

# **STRUKTUR DAN KOMPOSISI KOMUNITAS FITOPLANKTON DI WADUK SERMO, KULON PROGO, D.I. YOGYAKARTA**

**Della Putri Syalom**

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## **INTISARI**

Waduk Sermo adalah salah satu bendungan air di Yogyakarta yang menunjukkan status mutu air tercemar ringan menurut Indeks Pencemaran, serta berstatus tercemar sedang menurut STORET. Pencemaran tersebut akan berdampak terhadap organisme air, termasuk fitoplankton. Adanya perubahan karakteristik lingkungan seperti perubahan cuaca dan iklim yang diikuti dengan pola penanaman rumput kolonjono di sekitar Waduk Sermo mengakibatkan akumulasi nutrisi berlebih yang dapat mengganggu stabilitas komunitas fitoplankton yang sensitif dan memiliki toleransi berbeda-beda terhadap faktor lingkungannya. Oleh karena itu, penelitian ini bertujuan untuk mempelajari komposisi, densitas dan distribusi komunitas fitoplankton, status trofik dan indeks similaritas perairan Waduk Sermo, serta hubungan antara kelimpahan fitoplankton, konsentrasi klorofil-a, dan faktor fisikokimia di Waduk Sermo.

Digunakan metode *non-random purposive sampling* dengan lima titik sampling, sebanyak tiga ulangan tiap titik sampling. Tahapan kerja di lapangan meliputi pencuplikan dan preservasi plankton, pengukuran parameter fisikokimia, serta pengambilan sampel air untuk uji nutrisi dan klorofil-a. Selanjutnya, di laboratorium dilakukan pengamatan, identifikasi, perhitungan cacah individu, dan pengolahan data fitoplankton, pengujian uji nitrat, fosfat, dan amonia, serta konsentrasi klorofil-a. Penelitian ini menunjukkan hasil bahwa komposisi komunitas fitoplankton Waduk Sermo tersusun atas alga diatom *pennate*, alga diatom *centric*, alga koloni, alga filamen, alga unisel, dan dinoflagellata. Alga koloni dengan *Microcystis* spp. yang menjadi spesies dengan frekuensi dan densitas tertinggi yang menyusun 98-99% komunitas fitoplankton perairan Waduk Sermo. Waduk Sermo berada pada tingkat eutrofik berdasarkan kelimpahan fitoplankton, tetapi berada pada tingkat hipereutrofik berdasarkan kadar fosfat dan konsentrasi klorofil-a. Namun, berdasarkan kadar nitratnya menunjukkan kategori perairan oligotrofik. Diketahui bahwa berdasarkan CCA, kelimpahan alga koloni menjadi *proxy point* yang dapat merespon baik seluruh variasi parameter lingkungan di seluruh titik sampling, terkhusus di TS 3 dan TS 4.

**Kata kunci:** eutrofik, klorofil-a, nutrisi.

## **STRUCTURE AND COMPOSITION OF PHYTOPLANKTON COMMUNITY IN SERMO RESERVOIR, KULON PROGO, D.I. YOGYAKARTA**

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### **ABSTRACT**

Sermo Reservoir is one of the dams in Yogyakarta that indicated mild-polluted by Pollution Index and mid-polluted by STORET method. Pollutants that occur in the water bodies of the dam will impact the water organisms, including phytoplankton. The alteration in the environmental characteristics over time, including climate and weather, followed by the planting pattern of kolonjono grass around the Sermo Reservoir results in the accumulation of excess nutrients that can disrupt the stability of phytoplankton community which is sensitive and has different tolerances to their environment. Therefore, the objective of this study was to study the composition, density and distribution of phytoplankton community, to evaluate the trophic status and similarity index of Sermo Reservoir waters, as well as the relationship among phytoplankton abundance, chlorophyll-a concentration and physicochemical factors in Sermo Reservoir.

The non-random purposive sampling method was used in five sampling points with three repetitions for each sampling point. The study was conducted in the field including sampling and preserving plankton, measuring physicochemical parameters, and sampling the water samples for nutrients and chlorophyll-a tests. Observations, identification, individual counts, and data analysis are accomplished in the laboratory. The nutrients including nitrate, phosphate, and ammonia, as well as chlorophyll-a concentration are tested in the lab. Results show that the composition of the phytoplankton community in Sermo Reservoir consists of pennate diatom algae, centric diatom algae, colony algae, filament algae, unicellular algae, and dinoflagellates. Colony algae with *Microcystis* spp. as the highest frequency and density, making up 98-99% of the phytoplankton community in Sermo Reservoir waters. Sermo Reservoir is a eutrophic level based on the phytoplankton's abundance yet it is a hypereutrophic based on phosphate and chlorophyll-a concentrations. However, based on its nitrate concentration, it shows as an oligotrophic. CCA ordination shows that colony algae is the proxy point that responds well to all variations of environmental parameters in all sampling points, especially at TS 3 and TS 4.

**Keywords:** chlorophyll-a, eutrophic, nutrient.