河川整治冠全國--簡評

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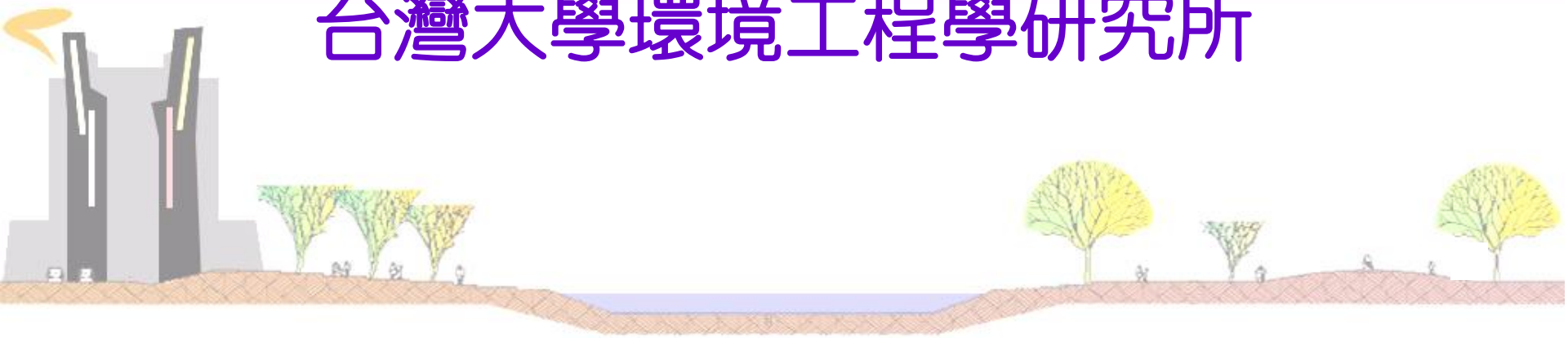


淡水河流域水污染負荷

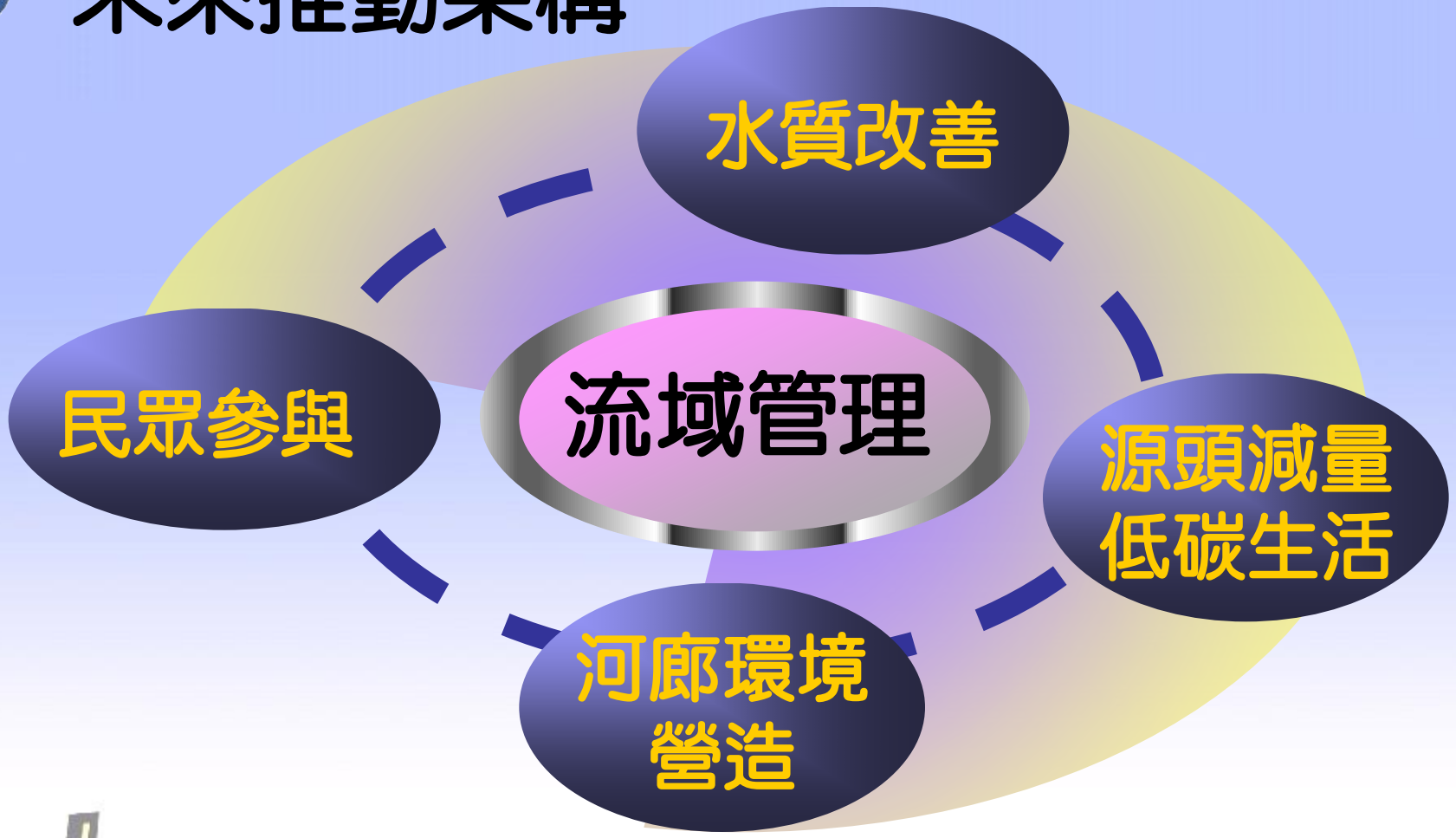
類別	排放水量 CMD	生化需氧量排放量 Kg/day	氨氮排放量 Kg/day	懸浮固體排放量 Kg/day
生活污水	1,088,146 (88%)	183,986 (93%)	36,660 (98.5%)	183,221 (65%)
事業廢水 *含養豬廢水	151,772 (12%)	13,842 (7%)	568 (1.5%)	97,852 (35%)
合計	1,239,918	197,828	37,228	281,073

資料來源：淡水河係污染整治支援計畫，環保署，96年

主要戰略

- 鐵腕取締砂石場及重大水污染源
- 實施尿液回收
- 下水道建設
- 現地處理－溼地及礫間

未來推動架構



再加油！讓淡水河更清澈

大漢溪污染分析

- 關鍵項目：氨氮
- 影響因素：
  - 鳶山堰取水後河川流量低，約5-10CMS
  - 生活污水：以滴仔溝、西盛排水及塔寮坑溪為主要污染來源。

新店溪污染分析

- 關鍵項目：氨氮
- 影響因素：
  - 生活污水：以瓦瑤排水、中和排水及江翠排水為主要污染來源。

淡水河本流污染分析

- 關鍵項目：氨氮及溶氧
- 影響因素：
  - 生活污水為主要污染源，以二重疏洪道及迪化污水處理廠（台北市）排水為主。

Table 6. Wastewater quality based on water savings and source separation strategies(Henze 1997)

Quality	250 L/cap/day		160 L/cap/day		80 L/cap/day	
	Conventional	Toilet separation*	Conventional	Toilet separation	Conventional	Toilet separation
COD* (g/m^3)	520	130	815	200	1625	400
BOD* (g/m^3)	240	80	375	125	750	250
Nitrogen (g/m^3)	50	6	80	9	165	19
Phosphorus (g/m^3)	10	1.6	16	2.5	31	5

* Assume non-P detergents and solid waste separation at sink. COD (chemical oxygen demand). BOD (biological oxygen demand).

Table 7. Cost estimates of struvite production and sale from the WWTP

Country	Description	Cost (US$/tonne)
Australia	Cost of producing 1 tonne of struvite	140
Australia	Suggested market value for struvite	877
Australia	Conservative market of struvite as "boutique" fertiliser	261
Japan	Operational costs for producing 1 tonne of struvite	460
Japan	Cost of purchasing 1 tonne of struvite	250
Japan	Suggested value of struvite	1885
Japan	Final product from struvite	500
UK	Cost of struvite as an ingredient	9
UK	Cost of phosphate rock	40–50
UK	Suggested market value of struvite	283

Table 8. Dilution factors in toilets (Udert et al. 2003)

Toilet type	Typical dilution factor
Conventional urinal	600
No mix trap	30
No mix tank	4 (range 1 10)
Waterless trap	1

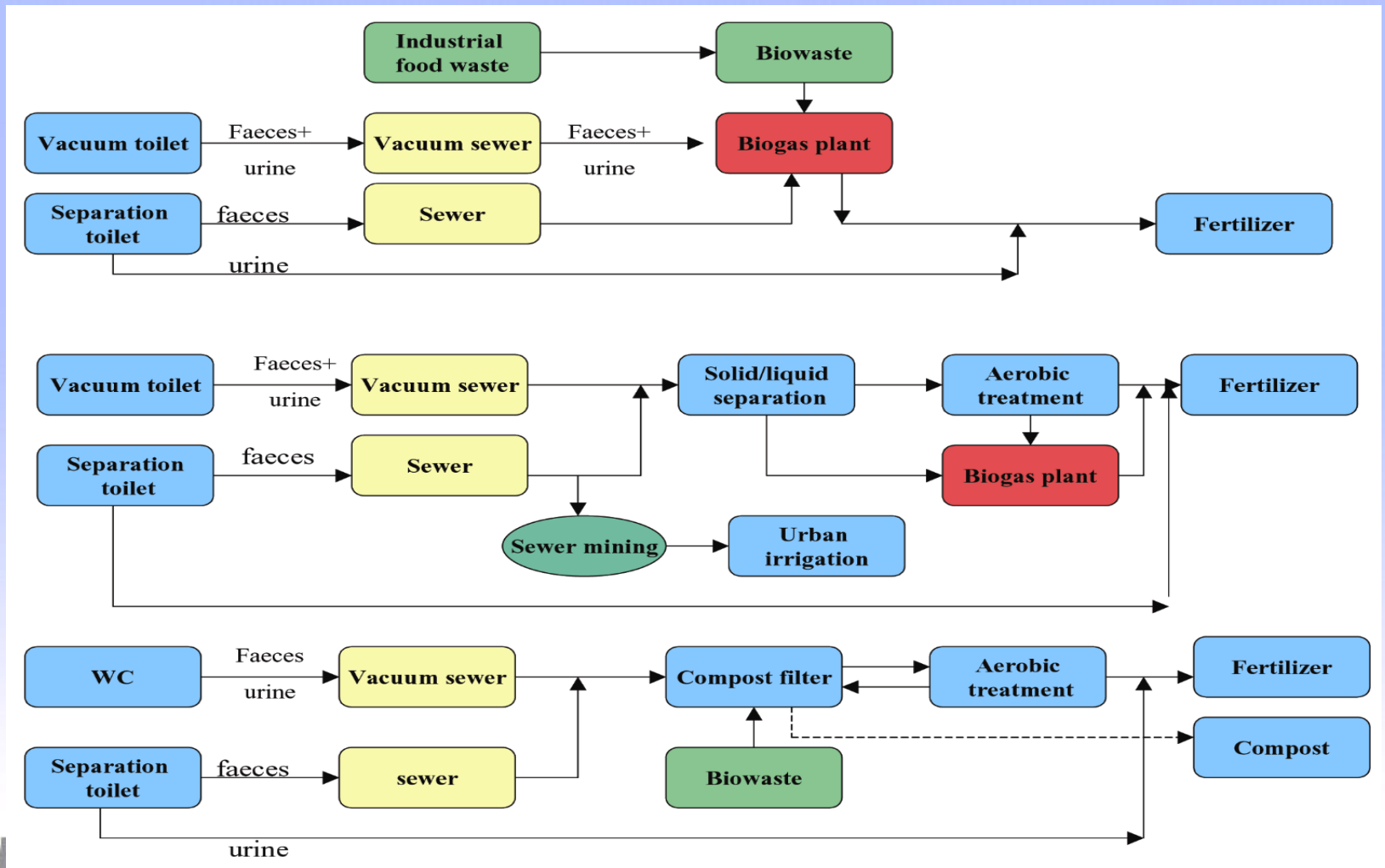
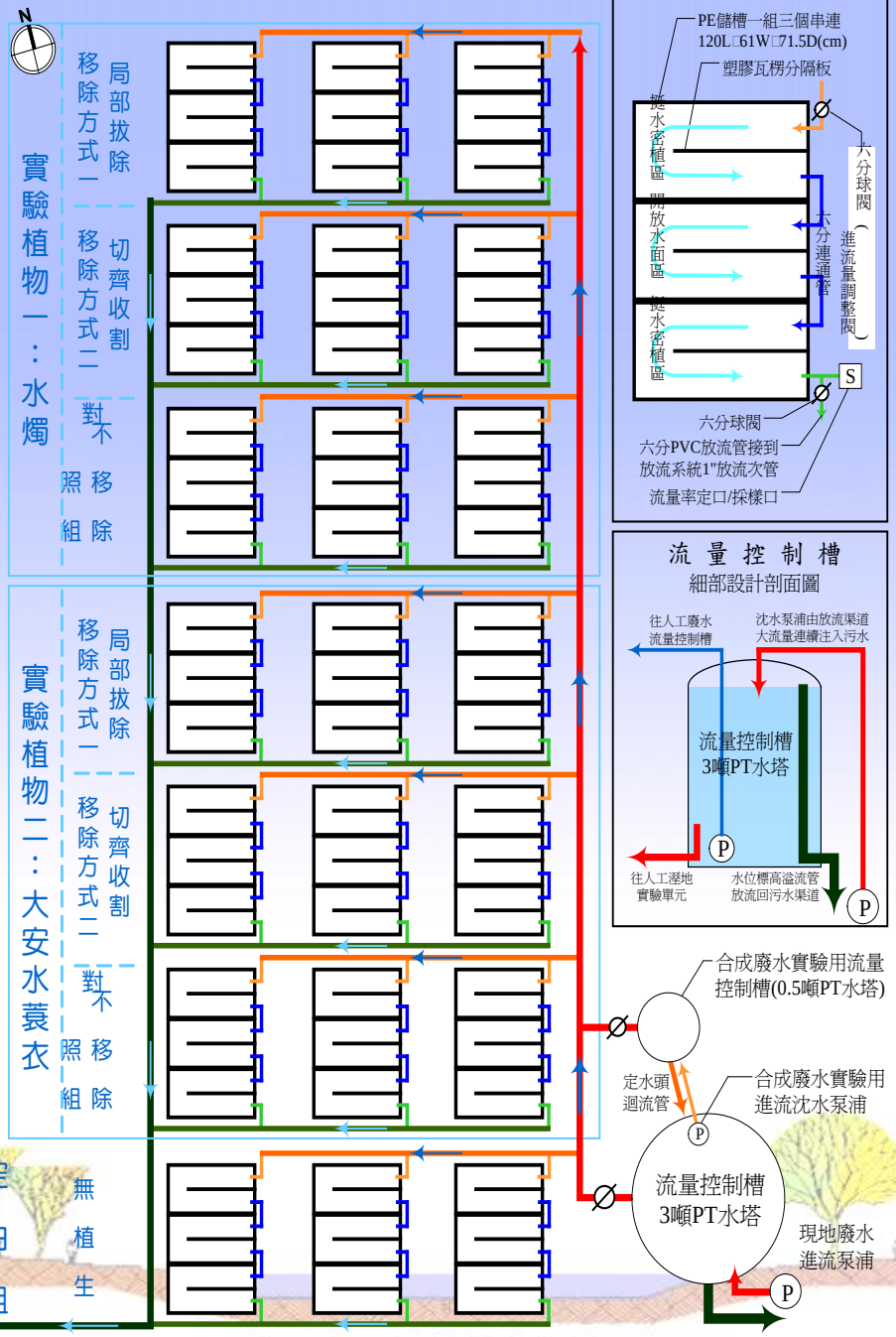


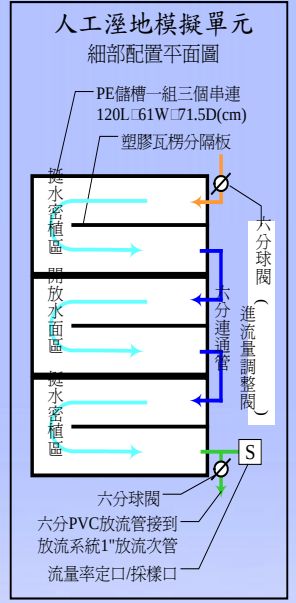
Figure 7. Examples of alternative wastewater systems with resource recovery (Otterpohl 2002)

Table 9. Examples of demonstration projects on alternative sanitation

Demonstration	Location	System	Current capacity	Reference
Flintenbreite	Lubeck, Germany	Vacuum-biogas	400 pe	Otterpohl 2002
Lambertsmuhle,	Cologne, Germany	Urine separation toilets and composting	1 house	Otterpohl 2002
Basel University of Applied Sciences	Basel, Switzerland	Urine separation toilets, timed discharge into sewers	—	EAWAG 2003
Understenshojden	Stockolm, Sweden	Urine separation	160 pe (apartments)	Jönsson *et al.* 1997
Masimbwe Secondary School	Tanzania	Biolatrine-biogas		UNDP 2004
Newington, Olympic Village	Homebush, Australia	Dual piping, recycled water for non-potable use	2000 houses	ABC 2000

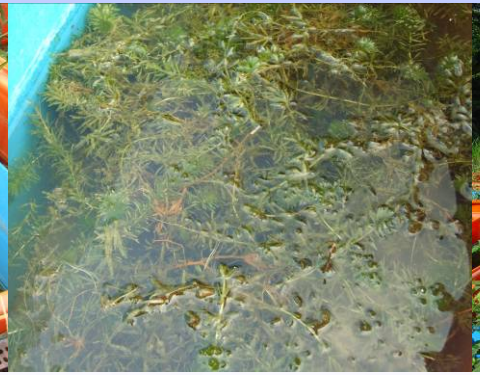
微型人工溼地研究場地布置示意圖

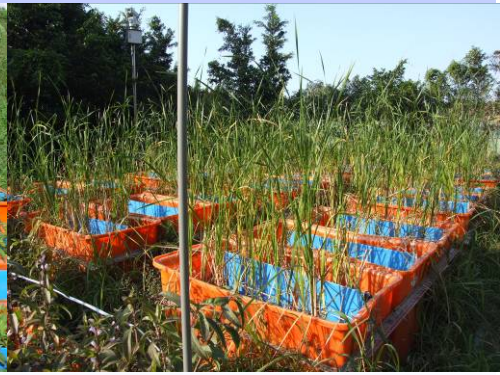






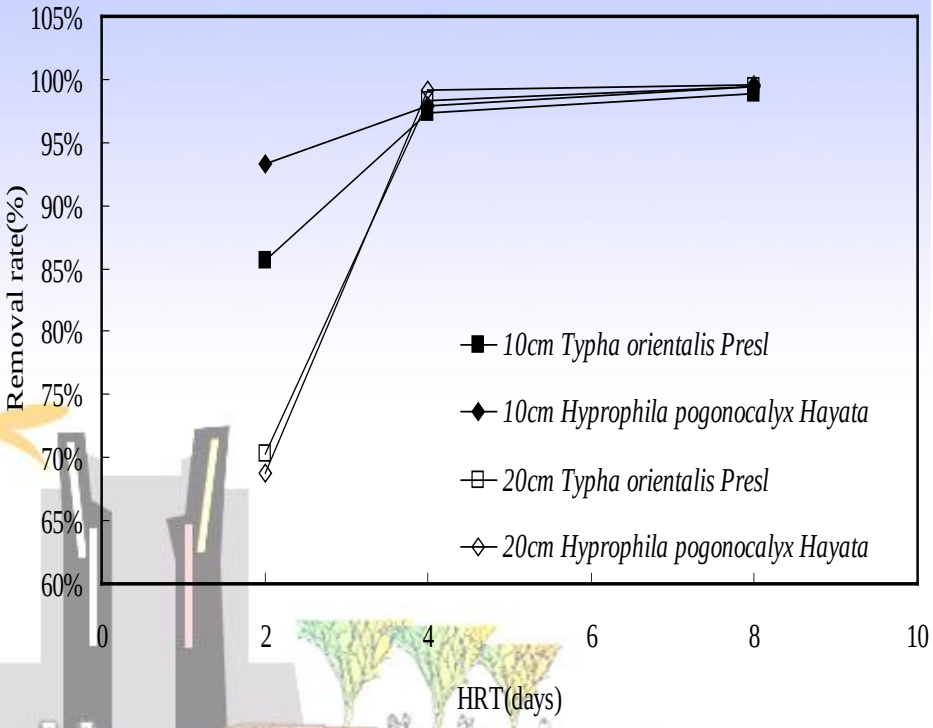


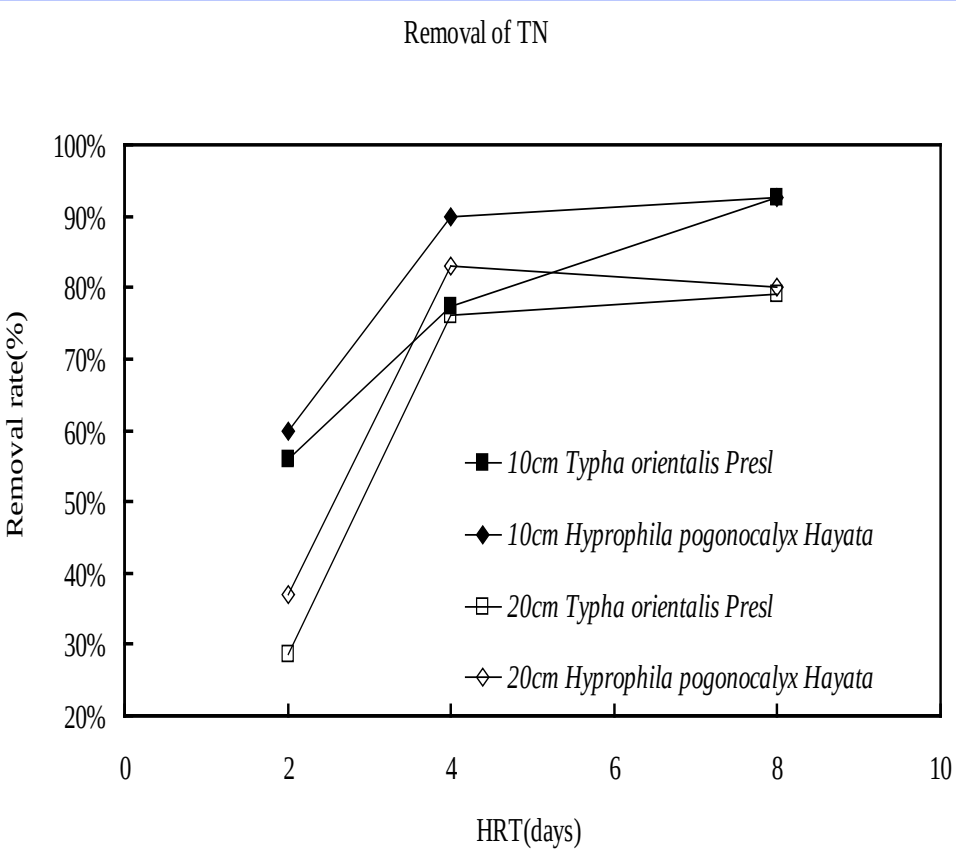







四、結果與討論


Removal of NH_3-N
105%
100%
95%
90%
85%
80%
75%
70%
65%
60%
Removal rate(%)
0
2
4
6
8
10
HRT(days)
10cm Typha orientalis Presl
10cm Hyprophila pogonocalyx Hayata
20cm Typha orientalis Presl
20cm Hyprophila pogonocalyx Hayata


Removal of TN
100%
90%
80%
70%
60%
50%
40%
30%
20%
Removal rate(%)
0
2
4
6
8
10
HRT(days)
10cm Typha orientalis Presl
10cm Hyprophila pogonocalyx Hayata
20cm Typha orientalis Presl
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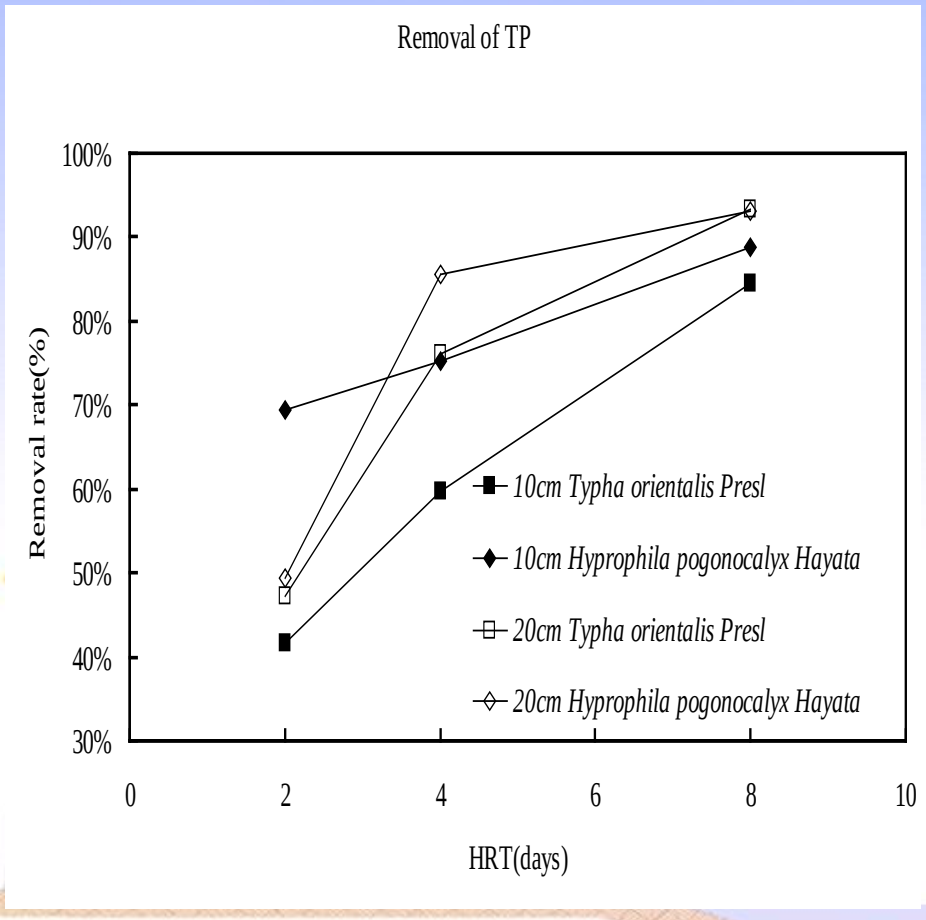
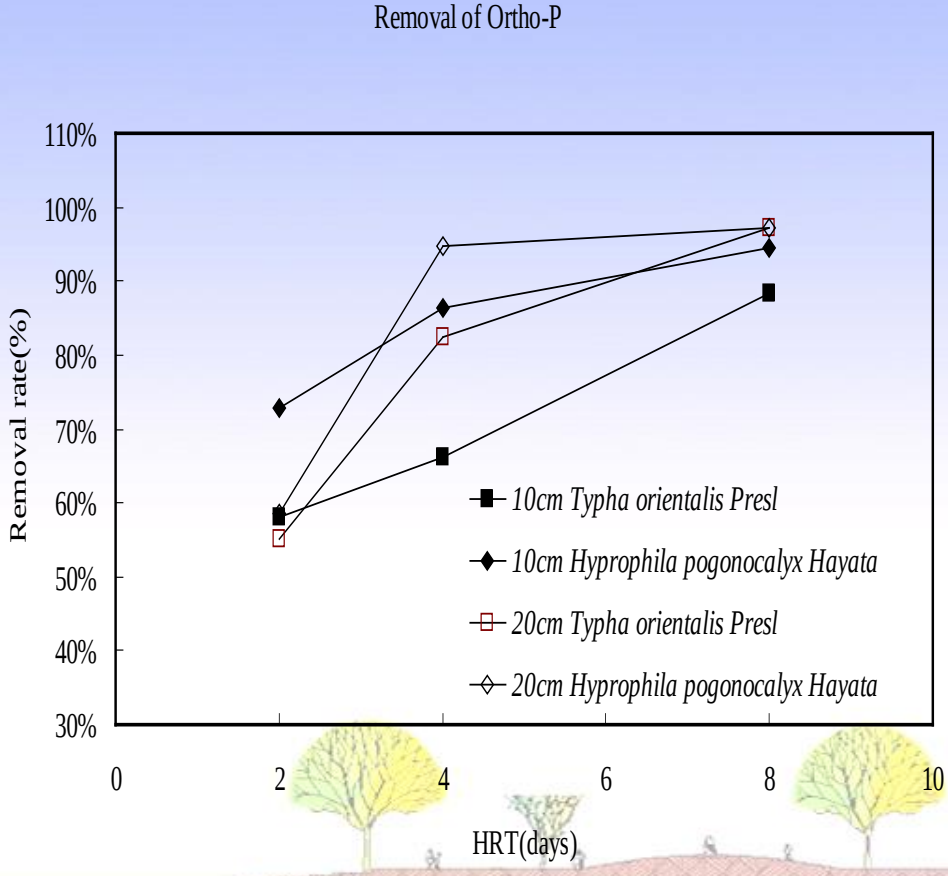
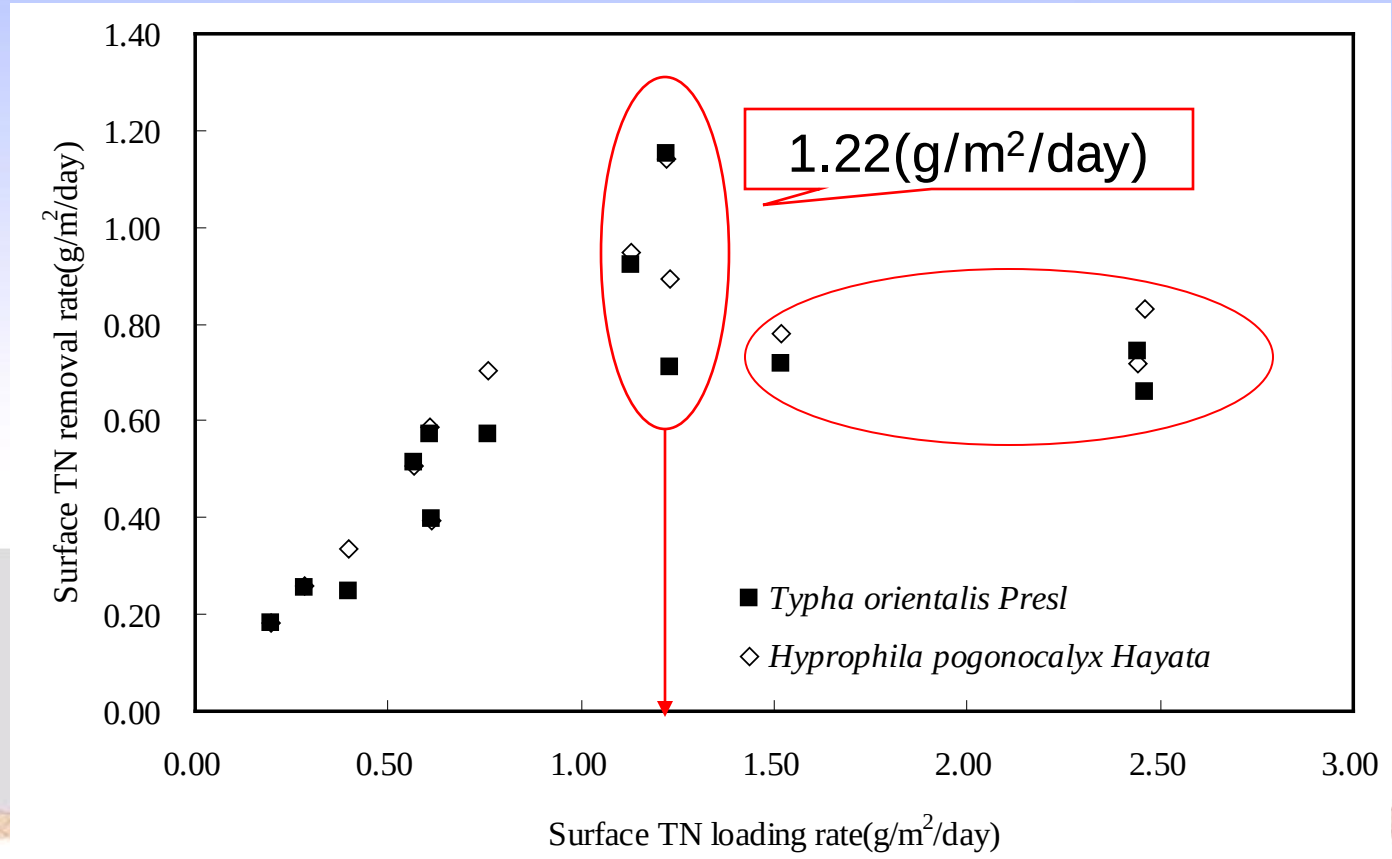

Removal of TP
Removal rate(%)
100%
90%
80%
70%
60%
50%
40%
30%
0
2
4
6
8
10
HRT(days)
10cm Typha orientalis Presl
10cm Hyprophila pogonocalyx Hayata
20cm Typha orientalis Presl
20cm Hyprophila pogonocalyx Hayata


Removal of Ortho-P
Removal rate(%)
110%
100%
90%
80%
70%
60%
50%
40%
30%
0
2
4
6
8
10
HRT(days)
10cm Typha orientalis Presl
10cm Hyprophila pogonocalyx Hayata
20cm Typha orientalis Presl
20cm Hyprophila pogonocalyx Hayata

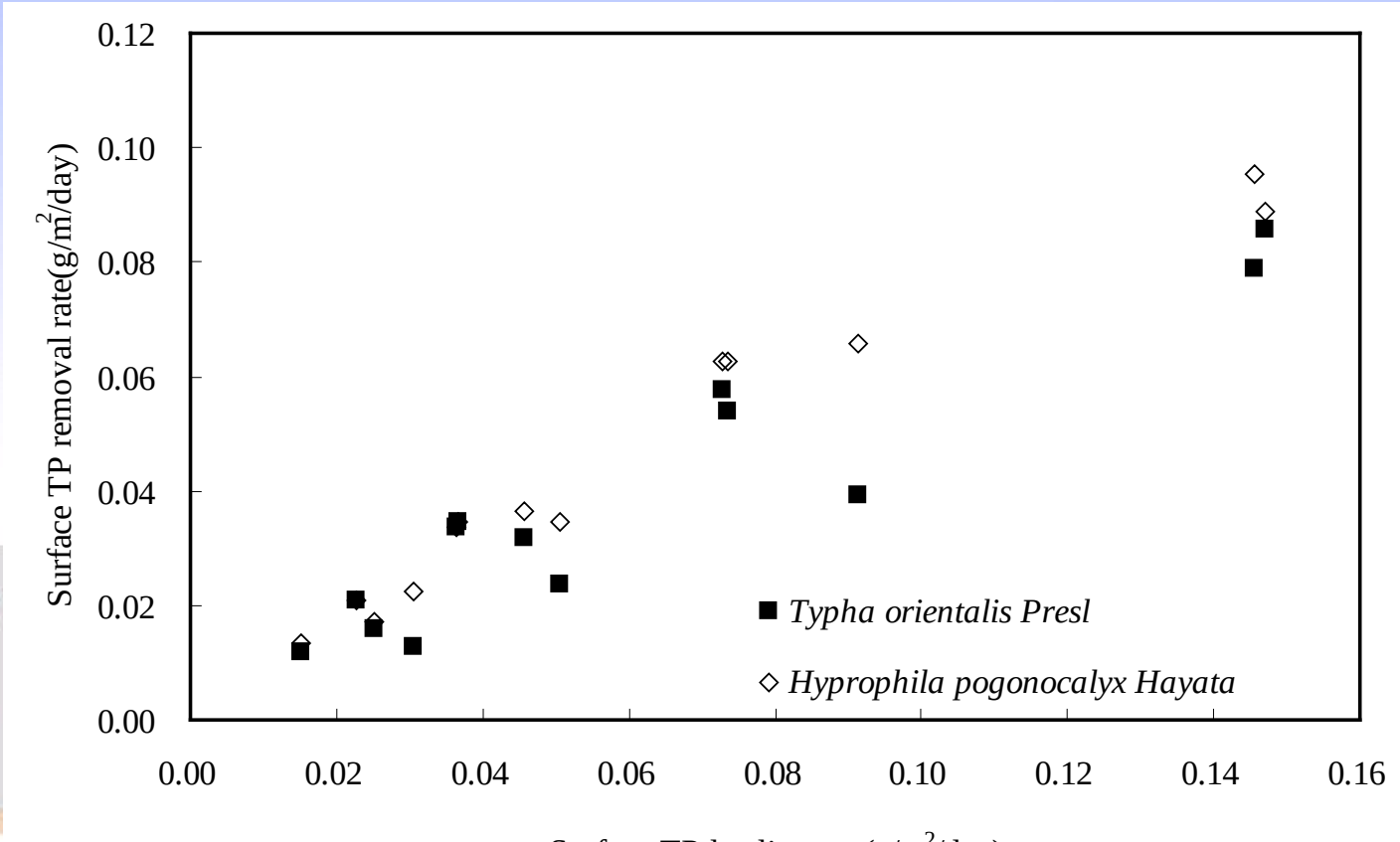
四、結果與討論

- TN-表面積污染負荷與去除量



四、結果與討論

- TP-表面積污染負荷與去除量



Trust me, You can make it!