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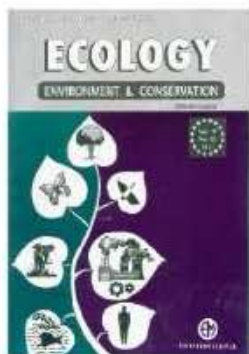
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[STUDY OF CONCENTRATIONS OF HEAVY METALS CADMIUM TRAPPED IN PORITES LUTEA SKELETON IN KONDANG MERAK, EAST-JAVA, INDONESIA](#)

OKTIYAS MUZAKY LUTHFI, SIGIT RIJATMOKO, ANDIK ISDIANTO, MUHAMMAD ARIF ASADI, DADUK SETYOHADI, ALFAN JAUHARI, ALI ARMAN LUBIS AND AGOES SOEGIANTO

[Get Abstract](#)

[UPTAKE OF METAL IONS FROM ARTIFICIAL GREY WATER BY BOTRYOCOCCUS SP.](#)

RADIN MAYA SAPHIRA RADIN MOHAMED, MUHAMMAD SAFWAN MISWAN, ADEL ALI SAEED AL-GHEETHI, AMIR HASHIM MOHD KASSIM, WUROCHEKKE ANWARUDDIN AHMED1 AND NURINA FITRIANI

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AMIT ARORA, SUKHJINDER SINGH SANDHU AND NARENDRA SINGH

[Get Abstract](#)

[POTENTIAL HEAVY METALS REMEDIATION TEST ON CHAETOCEROS CALCITRANS](#)

DWI CANDRA PRATIWI, NIKEN PRATIWI1, GUNTUR, RARASRUM DYAH K. AND AGOES SOEGIANTO

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[Vol 40, Issue 3, 2021](#)

[Vol 40, Issue 2, 2021](#)

[Vol 40, May Suppl. Issue, 2021](#)

[Vol 40, Issue 1, 2021](#)

[Vol 39, Issue 4, 2020](#)

[Vol 39, Nov Suppl. Issue, 2020](#)

[Vol 39, Issue 3, 2020](#)

[Vol 39, Issue 2, 2020](#)

[Vol 39, Issue 1, 2020](#)

[Vol 39, Feb Suppl. Issue, 2020](#)

[Vol 38, November Suppl Issue](#)

[Vol 38, Issue 4, 2019](#)

[Vol 38, Issue 3, 2019](#)

[Vol 38, August Suppl Issue](#)

[Vol 38, Issue 2, 2019](#)

[Vol 38, March Suppl Issue](#)

CADMIUM AND COPPER TOXICITY TEST AS GROWTH INHIBITOR OF SKELETONEMA COSTATUM

GUNTUR, DWI CANDRA PRATIWI, NIKEN PRATIWI, DEFRI YONA, RESPATI DWI S., RARASRUM DYAH K AND AGOES SOEGIANTO

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ACCUMULATION OF MERCURY AND ITS IMPACT ON THE CHLORIDE CELL OF GILLS OF TILAPIA (OREO CHROMIS NILOTICUS LINNAEUS, 1758)

KIKI SYAPUTRI HANDAYANI*, BAMBANG IRAWAN AND AGOES SOEGIANTO*

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REMOVAL OF POLLUTANTS OF TEXTILE INDUSTRY BY ELECTRO COAGULATION

AMIT ARORA, RAJESH KUMAR KAMBOJ AND ASHISH GUPTA

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THE EFFECT OF NUTRIENT ABUNDANCE ON DISTRIBUTION OF CYANO BACTERIA AND CHLOROPHYLL-A IN SEDATI WATER, SIDOARJO

LUTHFIANA APRILIANITA SARI, KUSTIAWAN TRI PURSETYO, SULASTRI ARSAD, ENDANG DEWI MASITHAH, EKO SETIAWAN AND MOCHAMMAD AFFANDI

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MECHANISM OF MASS TRANSPORT AND CALCULATION OF FREE ENERGY FOR THE ADSORPTION OF PB(II) ION BY ADSORBENT MADE FROM SOLID TOFU WASTE IMMOBILIZED ON SILICA SURFACE

HANDOKO DARMOKOESOEMO, EKO PRASETYO KUNCORO, GANDEN SUPRIYANTO AND YOSEPHINE SRI WULAN MAHUHARA

[Get Abstract](#)

EFFECT OF HEAVY METALS ON SUPER OXIDE DISMUTASE (SOD), MALONDIALDEHYDE (MDA), AND EPIDERMAL HISTOLOGY OF TUBIFEX SP. WORM

IRAWATI MEI WIDIASTUTI, ASUS MAIZAR SURYANTO HERTIKA, MUHAMMAD MUSA, DIANA ARFIATI AND AGOES SOEGIANTO

[Get Abstract](#)

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[Vol 37, Issue 3, 2018](#)
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[Vol 37, May Suppl. Issue 2018](#)
[Vol 37, Issue 1, 2018](#)
[Vol 36, Issue 4, 2017](#)
[Vol 36, Issue 3, 2017](#)
[Vol 36, Issue 2, 2017](#)
[Vol 36, Issue 1, 2017](#)
[Vol 35, Issue 4, 2016](#)
[Vol 35, Issue 3, 2016](#)
[Vol 35, Issue 2, 2016](#)
[Vol 35, Issue 1, 2016](#)
[Vol 34, Issue 4, 2015](#)
[Vol 34, Issue 3, 2015](#)
[Vol 34, Issue 2, 2015](#)
[Vol 34, Issue 1, 2015](#)
[Vol 33, Issue 04, 2014](#)
[Vol 33, Issue 03, 2014](#)
[Vol 33, Issue 02, 2014](#)
[Vol 33, Issue 01, 2014](#)
[Vol 32, Issue 04, 2013](#)
[Vol 32, Issue 03, 2013](#)
[Vol 32, Issue 02, 2013](#)
[Vol 32, Issue 1, 2013](#)
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[Vol 31, Issue 3, 2012](#)
[Vol 31, Issue 2, 2012](#)
[Vol 31, Issue 1, 2012](#)
[Vol 30, Issue 4, 2011](#)
[Vol 30, Issue 3, 2011](#)
[Vol 30, Issue 2, 2011](#)
[Vol 30, Issue 1, 2011](#)
[Vol 29, Issue 4, 2010](#)
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[Vol 29, Issue 2, 2010](#)
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[Vol 26, Issue 3, 2007](#)
[Vol 20, Issue 02, 2001](#)
[Vol 20, Issue 01, 2001](#)
[Vol 19, Issue 03, 2000](#)
[Vol 19, Issue 01, 2000](#)

EFFECT OF WASTE GLASS POWDER ON VARIOUS PROPERTIES OF CONCRETE

AMIT ARORA, PARAMPREET KAUR AND VARINDER SINGH

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SMALL-SCALE CHICKEN SLAUGHTERHOUSE INDUSTRIES: PRODUCTION AND EFFLUENT QUALITY CHARACTERISTICS

JULIZA ABU BAKAR, RADIN MAYA SAPHIRA RADIN MOHAMED, MAHBOBA BAKARRADHI BAKER, ADEL ALI SAEED AL-GHEETHI AND NURINA FITRIANI

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EFFECTIVENESS OF MAGNETIC FIELD INDUCTION FROM SOLENOID COILS TO REDUCE LEADS (Pb) IN WASTEWATER

SURYANI DYAH ASTUTI, LAILIA ANGGRAINI, AMILIYATUL MAWADDAH, FADLI AMA AND PUSPA ERAWATI

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EFFECT OF PARTICLE SIZE OF HYDROXY APATITE BASED CORALAS ABSORBANT OF NICKEL CONTAMINANT

SISWANTO, DYAH HIKMAWATI, ZASKYA DWI ARIDHYANTI AND UMI KULSUM

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EVALUATION OF ALKALINE PECTIN LYASE OF PSEUDOMONAS SP. FOR TEXTILE INDUSTRY EFFLUENT MANAGEMENT

RITU SAHARAN AND KANTI PRAKASH SHARMA

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NOISE AND HEARING LOSS EXPERIENCE AMONG GROUND HANDLING WORKERS IN JUANDA AIRPORT SURABAYA

NUGRAENI AFFIANTI, NYILO PURNAMI AND RISA ETIKA

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THE CORRELATION BETWEEN TNF- ALPHA VALUE WITH HEARING THRESHOLD AT 4000 HERTZ AFTER EXPOSURE TO GUNFIRE OF NATIONAL POLICE ACADEMY IN EAST JAVA, INDONESIA

ISMELIA FADLAN, NYILO PURNAMI AND JENNY ENDANG BASHIRUDDIN

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THE ROLE OF CONTINUOUS MODERATE EXERCISE ON HSP70 EXPRESSION AND THE TRANSFORM CELL NUMBER ON ORAL SQUAMOUS CELL MUS MUSCULUS INJECTED BY BENZOPYRENE

ANIS IRMAWATI, SANTIKA RENTIKA HADI, ABDUL HARIS, RETNO PUDJI RAHAJU, THERESIA INDAH BUDHY AND NOOR FAIZAH BALQIS

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ASSESSMENT OF SORPTION POTENTIAL OF PADDY STRAW BIOCHAR FOR LEAD (PB²⁺) REMOVAL FROM WASTEWATER

DIPAKSHI SHARMA, SARASWATI SAINI, DINESH KUMAR, INDERPREET KAUR AND SATWINDERJEET KAUR

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CORRELATION BETWEEN REACTIVE OXYGEN SPECIES WITH NOISE INDUCED HEARING LOSS IN AUTOMOTIVE VOCATIONAL SCHOOL STUDENT

VERA MELYANI, NYILO PURNAMI, RIZKA FATHONI PERDANA, DHANY ARIFianto AND AINUN NADIROH

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BIO PROSPECTING OF CELLULOLYTIC AND BIO SURFACTANT PRODUCING BACTERIA FOR ORGANIC WASTE TREATMENT

ALMANDO GERALDI, NI'MATUZHROH, AKEN PUTI WANGUYUN, SUCIPTO HARIYANTO, BRIGITA NUR DIYAN AGUSTIANA, ALIFAH NASTITI, RIZQIA NURUL ALFIYANITA, INDRA GUMILAR, TESALONIKA TETYA VIRGINIA, SITI RIZQIYATUL MUKARROMAH, ANNISA DWI SAVITRI, ERNA ERVIANA NADHIFA, KHAF

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UNDERSTANDING PESTICIDE DEGRADING-MICROBE COMMUNITY USING MOLECULAR APPROACHES

AKEN PUTI WANGUYUN AND ALMANDO GERALDI

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GEO CHEMICAL EVALUATION OF HEAVY METAL POLLUTION IN THE SOIL OF THE ARANI TALUK OF TAMIL NADU, SOUTH INDIA

P. MOHANA, P.M. VELMURUGAN AND M. JAYAPRAKASH

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UTILIZATION OF FISH AND EGG SHELL WASTE AS LIQUID FERTILIZERS IN AN EFFORT TO REDUCE ENVIRONMENTAL POLLUTION AND IMPROVE SOYBEAN YIELD

JAJUK HERAWATI, INDARWATI, TATUK TOJIBATUS SAADAH AND RISTANI WIDYA INTI

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TECHNICAL ASPECT OF A CENTRALIZED DOMESTIC WASTE WATER MANAGEMENT SYSTEM IN SUKOLILO DISTRICT, SURABAYA, INDONESIA

DWI AGUSTIANG NINGSIH, EDDY SETIADI SOEDJONO AND NURINA FITRIANI

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EXAMINATION OF COMBUSTION PROCESS OF HARD COAL AND PREDRIED LIGNITE BLENDS

AMIT ARORA, HALINA PAWLAK-KRUCZEK, MARCIN BARANOWSKI, MARCIN DEBOWSKI, KRYSZTIAN KROCHMALNY, LUKASZ NIEDZWIECKI AND JAKUB MULARSKI

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PROTECTIVE EFFECT OF OKRA PODS METHANOL EXTRACT AGAINST LEAD ACETATE-INDUCED TESTICULAR TOXICITY IN MICE

LISTIJANI SUHARGO, BRILIAN RATNA WATI AND SRI PUJI ASTUTI WAHYUNINGSIH

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POLLUTION ABATEMENT THROUGH REUSE OF TWO BYPRODUCTS OF THERMAL POWER PLANT-WASTEWATER AND FLYASH AS AN IRRIGANT AND FERTILIZER

AFROZA AKHTER, ABDUL RASHID DAR, MOHAMMAD RAFIQ WANI, RAZIA PARVEEN REYAZ-UL-REHMAN, NASEER HUSSAIN SHAH AND ARIF INAM

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ADSORPTION OF Pb(II) FROM AQUEOUS SOLUTION USING MIXTURE OF TOFU SOLID WASTE AND BENTONITE

EKO PRASETYO KUNCORO, MOCHAMAD ZAKKI FAHMI, FADLI AMA, ISNI ARLIYANI AND MUHAMMAD SYAIFUDDIN

EVALUATION OF ANTIOXIDANT PROPERTIES OF CURCUMIN FOR THE MANAGEMENT OF LEAD EXPOSED IN MICE

SUGIHARTO, WIN DARMANTO, SRI PUJI ASTUTI, CHERYL ATIRA, PUTRI OLIVIA AND YANI MARTHA

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APPLICATION OF CELLULOSE ACETATE-TIO₂ HOLLOW FIBER PHOTO CATALYTIC MEMBRANE COMPOSITE FOR PROFENOFOS DEGRADATION

SITI WAFIROH, ASTRID MAULIDINA WIBIARISKY AND ABDULLOH

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BIODIVERSITY OF PHYTO PLANKTON OF SIKAM RESERVOIR FROM RAJURA, DISTRICT- CHANDRAPUR, MAHARASHTRA STATE(INDIA)

S.A. DHOBLE, Y.B. GEDAM AND M.B. WADEKAR

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REMOVAL OF CADMIUM FROM ELECTROPLATING INDUSTRY WASTE WATER USING ADSORBENT FROM SOLID WASTE OF AGAR INDUSTRY

NURUL ALVIA ISTIQOMAH, EKO PRASETYO KUNCORO, THIN SOEDARTI AND SALAMUN

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QUALITATIVE EVALUATION OF SOIL PARAMETERS IN THE VICINITY OF PAPER INDUSTRY FROM SIRPUR KAGHAZNAGAR BLOCK, ADILABAD DISTRICT, TELANGANA, INDIA

HARISH KUMAR AGRE, VENKATESHWARLU C.H. AND K. SIREESHA

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THE EFFICACY OF POMEGRANATE EXTRACT (PUNICA GRANATUML.) AND ELLAGIC ACID ON THE EXPRESSION OF VEGF AND ORALCANCER CELLS APOPTOSIS OF MUS MUSCULUS DUE TO BENZOPYRENE INDUCTION

SRI HERNAWATI AND ANIS IRMAWATI

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MARINE LITTER CHARACTERIZATION ON THE EASTERN COAST OF SURABAYA CITY, EAST JAVA, INDONESIA: CASE STUDY OF CUMPAT BEACH AND KENJERAN BEACH

BIEBY VOIJANT TANGAHU, ANAK AGUNG GDE KARTIKA, DIAN SAPTARINI, FEBRURIYANA PIRADE AND TRIADNA FEBRIANI AABIDAH

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IMPACT OF COPPER AND LEAD ON THE WATER QUALITY AND GROWTH OF LEMNA MINOR L. IN MACRO PHYTE PONDS

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JUNAIRIAH, NI'MATUZAHROH, NABILAH ISTIGHFARI ZURAI DASSANA AZ AND LILIS SULISTYORINI

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THE EFFECT OF NUTRIENT ABUNDANCE ON DISTRIBUTION OF CYANOBACTERIA AND CHLOROPHYLL-A IN SEDATI WATER, SIDOARJO

LUTHFIANA APRILIANITA SARI^{1*}, KUSTIAWAN TRI PURSETYO², SULASTRI ARSAD³,
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ABSTRACT

Cyanobacteria are algae that are dominated by Harmful Algal Blooms group (HABs). The phenomenon of farmed fish mortality due to HABs has occurred in several Asian countries, such as Korea, Japan, and the Philippines in 2004. HABs phenomenon occurs due to the emergence of excessive nutrient pollution in the waters. One of the waters around Surabaya is Sedati waters where the waters of the estuary of the 10 rivers that are in the waters around them. The results showed an average BOD value results in March (22.86 mg. L⁻¹) and April (23.86 mg. L⁻¹). Density of plankton March was 84.533 cells mL⁻¹ and in April 10,086,667 cells. mL⁻¹. A chlorophyll concentration level in March (0.05 mg. L⁻¹) and April (0.07). These results are expected because organic and inorganic materials that exist in waters Sedati is a nutrient for plankton growth.

KEY WORDS: East Beach of Surabaya, Plankton, Estuary, Pigment

INTRODUCTION

Cyanobacteria algae phytoplankton is included in the group Cyanobacteria Harmful Algal Blooms (HABs). Harmful cyanobacteria have a negative significant impact on socio-economic and ecological conditions of fisheries, agriculture, tourism, water quality and habitat (Gilbert, 2013; Carmichael and Boyer, 2016). Phytoplankton cyanobacteria produce toxins (cyanotoxins) that can cause acute or chronic conditions on the health of mammals (including humans) and other organisms Eigemann *et al.* (2018) and Lipi (2018) states that the poison possessed harmful algal species of marine animals to

accumulate through the food chain. Toxic algae that are harmful to one is Paralytic shellfish poisoning. Paralytic shellfish toxins have toxic called anatoxina. The toxic is predominantly owned by the cyanobacterium *Microcystis* genus are known to produce microcystin. Another genus that has toxic cyanobacteria *Anabaena* (Fischer *et al.*, 2005).

Awareness of the impact of cyanobacteria phytoplankton increased so that research activities aimed to monitor the distribution and density of phytoplankton especially cyanobacteria produce toxins potentially harmful to the health of organisms and degrade water quality. The distribution and density of plankton in the waters are affected by

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several environmental parameters and physiological characteristics. Distribution and density of plankton change the dynamic on many levels as a response to changes in environmental conditions of physical, chemical, and biological (Suthers and Rissik, 2008).

This research was carried out in Sedati waters which have changes in environmental conditions of physics, chemistry, and biology because it is the estuary of the Dadapan river. Approximately 10 rivers flow into sedati waters, resulting in various physical-chemical, geological and biological processes that are controlled by the tidal power and run-off of fresh water from these rivers (Sari *et al.*, 2018). As a result of the process, sedati waters which are estuarine regions have a lot of organic material intake. This intake is a nutrient that is beneficial for plankton growth. Biology in sedati waters has a community structure, one of which is sea cucumber (Winarni *et al.*, 2014). The community structure has a distribution index ranging from high to low, none of which is very high.

MATERIALS AND METHODS

Tools and materials

The research material used was plankton while the research materials used were 4% formalin (Brataco), distilled water (Brataco), alcohol (Brataco) and lugol (Brataco).

The tool used in the research were sample bottles, bottle insulation, plastic clips, gel ice and Styrofoam which were tools for sampling equipment. The electronic devices used during sampling were GPS, refractometer, pH meter, and AZ 8402 Dissolved Oxygen Meter. Tools at the laboratory were: measuring cup, Erlenmeyer, dropper pipette, volume pipette, microscope, tissue, hand glove, mask, homogenizer, hand tally counter, 25X American autoclave, hemocytometer, Sedgwick-Rafter cell, Spectrophotometer, Hettich EBA-20 centrifuge, hot plate stirrer, Ohaus PA 2102 digital scales, OHAUS digital scales and Analytical Balance PA41.

Method

The survey method used in this research was the method of field observations conducted in the Sedati waters, the results were analyzed in the laboratory.

A. Determination stations (locations)

Before performing the sampling, in specified areas or sampling site. Samples of plankton and water were done in five (five) stations and 3 points in the waters around Sedati. Sampling was conducted every month during the months of March and April to see the changes in fertility waters when rainfall is high, medium and low. Rainfall data based on information from the website of the Meteorology, Climatology, and Geophysics. The identification and measurement of chlorophyll a plankton sample that was obtained were conducted in the Laboratory of the Faculty of Fisheries and Marine Dry Airlangga University Surabaya, and water quality samples were measured at the Faculty of Public Health Airlangga University.

B. Sampling

Plankton and water sampling is done at each sampling site. Sampling of microalgae (phytoplankton) using a plankton net with a diameter of 10 μm . Zooplankton sampling using a plankton net with a diameter of 80 μm .

C. Identification and Counting Plankton Density

Plankton identification based on morphology was observed with a microscope. Identification of phytoplankton based guide the identification of plankton used Methods for the study of marine

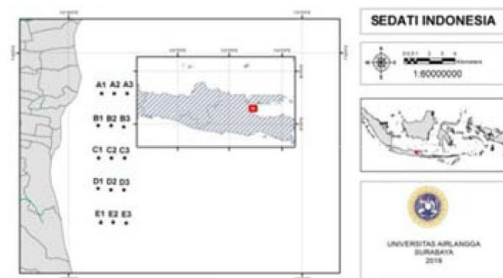


Fig. 1. Sampling sites in Sedati waters, Sidoarjo.

A1	:	Latitude -7.361540° Longitude 112.856740°
A2	:	Latitude -7.361830° Longitude 112.865816°
A3	:	Latitude -7.362030° Longitude 112.874892°
B1	:	Latitude -7.384980° Longitude 112.854337°
B2	:	Latitude -7.385400° Longitude 112.863506°
B3	:	Latitude -7.385650° Longitude 112.872581°
C1	:	Latitude -7.407540° Longitude 112.854777°
C2	:	Latitude -7.407730° Longitude 112.863733°
C3	:	Latitude -7.408080° Longitude 112.873099°
D1	:	Latitude -7.430150° Longitude 112.854275°
D2	:	Latitude -7.430590° Longitude 112.863373°
D3	:	Latitude -7.430840° Longitude 112.872664°
E1	:	Latitude -7.453680° Longitude 112.856253°
E2	:	Latitude -7.453880° Longitude 112.865259°
E3	:	Latitude -7.454090° Longitude 112.874416°

benthos (Eleftheriou, 2013), Atlas of Marine Zooplankton 1 Straits of Magellan amphipods, Euphausiids, Mysids, ostracods, and Chaetognaths (Guglielrno and Ianora, 1997), Identifying marine phytoplankton (Thomas, 1997), Plankton: a guide to Reviews their ecology and monitoring for water quality (Suthers and Rissik, 2008), and Algae (Barsanti and Gualtieri, 2014),

D. Water quality

Chlorophyll levels were measured its using the method of Vonshak (1997).

In addition to chlorophyll, the observed supporting were the concentration of Biochemical Oxygen Demand (BOD), dissolved oxygen (DO), temperature, pH, brightness, and salinity. Measurement of dissolved oxygen concentration and temperature of the water is done by using AZ 8402 Dissolved Oxygen Meter. The measurement of pH and salinity in a row using a pH meter and a refractometer respectively. Measurement parameters of this investigation were conducted directly in the sampling location. Water quality measured includes temperature, brightness, depth, DO and pH. BODs' Measurement was done in the Laboratory of the Research and Standardization Agency (BARISTAND), Surabaya using the

Indonesian National Standard (SNI) 06-6989.72: 2009.

RESULTS

Data findings of Biochemical Oxygen Demand (BOD) Sidoarjo Sedati waters present in Figure 1. Data findings of in total plankton Sidoarjo Sedati waters are presented in Table 1. Data findings of in chlorophyll a in March and April in Sidoarjo Sedati waters are presented in Figure 2. Data findings of water quality parameters in Sidoarjo Sedati waters are presented in Figure 3.

Algae are organisms that normally is in the aquatic ecosystem. They are the producers of the food chain system. In general, large algae microscopic, but some macroscopic algae are mostly harmless. Algae become dangerous when the rate of increase of growth beyond normal limits (blooming). Algae also are dangerous when the presence of toxic algae cannot be controlled. One class of harmful algae is a group of cyanobacteria. Scale cyanobacteria problem in Asia has increased in recent decades due to the increased use of agricultural fertilizers, aquaculture development, and population growth.

The results showed lower levels of BOD

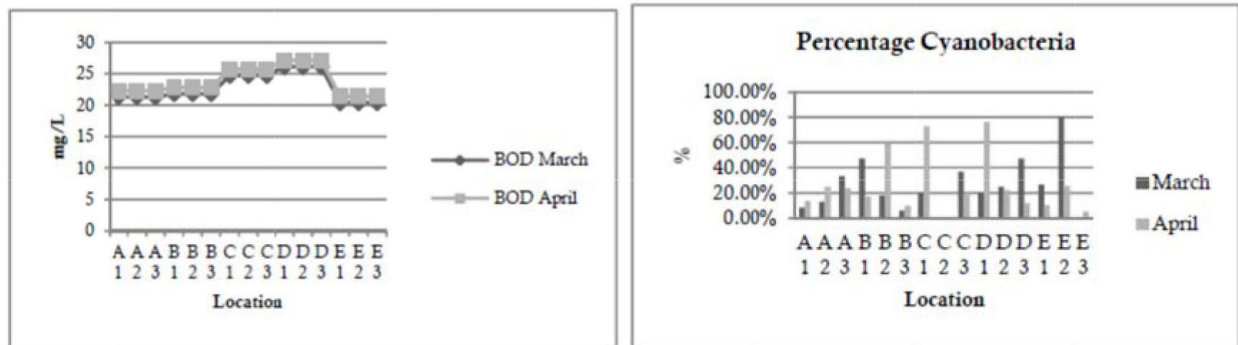


Fig. 1. a. Graph Biological Oxygen Demand (BOD); b. Percentage of cyanobacteria in March and April

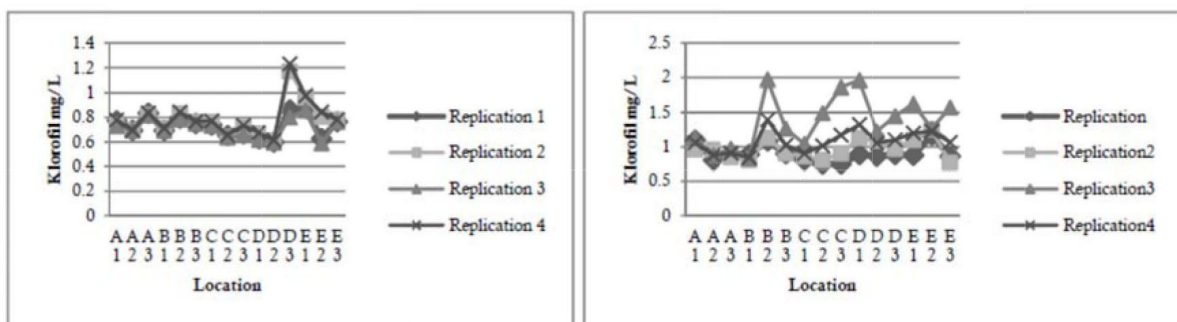


Fig. 2. a. Chlorophyll A in March; b. Chlorophyll A in April

Table 1. Total plankton

Zone	Total Plankton × 10 ² (cells. mL ⁻¹)	
	March	April
A 1	925	120,000
A 2	800	173,000
A 3	525	60,000
B 1	875	43,000
B 2	3,530	98,000
B 3	500	0
C 1	550	13,000
C 2	675	30,000
C 3	525	300,000
D 1	525	75,000
D 2	450	280,000
D 3	825	43,000
E 1	725	205,000
E 2	775	63,000
E 3	475	10,000

appropriate Quality standards based on the Minister of Environment Decree No. 51 of 2004 is <20 mg / L higher than the average value of the results in March (22.86) and April (23.86). BOD is a test to determine the quality of wastewaters of both organic and inorganic. This waste is a nutrient that plays a role in the growth of plankton in general and specifically Cyanobacteria. Density of plankton in total in March of 84.533 cells / mL and April 10,086,667 cells / mL. The chlorophyll concentration level in March (0:05 mg / L) and April (0:07). These results are expected because organic and inorganic

materials that exist in waters Sedati is a nutrient for plankton growth. Other water qualities such as temperature (24.6 - 36.7 ° C), Transparency (72-164 cm), pH (7.84 - 8:29) and DO (4. 3 - 13.5 mg.L⁻¹) are still in Quality standards based on the Minister of Environment Decree No. 51 of 2004.

Nitrogen is one of the elements needed by phytoplankton in the formation of the body structure of organisms primarily to synthesize protein (Spellman, 2003). Meanwhile, the role of nitrogen is as a molecular basis for the formation of chlorophyll, and nitrogen deficiency can even lead to the inhibition of the synthesis of chlorophyll (Riyono, 2007).

Nitrogen is absorbed in the form of nitrite, nitrate, and ammonium, nitrogen compounds are then converted into an amino group (glutamic acid) (Setiapermana, 2006; Kadim and Arsad, 2016). This amino group will be subdivided into nitrogen molecules in the manufacture of 5-aminolevulinic. The 5-aminolevulinic molecule is then converted again in some of the reactions to be Mg-protoporphyrin IX (the basic structure of chlorophyll) and finally to chlorophyll-a (Wettstein *et al.*, 1995) so that the nitrogen concentration greatly affect the concentration of chlorophyll, especially chlorophyll-a. (Magumba *et al.*, 2013). In fact, the amount of nitrogen content equal to the amount of chlorophyll (Bojovic and Markovic, 2009).

Chlorophyll-a in phytoplankton pigment is

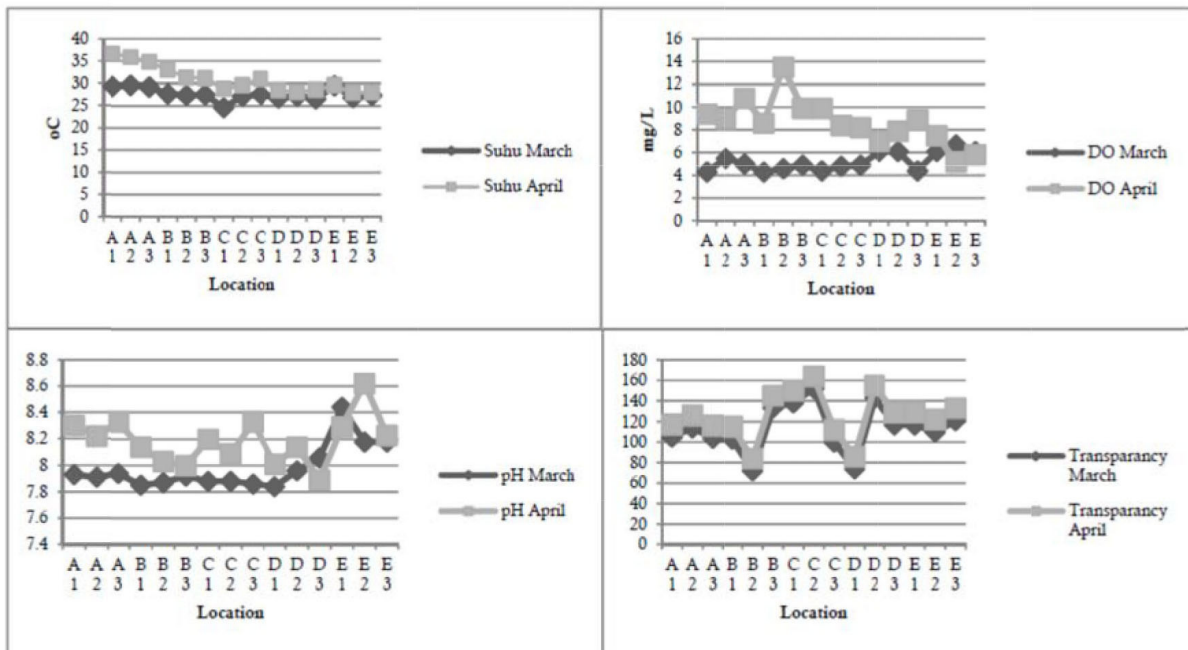


Fig. 3. Graph water quality indicators (Temperature, Dissolved oxygen, pH, and Transparency)

active in the process of photosynthesis (Marlian, 2016). Chlorophyll-a concentration in water can be used as a visual parameter of the amount of biomass of phytoplankton (Aryawati *et al.*, 2014). Lot sizes (biomass) phytoplankton at certain water can be used as an indication of the pollution of the waters (Chen *et al.*, 2017). So indirectly chlorophyll-a may be one parameter indicator for water pollution or water primary productivity (Safitri, 2014; Effendi *et al.*, 2012).

CONCLUSION

Cyanobacteria algae group which causes environmental, economic, or human health, an increase in the frequency, duration, and geographic area for nutrient pollution. The results showed an average BOD value results in March (22.86) and April (23.86). Density of plankton in total in March of 84.533 cells / mL and April 10,086,667 cells. mL⁻¹. A chlorophyll concentration level in March (0:05 mg. L⁻¹) and April (0:07). These results are expected because organic and inorganic materials that exist in waters Sedati is a nutrient for plankton growth.

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REFERENCES

- Aryawati, R., Isnaini, and Surbakti, H. 2014. *Hubungan Konsentrasi Klorofil-A Dan Kandungan Hara Di Perairan Selat Bangka*. Seminar Nasional MIPA. Program Studi Ilmu Kelautan FMIPA. Universitas Sriwijaya. Palembang. 1-7.
- Barsanti, L. and Gualtieri, P. 2014. *Algae*. CRC Press. Taylor & Francis. 344p
- Bojovíæ, B. and Markovíæ, A. 2009. Correlation Between Nitrogen and Chlorophyll Content In Wheat (*Triticum aestivum* L.). *Kragujevac Journal of Science*. 31 : 69-74.
- Carmichael, W. W. and Boyer, G. L. 2016. Health impacts from cyanobacteria harmful algae blooms: Implications for the North American Great Lakes. *Harmful Algae*. 54 : 194-212.
- Chen, H., W. Zhou, W. Chen, W. Xie, L. Jiang, Q. Liang, M. Huang, Z. Wu and Wang, Q. 2017. Simplified, Rapid, and Inexpensive Estimation of Water Primary productivity Based on Chlorophyll Fluorescence Parameter Fo. *Journal of Plant Physiology*. 211 : 128-135
- Effendi, R., P. Pallon, dan N. Ihsan. 2012. Analisis Konsentrasi Klorofil-A Di Perairan Sekitar Kota Makassar Menggunakan Data Satelit *Topexiposeidon*. *Jurnal Sains dan Pendidikan Fisika* 8 (3) : 279-285.
- Eigemann, F., Schwartke, M. and Schulz-Vogta, H. 2018. Niche separation of Baltic Sea cyanobacteria during bloom events by species interactions and autecological preferences. *Harmful Algae*. 72: 65-73.
- Eleftheriou, A. 2013. *Methods for the Study of Marine Benthos*. Wileyblackwell. 502p.
- Fischer, W.J., Altheimer, S., Cattori, V., Meier, P.J., Dietrich, D.R. and Hagenbuch, B. 2005. Organic anion transporting polypeptides expressed in liver and brain mediate uptake of microcystin. *Toxicology and Applied Pharmacology*. 203 : 257-263.
- Gilbert, P. M. 2013. Harmful Algal Blooms in Asia: an insidious and escalating water pollution phenomenon with effects on ecological and human health. *ASIA Network Exchange* 21 (1) : 1-17
- Guglielmo, L. and A. Ianora. 1997. *Atlas of Marine Zooplankton 1 Straits of Magellan Amphipods, Euphausiids, Mysids, Ostracods, and Chaetognaths*. Springer. 263p
- Kadim, M.K. and Arsad, S. 2016. Distribution and Abundance of Microalgae Based on Coastal Characteristic and Ecology in Bone Bolango Coastal Region. *Asian Jr. of Microbiol. Biotech. Env. Sc.* 18 (2) : 395-401.
- Lipi. Waspada alga ganggang beracun di perairan indonesia. (<http://sivitas.lipi.go.id/zain003>)<http://lipi.go.id/siaranpress/waspada-alga-ganggang-beracun-di-perairan-indonesia/13557>. 2012. 02 Februari 2018. 2 p.
- Magumba, D., Maruyama, A., Takagaki, M., Kato, A. and Kikuchi, M. 2013. Relationships between Chlorophyll-a, Phosphorus and Nitrogen as Fundamentals for Controlling Phytoplankton Biomass in Lakes. *Environmental Control in Biology*. 51(4) : 179-185.
- Marlian, Neneng. 2016. *Analisis Distribusi Horizontal klorofil-A Sebagai Indikator Tingkat Kesuburan Perairan di Teluk Meulaboh Aceh Barat*. Sekolah Pascasarjana. ITB.
- Riyono, S.H. 2007. Beberapa Sifat Umum Dari Klorofil Fitoplankton. *Jurnal Oseana*. 32 (1) : 23-31.
- Safitri, N.M. 2014. Estimasi Distribusi Klorofil-A di Perairan Selat Madura Menggunakan Data Citra Satelit Modis dan Pengukuran In Situ Pada Musim Timur. *Journal of Life Science* 1 (2) : 117-126.
- Sari, L. A., Satyantini, W.H., Manan, A., Pursetyo, K. T. and Dewi, N. N. 2018. The identification of plankton

- tropical status in the Wonokromo, Dadapan and Juanda extreme water estuary. *IOP Conference Series: Earth and Environmental Science*. 137(1) : 012029.
- Setiapermana, Deddy. 2006. Siklus Nitrogen Di Laut. *Jurnal Oseana*. 31 (2) : 19-31.
- Spellman, F.R. 2003. *Water and Wastewater Treatment Plant Operations*. A CRC Company, Press LLC. New York. 468 pp.
- Suthers, I. M. and Rissik, D. 2008. *Plankton: A Guide to Their Ecology and Monitoring for Water Quality*. National Library of Australia Cataloguing-in-Publication entry. CSIRO Publishing. 273p
- Tomas, C.R. 1997. *Identifying Marine Phytoplankton*. Printed in The United States of America . 875p
- Vonshak, A. 1997. *Spirulina platensis (Arthrospira)*. *Physiology, Cell-Biology and Biotechnology*. Ben-Guion University of Negev. Israel. 43-66 pp.
- Wettstein, D.V., Gough, S. and Kannangara, C.G. 1995. *Chlorophyll Biosynthesis*. *The Plant Cell*. 7: 1039-1057.
- Winarni, D., Affandi, M., Masithah, E.D. and Kristanti, A. N. 2014. Struktur Komunitas Teripang di Pantai Timur Surabaya. *Jurnal Matematika dan Ilmu Pengetahuan Alam*. 117 (1).
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