PHOSPHATE DISTRIBUTION IN THE COASTAL WATER OF PERHENTIAN ISLAND, SOUTH CHINA SEA

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BY

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ABSTRACT

Much attention has been given in recent years to the productivity, fisheries resources and pollution status of Perhentian Island, South China Sea due to lack of information. Phosphorus is one of the important micronutrient that drives the primary production in the sea. In Perhentian Island, sewage problem, activities on land, fisheries, recreation and tourism industry (300 000 tourists visited during the 2000 year) have contributed a great impact on water quality of the seawater, especially the phosphorus pollution.

Two sampling trips, which were from 17th-19th April 2001 (Inter Monsoon) and 16th-18th August 2001 (Southwest Monsoon), were carried out to study the distribution of phosphorus in water and sediment of Perhentian Island. A total number of 16 sampling stations were established. The mean values for the ortho-phosphate, organic phosphorus and total phosphorus in water were 0.443, 2.207 and 2.677 μM respectively, while the mean values for inorganic phosphorus, organic phosphorus and total phosphorus in sediment were 3.65, 4.55 and 8.21 μg-at P/g dry sediment respectively.

The distribution of phosphorus in water was probably due to a combination of the effects of active primary productivity, mineralisation process, dilution factor, terrestrial input and precipitation. Meanwhile, factors for distribution of phosphorus in sediment was probably due to the land based activities, accumulation of organic materials from the marine derived sources, topographical effects and the water movement.

ABSTRAK

Perhatian yang banyak telah diberikan kepada produktiviti, sumber perikanan dan status pencemaran di Pulau Perhentian, Laut China Selatan kebelakangan ini. Fosforus merupakan salah satu mikronutrien yang penting dalam menentukan kadar pengeluaran primer di laut. Di Pulau Perhentian, masalah kumbahan dan bahan buangan, aktiviti daratan, perikanan, rekreasi serta industri perlancongan (sebanyak 300 000 pelancong telah melawat Pulau Perhentian pada tahun 2000) telah membawa impak yang besar ke atas kualiti air dalam air laut, terutamanya dalam pencemaran fosforus.

Dua ekspedisi persampelan, iaitu dari 17^{hb}-19^{hb} April 2001 (Monsun Peralihan) dan 16^{hb}-18^{hb} Ogos 2001 (Monsun Barat Daya) telah dijalankan bagi mengkaji distribusi fosforus bagi air dan sedimen di Pulau Perhentian. Sebanyak 16 stesen kajian telah dipilih untuk ekspedisi ini. Nilai min bagi orto-fosfat, fosfat organik dan jumlah fosfat dalam air adalah masing-masing sebanyak 0.443, 2.207 dan 2.677 μM. Sementara itu, nilai min bagi fosfat tak organik, fosfat organik dan jumlah fosfat dalam sedimen pula adalah masing-masing sebanyak 3.65, 4.55 dan 8.21 μg-at P/g endapan kering.

Distribusi fosforus dalam air mungkin disebabkan oleh kombinasi kesan daripada produktiviti primer yang aktif, proses mineralisasi dalam air, faktor pencairan, input daratan dan juga jumlah hujan. Sebaliknya, faktor-faktor yang mungkin bagi distribusi fosforus dalam sedimen pula adalah daripada aktiviti daratan, akumulasi bahan organik daripada sumber marin, kesan topografikal dan pergerakan air.