

# Monitoring of environmental pollution caused by the heavy oil spill accident at the Japan sea and evaluation of toxicities of polluted environmental samples

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# 1999 Fiscal Year Final Research Report Summary

## Monitoring of environmental pollution caused by the heavy oil spill accident at the Japan sea and evaluation of toxicities of polluted environmental samples

Research Project

### Project/Area Number

10672106

### Research Category

Grant-in-Aid for Scientific Research (C)

### Allocation Type

Single-year Grants

### Section

一般

### Research Field

Environmental pharmacy

### Research Institution

Kanazawa University

### Principal Investigator

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### Co-Investigator(Kenkyū-buntansha)

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### Project Period (FY)

1998 – 1999

### Keywords

heavy oil / oil spill accident / oil contamination / sea pollution / soil pollution / polycyclic aromatic hydrocarbon / mutagenicity / endocrine disrupting activity

### Research Abstract

A Russian tanker Nakhodka met a hull-broken accident in sailing in the Sea of Japan on January 2, 1997, releasing a huge quantity of heavy oil into the Sea of Japan and the spilled oil polluted the coastline from the Shimane Prefecture through the Yamagata Prefecture. So, we conducted extensive scientific studies to assess where and how long the pollution by the oil or chemicals persist in the environment and the impact of the spill on biological systems. The following results were obtained in the present study: 1) The survey of oil-polluted area in Ishikawa Prefecture revealed that several area have been still heavily polluted with oil even at 2 years post-accident while

number of polluted area has decreased in the course of years. 2) Many of the coasts polluted with oil located at the area steep and hard to get near and had surfaces covered with rocks or boulder / cobble / pebble / gravel. It has been considered that much effort to remove the reached oil was not made and natural cleaning effect with those areas was small. 3) As for polycyclic aromatic hydrocarbons (PAHs) in reached oils, concentrations of PAHs with 3-to 6-rings did not decrease significantly and were approximately half those of the oil loaded in the Nakhodka. 4) Indirect mutagenicities of reached oils sampled at 1 year post accident were approximately 80% of those sampled immediately after the accident and found to correspond to the PAH concentrations in reached oils. 5) Heavy oils including the Nakhodka-loaded oil were found to show antiestrogenicity and this activity was due in part to PAHs.

## Research Products (28 results)

All Other  
All Publications

[Publications] 木津良一: "日本海重油流出事故"衛生化学. 44. 321-333 (1998) ▼

[Publications] Nariaki Takayama: "HPLC/Chemiluminescence Detection of Methamphetamine and Amphetamine in Black and White Hair Samples"Japanese Journal of Toxicological and Environmental Health. 44. 116-121 (1998) ▼

[Publications] Ryoichi Kizu: "Significance of Water Solubility in the Gastrointestinal Absorption of trans-Bis (n-valerato)(1R,2R-cyclohexanediamine) (oxalato)platinum(IV)"Anti-Cancer Drugs. 9. 167-174 (1998) ▼

[Publications] Kazuichi Hayakawa: "Flow Injection Analysis of C-Fuel Oil-Contaminated Samples Based on Fluorescence Detection of Polycyclic Aromatic Hydrocarbons"Analytical Science. 14. 845-847 (1998) ▼

[Publications] Ryoichi Kizu: "A New Orally Active Antitumor 1R,2R,-Cyclohexanediamine-Platinum(IV) Complex : trans-(n-Valerato)chloro(1R,2R-cyclohexanediamine) (oxalato) platinum (IV)"Cancer Chemotherapy and Pharmacology. 43. 97-105 (1999) ▼

[Publications] 木津良一: "重油のエストロゲン作用とその評価法"分析化学. 48. 617-622 (1999) ▼

[Publications] 早川和一: "化学発光検出HPLCを用いた発癌性ニトロアレーンの大気内挙動と毒性に関する研究"Chromatography. 20. 37-43 (1999) ▼

[Publications] Tsuyoshi Murahashi: "2-Nitrofluoranthene, 1-, 2- and 4-Nitropyrenes and 6-Nitrochrysene in Diesel-Engine Exhaust and Airborne Particulates"Journal Health Science. 45. 244-250 (1999) ▼

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[Publications] Ryoichi Kizu: "Antiandrogenic Effect of Crude Extract of C-Heavy Oil"Materials Science & Engineering C. (In Press). (2000) ▼

[Publications] Kazuichi Hayakawa: "Oil and Hydrocarbon Spills, Modeling, Analysis and Control"Computational Mechanics Publications. 372 (1998) ▼

[Publications] 木津良一: "衛生薬学"廣川書店. (1999) ▼

[Publications] 木津良一: "薬学生のための臨床化学"南江堂. 227 (1999) ▼

[Publications] 木津良一: "最新機器分析学"南山堂. 376 (2000) ▼

[Publications] Ryoichi Kizu, Kyoko Ando, Kazuichi Hayakawa.: "Oil Spill Accident in the Sea of Japan."Eisei Kagaku. 44. 321-333 (1998) ▼

[Publications] Nariaki Takayama, Seishi Tanaka, Ryoichi Kizu, Kazuichi Hayakawa.: "HPLC / Chemiluminescence Detection of Methamphetamine and Amphetamine in Black and White Hair Samples."Japanese Journal of Toxicology and Environmental Health. 44. 116-121 (1998) ▼

[Publications] Ryoichi Kizu, Takeo Nakanishi, Shigeki Yamamoto, Kazuichi Hayakawa, Akio Matsuzawa, Masazumi Eriguchi, Yasutaka Takeda, Nachio Akiyama, Yoshinori Kidani.: "Significance of Water Solubility in the Gastrointestinal Absorption of trans-Bis(n-valerato)(1R,2R-cyclohexanediamine)(oxalato)platinum(IV)"Anti-Cancer Drugs. 9. 167-174 (1998) ▼

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[Publications] Ryoichi Kizu, Takeo Nakanishi, Kazuichi Hayakawa, Akio Matsuzawa, Masazumi Eriguchi, Yasutaka Takada, Nachio Akiyama, Tatsuko Tashiro, Yochinori Kidani: "A New Orally Active Antitumor 1R,2R-Cyclohexanediamine-Platinum(IV) Complex: trans-(n-Valerato)chloro(1R,2R-cyclohexanediamine)(oxalato)platinum(IV)"Cancer Chemotherapy and Pharmacology. 43. 97-105 (1999) ▼

[Publications] Ryoichi Kizu, Shoko Kato, Osamu Usui, Kazuichi Hayakawa.: "Estrogenic Activity of Heavy Oil and Its Assay Method."Bunseki Kagaku. 48. 617-622 (1999) ▼

[Publications] Kazuichi Hayakawa, Ryoichi Kizu, Kyoko Ando.: "Study on Atmospheric Behavior and Toxicity of Carcinogenic Nitroarenes by High-Performance Liquid Chromatography Using Chemiluminescence Detection"Chromatography. 20. 37-43 (1999) ▼

[Publications] Tsuyoshi Murahashi, Ryoichi Kizu, Hitoshi Kakimoto, Akire Toriba, Kazuichi Hayakawa.: "2-Nitrofluoranthene, 1-,2-and 4-Nitropyrenes and 6-Nitrochrysene in Diesel-Engine Exhaust and Airborne Particulates."Journal of Health Science. 45. 244-250 (1999) ▼

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[Publications] Hitoshi Kakimoto, Moritugu Kitamura, Yutaka Matsumoto, Shigekatsu Sakai, Fumio Kanoh, Tsuyoshi Murahashi, Kazuhiko Akutsu, Ryoichi Kizu, Kazuichi Hayakawa.: "Comparison of Atmospheric Polycyclic Aromatic Hydrocarbons and Nitropolycyclic Aromatic Hydrocarbons in Kanazawa, Sapporo and Tokyo"Journal of Health Science. 46. 5-15 (2000) ▼

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