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湖泊水体中 HCHs 沉降通量及其与浮游植物间响应关系*

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摘　要: 2006 , TOC (HCHs) . , , , ; , , ; HCHs , TOC , HCHs TOC .

关键词: ; ;

Settling fluxes of HCHs and the relations to algal biomass in a eutrophic lake

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Abstract: Particle settling fluxes, phytoplankton biomass and concentrations of HCHs and TOC, sampled from a small blocked lake, were monitored from spring to autumn in 2006. The results showed that biomass of phytoplankton was high at the end of spring and autumn. The same change trend was found with phytoplankton biomass, chlorophyll concentrations and suspended particulate materials, and a closely relationship found between suspended particulate materials and phytoplankton biomass. Particle settling fluxes were high in spring in which there was a lag period with suspended particulate materials and chlorophyll concentrations, and kept lower in summer and autumn. HCHs settling fluxes were high in spring which was consistent with the change trend of organic carbon settling fluxes. This indicated that HCHs settling fluxes were mainly controlled by organic carbon settling fluxes.

Keywords: HCHs; settling fluxes; phytoplankton

. , , , . , , , [1]. (HOCs) [2], HOCs , HOCs [3], HOCs . , HOCs . , [4-6], . , , .

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(HCHs) HOCs, . HCHs
, . , ,
, , , . ,
. 2006 3 10 ( )
7 , ,
TOC HCHs , HCHs .

1 材料与方法

1.1 采样点

, 4.5km^2, 3.2m.
. 3 5 , . .

1.2 水样的采集和水质分析

, 0.5m , .
, . (SPM) [7].
[8].

1.3 沉降颗粒物的捕获

150mm, 1:3 . 45° ,
500ml , .
40 , swimmer . 2% ,
HCHs . , 7d , , .

1.4 有机污染物的提取

80 50mg, . 3 : (1:1)5ml,
15min, 4000 /min 5min. 100ml , . K-D
, , 0.1ml, . .

1.5 色谱分析条件

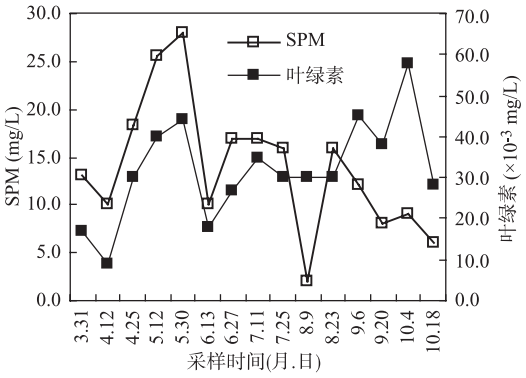
Agilent6890N , μ-ECD , (30m×0.25mm×0.5μm),
: 250℃, : 300℃, N_2: 1.5ml/min, : 1μl, . : 150℃(2min)→10℃/min
→230℃→5℃/min→275℃(5 min). α-HCH β-HCH γ-HCH δ-HCH 48.3% 78.5%
62.6% 103.3% .

2 结果与讨论

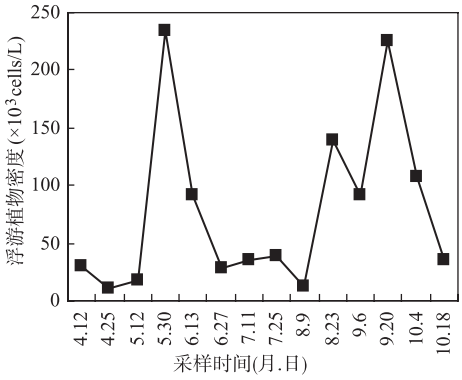
2.1 浮游植物生长与悬浮颗粒物间的关系

. SPM
(1), (3 5), , 0.017mg/L 0.044mg/L; (6 8)
, 6 13 (0.018mg/L), 0.03mg/L
; (9 10) 10 4 0.058mg/L.
, , , . [9].
SPM . SPM 5 12 5 30 ,
25.5mg/L 28.0mg/L, (1). , 8 9 10 4
, .
, ,
(2). (5 30) (9 10) .
, , . 5 , ,
. , SPM .

1　2　, SPM　, SPM　.



1　SPM

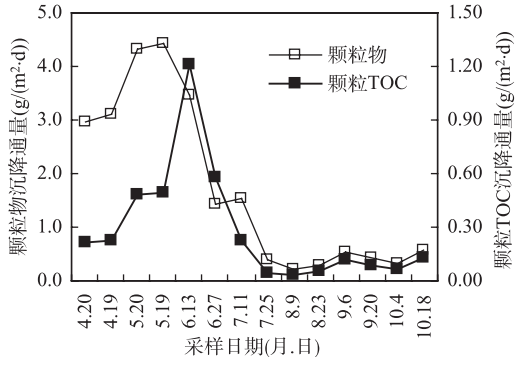


2

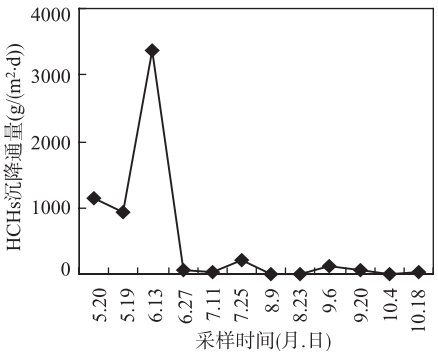
Fig.1 Concentrations of chlorophyll-a and SPM in water phase　Fig.2 Phytoplankton biomass in water phase

2.2 水体颗粒物沉降通量的变化

4 5　, , , . 6 13 TOC . 6 13 TOC , , TOC (3). SPM , , SPM , , SPM 5 30 , 6 13 . . , , , [10]. , SPM , , . (4 5) , [11].



3　TOC



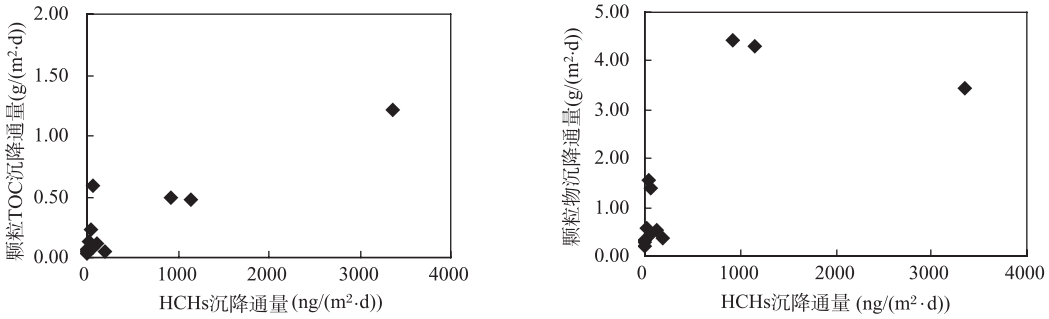
4　HCHs

Fig.3 Particle settling fluxes and organic carbon settling fluxes　Fig.4 HCHs setting fluxes in water phase

2.3 水体中 HCHs 的沉降通量

HCHs (4). 3 4 , HCHs TOC . HCHs TOC 5 6 , 6 13 .

HCHs TOC (5), 0.8156 0.4775, HCHs TOC . HCHs / , . Maria DDT PCBs [12].



5 HCHs TOC

Fig.5 Relationships between HCHs settling fluxes, particle settling fluxes and organic carbon settling fluxes

3 结论

(1) . SPM , SPM .

(2) TOC . , SPM ; . , .

(3) HCHs , TOC , HCHs TOC . HCHs / , .

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