AHW30-P13   Room:Convention Hall   Time:May 22 18:15-19:30

Characteristics of nutrient condition and phytoplankton variation and its controlling factors in agricultural reservoirs

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Reservoirs and ponds have been used as important water resources in the agriculture area with little rain, and its importance will increase with the worldwide climate change. However, the lack of maintenance causes eutrophication and phytoplankton bloom, which often induces the problem such as clogging of irrigation line. For the sustainable use of agricultural reservoirs, it is important to clarify the trigger of eutrophication and control it based on the characteristics of reservoirs. We aimed to confirm the characteristics of nutrient condition and phytoplankton variation and its controlling factors in agricultural reservoir, nutrients and fluorescence data were collected and the relation with residence time was examined on the 6 ponds (P1~P6) located on a small island intensively cultivated by citrus farms in western Japan.

Residence times of pond water were estimated to be from 7 to 2,348 days, which decreased about 1/3 from August to December in P1, P2 and P3. Nutrient condition in the pond water was totally in the significant N-rich and P-limited condition compared with the Redfield ratio in both summer and winter. The estimated budget of DIN, DIP and DSi suggests that the ponds acted as a sink of nutrients to the downstream environment throughout the year. Fluorescence was totally higher in the ponds with shorter residence time. It suggests the possibility of that cyanobacteria with relatively low chlorophyll content was dominant in the longer residence time ponds, while other phytoplankton such as diatom and green algae was dominant in the shorter residence time ponds in the study area. On the seasonal variation, residence time decreased while fluorescence increased in P1 and P2 from August to December. It suggests that the dominant species of primary producer changed from cyanobacteria to diatom from summer to winter. These results suggest that residence time is one of the critical factors for controlling the phytoplankton variation in the ponds.