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BENTHIC FORAMINIFERA AS INDICATORS
FOR WATER QUALITY OF CORAL REEFS ECOSYSTEM
IN BIDADARI AND RINGIT ISLANDS,
THOUSAND ISLANDS

Ling. Trop., 5, 1 (2011): 1-10.

Seribu Islands consist of islands and coral reefs which were built up by coral formation of Sunda shelf on Pleistocene. The Islands are reached by unique and high biodiversity. Coral reefs that live on around the Thousand Islands would affect the biotic and abiotic condition of the islands. Coral degradation would finally lead to decreasing of human prosperity because of the ecosystem changing. Coral reef condition could be identified early by foraminiferal recognition. This method has shed light on the benthic foraminifera as symbiont-bearing of coral reefs by FORAM (Foraminifera in Reef Assessment and Monitoring) Index. The objective of this study was to recognize the abundance of benthic foraminifera as bioindicator of coral reefs environment condition in Bidadari Island and Ringit Island of Thousand Islands. This study was held in Ringit Island and Bidadari Island of Thousand Islands on January 27 – 30, 2008. Result of this study showed that benthic foraminifera of Ringit Island were generally more abundant than Bidadari Island. That condition was in line with the water condition af each Island, especially for transparency. Transparency of Ringit Island was recorded at 9 to 10 m, higher than that of Bidadari Island that was recorded at 4 to 5 m. The environmental condition of Ringit Island was more conducive to coral reefs growth within FORAM index 8.24 to 8.29 than Bidadari Island (FORAM index between 7.02 – 7.51).

Keywords: foraminifera, FORAM Index, Ringit Island,
Bidadari Island, and Seribu Islands.

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THE APLICATION OF SYLVOFISHERY UPON
THE ENVIRONMENTAL PERCEPTION
IN THE NORTH SHORE OF SEMARANG CITY

Ling. Trop., 5, 1 (2011): 11-19.

Coastal area has a very important function for life, either through economy, social and environment. One of the most important factors for coastal environmental continuity is the mangrove forest. In general, the mangrove forest nowadays is in heavily damage condition, and that disturbs the environmental conservation. Because of that condition, the best solution for the coastal area conservation is the wanamina (sylvofishery). Wanamina (sylvofishery) is an integrated activity between brackish water fishery and mangrove forest cultivation at the same location. The research is held in the north shore of Mangunharjo Sub-district, Tugu District of Semarang city. The purpose of this research is to obtain the result from wanamina (sylvofishery) using Rhizophora, Avicennia, without mangrove and also Milkfish (Bandeng) using organic food. The research methods that used are field research and direct observation for 4 months. The experiment design used is random design complete with 3 treatments and 3 repetitions. The treatment applied in Rhizophora Mangrove, Avicennia Mangrove and (without mangrove). Obtained data is analyzed with balance design of variant analysis at 0.05% test level. The result obtained shows that the cultivated Milkfish (Chanos-chanos) in the location of Rhizophora give the best result next is the Avicennia and the last is the without mangrove.

Keywords: aplication, Sylvofishery, and
environmental perception.

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PERIPHYTON COMMUNITY AND AQUATIC PHYSICO-CHEMICAL CONDITION AS INDICATOR
OF WATER QUALITY OF UPSTREAM CISADANE RIVER, WEST JAVA

Ling. Trop., 5, 1 (2011): 21-32.

Cisadane River flows through ± 140 km, from Pangrango Mt. to Jawa Sea, with catchment area about 7,679.3 Ha. Cisadane River is used by local community to fulfill their daily need. Development of community activities along the river will influence the quality of water and river environment. The change of water quality and also the hydrological pattern will change the community structure of aquatic biota, such as periphyton. The aim of this research is to determine the quality of upstream of Cisadane River, based on community structure of periphyton and physico-chemicals of water quality. The observation was held monthly from June to November 2007 at three sampling sites (106°49'30"-106°52'00" W, 06°45'00"-06°46'30" S, ± 600 m usl). NSF-Water Quality Index was used to indicate the water quality physico-chemically, while saprobity classification and saprobity indices were used to evaluate the water quality biologically. The result show the physico-chemical and biological based evaluation. It is showed that the physico-chemical water quality of upstream Cisadane River is still in good condition. The 62 genera of periphyton community from the classes of Bacillariophyceae, Chlorophyceae, and Cyanophyceae, and Protozoa show that the river has low input of organic and inorganic materials.

Keywords: periphyton, upstream Cisadane River, and water quality.

DDC 615.951 2
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RESIDU POLIKLOROBIFENIL (PCB) DALAM AIR DAN SEDIMEN DI PERAIRAN ESTUARI CISADANE
POLYCHLOROBIPHENYL (PCB's) RESIDUE IN WATER AND SEDIMENT CISADANE ESTUARINE
Ling. Trop., 5, 1 (2011): 33-43.

Cisadane Estuarine is a fisheries source for local fisheries. Quality of the fisheries in this location depend on the environment for their live. Polichlorobiphenyl (PCB) is organochlorine compound beside has same toxic with pesticide, also have persisten toxicification in the nature. Observation on polychlorobiphenyl (PCB's) in water and sediment were conducted in July and November 2005. Water sampel as taken in 6 stations and sediment samples 13 stations wich found near the land. Propose of the study was to know pollution level of PCB residue. Concentration of PCB's residue were determined by Gas Chromatography – Hewlett Packard 5890 series II, equipped with Electron Capture Detector (GC-ECD). PCB residue measured as a total concentration compare with mix 30 compounds PCB in the standard. PCB's residues in water in July was between 10.273 and 22.534 ppt and in November between 1.115 and 66.174 ppt. In the sediment range PCB residue between 0.701 and 7.387 ppb, in July and in November between 0.703 and 19.326 ppb. Based on the average of the PCB residue in the water, the condition of Cisdane Estuarine was higher compared with Quality standard for marine life published by State Ministry for Population and Environment/No 51/2004, is 10 ppt.
Keywords: Poly chlorobifenil, gas Chromatography, and Cisadane Estuary.

DDC 639.32
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THE PATTERN STRUCTURE OF CURRENTS MOVEMENT AND ITS INFLUENCE ON FISH ABUNDANCE ORIENTATION IN THE BENGGALA STRAIT WATERS, BANDA ACEH
Ling. Trop., 5, 1 (2011): 45-52.

Abstract: Current pattern in the Benggala Strait waters is important to understanding, because to influence on material transport, chemical reaction, stability of water column and migration of marine organism. This current structure is useful to determine orientation the area concentrations of marine organism. Therefore, need a better knowledge about dynamic of current and its variability. The objective of research is to know and to analysis tends current structure of sea surface current and velocity distribution from the surface until the depth 500 m based on data records of ADCP. The Research of currents were carried out in the Benggala strait waters, Banda Aceh, on August 2005 by Research Vessel of Baruna Jaya VIII. Currents were measured by ADCP (Acoustic Doppler Current Profiler), which can measured the current with track system every station until depth of 500 m. ADCP instrument fill of sensor and capable measured the current velocity, current direction and depth simultaneously. Current data record by ADCP were be analysis and results show that a mean flow current to the south east and a clock wise circulation to leave the strait to offshore or Indian Ocean. Current velocity in Benggala strait is relatively strong with current velocity to reach more than of 1.5 m/second and current direction to the south west. Current pattern is also performance a main current that flow to the south west. Its current is tend to follow the tide pattern and is an indication of local effect in the western of strait.
Keywords: current, pattern, structure, Benggala Strait, and Banda Aceh waters.

DDC 628.440 4
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DETERMINATION OF THE CONCENTRATION OF COPPER ION AND LEAD ION LEACHED AFTER STABILIZATION/SOLIDIFICATION PROCESS USING PORTLAND CEMENT
Ling. Trop., 5, 1 (2011): 53-61.

In this study, wastewater used in the experiment is an artificial wastewater containing copper and lead with each concentration of 500 mg/L. Metal ions were precipitated as hydroxide compounds [Cu (OH_2, $Pb(OH)_2$] and sulfide compounds (CuS, PbS). The precipitate partly was direct leached tested and the other part was stabilized/solidified by using Portland cement. Furthermore, TCLP test (Toxicity Characteristic Leaching procedure) was done by using the Rotary Agitator with rotational speed 30 ± 2 rpm for 18 ± 2 hours. From the TCLP test results showed that the compounds of $Cu(OH)_2$ and $Pb(OH)_2$ leached without solidification process which carried out with Portland cement, both are 0.86 mg/L and 45.6 mg/L. While the compounds CuS, and PbS leached also without solidification process which carried out with Portland cement, are 424 mg L; and 159 mg L. When the compounds of $Cu(OH)_2$, CuS, $Pb(OH)_2$, PbS were stabilized/solidified with Portland cement at the ratio 1:1, apparently both of copper ions from $Cu(OH)_2$, and lead ions from $Pb(OH)_2$ did not experience leaching. In contrast to copper ions in the form of CuS, and lead ions in the form PbS, leaching was experienced at 3.56 mg/L and 1.16 mg/L. These values were still below the required quality standard for TCLP.
Keywords: wastewater, heavy metals, hazardous waste, and TCLP test.

DDC 628.445 64
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STUDY OF REGIONAL LANFILL DETERMINATION IN METROPOLITAN CITY
Ling. Trop., 5, 1 (2011): 63-72.

One of the main target of solidwaste policy is to achieve improved performance of solid waste management institutions and the development scheme of regional cooperation. An integrated soliwaste management in a metropolitan city is a need to solve problems of waste management,such as limited suitable landfill sites and environmental degradation causes unsupervised dumping in cross boundary system. It was identified that responsibilities among local governments in terms of managing or financing of final treatment site of solidwaste (TPA) has not been yet coordinated well, beside that decisions of regions impact compensation of TPA are difficult to be achieved. Therefore the regional cooperation among the cities for common purposes will greatly support for integrated planning. The purpose of this study is to get criterias for TPA determination considering characteristic area and planning integration. Research method for analysis data is descriptive comparative and first stage of the Analytic Hierarchy Process (AHP). The results of research shows that site selection should be based on regional hierarchy as alternatives for suitable site. In the case of Mamminasata regional landfill determination, the most suitable site is in the border area which had fulfilled the technical feasibility of SNI requirements but still need to consider integrated planning and impact prevention to urban cross boundary.
Keywords: solidwaste, regionalization, management, TPA, and cross boundary.

DDC 363.728 5
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TECHNICAL, ECONOMIC, AND ENVIRONMENTAL ANALYSIS ENERGY PRODUCTION POTENTIAL FROM MUNICIPAL SOLID WASTE
Ling. Trop., 5, 2 (2011): 111-119.

Various problems from existing municipal solid waste treatment induced MSW municipilities to find out the best choice of many kind available choice. The thermal convertion and anaerobic digestion as the components of some solutions insolid waste management were involved in five msw treatment alternative strategies. The fifth of alternative stragies were compared base on its thecnical, economic, and environment assessment. The technical assessment in term of capacity system to convert energy from MSW base on their efficiency process. Environmental assessment were carry out with emission and impact potential estimation.The avoided environmental impacts derived from energy recovery were calculated too. Economic assessment were accounted by involvedthe externality of global warming, acidification, eutrofication, andphotochemical oxidant savings for the waste treatment alternatives considered.The process parameters to calculate all of these aspek using publicly available data. The characteristics of treated MWS in SARBAGITA areawere used as input data. It was found that the combination of gasification and anaerobic digestion method (strategy_3) was the highest in energy recover, all optionscompared have lower environmental impacts than the baseline strategy and the strategy_5 (gasification) was the most environmentally feasible, strategy_1 (landfilling) was the most economically feasible, but, in aggregate strategy_3 (incineration) showed as the best choice.
Keywords: municiple solid waste, global warming, acidification, eutrophication, and photochemical oxidant.

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COPPER EFFECT TO GROWTH OF AQUATIC MICROALGAE, Isochrysis sp
Ling. Trop., 5, 2 (2011): 121-129.

Heavy metals enter aquatic ecosystem from different sources including domestic and industrial wastewaters, agricultural runoff, and release from contaminated sediments or atmospheric deposition. Heavy metal pollutant can affect aquatic organism's life. One of aquatic organisms which can be suffered is primary producer, microalgae. Heavy metal which highly detected in waters is copper. Copper is micronutrient which important in photosynthetic process because copper is an essential as a component of enzyme and electron transport chain. Bui it certain dosage, copper can be toxic for organism. Isochrysis sp is a dominant microalgae in aquatic ecosystem. In this research, we compared copper effect than cadmium into growth of marine microalgae, Isochrysis sp. IC_{50}-96 h of cadmium as reference toxicant was 1.287 mgL^{-1} Cd whereas IC_{50}-96h of copper to growth of Isochrysis sp was 0.0372 mgL^{-1} Cu, respectively. Both cadmium and copper were inhibited growth of Isochrysis sp. From IC_{50}-96 h value, it could be concluced that copper was more toxic to Isochrysis sp than cadmium. The toxicity of copper to Isochrysis sp was 34 times stronger than cadmium. It is estimated that at concentration of 0.018 mgL-1 copper does not show observable effect (NOEC) to Isochrysis sp. Mean while the lowest observable effect of copper (LOEC) to Isochrysis sp was at concentration of 0.032 mg $L^{-1.}$
Keywords: cadmium, cooper, Isochrysis sp, and toxicity.

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POPULATION DYNAMICS OF BENTHIC FORAMINIFERA IN CIREBON COASTAL WATERS
Ling. Trop., 5, 2 (2011): 131-141.

Sukalila river flows through the capital city of Cirebon. The municipal of Cirebon is the crowded area in the city. Water condition in the estuary and along the neighbourhood coastal water were affected by effluent which flows from settlements in the upper land and also from fish and salt ponds along the coastal land. Benthic foraminifera as the element of soft bottom community is used widely as bioindicator on ocean health monitoring. The research aim was to investigate the impact of human activities to benthic foraminifera. Two kinds of sampling activities were carried out, lateral and vertical sampling. Van Veen Grab was used on horizontal sampling and two inch diameter of pvc pipe was used on vertical sampling. Staining was carried out to differentiate between living and dead specimen. Benthic foraminifera in research site was tiny (< 0,125 mm) and thinner compare to Jakarta Bay specimens, the diversity indices were also lower. Population dinamics in horizontal distribution and the subsisted of abnormal test were related to water quality ie. acidity and dissolved oxygen in the bottom waters. Vertical distribution pattern was represented the benthic foraminiferal development in the century, which shows that there are trend of population decreased on Asterorotalia trispinosa and Cribrononion hispidulus as shallow open shelf taxa, but there are the increased trend of Ammonia beccarii and arenaceous taxa which have higher adaptation ability.
Keywords: dynamics, foraminifera, benthic, and coastal water.