

Long-Term Preservation of Microalgae and their Optical Properties

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This paper describes a unique protocol, using a gelatin-based embedding technique that allows for the long-term preservation of microalgae cellular structures and their spectral absorption and fluorescence properties. This facilitates the creation of archives of natural microalgae and phytoplankton cells for environmental studies. A re-examination of samples collected and prepared over two decades at McMurdo Station, Antarctica and at the California Bight near Los Angeles demonstrated the long-term preservation of the cells and their optical properties. The technique was developed for microphotometric analysis and was described in a publication during 1987 (cited in the text). However, the long-term preservation using this protocol was

only verified during 2011. To this date there is no other published protocol that facilitates such high quality preservation of cell structure, including their optical properties for over two decades as demonstrated in the text. Optical analysis of individual species could provide a better understanding of the photo adaptation response of microalgae to environmental changes.

Both authors are currently faculty members at the University of Southern California, Los Angeles and have numerous publications in the field of sea ice microalgae and phytoplankton cells optical properties. During 1993-1996, C.W. Sullivan was Director of the Polar Programs at the National Science Foundation, D.C.

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