붙임 | **연구실적 블라인드 처리 기준**

한국해양과학기술원 채용은 「블라인드 채용 기준」에 따라 편견 없는 채용을 실시하고 있습니다. 이에 입사지원서 작성 시 첨부하는 연구실적(논문, 특허) 증빙자료에 대한 블라인드 처리 기준을 다음과 같이 안내드립니다. 블라인드 처리 기준을 숙지하시어 전형과정에서 불이익을 받지 않도록 유의하시기 바랍니다.

❑ [논문 실적] 블라인드 처리 기준(샘플 참조)

❍ 논문 저자의 인적사항 관련 정보 블라인드 처리

- 지원자 및 논문에 관련된 모든 저자의 인적사항을 유추할 수 있는 정보* 블라인드 처리

  * 성명, 연락처, e-mail 등

  ※ 교신저자 등 별도로 연락처가 기재된 것 모두 블라인드 처리

⇒ (블라인드 처리 시 유의사항)

• 저자순을 확인할 수 있게 저자별로 구분하여 저자 성명 전체를 블라인드 처리. 단, 지원자의 경우 성(Last name)을 제외하고 블라인드 처리

❍ 사사문구(Acknowledgments) 블라인드 처리

❍ 저널명, 논문명 및 주요 Article info(게재권호, ISSN 등) 블라인드 미처리

❍ 논문 증빙자료 첨부파일 명칭은 출생일자로 지원자를 구분 가능하도록 변경 후 제출 (문서내부에 기재된 성명과 출생일자도 모두 블라인드 처리)

※ A01 분야 지원자 홍길동(09월 30일 출생)의 첨부파일 명칭 변경 예시

PDF (A01_홍OO_0930) 연구실적 1, PDF (A01_홍OO_0930) 연구실적 2 등

❑ [특허 실적] 블라인드 처리 기준(샘플 참조)

❍ 특허권자 및 발명자 인적사항 관련 정보 블라인드 처리

- 지원자 및 모든 공동발명자의 인적사항을 유추할 수 있는 정보* 블라인드 처리

  * 성명, 생년월일, 주소 등

⇒ (블라인드 처리 시 유의사항)

• 총 발명 인원수를 확인할 수 있게 발명자별로 구분하여 블라인드 처리

❍ 사사문구(Acknowledgments) 블라인드 처리

❍ 특허번호, 발명의 명칭, 등록일 등 특허기본 정보 블라인드 미처리

❍ 특허 증빙자료 첨부파일 명칭은 출생일자로 지원자를 구분 가능하도록 변경 후 제출

※ A01 분야 지원자 홍길동(09월 30일 출생)의 첨부파일 명칭 변경 예시

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Variability in Particl … Polymetallic Nodules in the Equatorial Ea … M … Excess ^{210}Pb

지원자의 저자순 확인 가능하도록
“지원자 성” 블라인드 미처리

저자 이름 블라인드 처리

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[redacted]

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Abstract – Radionuclide activities of ^{210}Pb and ^{226}Ra were measured to determine bioturbation coefficients (D_b) in seven sediment cores from the Korean licensed block for polymetallic nodules in the Clarion–Clipperton Fracture Zone. Variability in D_b is considered in the context of the sedimentological, geochemical, and geotechnical properties of the sediments. D_b values in the studied cores were estimated using a steady-state diffusion model and varied over a wide range from 1.1 to 293 cm^2/yr with corresponding mixing depths (L) of 26 to 144 cm. When excepting for spurious results obtained from cores where diffusive mixing does not apply, D_b values range from 1.1 to 9.0 cm^2/yr with corresponding mixing depths (L) of 26 to 63 cm. Such wide variability in D_b and L values is exceptional in sites with water depths of ~5000 m and is attributed in this study to an uneven distribution of sediment layers with different shear strengths and total organic carbon (TOC) contents, caused by erosion events. The studied cores can be grouped into two categories based on lithologic associations: layers with high maximum shear strength (MSS) and low TOC content, showing a narrow range of D_b values (1.1–9.0 cm^2/yr); and layers with low MSS and high TOC content, yielding much higher D_b values of over 30 cm^2/yr. The distribution of different lithologies, and the resultant spatial variability in MSS and labile organic matter content, controls the presence and maximum burrowing depth of infauna by affecting their mobility and the availability of food. This study provides a unique case showing that shear strength, which relates to the degree of sediment consolidation, might be an important factor in controlling rates of bioturbation and sediment mixing depths.

Keywords – bioturbation coefficient, polymetallic nodule, Clarion-Clipperton Zone, excess Pb-210

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1. Introduction

In the marine environment, burrowing, feeding, and relocation of benthic organisms, collectively referred to as bioturbation, result in the displacement and mixing of sediments and can thus substantially modify the physical, chemical, and biological properties of sediment (DeMaster and Cochran 1982; Boudreau 1994). Anthropogenic activities, such as the exploitation of polymetallic nodules, can disturb the deep-sea floor and have negative impacts on benthic ecology (Thiel 2001). For example, the biogeochemical environment of the seabed along and around seabed mining routes can be altered significantly due to the resuspension of sediments, the release of chemically active substances into the water column, and the subsequent resettlement of aforementioned materials. Bioturbation is a process that disperses recently deposited inputs through the upper several tens of centimeters of the sediment column and decreases their concentrations at the sediment surface. Therefore, a quantitative understanding of biological mixing is important in predicting the behavior of resettled substances from mining activities. For this reason, the scientific community recommends the determination of bioturbation coefficients, a measure of the rate of particle mixing, at and around planned seabed mining sites (ISA 2001). A series of recommendations have been issued for this purpose for exploration license holders by the International Seabed Authority (ISA), an autonomous international organization that regulates and controls activities relating to seabed mineral resources beyond the limits of

저자 이름 블라인드 처리

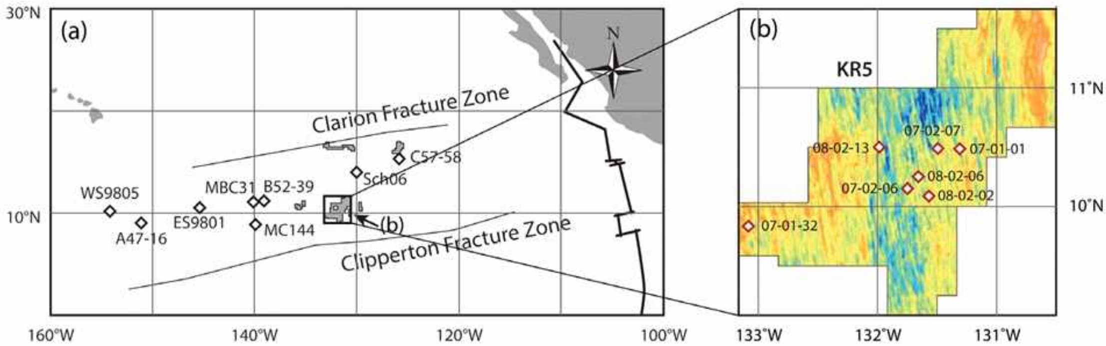

Fig. 1. Locations of the studied cores and other cores for which bioturbation coefficients have been reported. Core locations are from DeMaster and Cochran (1982), Cochran (1985), Smith et al. (1997), Yang and Zhou (2004), and Schmidt et al. (2006)

national jurisdiction (ISA 2013).

The Clarion–Clipperton Fracture Zone (CCFZ) in the northeast Pacific shows the densest occurrences of polymetallic nodules and hosts 16 tenures for the exploration of polymetallic nodules. Despite the crowded distribution of the tenured blocks and the vast size of each tenure (~75,000 km^2 each), bioturbation coefficients have been reported from only nine sites to date in the CCFZ (DeMaster and Cochran 1982; Cochran 1985; Smith et al. 1997; Yang and Zhou 2004; Schmidt et al. 2006; see Fig. 1 for the location of the study sites). The bioturbation coefficient is a parameter that must be incorporated into numerical simulations of geochemical processes in deep-sea sediments that may be impacted by future mining. Thus, its variability needs to be investigated systematically at potential mining sites in the context of lithology, geochemistry, and geotechnical properties. In this study, bioturbation coefficients were determined at seven sites in a Korean licensed block using the radionuclides ^{210}Pb and ^{226}Ra (Fig. 1), and variability amongst the coefficients was investigated in terms of sediment properties such as lithologic distribution, manganese and organic matter content, porosity, dry bulk density, and shear strength. This study provides valuable bioturbation coefficient data in the CCFZ where data coverage is sparse. It also addresses the potential causes of spatial variations in bioturbation rates in the study area.

2. Theoretical Background

^{210}Pb has been used to characterize the mixing characteristics of deep-sea sediments along with many radionuclides of the natural uranium and thorium series (e.g. Nozaki et al. 1977; Peng et al. 1979; DeMaster and Cochran 1982; Cochran 1985; Suckow et al. 2001). ^{210}Pb, produced in the atmosphere and water column by the decay of ^{226}Ra and ^{222}Rn, is exported to the seabed by sinking particles. The ^{210}Pb incorporated into the sediment from this process is called 'excess ^{210}Pb' (^{210}Pb$_{ex}$) as it exists in excess of ^{210}Pb that is produced in situ from the decay of ^{226}Ra and ^{222}Rn within the sediment column ('supported ^{210}Pb'). The ^{210}Pb$_{ex}$ signal decreases over time and approaches zero after about 100 years (half-life of 22.3 years). If sediment accumulation alone controls the distribution of ^{210}Pb$_{ex}$, then ^{210}Pb$_{ex}$ activity should not be detectable in parts of the sediment column deposited prior to 100 years ago. However, the ^{210}Pb$_{ex}$ signal commonly extends downwards, below the expected depth for zero activity in deep-sea sediments, due to sediment mixing by bioturbation (Benninger et al. 1979; DeMaster and Cochran 1982; Boudreau 1994).

Goldberg and Koide (1962) described these biological mixing processes in terms of a bioturbation coefficient (D_b, cm^2/y) that is comparable to a diffusion coefficient in a steady-state eddy diffusion model of radionuclides, as follows:

$$D_b \rho \frac{\partial^2 A'}{\partial x^2} - \rho S \frac{\partial A'}{\partial x} - \rho \lambda A' + \rho P - R = 0 \quad (0 \le x \le L) \quad (1)$$

where A' = total activity concentration of the radionuclide (dpm/g sediment), x = depth in the sediment (cm), L = depth of the mixed layer (cm), D_b = particle mixing coefficient (cm^2/yr), S = sediment accumulation rate (cm/yr), λ = decay constant of the radionuclide (yr^{-1}), P = production rate of the radionuclide from the in situ decay of its parent (dpm/g yr), R = rate at which the radionuclide is removed from the sediment by dissolution (dpm/cm^3 yr), and ρ = dry bulk density of the studies with more intensive sampling are necessary to better understand D_b variability in terms of shear strength and the depth distribution of labile organic matter at the study site.

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[특허(등록)] 블라인드 처리 샘플

특허증
CERTIFICATE OF PATENT

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출원번호 Application Number	제 10-2019-0025275 호
출원일 Filing Date	2019년 03월 05일
등록일 Registration Date	2019년 07월 31일

발명의 명칭 Title of the Invention

스피룰리나 추출물 제조방법, 스피룰리나 추출물을 포함하는 인지능 개선용 약학적 조성물 및 건강기능식품

특허권자 Patentee

[redacted]

특허권자 정보 블라인드 처리

발명자 Inventor

등록사항란에 기재

위의 발명은 「특허법」에 따라 특허등록원부에 등록되었음을 증명합니다.

This is to certify that, in accordance with the Patent Act, a patent for the invention has been registered at the Korean Intellectual Property Office.

2019년 07월 31일

QR코드로 현재기준 등록사항을 확인하세요

특허청장
COMMISSIONER,
KOREAN INTELLECTUAL PROPERTY OFFICE

박 원주

특허청
Korean Intellectual Property Office

등 록 사 항

특 허 등록 제 10-2007675 호

Patent Number

발명자 Inventors

[redacted]

총 발명자 수 확인을 위해 발명자 개별 블라인드 처리

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전체 청구항 수 : 총 12 항 심사관 : 윤동준

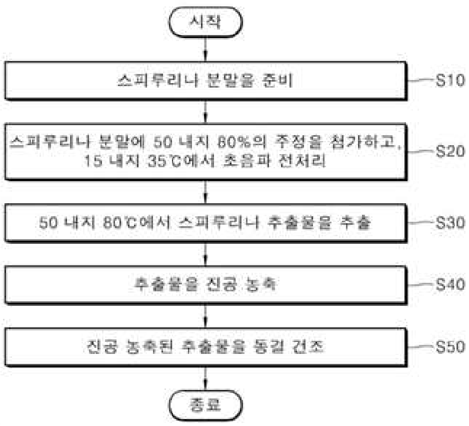
(54) 발명의 명칭 **스피룰리나 추출물 제조방법, 스피룰리나 추출물을 포함하는 인지능 개선용 약학적 조성물 및 건강기능식품**

(57) 요 약

본 발명의 목적은 스피룰리나 추출물의 추출 수율을 높임과 동시에 추출물에 포함된 클로로필의 총 함량을 보존하고자 하기 위함이다. 또한, 스피룰리나 추출물을 유효성분으로 포함한 퇴행성 뇌신경 질환의 예방 또는 치료를 위한 약학적 조성물 및 건강기능식품을 제공하고, 스피룰리나 추출물을 이용한 퇴행성 뇌신경 질환의 치료방법을 제공하기 위함이다.

본 발명은(a) 스피룰리나 분말을 준비하는 단계; (b) 상기 스피룰리나 분말에 50 내지 80 %의 주정을 가하고, 15 내지 35 ℃에서 초음파 전처리하는 단계; (c) 50 내지 80 ℃에서 스피룰리나 추출물을 추출하는 단계; (d) 상기 스피룰리나 추출물을 진공 농축하는 단계; 및 (e) 상기 진공 농축된 스피룰리나 추출물을 동결 건조하는 단계;를 포함하는 스피룰리나 추출물 제조방법을 제공한다.

대 표 도 - 도1



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사사문구 블라인드 처리

이 발명을 지원한 국가연구개발사업

과제고유번호 [redacted]

부처명

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연구사업명

연구과제명

기 여 율

주관기관

연구기간