

# AQUAPHYTE



UNIVERSITY OF  
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CENTER FOR AQUATIC PLANTS

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## Aquatic Plant Encrustations

You look into a Florida lake and ask, "Why aren't the plants green? What are the submersed plants covered with?" The answers given for the past 100 years have been, they're covered with "marl" or "carbonates", but nobody really knew for sure. A University of Florida benthic ecologist *did* want to know for sure, but could find little published research about the kinds of minerals that encrust submersed macrophytes.

Dr. Paul Zimba (UF Fisheries and Aquatic Sciences) undertook to identify which minerals encrust submersed plants in Florida. He reported his findings to the EWRS (European Weed Research Society) 9th International Symposium on Aquatic Weeds in Dublin in September.

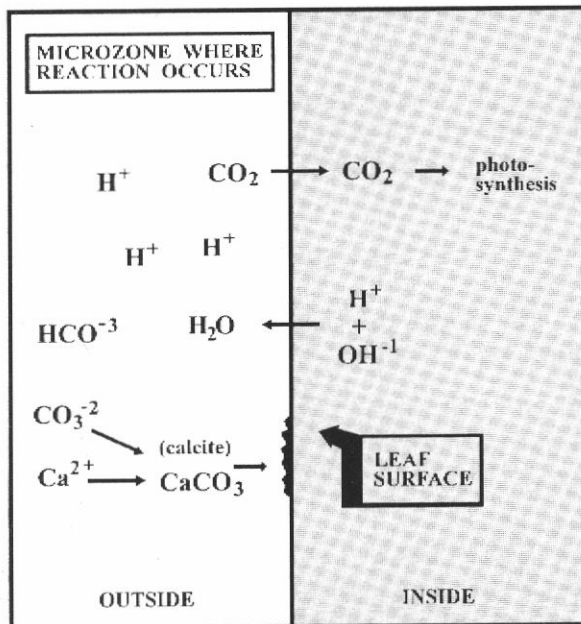
Encrustation of submersed macrophytes results from photosynthesis, sinking of dead plankton, sediment resuspension and growth of attached biota. Zimba sampled submersed plants from 18 Florida lakes, (oligo- to hyper-eutrophic) and analyzed the encrusted materials on the leaves of 11 underwater species.

Previous research (in temperate lakes) found calcite (calcium carbonate having hexagonal crystals) to be the predominant form of carbonate formed in freshwater systems. In the present study, calcite also was most common, found on plants in 12 of the 18 lakes.

However, Zimba identified other plant-encrusting minerals: biotic and sand silica was abundant on plants in some lakes; the iron oxide, hematite, was found on the plants of another lake; and the "marl" on plants in other lakes was found to consist of sodium chloride (table salt) and sylvite (potassium chloride).

Now we know that submersed plant encrustations in Florida are not always calcite. In some lakes, the encrustations may be comprised of silica, hematite, sodium chloride or potassium chloride.

### How are encrustations formed as a result of plant photosynthesis?



**Intensive plant photosynthesis** depletes available  $CO_2$  in the water. The photosynthetic cycle pumps hydrogen ions into the water, thus shifting the pH of the microzone of water surrounding the leaf to basic conditions. Basic conditions favor the precipitation of dissolved mineral salts onto the leaf surface.

## Development of Constructed Wetlands in Slovenia

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Constructed wetlands offer an effective and economical solution to the growing problems of environmental pollution. They are simple in concept, inexpensive to construct and easy to operate. Constructed wetlands are built as a part of the natural local environment which they successfully preserve by protecting it against pollution.

The research group of the Water Management Institute has since 1989 designed and built seven constructed wetlands on the territory of Slovenia. They were installed to treat domestic sewage, waste waters from food processing plants, landfill leachate and to further clean waste waters from conventional treatment plants. Field analysis and operation experience have shown that constructed wetlands are

[See WETLANDS on Page 14]

### INTERNET ACCESS

Yes, E-mail can be sent to the Aquatic Plant Information Retrieval System (APIRS) through INTERNET:

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