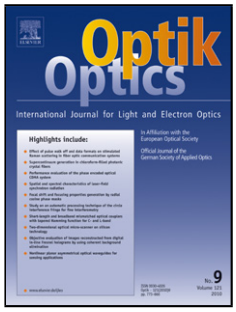

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PII: S0030-4026(18)31380-9
DOI: https://doi.org/10.1016/j.ijleo.2018.09.077
Reference: IJLEO 61516

To appear in:

Received date: 10-7-2018
Accepted date: 16-9-2018

Please cite this article as: Bi X, Lin S, Zhu S, Yin H, Li Z, Chen Z, Species identification and survival competition analysis of microalgae via hyperspectral microscopic images, *Optik* (2018), https://doi.org/10.1016/j.ijleo.2018.09.077

Species identification and survival competition analysis of microalgae via hyperspectral microscopic images

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Abstract:

Hyperspectral imaging technology was employed to study the effect of pH on survival competition of three species of microalgae in this experiment. An SVM classifier trained by both the fluorescence and transmission spectra was used to identify the species of each microalgae in mixed samples. Then, a series of image processing methods were applied to optimize the identification result and calculate the number of each species. Our experimental results showed the specificity and sensitivity of SVM classifier reached 100% and the growth situation of three species of microalgae could be observed intuitively. With this method, the distribution and number of three species of microalgae under the pH of 7.9 and 8.6 at different time were demonstrated.

Keyword: hyperspectral imaging; SVM classifier; effect of pH; survival competition of microalgae;

1. Introduction

Algae is a promising feedstock for biofuels production, which also play a significant role in ecological processes and communities. Since there is a great number of algae with different species in the water body, to study the growth situation