INVESTIGATE INTO THE CAUSE OF THE DIATOM ALGAL BLOOM IN DRINKING WATER SOURCE IN IRELAND

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Abstract - Vartry reservoir is a very important drinking water source in Ireland and consists of two connected parts the upper lake and the lower lake. Since 2013, Asterionella dominated diatom bloom has been occurring in spring which leads to the serious clogging of the slow sand filters in the Vartry water supply scheme. As a result, the potential shortage of drinking water exists. The availability of soluble reactive phosphorus (SRP) in the Vartry reservoir was quite low and remained stable during the studied period. Silica is required for the growth of diatom so the concentration of silica changed significantly during the diatom bloom. Nutrients were not the major reason for the diatom bloom in the reservoir and the limitation of silica existed in the upper lake in 2017. Stratification existed in the Vartry reservoir normally from May to August every year. The amount of diatom reduced obviously after the onset of thermal stratification. In 2017, the thermal stratification maybe the major reason for the end of diatom bloom. Daphnia, rotifer, copepods were the major zooplankton in the Vartry reservoir. In the lower lake, the peaked density of zooplankton in 2017 was 115 individuals/L which was much higher than that in 2016. Considering similar nutrient availability and thermal stratification condition in 2016 and 2017, grazing caused by the zooplankton can not only limit the growth of diatom but also delay the diatom bloom.

Key words - Diatom, Asterionella, Silica, Nutrients, thermal Stratification, zooplankton.