

**LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : PROSIDING**

Judul Karya Ilmiah : Marine ecology conditions at Weda Bay, North Maluku based on statistical analysis on distribution of recent foraminifera

Jumlah Penulis : 3 Orang (**Anis Kurniasih**, Septiriono Hari Nugroho and Reddy Setyawan)

Status Pengusul : Penulis ke-1

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Total = (100%)	23,2	23,2	23,2
Nilai Pengusul = (60% x 23,2) = 13,92			

Semarang,

Reviewer 2



Rinal Khaidar Ali, ST, M.Eng.
NIP. 198505042018031001
Unit Kerja : Teknik Geologi FT UNDIP

Reviewer 1



Dr. Dian Agus Widiarso, ST, MT
NIP. 197608122010121002
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- Kecukupan dan kemutakhiran data/informasi dan metodologi:**
Data diperoleh dan diolah dengan metode yang mutakhir, akan tetapi ada beberapa referensi yang kurang update terutama yang berkaitan dengan dengan klasifikasi foraminifera.
- Kelengkapan unsur dan kualitas terbitan:**
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Semarang,

Reviewer 1



Dr. Dian Agus Widiarso, ST, MT
NIP. 197608122010121002

Unit Kerja : Teknik Geologi FT UNDIP

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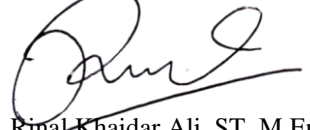
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Rinal Khaidar Ali, ST, M.Eng.
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Marine ecology conditions at Weda Bay, North Maluku based on statistical analysis on distribution of recent foraminifera

[Kurniasih, Anis^a](#); [Hari Nugroho, Sepriono^b](#); [Setyawan, Reddy^a](#) [Save all to author list](#)^a Geologial Engineering Diponegoro University, Semarang, 50275, Indonesia^b Deep Sea Research Centres-LIPI, Bandung, 16003, Indonesia1 27th percentile
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Analysis of foraminifera in geology, usually being used to find the age of rocks/ sediments and depositional environment. In this study, recent foraminifera was used not only to determine the sedimentary environment, but also to estimate the ecological condition of the water through a statistical approach. Analysis was performed quantitatively in 10 surface seabed sediment samples in Weda Bay North Maluku. The analysis includes dominance (Simpson Index), diversity and evenness (Shannon Index), and the ratio of planktonic -benthic. The results were shown in the plotting diagram of M-R-T (Miliolid-Rotalid-Textularid) to determine the depositional environment. Quantitative

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A preliminary study in vertical distribution of planktonic foraminifera and marine ecological conditions of Simeulue sub-basin, Aceh, Indonesia

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(2018) *MATEC Web of Conferences*

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(2007) *Journal of the Geological Society of India*

Upper Campanian-lower Maastrichtian planktonic foraminifers from Govorov Guyot (Magellan Seamounts, Pacific Ocean)

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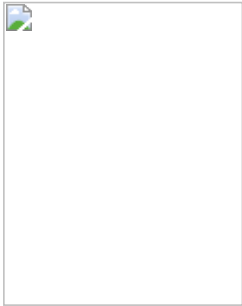

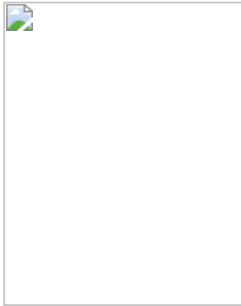
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Marine ecology conditions at Weda Bay, North Maluku based on statistical analysis on distribution of recent foraminifera

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Abstract. Analysis of foraminifera in geology, usually being used to find the age of rocks/ sediments and depositional environment. In this study, recent foraminifera was used not only to determine the sedimentary environment, but also to estimate the ecological condition of the water through a statistical approach. Analysis was performed quantitatively in 10 surface seabed sediment samples in Weda Bay North Maluku. The analysis includes dominance (Simpson Index), diversity and evenness (Shannon Index), and the ratio of planktonic - benthic. The results were shown in the plotting diagram of M-R-T (Miliolid-Rotalid-Textularid) to determine the depositional environment. Quantitative analysis was performed using Past software (paleontological version Statistic 1:29). The analysis result showed there was no domination of certain taxon with a moderate degree of evenness and stable communities and considerably a moderate diversity. The results of this analysis indicated that research area had a stable water conditions with the optimum level of carbonate content, oxygen supply, salinity, and temperature. The ratio of planktonic and benthic indicate the relative depth, which was deeper the water increased the percentage of planktonic foraminifera. Based on M-R-T diagram showed the distribution of sediment deposited on exposed carbonate (carbonate platform) environment with normal saline.

1 Preliminary

Analysis of the waters condition is very important because Indonesia is an archipelagic country that most of its territory is covered by the sea. Ecological condition of a water body can become a reference about the usage of the waters for the fishing industry. The ecological condition of waters can be measured directly on water samples including the levels of carbonate, salinity, and temperature. However, this measurement is less precise to describe the ecological conditions in a long time scale. Ecological condition of waters can also be known by observing the organisms that live in the waters, which is to determine the correlation between the components of biotic and abiotic. One of the living organisms that is abundant in the sea is foraminifera.

This research was conducted by applying the method in seabed sediment samples taken from Weda Bay, North Maluku. The goal is to determine the recent ecological condition of the water based on the distribution of foraminifera contained in the sediments. The benefit of the study is to determine the ecological conditions in a long time scale as the basis for the usage of the waters in fishing industry and so on.

Within the scope of geosciences, foraminifera are generally only used as a marker of age and depositional environment of rocks, but in this study, statistical methods was used in recent foraminifera community in

sediments to estimate the ecological condition of waters. Previous research on ecological analysis based on distribution of foraminifera had been done by [1] on the sediment surface in the Makassar Strait. The purpose of this study was to determine the distributional pattern of foraminifera, which include uniformity, diversity, and dominance of the individual as well as knowing the ecology of the waters at this time (Recent) based on the distribution of foraminifera contained in the sediments.

2 Research method

2.1 Research site

The research site was the territorial waters of Weda Bay, North Maluku (Fig.1). From all the sediment samples were taken, 10 of them performed a quantitative analysis of foraminifera, that was sample B2, B3, ST1, ST2, ST5, ST6, ST7, ST9, ST10, and ST11.

2.2 Sampling method

Sediment sampling was conducted by using a grab sampler. Sample of the sediment was weighed and then washed using a 100-mesh sieve with openings. Sample of the sediment was analyzed, mainly the foraminifera from 1 gram of sediment leftovers (washed residue). The distribution of foraminifera was quantified by the

Atomistic-continuum hybrid analysis of dislocation behavior in spinodally decomposed Fe-Cr alloys

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Abstract. In this study, we first present the molecular dynamics (MD) simulation of dislocation behavior in a spinodally decomposed Fe-Cr alloy. The MD simulation is used for exploring the nature of the interaction between a dislocation and the spinodal decomposition without any specific assumptions. In order to classify the interaction mechanism, dislocation dynamics (DD) simulations of the interaction between a dislocation and the spinodal decomposition are performed. In the simulations, we controlled the interaction mechanism by adding and removing the atomistic mechanism. The simulation results clearly illustrate that the atomistic mechanism can be negligible in determining the critical resolved shear stress (CRSS) of spinodally decomposed Fe-Cr alloys, and the internal stress generated by the lattice constant mismatch is a dominant mechanism. These findings are very useful for simplifying the analysis of the mechanism of material strength change due to the spinodal decomposition. Particularly in the analysis using the DD simulations, the required computational effort for simulating the dislocation behavior is greatly reduced by taking into account only the internal stress without the atomistic dislocation core influence.

1 Introduction

Duplex stainless steels consisting of ferrite and austenite phases have a high material strength, particularly the corrosion resistance, and are used as a material of primary coolant pipes in nuclear power plants. When the material is aged at temperatures in a range from 300 to 500°C, spinodal decomposition occurs in the ferrite phase, which causes an ultrafine phase separation mixing Fe-rich and Cr-rich phases. The phase separation leads to a material embrittlement and material strength change, and therefore, it is very important to understand the influence of the phase separation on the material strength for ensuring the reliability and integrity of structures. In order to investigate the material strength degeneration mechanism, an equation for the internal stress distribution arisen from the phase separation has been derived [1]. The equation can be used as a fundamental tool for investigating the influence of phase separation on the micro-scale material deformation mechanism, such as dislocation behavior. Kato conducted extensive theoretical studies on the interaction of the internal stress and dislocation and on the influence on the critical resolved shear stress (CRSS), which is a shear stress necessary for dislocations to initiate their motion in materials [2]. The information obtained by the studies is variable in clarifying the dislocation behavior in the internal stress field, and however, due to the

complexity and limitation of the theoretical approach to the problem, the information is limited for dislocations with a simple shape, even though the dislocation shape must be changed a lot by the interaction with the internal stress field. In addition, the influence of the spinodal decomposition on the material strength must be controlled by not only the internal stress field, and also the other type of elements associated with atomistic chemical energies. Thus, in order to fully understand the detailed mechanism of the material strength degeneration due to the spinodal decomposition, the understanding must cover very wide range from atomistic to continuum.

Owing to a remarkable development of dislocation dynamics (DD) simulation methodology, collective behavior and complex interactions of dislocations can be simulated and calculated using computers [3-5]. Up till now, the DD method has been successfully applied to various plasticity problems of metals and alloys. Takahashi and Ghoniem have developed a dislocation dynamics-based computational method for dislocation-precipitate interaction problems, and investigated the interaction of dislocations with precipitates in terms of elasticity [6]. Furthermore, they developed a hybrid atomistic-continuum method for investigation of dislocation cores [7-8]. The method provides us with a new opportunity to study the dislocation dynamics

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Flexural behaviour of reinforced concrete beams with discrete steel – polypropylene fibres

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Abstract. This paper discusses the experimental results on the flexural test of concrete containing different proportions of steel fibre (SF) and polypropylene fibre (PPF). The flexural test was carried out under 4-point bending load and followed the relevant standards to FRC. Hooked-end deformed SF fibre with 60 mm length and fibrillated virgin PPF fibre with 19 mm length were used in this study. Meanwhile, the concrete was designed for high strength concrete of C60. The mixture included both single SF and PPF, and also the combination of both fibres; Control beam (PC), beam with 75%SF, beam with 75%SF + 25%PPF and beam with 25%PPF. The total fibre volume fraction (V_f) was fixed at 1.5%. The experimental results show that the percentage proportion of combined SF-PPF at 75-25% had the best performance for its flexural capacity. Mixture with single PPF was also found not effective in delaying the onset of tension cracks and to increase the tensile strength of the concrete. Experimental result also shows beam with 75%SF + 25%PPF had their structural stiffness improved the most as compared with the others. For the compressive strength, beam with 75%SF + 25%PPF also revealed comparable performance with the control for high strength composite concrete.

1 Introduction

Plain concrete is weak in tension because it contains numerous micro cracks. These micro cracks propagate in the concrete matrix under constant applied load. Consequently, plain concrete members cannot sustain tensile stresses developed due to the applied force without the addition of reinforcing elements that are able to withstand these stresses. The addition of randomly distributed discrete fibres to the structural concrete increases its stiffness, ductility and load carrying capacity, while at the same time reduced crack development and propagation. According to the composite material theory and other findings [1], positive synergy of different fibres can complement each other to make new composite material with high performance and good economic benefits [2]–[4]. The use of two or more types of fibres in a suitable combination may potentially improve the overall properties of concrete and resulted in performance synergy [5]–[7]. In this study, steel fibre (SF) and polypropylene fibres (PPF) were combined to produce a hybrid system. Due to the lack of information on the ductile performance of hybrid fibre reinforced concrete composite (HyFRCC), an attempt was made to examine the ductility performance of HyFRCC beams. The

presence of one fibre enabled more effective utilization of the potential properties of the other fibre which resulted in improved flexural rigidity, and at the same time controlled the cracking development.

2 Related previous study

A study by [8] found that concrete mixed with two different lengths of SF possessed excellent resistance to air blast loading as compared with plain concrete. In their study, the total volume fraction was fixed at 1.5%, with the mixture containing 70% long and 30% short hooked-end type steel fibre.

The investigation indicates that the steel fiber reinforced concrete panel containing of 1.5% volume fraction gave the best performance under explosive loading. In another study by researcher [9], the concrete containing 0.5% volume fraction of SF not sufficient to provide adequate resistance against blast loading and 1% of the fibres shows the best performance and significant to reduced hair line cracks on the specimen. Further investigation using three different properties of carbon and polypropylene micro fibres added to steel fibres in a concrete mixture showed that macro fibres of steel with highly deformed geometry produced better hybrid than

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Lactic acid production from date juice using *Lactobacillus casei* ATCC 393 in batch fermentation

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Abstract. *Lactobacillus casei* ATCC 393 was employed as a fermentative organism to convert sugars from date juice into lactic acid. Both glucose and fructose in date juice were fermented directly without any pre-treatment. The influences of supplementation of yeast extract and date juice concentration on some fermentation parameters, such as: cell growth rate, sugar conversion, productivity and yield, were investigated using this bacterium in batch fermentation. The results showed that by adding yeast extract about 20g/l in a date juice medium, the maximum specific growth rate of bacteria (μ_m) enhanced from 0.1229 to 0.1819 g/l. Meanwhile, increasing date juice concentration from 86.6942 to 158.9181 and 229.5367 g/l enhanced the μ_m from 0.1819 to 0.2107 and 0.1916 g/l, respectively. It indicated that the optimum value for μ_m is 0.2107 g/l in this concentration range. In the date juice concentration of 158.9181 g/l, the optimum lactic acid can be produced is 117.8301 g/l with yield of 92.685% for 48 h.

1 Introduction

Lactic acid, one of the most important organic acids, and its derivatives has been utilized in many applications such as in the food, textile, pharmaceutical, cosmetic and chemical industries [1]. Even, it became a prime candidate to be developed as a biodegradable polymer. Polymerization of lactic acid obtained poly (lactic acid) which has comparable mechanical properties, transparency, and UV light barrier to many conventional polymer (polystyrene, polyethylene, etc.) [2].

Recently, the global poly (lactic acid) market was expanding rapidly followed by increasing of lactic acid demand. Several factors stimulated this growth such as: sustainability of raw materials and government policy for bio-based and biodegradable product to tackle the waste problem. The global market of lactic acid is predicted to reach 1076.9 thousand tonnes in 2016 [3]. However, the global production of lactic acid is only 120 thousand tonnes in 2006 [4], thus the minimal production growth of lactic acid is 25% per years until 2016 to balance the gap between production and demand.

Lactic acid can be produced through chemical synthesis and microbial fermentation. The fermentation is an effective and attractive method due to produce lactic acid in high purity of one stereoisomer. The high purity of L(+) or D(-) lactic acid can be produced depending on a microbial strain and source of carbon (substrate) [4,5]. The economics of lactic acid fermentation is affected by many factors: raw material, purification, etc. The cost of the raw materials spends

approximately 60-80% of the total production cost [5]. Thus, it is important to explore some potential of agriculture product to get cheap and abundantly existing material. It can be summarized that there are three big groups of substrate: sugar, starchy material and lignocellulose.

As well known, sugar was reported as the preferred carbon sources. However, it is very expensive to use as the feedstock for lactic acid fermentation. Date is one of the promising biomass for lactic acid production without complicated pretreatment. Date contains between 70-80 wt% of fermentable sugars, mainly glucose and fructose in a balance ratio which can be consumed directly by lactic acid bacteria [6] Besides that, as reported by Al-Hooti et al. [7] and Al-Farsi et al. [8], date contains some minerals and low range of vitamins. In Arabic countries, a lot of dates are being wasted due to overproduction and poor handling low quality dates. Thus, production of lactic acid from dates is very attractive.

Lactobacillus casei, a genus of facultative anaerobic bacteria, is one of the bacteria that able to convert some sugars to lactic acid. During its growth, it consumes sugars as energy sources and converts to lactic acid. In this work, *Lactobacillus casei* ATCC 393 was employed to produce lactic acid from date juice. We investigated the effect of yeast extract as nitrogen source and initial sugar concentration on lactic acid production in batch fermentation.

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