

Effect of microbubbles on growth of water alga Nitella

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Microbubble with diameter of several to tens of micron is well known to improve growth of animals and plants. However, its physical and chemical mechanism is still unknown. This study investigated the effect of the microbubbles to giant internodal cells of water alga Nitella. The alga was cultivated in fresh water at about 26 degrees centigrade under fluorescent light 12 hours a day. The internodal cells were cut off and irradiated by 150 W halogen lamp of the microscope to remove a part of chloroplasts below the cell wall. These pretreated cells were cultured on exposure to the microbubbles 6 hours a day. Due to microbubbles, the dissolved oxygen in water increased from 7.8 to 9.0 mg/L. The length of the internodal cell was measured every week and its microscope image was recorded to analyze the streaming velocity. As a result, we found that the cell length increased from 8.17 to 9.46 mm in a week (15.7 %/w) on average. On the other hand, if without microbubbles, the cells grew only from 7.67 to 8.00 mm per week (4.3 %/w). The streaming velocity was 70 micron/s if the microbubbles added but 38 micron/s if without microbubbles. Besides, the cell surface kept clean for 3 weeks in the experiment due to microbubble. These result suggested that the microbubbles influenced on cell activity.