

Composition of Chemical Characteristics of Dissolved Organic Matter in River Water Flowing through Peatlands in Sarawak, Malaysia and Eastern Hokkaido, Japan

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Importance of the study

Dissolved organic matter (DOM) in river water has diverse functions related to the dissolution and transportation of trace elements by complex formation, the supply of nutrients to aquatic biota and microbes, and the transportation and storage media in the carbon cycle and contributes to the biogeochemical processes in the local ecosystem. In this study, we aimed at the comparison of DOM formed in the tropic wetland and in the cool temperate wetland, selecting Sarawak in Malaysia and the eastern estuarial area, Hokkaido, Japan.

Sites



Mukah, Sarawak

Bakong: newly cleared site
Lebang: undisturbed site



Eastern Hokkaido

Chirai karibetsu, Kiritappu,
Kimontou, Numakawa

Results

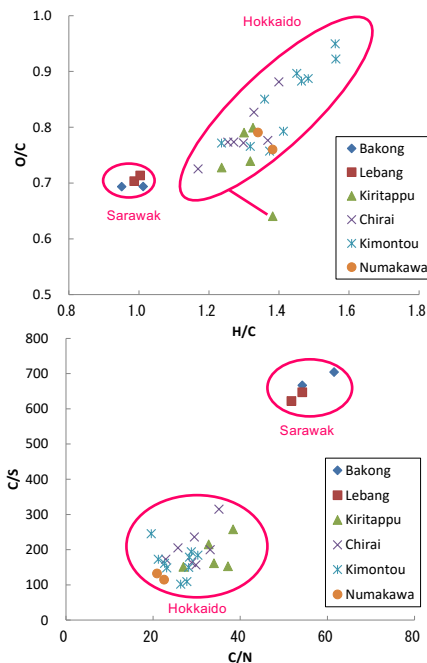


Fig. 1: Elementary number ratios of DOM in Sarawak and Hokkaido.

Above: O/C and H/C
Below: C/S and C/N

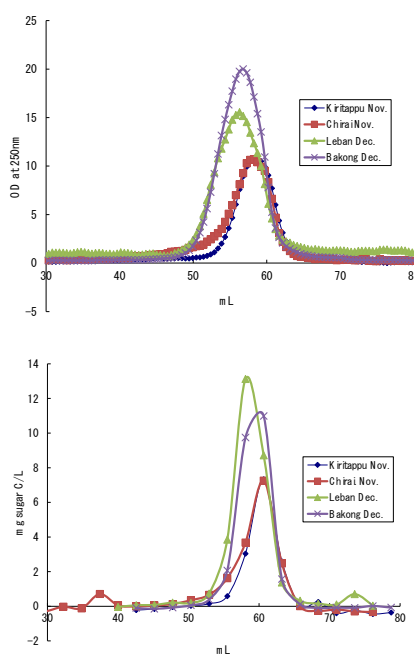


Fig. 2: Elution curves of DOM in Sarawak and Hokkaido.

Above: detected by OD at 250 nm
Below: detected by saccharide C mg/L
Eluted on Toyopearl HW-65S

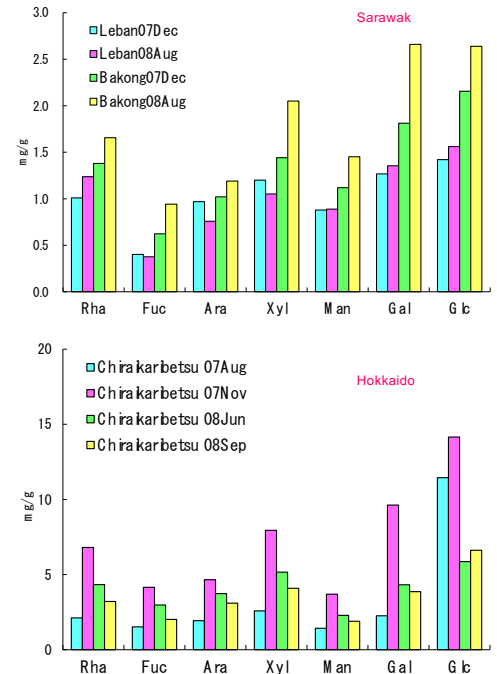


Fig. 3: Change in sugar composition of DOM in Sarawak and Hokkaido.

Above: DOM in Sarawak
Below: DOM in Hokkaido

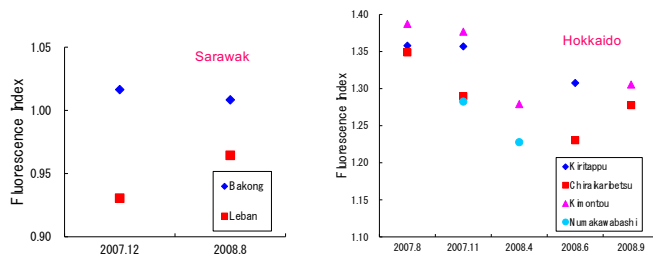


Fig. 4: Change in fluorescence index (FI) of DOM with season.

Left: DOM in Sarawak
Right: DOM in Hokkaido
Low FI: Terrestrial and peat origin
High FI: Microbial origin

Discussion

Compared with cool temperate river DOM, tropical river DOM was characterized by more oxidized state from the elementary composition, and depleted of protein-like and sugar components. Their average molecular weights were larger and the molecular weight distribution were narrower than those of DOM from the cool temperate area. The tropical river DOM was richer in terrestrial and peat components and not susceptible to seasonal changes.