The Department of Energy’s Aquatic Species Program (ASP) was funded from 1978 to 1996 in an effort to develop liquid transportation fuels from microalgae. During this time an extensive algal culture collection was amassed from water samples around the United States. Out of more than 3000 strains, 51 were well characterized in terms of growth and lipid production and these are described in the Microalgae Culture Collection (http://www.nrel.gov/docs/legosti/fy98/24190.pdf) and addendum (http://www.nrel.gov/docs/legosti/old/3079a.pdf). At the close of the ASP, a total of 20 strains of the original 3000, including 37 of the 51 strains listed in the Microalgae Culture Collection and addendum, were transferred to the Center for Marine Microbial Ecology and Diversity (CMMED) at the University of Hawaii (UH). The complete list of strains transferred is available in the ASP Closeout Report (http://www.nrel.gov/docs/legosti/9624190.pdf). However, this list does not include some strains that were listed in the Microalgae Culture Collection yet are present in the UH collection. With the resurgence in interest in using microalgae as a feedstock for producing liquid transportation fuels, many inquiries have come up regarding the current status of this important strain collection. Currently, 25 of the 51 strains listed in the Microalgae Culture Collection and addendum are still extant and have been re-established at the National Renewable Energy Laboratory. We present here the current status of these strains including a microscopic characterization of potential lipid vesicles using neutral lipid specific dyes.

Overview of the DOE Aquatic Species Program Work

This list shows the strains that were carefully investigated during the Aquatic Species Program and those that were transferred to the University of Hawaii at the close of that program. The green box shows the strains that still exist and are currently available from the University of Hawaii Marine Microbial Culture Center.

**Endogenous Lipid Vesicles**

Algal cells were stained with the neutral lipid specific dye, BODIPY 493/503. The stained cells were excited with 480 nm light and the pictures show the juxtaposition of the chlorophyll containing chloroplasts (red) and the putative lipid vesicles (green). When excited with 490 nm light, chloroplasts emit at 660 nm while BODIPY stained vesicles emit at 515 nm. These micrographs were taken of cells in the early stationary phase and have not been specifically stressed for lipid production.

**Conclusion**

An impressive collection of microalgae was assembled under the Department of Energy’s Aquatic Species Program. Maintenance of microalgae cultures over the long term is challenging requiring frequent transfers exposing the cultures to the risks of contamination and genetic drift. The loss of many strains from the collection over time highlights the difficulties involved in maintaining algal culture collections over the long term. New methods and technologies are continually being tried and cryopreservation, according to the literature, seems a good candidate for some species for long term storage. Although many of the strains have been lost over time, promising candidates for the production of lipids still exist from the original ASP culture collection.

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