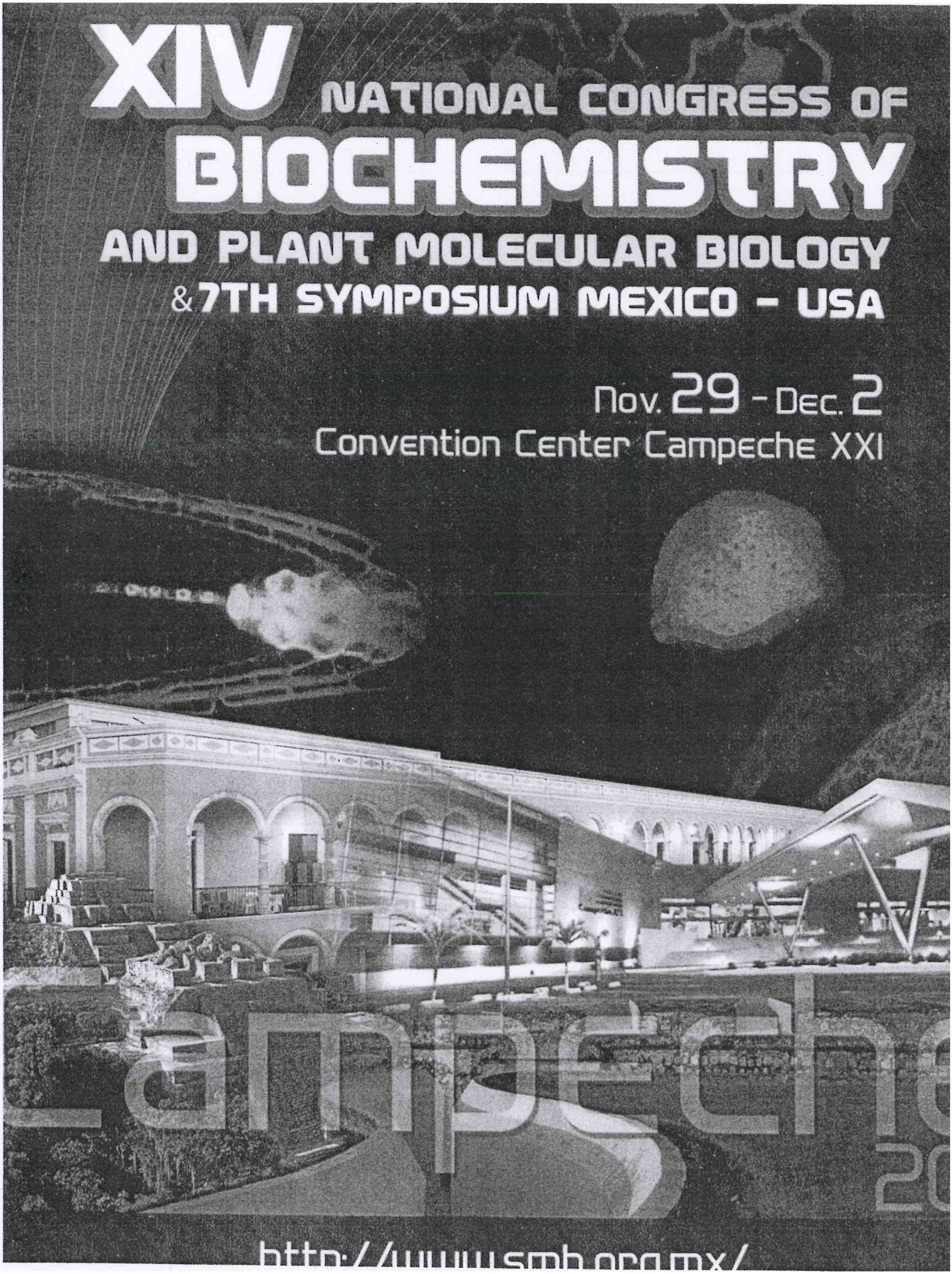
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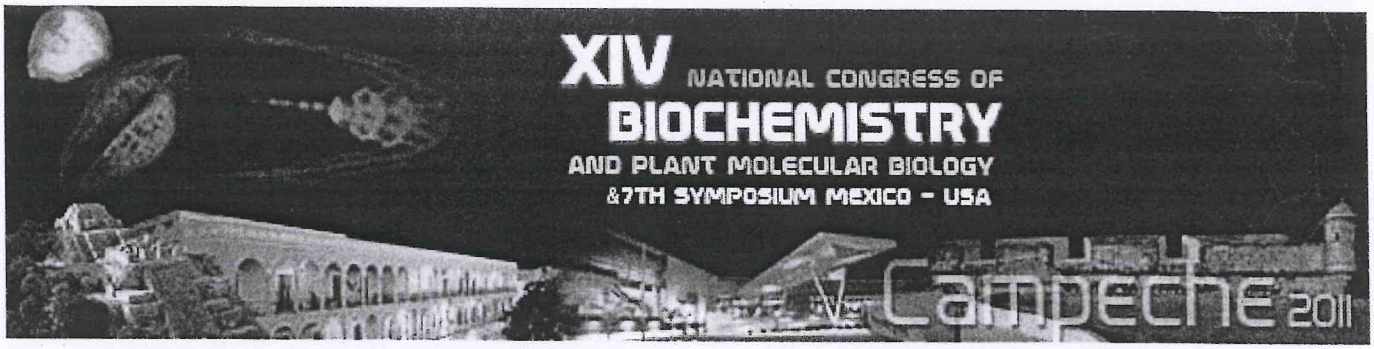

Effects of water stress in bryophytes with biotechnological potential by infrared spectroscopy.

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The study of desiccation tolerance in bryophytes has demonstrated the great ability of these organisms to tolerate extreme conditions[1]. Fourier Transform Infrared Spectroscopy has been used in recent years as an alternative technique to identify and quantify metabolites simultaneously in biological systems[2]. In this work two bryophytes (*Plagiomnium cuspidatum* and *Pseudocrossidium replicatum*) were analyzed by infrared spectroscopy in ATR mode, their behavior was compared with the behavior of a sensitive plant (*Arabidopsis thaliana*). The relationship between sugars and proteins was evaluated with respect to water loss in a consecutive dehydration process with the purpose of analyzing the plants physiological responses. Three kinetics of dehydration-hydration process in each plant were monitored by infrared spectroscopy, also parameters such as weight loss and photosynthetic efficiency were obtained at the same sampling time. Both *P. cuspidatum* and *P. replicatum* demonstrated ability to rehydrate and recover their photosynthetic activity and weight even after losing 80% of their initial weight in the three cycles. However *A. thaliana*, as was expected, only resisted one cycle and show a different behavior. Infrared results show that both bryophytes analyzed had a retention time of water (in the first minutes of the dehydration process) in which the sugar concentration increased; after this time, bands associated to water, sugars and protein decreased. Results obtained by infrared spectroscopy can contribute to understanding much better the mechanisms that allow to bryophytes to adapting to adverse conditions as water stress.

1. Matthew A.J. y Andrew J. Wood. (2007). Plant Dessication Tolerance. Blackwell Publishing. pp 311.

2. Ellis D.I., Broadhurst, D. B. Kell, J. J. Rowland, R. Goodacre. (2002). Applied Environ. Microbiol. 68 No. 6 2822-2828.