

## **Effects of residence time and nutrient load on eutrophic conditions and phytoplankton variations in agricultural reservoirs**

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**Abstract** The effects of residence time and nutrient load on eutrophic conditions and phytoplankton variations were examined on six ponds highly influenced by agricultural activity in western Japan. Estimated residence times ranged from 7 to 2348 days, which decreased from summer to winter. The nutrient condition was totally in a N-rich and P-limited condition compared with the Redfield ratio in both summer and winter. The estimated budget of DIN, DIP and dissolved silica (DSi) suggests that the ponds acted as a sink of nutrients to the downstream environment throughout the year. Fluorescence was clearly higher in the shorter residence time ponds. It suggests that cyanobacteria with relatively low chlorophyll content were dominant in the longer residence time while other phytoplankton was dominant in the shorter residence time. The opposite trend in residence time and fluorescence from August to December suggests that the dominant primary producer changed from cyanobacteria to diatoms.

**Key words** agricultural reservoirs; eutrophic condition; phytoplankton; residence time; nutrient load