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REVIEW ARTICLE

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Determination of Zooplanktons by Using Laser Counters

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Optical Plankton Counter (OPC) provides a method for easy and fast listing of zooplankton based on their body size. It is and can be used in many marine environments and lakes. The OPC can be used to determine the size and structure zooplanktons lakes. But many difficulties arise when we compare OPC estimates of zooplankton abundance with traditional samples. OPC estimates can agree with, overestimate, or underestimate zooplankton abundance and biomass compared with traditional net samples. Many causes can attribute to discrepancies between net and OPC densities. Coincident counts, in which two or more particles are counted together as one large particle, are considered to be a big problem.

The next generation of the OPC, the Laser OPC or LOPC contains the necessary modifications to accurately count and list zooplankton in lakes with high particle abundance and reduce coincident counts. The LOPC is capable of distinguishing individual particles in a better way than the OPC could differentiate individual particles. Also, the LOPC directly measures water flow rate through the machine which results in accurate sample volume estimates.

There are ways to compare the plankton samples processed by microscope analyses with LOPC estimates:

- We can estimate the relationship between size of individual animals and species measured by the LOPC and traditional microscope measurements methods to find out which type of species of zooplankton are likely to be detected by the LOPC.

- We can analyze about how the abundance, and biomass estimates from LOPC compare with traditional microscope counts and calculated biomass of the same preserved net samples.

The LOPC generally gives very good estimates of fixed net sample zooplankton abundance across lakes. The variation in the comparison may be due to presence of other particles in preserved net samples. It is believed that phytoplankton does not affect comparison of zooplankton biomass estimates and that phytoplankton is not well detected by the OPC. It is also stated that in situ use of LOPC should be done cautiously.

The LOPC has also overcome the concerns of incorrect volume estimation and coincident counts that were present in its predecessor, the OPC. It is found that coincident counts influence the OPC counts of zooplankton abundance. There are no such problems present in the LOPC, and this suggests that the LOPC is accurately counting all particles in the water.

The LOPC and its lab circulator are currently used and can be used in the future with great confidence to analyze preserved net samples of zooplankton. While the LOPC may tend to underestimate some sizes compared with microscope measurements, it does so consistently without any random fluctuations, and does not significantly alter the total abundance or biomass estimates in most cases. It is also believed that that the LOPC contains many improvements, like the reduction in coincident counts, which allows for direct measurements of zooplankton size and density in situ.

Future studies using the LOPC may need to consider the presence of larger detrital or algal aggregates, which may confound estimates of zooplankton abundance. The presence in lakes of zooplankton and detrital aggregates and phytoplankton colonies will result in the need for further improvements of sampling strategies which will increase the reliability in the data from the LOPC. The ability of the LOPC to accurately estimate abundance and biomass of particles will make the LOPC a reliable and frequently used instrument for sampling of zooplankton communities in lakes.