



# Ecology of *Bithynia siamensis* *goniomphalos* sampling in water reservoirs in 3 districts, Khon Kaen province, Thailand

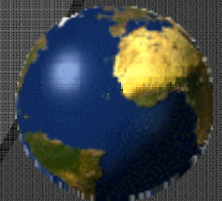


Apiporn Suwannatrai  
Ph.D candidate

Assoc. Prof. Dr. Smarn Tesana : Advisor  
Department of Parasitology Faculty of Medicine, KCU

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- ⦿ Objectives
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Introduction  
&  
rationale of the study

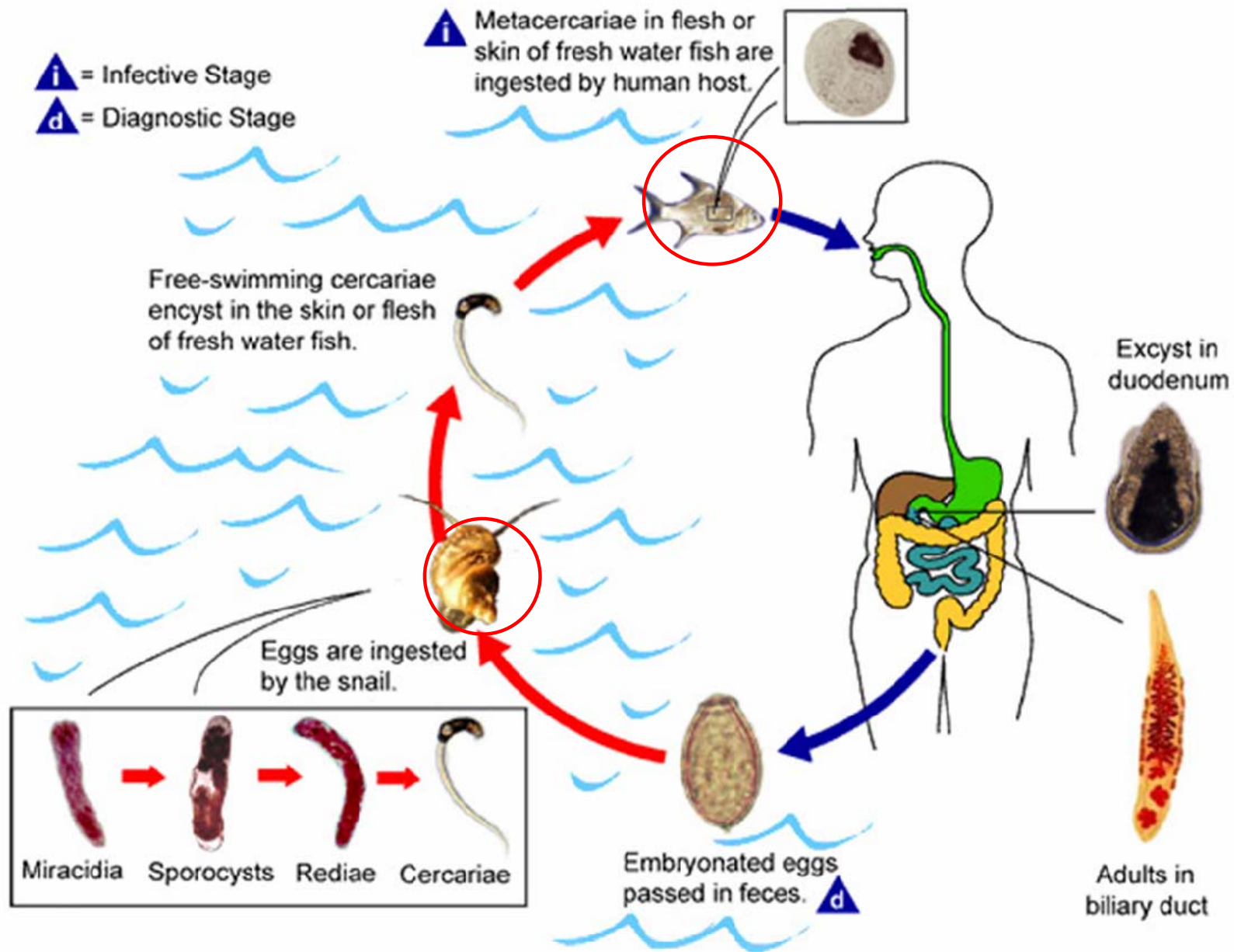


Fig I life cycle of *Opisthorchis viverrini*



# *Bithynia siamensis goniomphalos*

- ⦿ separated sex
- ⦿ subovately conic shell
- ⦿ size 10.2 – 14.9 x 5.6 – 8.5 mm.
- ⦿ apex of older shells was relatively wide and deep

(Brandt, 1974)



Fig 2 *B. siamensis goniomphalos*

# Ecology of

## *B. siamensis goniomphalos*

- ◎ It lived in a wide variety of habitat  
=> shallow , temporary pond ,  
crawled on plants, rock, mud etc.
- ◎ Found in water reservoirs at the depth  
not more than 50 cm
- ◎ pH 7-8.4, Temperature 24-28 °C  
(Sornmanee, *et al.*, 1998)

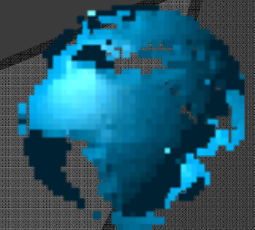
◎ Because of the role of snails in the transmission of opisthorchiasis, it is important to gain information such as snails ecology, snails bionomics and population dynamics etc., which are the baseline data for control program.

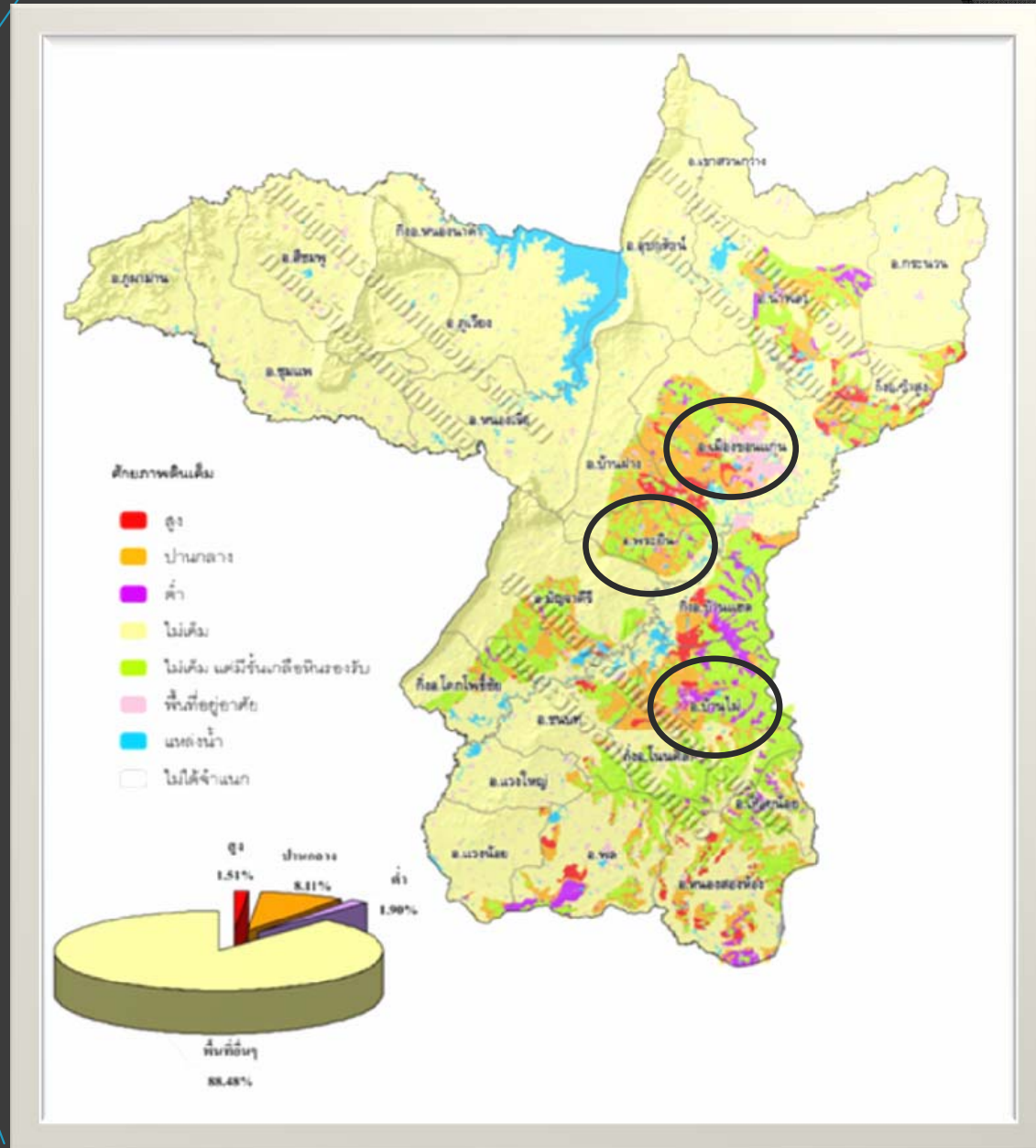
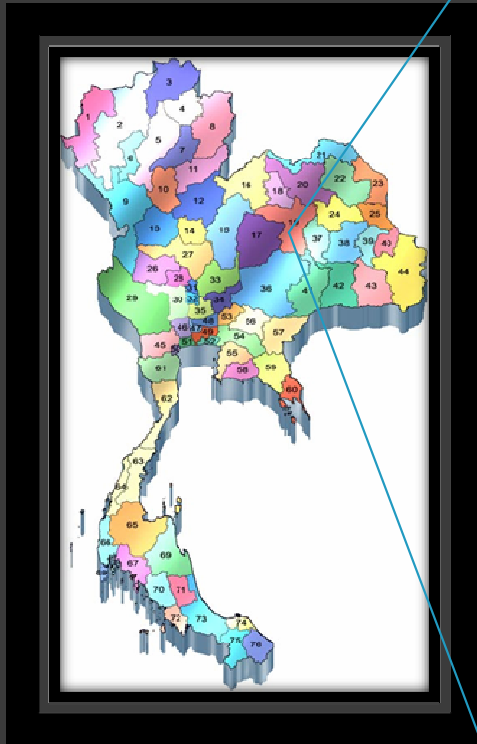
# Objective

- To study ecology of *Bithynia siamensis goniomphalos* sampling in water reservoirs in 3 districts, Khon Kaen province, Thailand.



# Materials and method





**Fig 3 sampling location**

Ref. : Geo-informatics center for development of Northeast Thailand

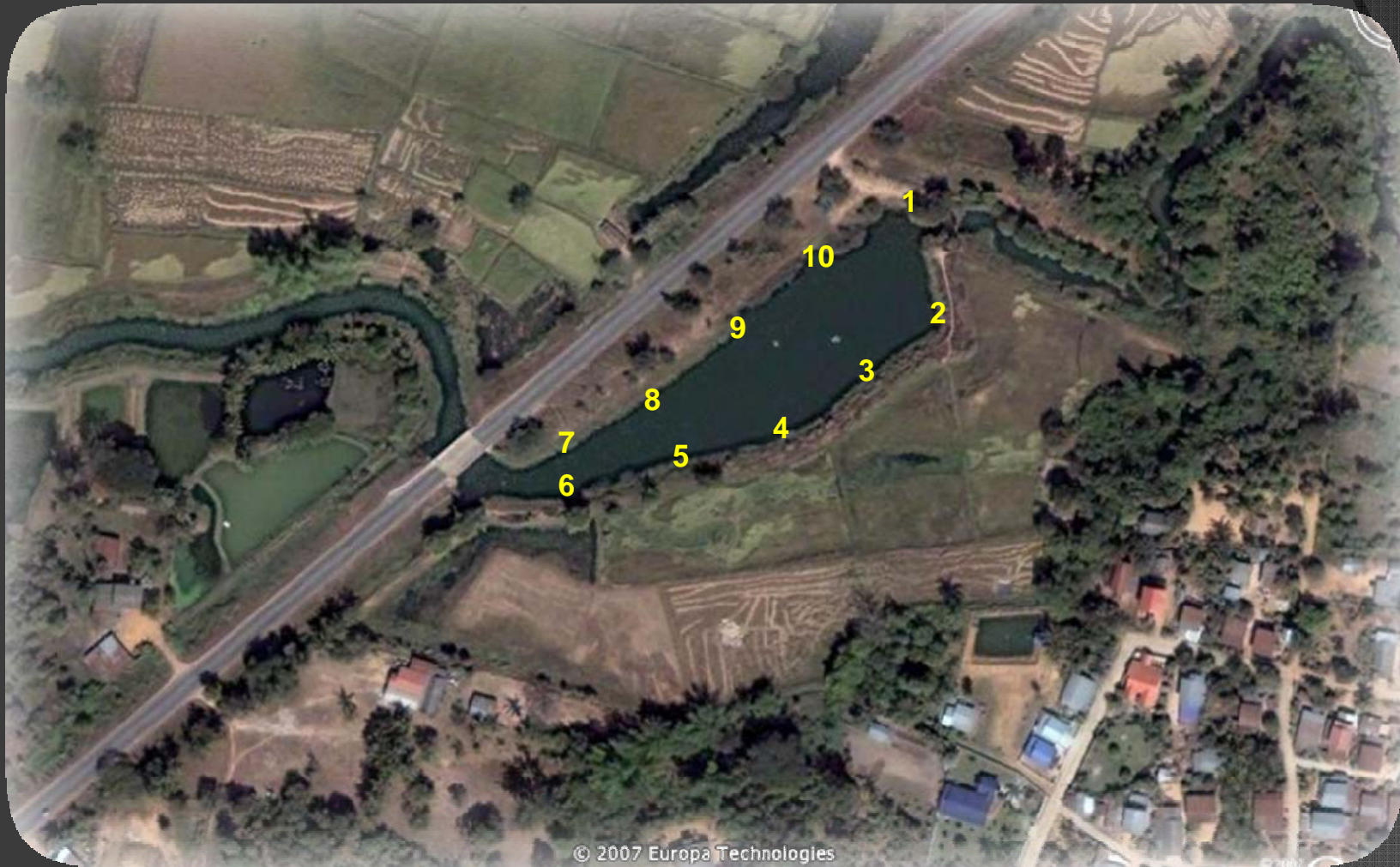
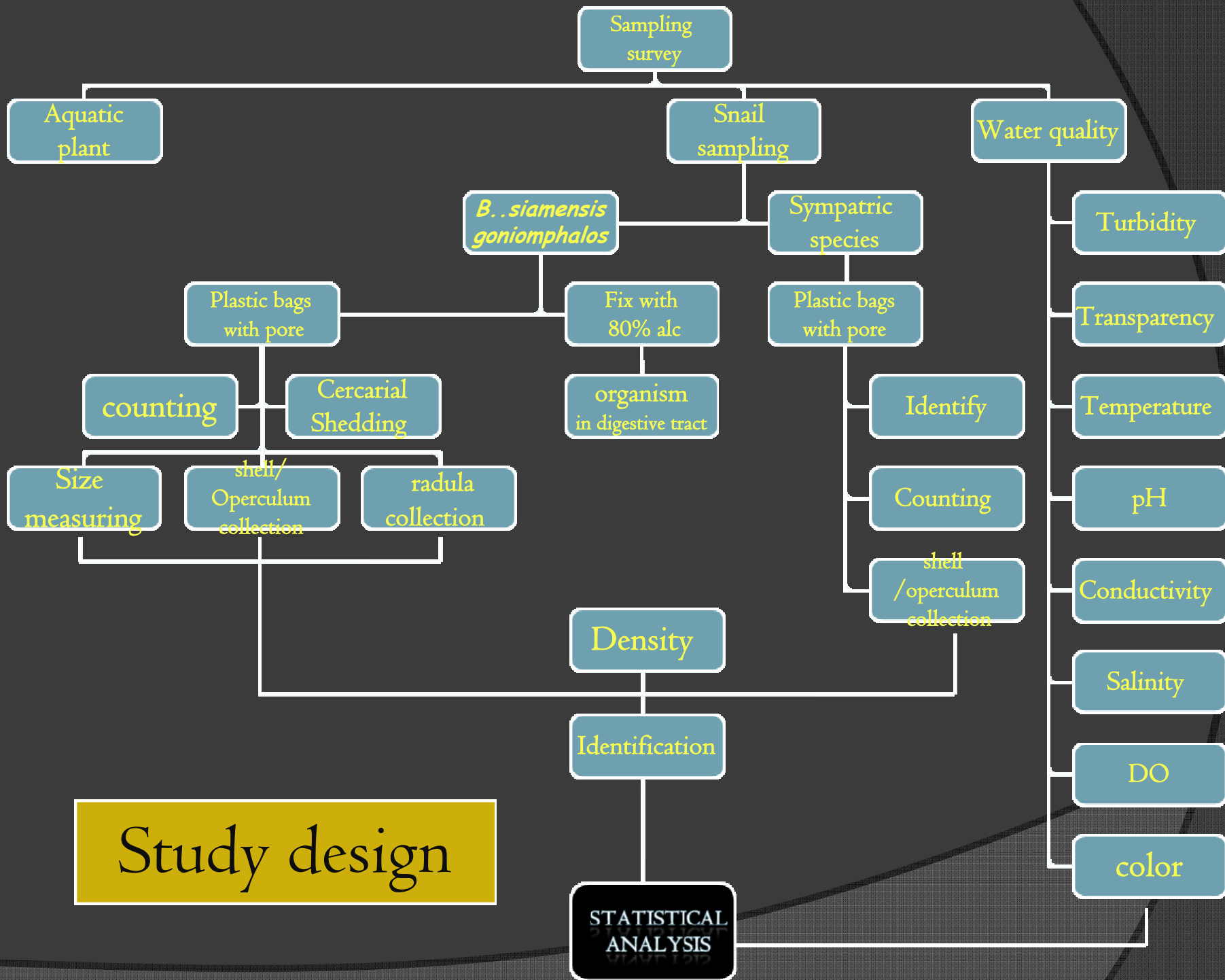


Fig 4 Sampling station





Study design

STATISTICAL ANALYSIS



# Results

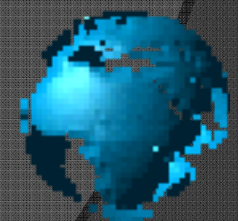




Fig 5 sampling locality found *B. siamensis goniomphalos*



Echinostome cercaria



Virgulate cercaria



Amatae cercaria

Fig 6 Cercarial shedding from *B. siamensis goniomphalos*





บัวสาย (*Nymphaea lotus*)



ธูปฤาษี (*Typha angustifolia*)



ต้นกก (*Cyperus digitatus*)



หญ้าขน (*Brachiaria mutica*)



หญ้าหว่าย (*Eragrostis tenella*)



ผักตบชวา (*Eichhornia crassipes*)



ผักกระเฉดต้น (*Neptunia oleracea*)



ผักบุ้ง (*Ipomoea aquatica*)

Fig 7 water plants



Table I show number, density and different size of sampling *B. siamensis goniomphalos* in 5 location

Locality	Total snail sampling	Density (snails/ Station)	Size group (cm.)				
			< 0.5	0.5-0.8	0.9-1.0	1.1-1.2	>1.2
Ban pa-yuen pond	323	64.6	54	85	152	32	0
Pa-nao weir	139	27.8	32	49	40	18	0
Kham reun roadside ditch	153	30.6	10	46	70	25	2
Doo-yai pond(I)	459	91.8	73	312	56	28	0
Sri-than weir	23	4.6	7	12	4	0	0

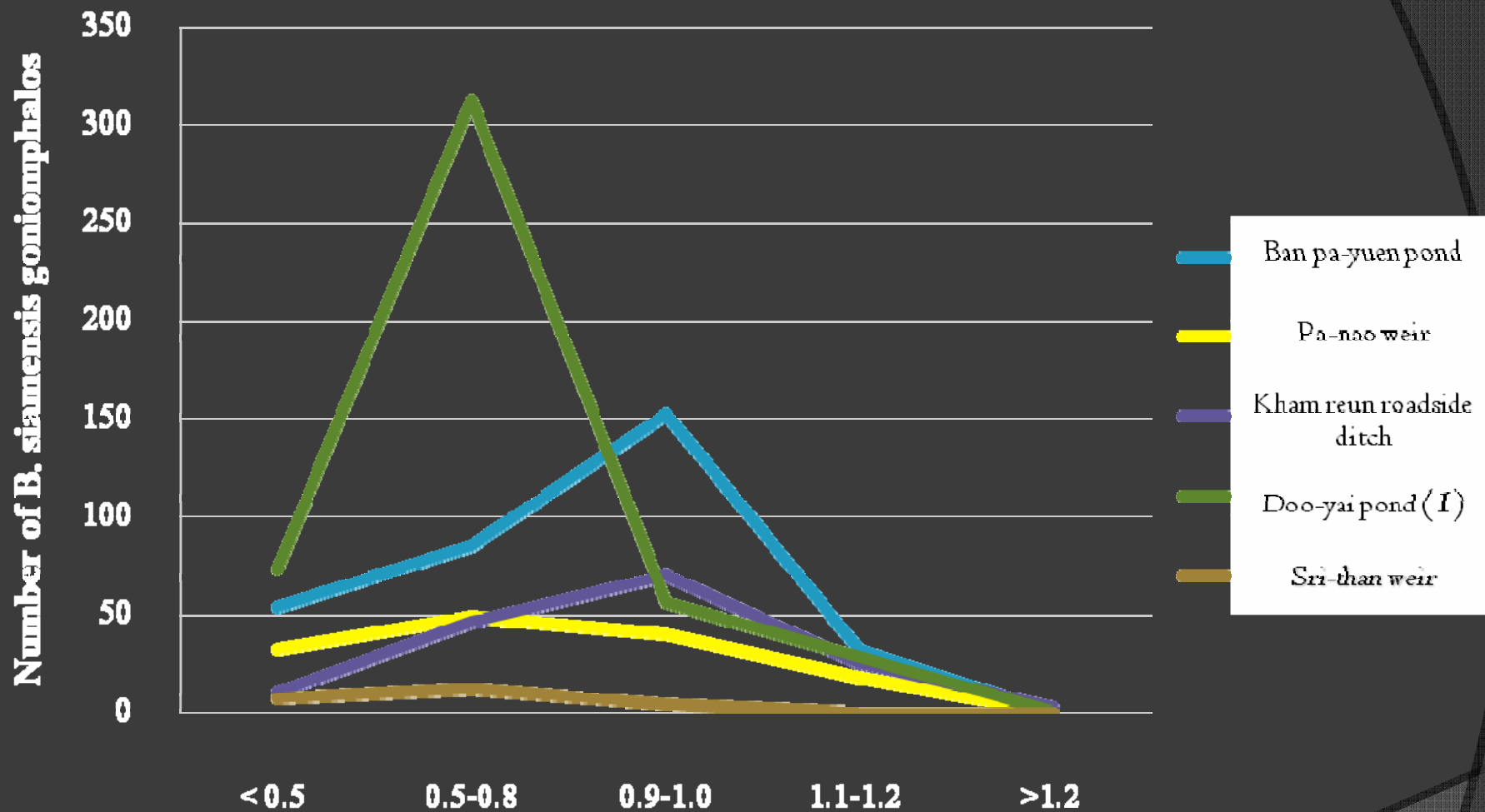


Fig 8 The frequency of size of sampling *B. siamensis goniomphalos* which were found in the different location

Table 2 The frequency of sampling *B. siamensis goniomphalos* which were found in the different depth.

Locality	Number of snail	Depth (m.)		
		0.5-1.0	1.1-1.5	1.6-2.0
Ban pa-yuen pond	78	78	-	-
Pa-nao weir	53	-	12	41
Kham reun roadside ditch	95	22	5	68
Doo-yai pond(I)	-	-	-	-
Sri-than weir	-	-	-	-

- not found *B. siamensis goniomphalos*



Fig 9 Sympatric snails species



◎ No snail found : 3 out of 10 localities

- salinity : 9.98 , 19.12 and 23.6 ppk

- conductivity : 17.40, 33.20 and 41.08  $\mu\text{s}/\text{cm}$

◎ No *B. siamensis goniomphalos* found :  
2 out of 10 localities – *M. tuberculata* and  
*I. exustus*

- salinity : 7.94 and 18.66 ppk

- conductivity : 14.15 and 32.84  $\mu\text{s}/\text{cm}$

- *B. siamensis goniomphalos* found :  
5 out of 10 localities.

Density correlation with

Conductivity  $r_s = 0.514$  (p<0.05)

Salinity  $r_s = 0.527$  (p<0.05)

Do  $r_s = -0.433$  (p<0.05)

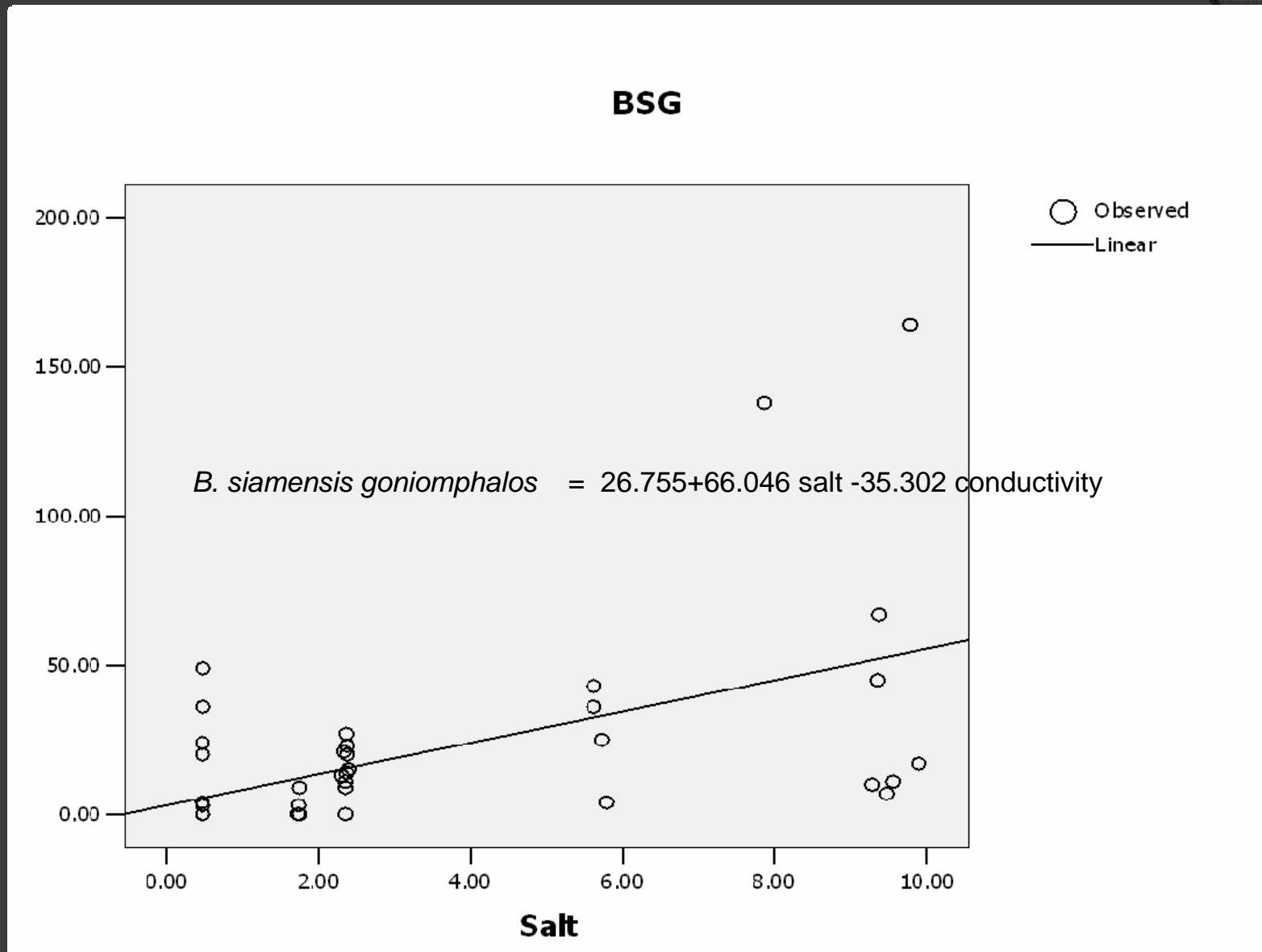


Fig I0 regression analysis between *B. siamensis goniomphalos* and salinity

◎4 Divisions of micro-organisms found in digestive tract of *B. siamensis goniomphalos*.

- Division Cyanophyta
- Division Chlorophyta
- Division Euglenophyta
- Division Chrysophyta



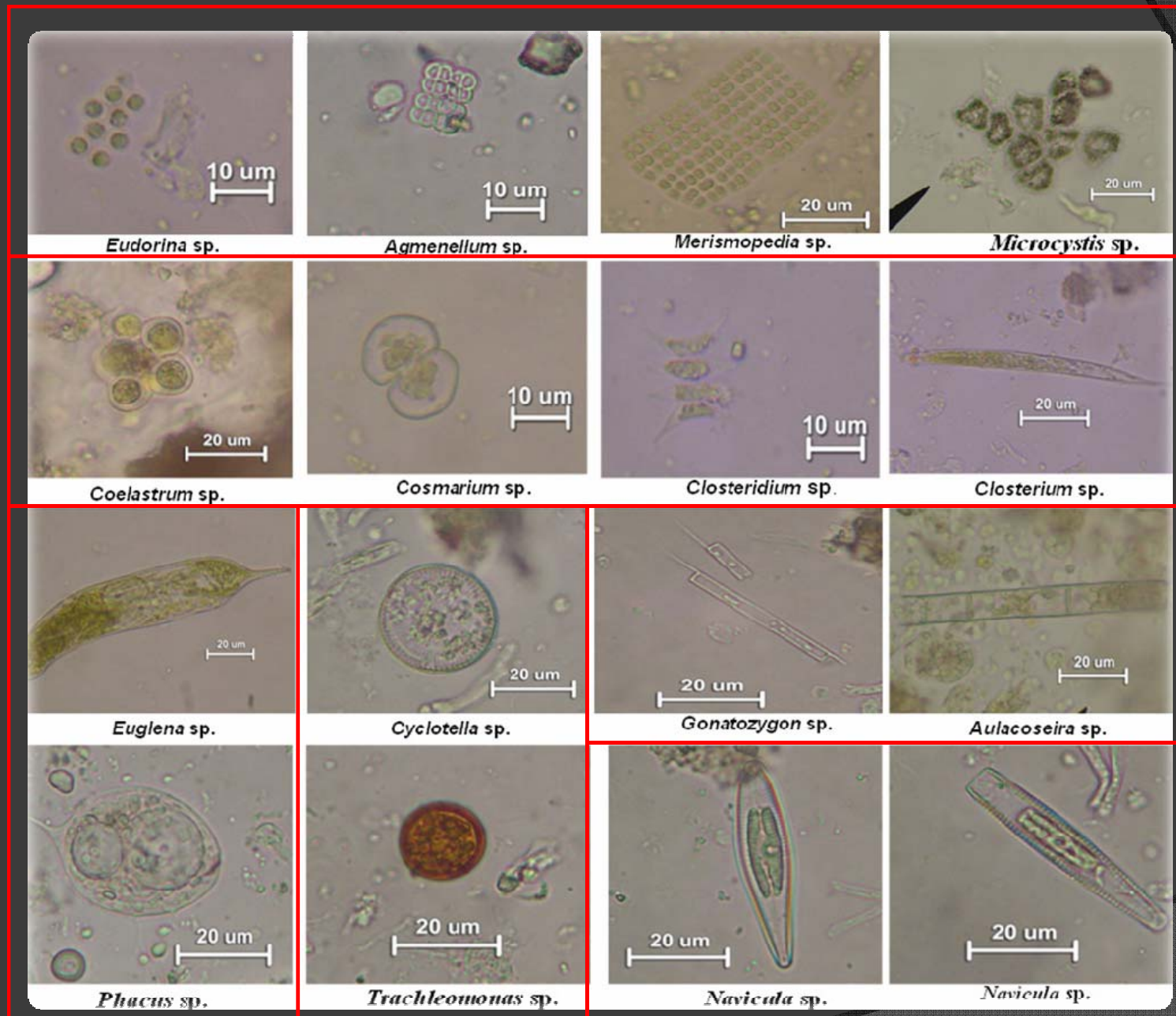
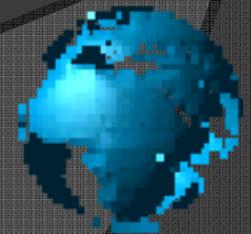


Fig 11 Organism in digestive tract of *B. siamensis goniomphalos*

# Discussion and conclusion



- Majority of *B. siamensis goniomphalos* crawled on water plant such as *Cyperus digitatus*, *Eragrostis tenella*.
- *B. siamensis goniomphalos* is food competition with viviparus snails due to the same micro-organism in digestive contents.

- ① Density of *B. siamensis goniomphalos* was variously distributed in each location resulting of water quality such as salinity and conductivity.
- ① Number of snail correlate with concentration of salinity.



- ◎ *B. siamensis goniomphalos* has numerous density in concentration of salinity about 10 ppk but in 19 ppk not found *B. siamensis goniomphalos*.
- ◎ In This study found *B. siamensis goniomphalos* in deep water to 2 metres.

● Doo-yai pond (I) and Ban pa-yuen pond found Division Cyanophyta and Division Chlorophyta high density of *B. siamensis goniomphalos* was found.

(Blain and DeAngelis, 1997)

# Acknowledgement

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โครงการปริญญาเอกกาญจนาภิเษก

Thank you for  
your kind attention



Table 5 show water quality in each station.

parameter	Ban pa-yuen pond	Pa-nao weir	Kham reun roadside ditch	Doo-yai pond (I)	Doo-yai pond (2) ***	Doo-yai fish pond ***	Sri-than weir
pH	8.01±0.15	7.20±0.23	7.28±0.13	6.85±0.09	6.95	6.86	7.41±0.04
Temperature (°C)	24.20±0.08	27.33±0.25	23.17±0.23	24.83±1.48	24.2	25.8	23.06±0.82
Turbidity (NTU)	19.45±1.35	3.26±0.49	12.57±0.61	4.26±3.37	8.33	15.3	16.08±3.88
Conductivity (µs/cm)	10.25±0.12	0.94±0.01	4.39±0.06	16.69±0.82	14.15	33.2*	3.29±0.01
Salinity (ppk)	5.69±0.08	0.47±0.00	2.35±0.02	9.33±0.63	7.94	19.12*	1.74±0.01
DO (ppm)	0.43±0.03	0.79±0.53	0.45±0.05	0.59±0.10	0.52	0.53	0.82±0.18

\* Measuring by dilution.

\*\* not found *B. siamensis goniomphalos*







Fig 6-2 sampling locality not found *B. siamensis goniomphalos*

Table 5 show water quality in each station.

parameter	Ban pa-yuen pond	Pa-nao weir	Kham reun roadside ditch	Doo-yai pond (I)	Doo-yai pond (2) ***	Doo-yai fish pond ***	Sri-than weir
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\* Measuring by dilution.

\*\* not found *B. siamensis goniomphalos*



Table 6 show correlation between *B. siamensis goniomphalos* and water quality

$r_s$		BSG	PH	TEMP	TURB	COND	SALT	DO
<b>Correlation Coefficient</b>		1.000	-.007	.168	.038	.514(**)	.527(**)	-.433(**)
<b>Sig. (1-tailed)</b>		.	.482	.129	.400	.000	.000	.001
<b>N</b>		47	47	47	47	47	47	47

\*\* Correlation is significant at the 0.01 level (1-tailed).

BSG = *B. siamensis goniomphalos*