



# อดีต ปัจจุบัน อนาคต และความก้าวหน้าการวิจัย เพลงกัตอนสัตว์ในประเทศไทย



**ศ.ดร.ละออศรี เสนาะเมือง**

ผู้อำนวยการศูนย์วิจัยอนุกรมวิธานประยุกต์  
และ  
คณบดีวิทยาลัยนานาชาติ  
มหาวิทยาลัยขอนแก่น

การประชุมวิชาการการบริหารจัดการความหลากหลายทางชีวภาพแห่งชาติ ครั้งที่ 5 ณ โรงแรมโดมอนด์พลาซ่า จ.สุราษฎร์ธานี  
วันที่ 12 กรกฎาคม 2561

# Common Freshwater Zooplankton in SE Asia



Rotifer



Cladoceran



Clam shrimp



Protozoa



Copepod



Fairy shrimp



Ostracod



# Study Area



More than **4,000 samples** were collected from a wide variety of freshwater habitats from **Thailand, Laos, Cambodia, Vietnam & Myanmar**

# Freshwater habitats



Lake



Swamp



Reservoir

# Freshwater Habitats



**Temporary ponds**

# Freshwater Habitats



ปลักควาย (Buffalo wallows)



Rice paddies

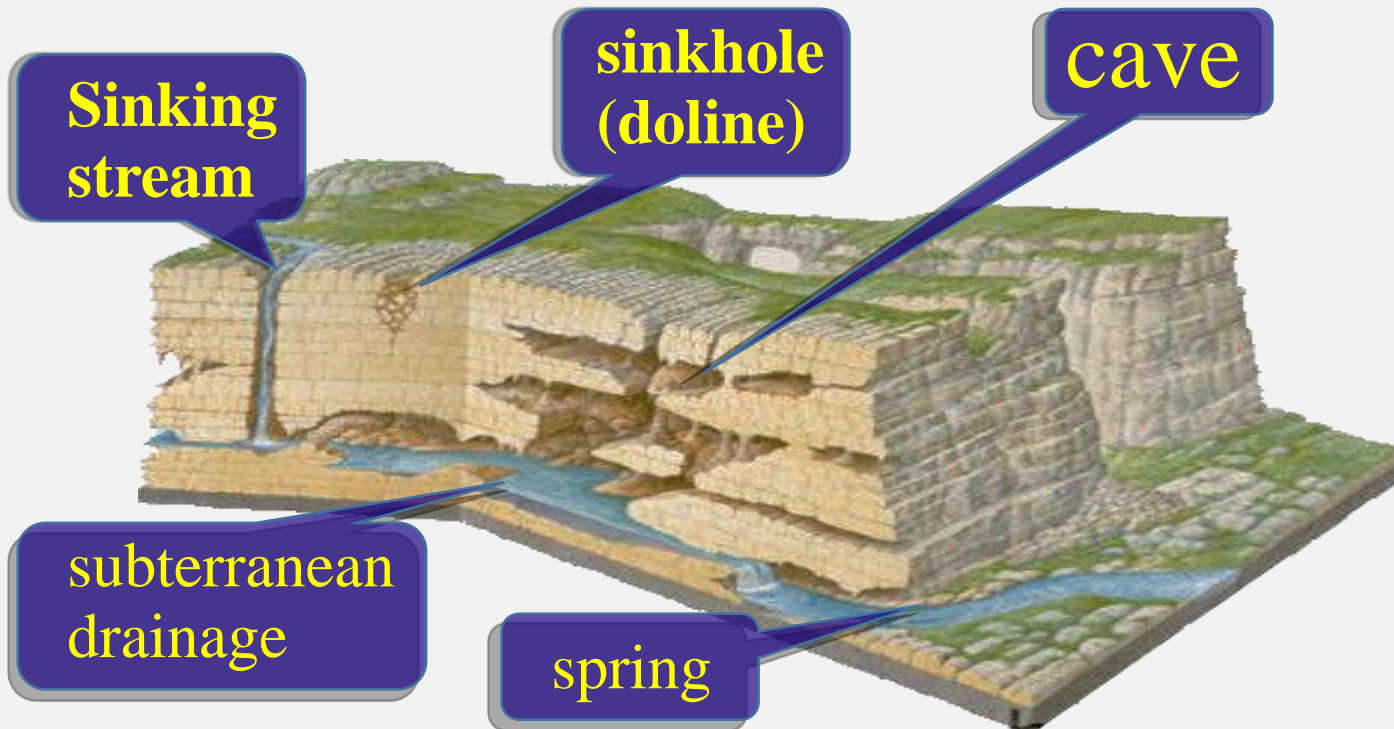


Temporary pond

# Limestone Karst and Caves

Limestone karst is sedimentary rocks outcrops that consists primarily of calcium carbonate.

Karst is characterized by springs, sinkholes and caves developed by dissolving of rock over the years. It can be divided into surface and cave levels.



**Samples have been collected from caves since 2007**



**Hand net**



**Drift net**



**Sucking bottle**



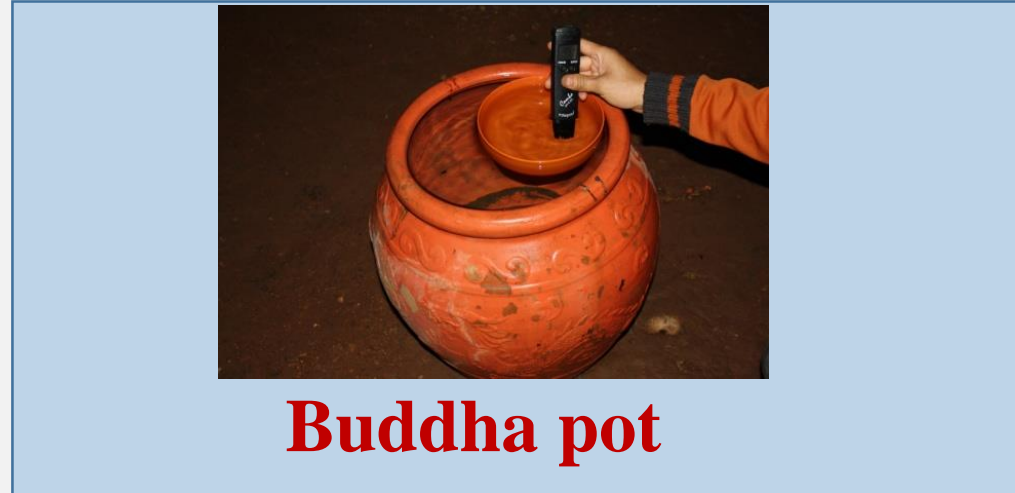
**Brancelj's bottle**



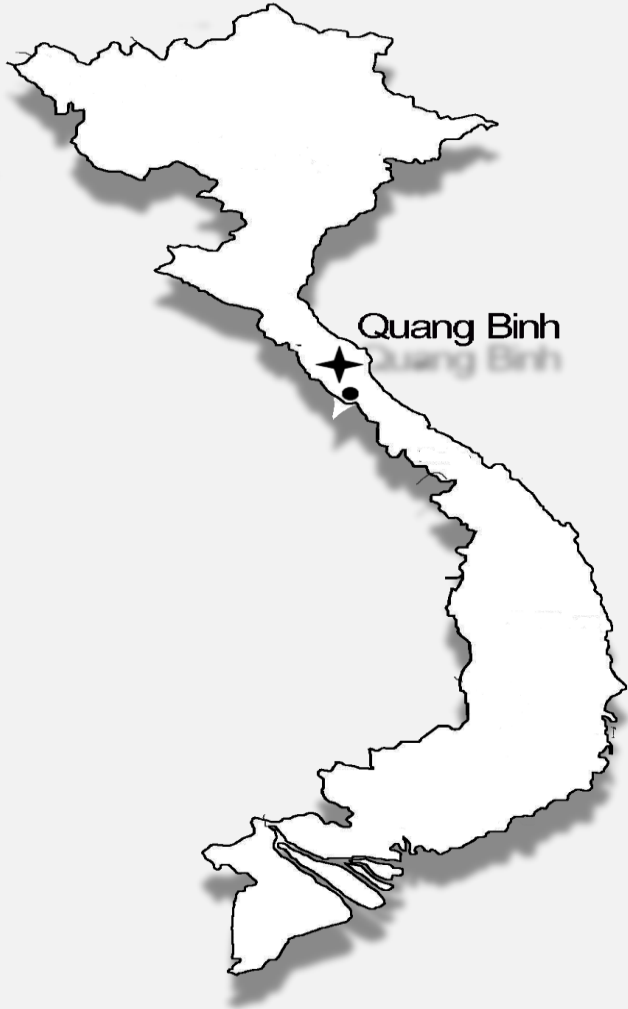
# Freshwater habitats in caves



**Dipping water**



# Thien Duong Cave, Vietnam



17° 31' 09.46" N  
106° 13' 17.80" E  
200 m a.s.l.

# Thien Duong Cave, Vietnam



- The cave name means 'Paradise cave'.
- UNESCO's World Heritage site.
- was discovered by a local man in 2005.
- the cave has been opened to tourists since 3 September 2010.
- 31 km long (but only 1 km is open to public), height  $\sim$ 100 m and 150 m wide.



# Numbers of New Species Described by Sanoamuang *et al.* since 1992



	New species
<b>Rotifers</b>	<b>14</b>
<b>Cladocerans</b>	<b>8</b>
<b>Calanoid copepods</b>	<b>11</b>
<b>Cyclopoid copepods</b>	<b>9</b>
<b>Harpacticoid copepods</b>	<b>5</b>
<b>Fairy shrimp</b>	<b>4</b>
<b>Clam shrimp</b>	<b>5</b>
<b>Cave dwelling shrimp</b>	<b><u>1</u></b>
<b>Total</b>	<b>57</b>



# Free-living Copepods



**Calanoid**



**Cyclopoid**



**Harpacticoid**

**Planktonic  
micro-crustaceans**

**Benthic  
micro-crustaceans**

# Numbers of recorded species: Past & Present

	1970-1992	1993-2018
<b>Rotifers</b>	<b>80</b>	<b>398</b>
<b>Cladocerans</b>	<b>30</b>	<b>112</b>
<b>Calanoid copepods</b>	<b>14</b>	<b>42</b>
<b>Cyclopoid copepods</b>	<b>7</b>	<b>47</b>
<b>Cave dwelling copepods</b>	<b>3</b>	<b>20</b>
<b>Fairy shrimp</b>	<b>0</b>	<b>4</b>
<b>Clam shrimp</b>	<b>2</b>	<b>9</b>
<b>Total</b>	<b>136</b>	<b>632</b>

1970-1992 = studied by previous scientists

1993-2018 = studied by L. Sanoamuang, her students and other new generation scientists.



## Species Numbers of Calanoids : past and present

	1984-1992	1993-2017
<b>Thailand</b>	<b>12</b>	<b>41</b>
<b>Laos</b>	<b>0</b>	<b>22</b>
<b>Cambodia</b>	<b>7</b>	<b>26</b>
<b>Vietnam</b>	<b>9</b>	<b>14</b>
<b>Myanmar</b>	<b>4</b>	<b>?</b>
<b>Malaysia</b>	<b>10</b>	<b>?</b>
<b>Philippines</b>	<b>6</b>	<b>?</b>
<b>Indonesia</b>	<b>14</b>	<b>?</b>
<b>Total</b>	<b>30</b>	<b>48</b>





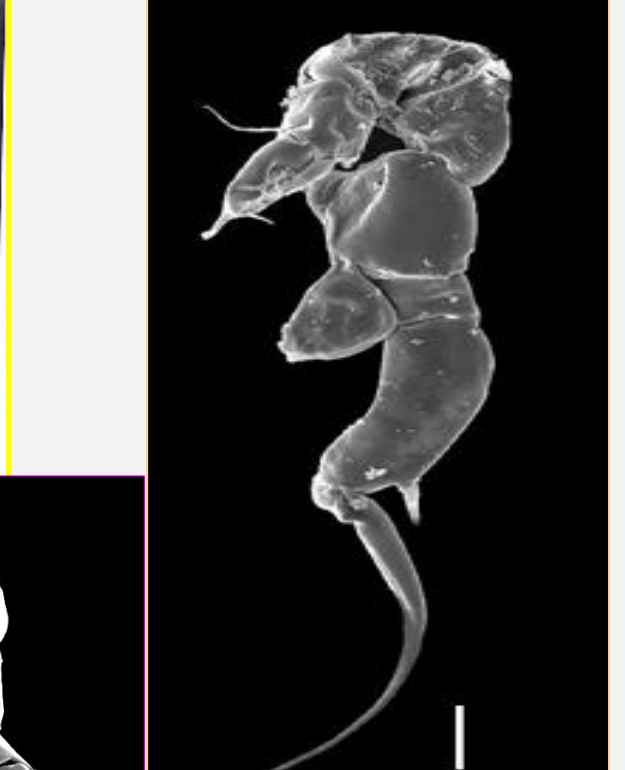
# Endemism of Calanoid Copepods

## Number of species

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<b>Common species</b>	<b>17</b>
<b>Rare species</b>	<b>15</b>
<b>Endemic species</b>	<b>16</b>
- Thailand	8
- Laos	1
- Cambodia	1
- Vietnam	3
- Thailand, Laos & Cambodia	6
- Thailand & Cambodia	1
- Laos & Cambodia	1
- Laos & Vietnam	1





**Copepods**

Examples of papers published  
from cave copepods

THE FIRST RECORD OF CAVE-DWELLING COPEPODA FROM  
THAILAND AND DESCRIPTION OF A NEW SPECIES: *ELAPHOIDELLA*  
*NAMNAOENSIS* N. SP. (COPEPODA, HARPACTICOIDA)

BY

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Khon Kaen 40002, Thailand

ABSTRACT

During a brief collecting expedition in Nam Nao National Park, Phetchabun province (northern Thailand) in November 2007, various water bodies connected with subterranean water were sampled. In five caves, eight samples were collected from pools and six species of Copepoda were collected. For the first time, a stygobiotic (= cave-dwelling) species of Copepoda was discovered in Thailand. It belongs to the order Harpacticoida and was recognized as a new species, *Elaphoidella namnaoensis* n. sp. Specimens were only collected from pools filled by percolating water. This indicates a specific ecology of the new species, linked to the unsaturated zone of karstic aquifers, where the hydrology is determined exclusively by rainfall.

A detailed description of the new species is presented here, supplemented with some information on its ecology and morphological adaptations. These adaptations are compared to those found in other *Elaphoidella* species from the unsaturated zone of karstic aquifers in Europe.

**A NEW *BRYOCYCLOPS* KIEFER (CRUSTACEA: COPEPODA: CYCLOPOIDA)  
FROM KARSTIC CAVES IN THAILAND**

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**La-orsri Sanoamuang**

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and Faculty of Science, Mahasarakham University, Thailand  
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**ABSTRACT.** — *Bryocyclops maewaensis*, new species, collected from a karstic cave in Lampang Province, (northern Thailand), is described. The new species can be distinguished from its congeners by several morphological characters, which include body ornamentation, the shape of anal operculum, three reduced-setae on P4 endopod-2 of the female, and particularly the modified spine on P3 endopod-2 of the male. It is most similar to *B. anninae* (Menzel, 1926), originally described from moist moss in Java. This is the first record of the genus in Thailand and the second representative of cave-dwelling Copepoda there. This species has so far been found only from pools filled with percolating water from the unsaturated zone of a karstic aquifer.

**KEY WORDS.** — *Bryocyclops maewaensis*, freshwater, subterranean habitats, stygobiont, cave-dwelling copepods

## First representatives of the genus *Fierscyclops* Karanovic, 2004 (Copepoda, Cyclopidae) from South East Asia

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### ABSTRACT

*We describe two new species of the genus Fierscyclops Karanovic, 2004, F. tanaosriensis n. sp. and F. solaris n. sp. from western Thailand, which are also the first records of this genus in Southeast (SE) Asia (and also Asia). The two new species share several characters such as: i) presence of lateral sensillum on the caudal ramus in both females and males; ii) one-segmented swimming leg 5 (P5) inserted on the lateral corner of the thoracic somite 5; iii) free segment of P5 with two elements (spine and seta), apical inner spine is robust, insertion distance between the apical spine and apical seta is relatively large; iv) swimming legs 1-4 (P1-P4) rami are two-segmented; v) distal segment of endopod (Endp2) of P4 has two apical spines; vi) spine and seta formula of distal segment of exopod (Exp2) of P1-P4 are 3.4.4.3 and 5.5.5.5, respectively; vii) coxobasis and Endp2 of the antenna have two and 10 setae, respectively. The two new species differ from the Australian type-species of the genus F. fiersi (De Laurentiis, Pesce & Humphreys, 2001) in: i) setation of the antenna; ii) longer inner apical spine on P5; iii) relatively longer genital double-somite in female; iv) relatively shorter caudal rami; v) presence of lateral sensillum on the caudal ramus in both females and males. The Thai species differ from one another in: i) ornamentation of the body integument; ii) shape of the posterior margin of the thoracic somite 2; iii) spinule ornamentation of the syncoxa of the maxilliped; iv) shape of the medial expansion of P2-P4 basis in females.*

*Key words:* Cyclopoida, groundwater, karst, Southeast Asia, Thailand.

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<https://doi.org/10.11646/zootaxa.4282.3.5>

<http://zoobank.org/urn:lsid:zoobank.org:pub:FF21414A-8B19-482F-9365-475058E7527E>

## Two new species of *Elaphoidella* (Copepoda, Harpacticoida) from caves in southern Thailand and a key to the species of Southeast Asia

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### Abstract

*Elaphoidella paraaffinis* **sp. nov.** and *E. ligorae* **sp. nov.** are described from Phra Kayang and Khao Plu caves respectively in southern Thailand. They both belong to Group I *sensu* Lang (1948). *Elaphoidella paraaffinis* and *E. ligorae* are similar to *E. affinis* Chappuis, 1933 and *E. cabezasi* Petkovski, 1982 respectively. *Elaphoidella paraaffinis* differs from *E. affinis* by (1) its larger sized setae on Exp P5, (2) the absence of an inner seta on Endp P1–P4, (3) fewer setae on P3 Endp-2, and (4) a larger number of ventral spinules on its anal segment. *Elaphoidella ligorae* differs from *E. cabezasi* by (1) its serrated posterior margin of maxilliped, (2) the presence of strong inner spinules on its caudal rami, (3) larger sized and a lower



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### Research article

[urn:lsid:zoobank.org:pub:F64382BD-0597-4383-A597-81226EEE77A1](https://zoobank.org/pub:F64382BD-0597-4383-A597-81226EEE77A1)

## **A new genus and two new species of cave-dwelling cyclopoids (Crustacea, Copepoda) from the epikarst zone of Thailand and up-to-date keys to genera and subgenera of the *Bryocyclops* and *Microcyclops* groups**

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**Edible Copepods from Laos, *Allodiaptomus nongensis* new species**

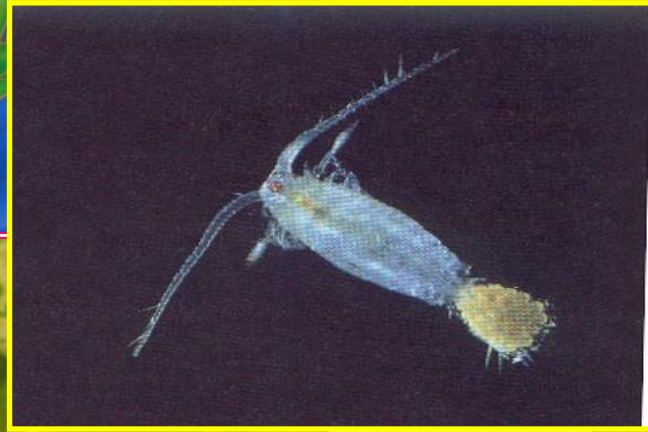




**Pla Kayong = tiny fishes**



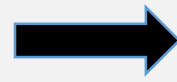
ปลาชยอง



*Allodiaptomus nongensis* new species



แปลงกักต่อนสัตว์ 4.0



ไรน้ำนางฟ้า



ไรน้ำนางฟ้าสิรินธร

*Streptocephalus sirindhornae* Sanoamuang et al., 2000



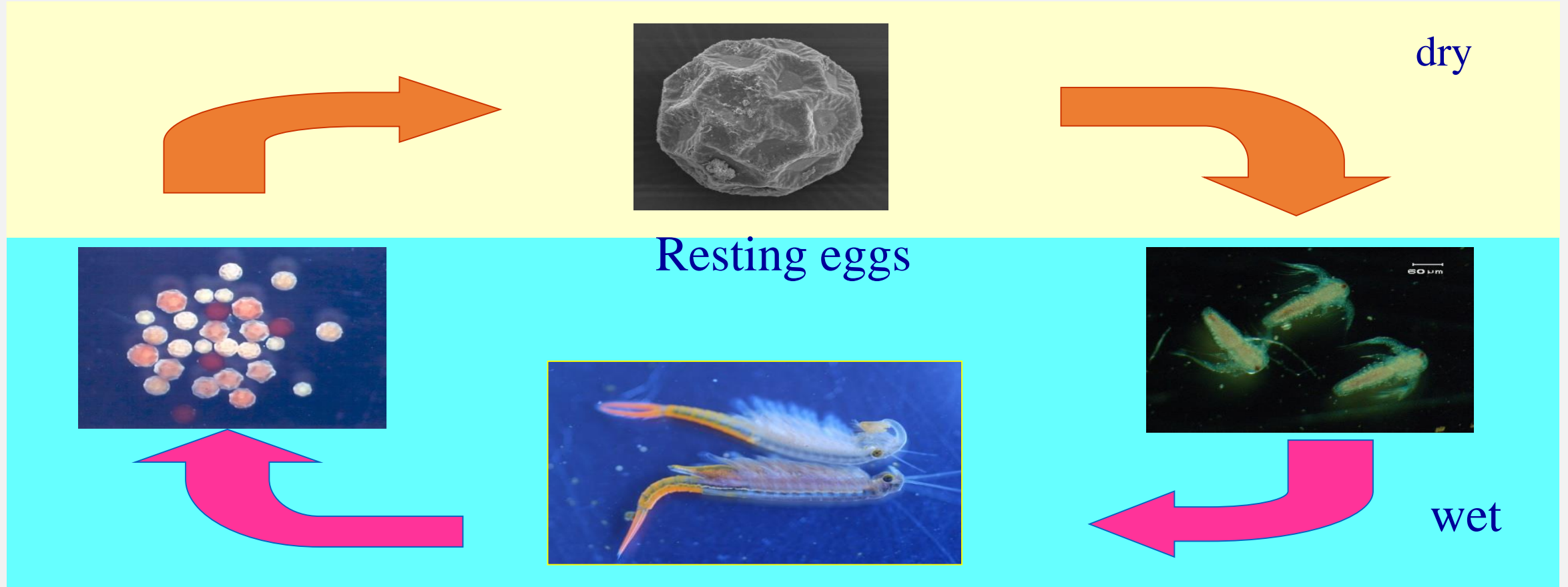
ไรน้ำนางฟ้าไทย

*Branchinella thailandensis*  
Sanoamuang et al., 2002

# โรนํ่านางฟ้า → สัตว์มหัศจรรย์

- เป็นสัตว์น้ำ แต่ไข่แห้งมีตัวอ่อนอยู่ข้างในยังไม่ตาย เมื่อมีน้ำจะฟักเป็นตัวทันที
- วงชีวิตสั้น เจริญเป็นตัวเต็มวัยประมาณ 6-14 วัน อายุขัย 23-72 วัน
- ตัวเมียมีไข่จำนวน 5,000-21,000 ฟอง/แม่ สามารถเก็บไว้ได้นานอย่างน้อย 2 ปี
- สามารถเลี้ยงได้ในทุกสถานที่ที่มีน้ำจืด ทั้งในกอละมัง ถังพลาสติก ถังไฟเบอร์กลาส บ่อซีเมนต์ บ่อดิน กระชัง อ่างเลี้ยงปลา ฯลฯ
- เปอร์เซ็นต์การฟักไข่ สูง 50-90 %
- มีคุณค่าอาหารสูง มีโปรตีนสูงถึง 50-74 %, มีแคโรทีนอยด์รวมสูง (254.41  $\mu\text{g g}^{-1}$  dry weight) **ซึ่งสูงกว่าไรแดงและอาร์ทีเมีย**  
เหมาะที่จะนำไปใช้ประโยชน์ เป็นทั้งอาหารเร่งสีตัวของปลา/กุ้ง หรือนำไปสกัดเป็น **super-vitamin A** (อาหารเสริมสำหรับคนได้)

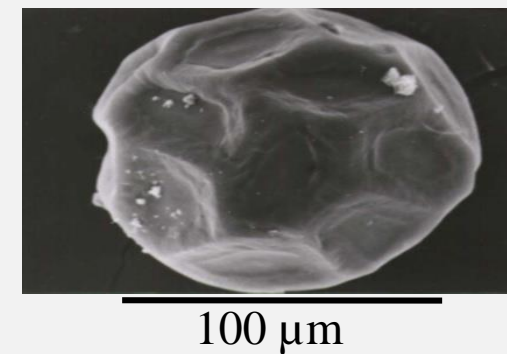
# Life Cycle of Fairy Shrimps



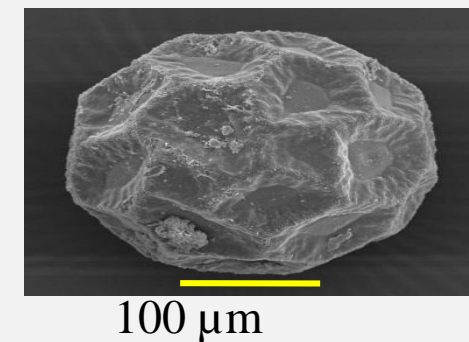
Life span ~ 1 month

# Discovery of Fairy shrimps in Thailand

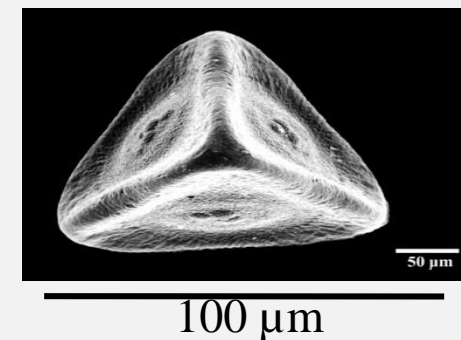
- ★ ไรน้ำนางฟ้าสิรินธร  
*Streptocephalus sirindhornae*  
Sanoamuang, Murugan,  
Weekers & Dumont, 2000



- ★ ไรน้ำนางฟ้าไทย  
*Branchinella thailandensis*  
Sanoamuang, Saengphan  
& Murugan, 2002



- ★ ไรน้ำนางฟ้าสยาม  
*Streptocephalus siamensis*  
Sanoamuang & Saengphan,  
2006





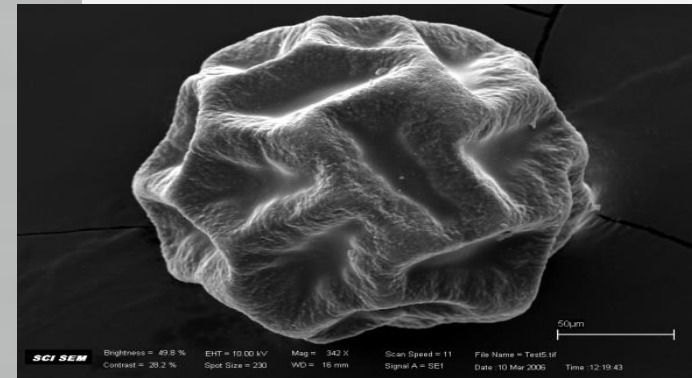
male

Body length = 2.1 (1.5-3.0) cm



female

Body length = 1.7 (1.3-2.5) cm



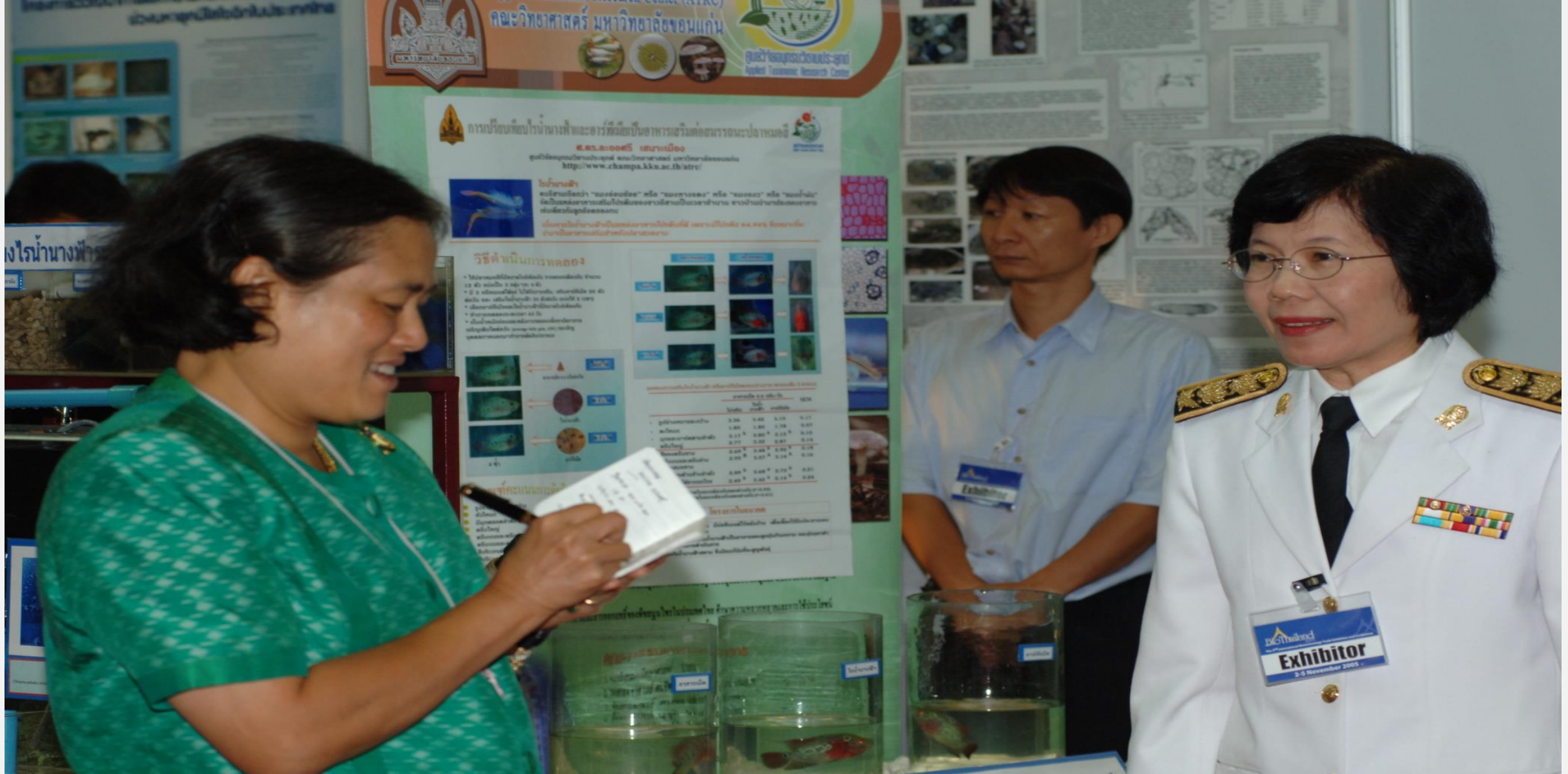
egg

ไรน้ำนางฟ้าสิรินธร

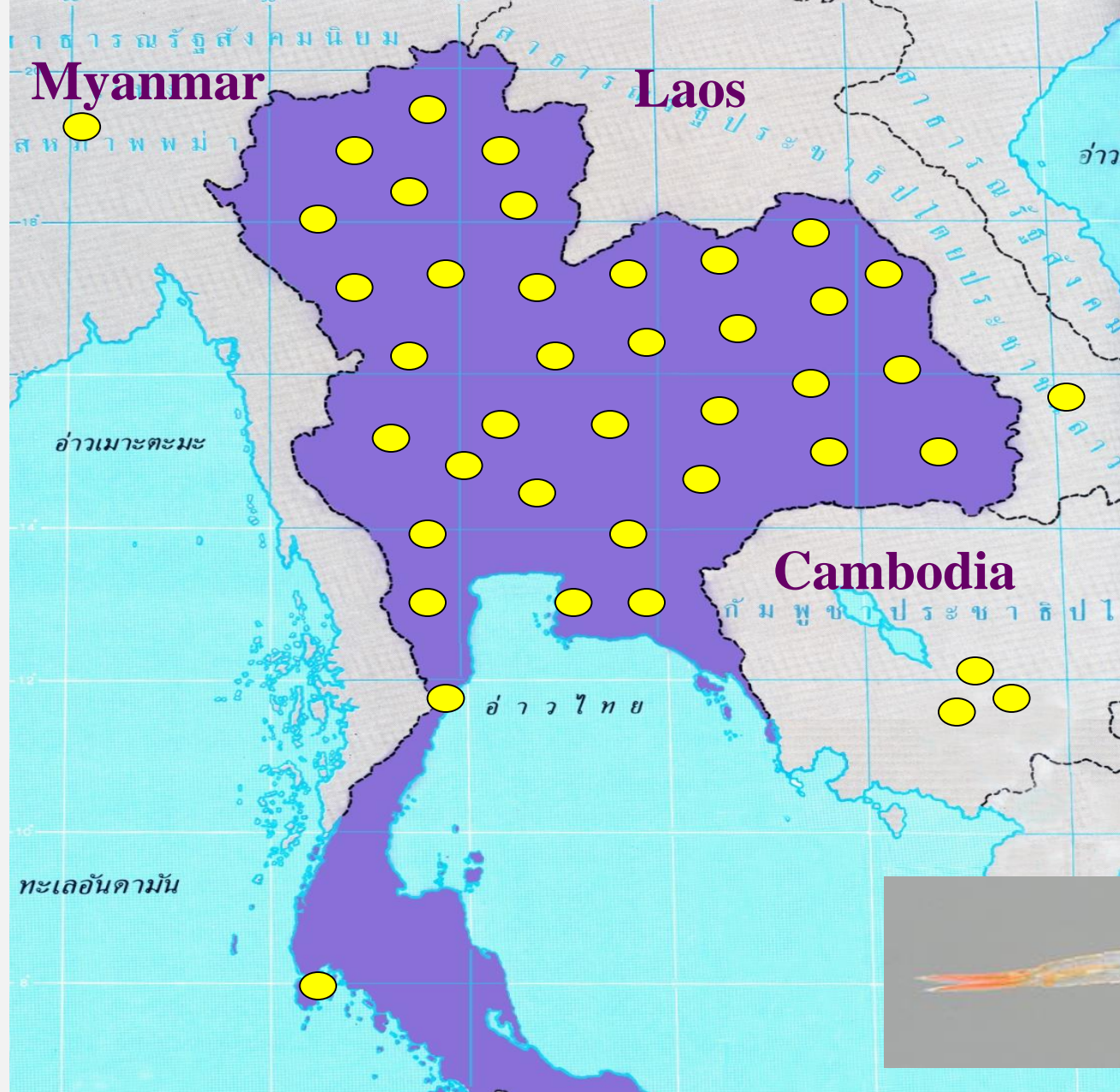
*Streptocephalus sirindhornae*

Sanoamuang, Murugan, Weekers & Dumont, 2000





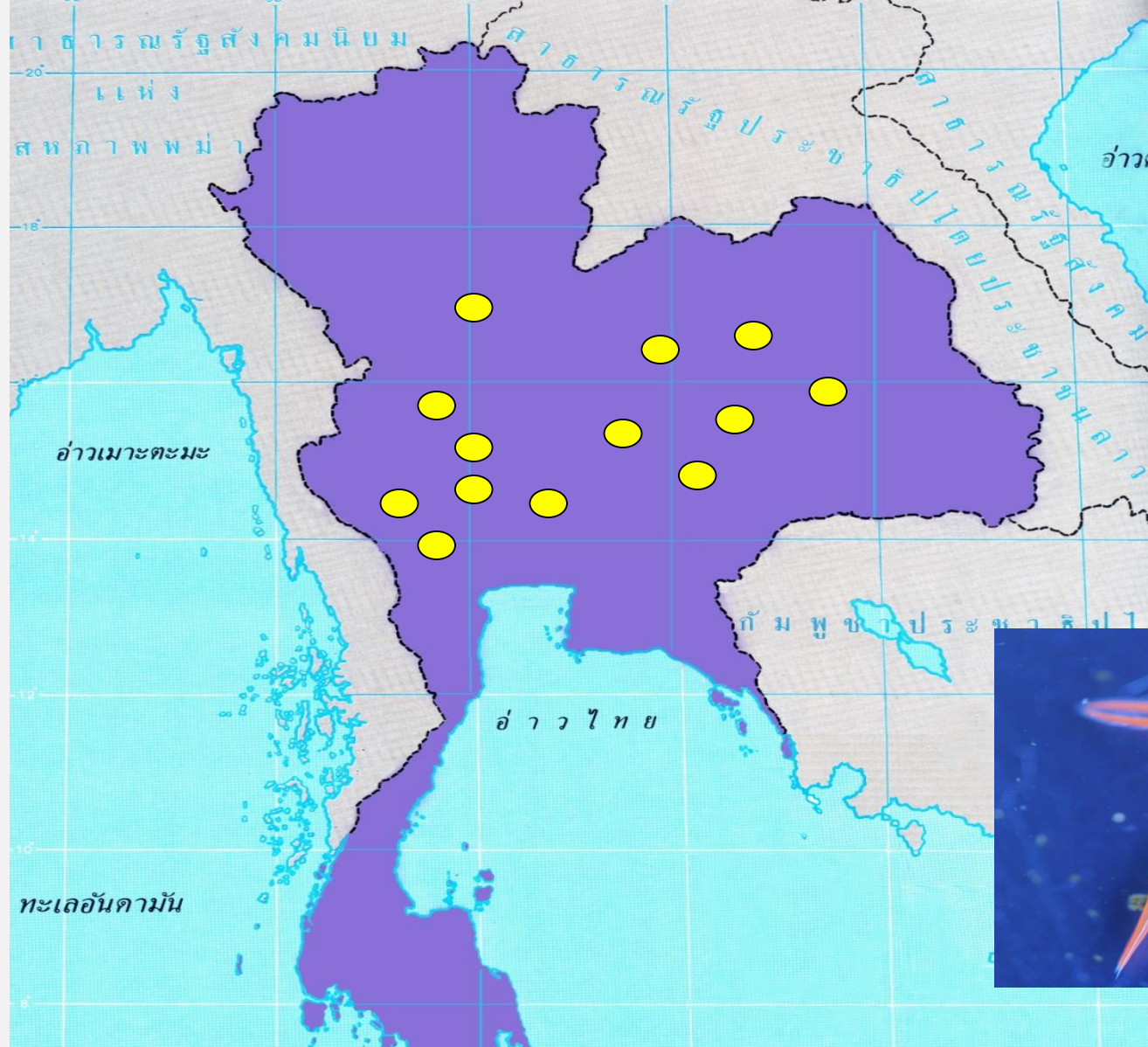
Presenting the new species to Princess Maha Chakri Sirindhorn on November 2, 2005.



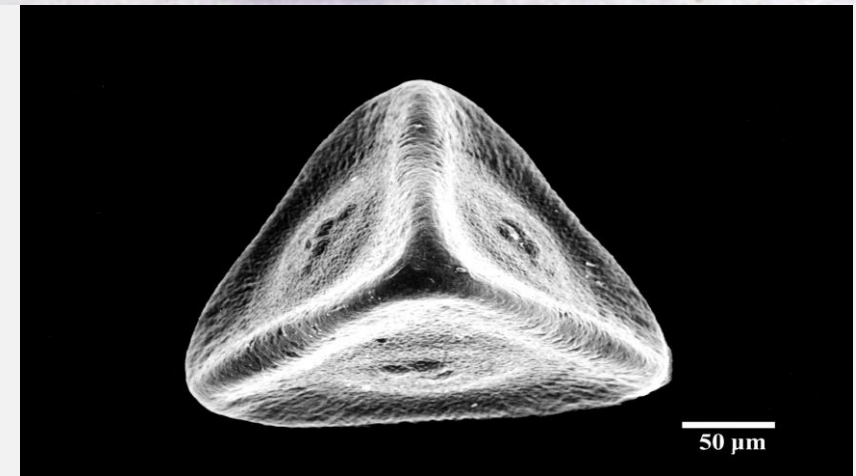
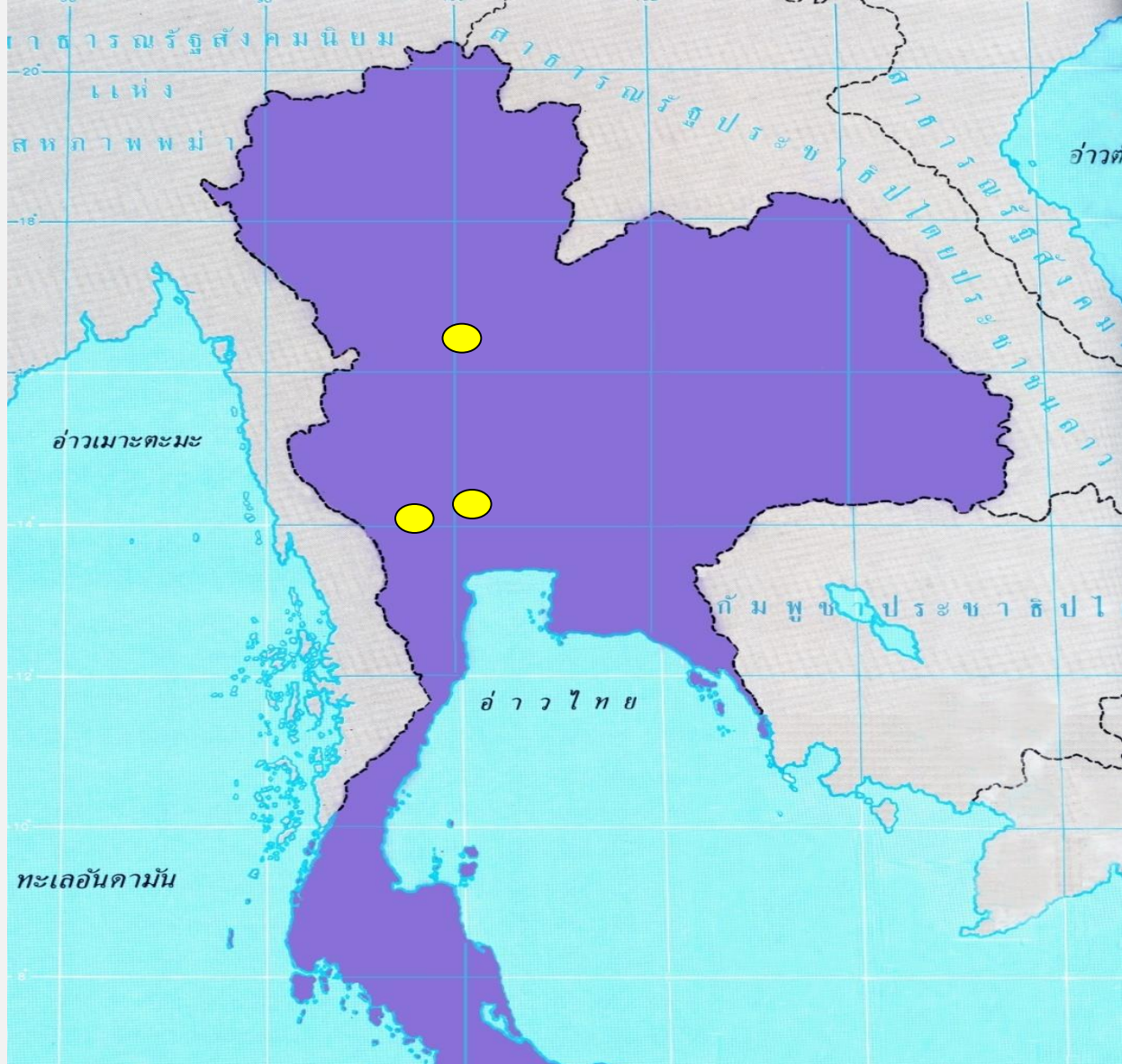
Recently, we found this species in **Yunnan** and **Guangxi** of China, and **Myanmar**.



**Distribution of *Streptocephalus sirindhornae***



**Distribution of *Branchinella thailandensis***  
Sanoamuang, Saengphan & Murugan, 2002



egg

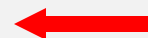
**Distribution of *Streptocephalus siamensis* Sanoamuang & Saengphan, 2006**

# New species from Myanmar -> *Streptocephalus shinsawbuae*



# Interesting Fact

- *Streptocephalus sirindhornae* is known to local people in Northeast Thailand as one of the delicious foods. People from NE Thailand eat anything that moves.
- After discovering the first species in Thailand, a Thai name (**Rai Nam Nang Fa**) of fairy shrimp was introduced. This word is now widely used by Thai scientists and local people.



**Cooked Fairy shrimps**

# In-door Culture Containers



black, circular, rectangular plastic containers  
optimal stocking density = 20 ind. L<sup>-1</sup>



# Concrete ponds & fiber glass tanks



Fiber glass tanks

circular concrete ponds

diameter of 1.0-1.5 m, volume = 120-250 L  
optimal stocking density = 10-15 ind. L<sup>-1</sup>



# Earthen ponds (1 Rai = 1,600 m<sup>2</sup>)



production yield of 15-17 kg wet weight per pond (culture period = 25 days)



## Harvesting fairy shrimps from earthen ponds



Pond area = 1,600 m<sup>2</sup>

Production yield = 15-17 kg  
wet weight per pond

Culture period = 25 days

# Floating Cages



optimal stocking density = 20 ind. L<sup>-1</sup>

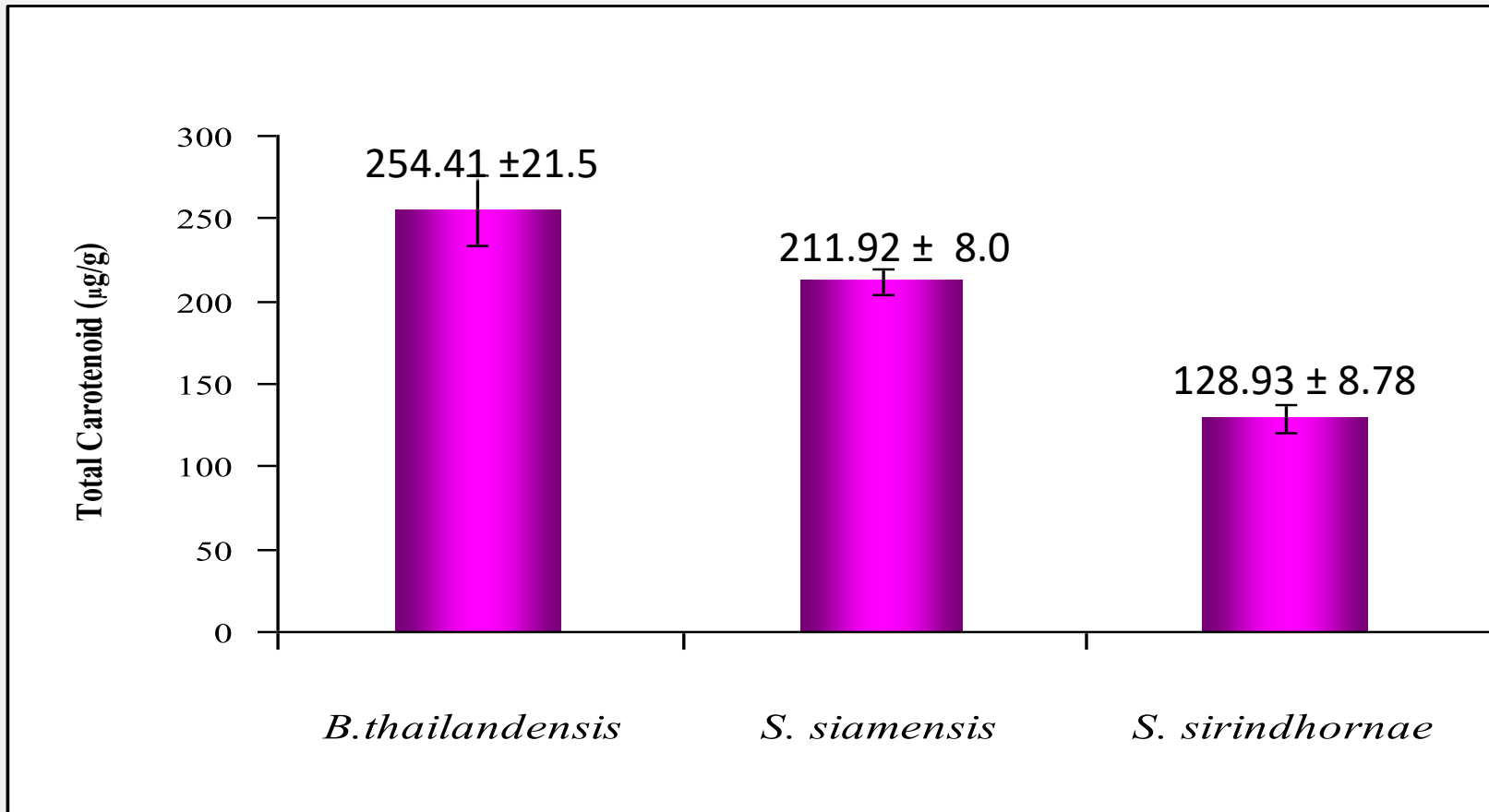


## Hatching Percentage of eggs

<i>S. sirindhornae</i>	<i>B. thailandensis</i>	<i>S. siamensis</i>
<b>70%</b>	<b>80-95%</b>	<b>60%</b>

## Protein Content

	Dried basis (mg/ g dw)		
	<i>S. sirindhornae</i>	<i>B. thailandensis</i>	<i>S. siamensis</i>
<b>Approximate Protein (%)</b>	<b>68.69</b>	<b>68.47</b>	<b>66.11</b>



Total carotenoid content ( $\mu\text{g g}^{-1}$  dry sample)

Note: *S. dichotomus* =  $114.3 \pm 8.62 \mu\text{g g}^{-1}$  dry sample

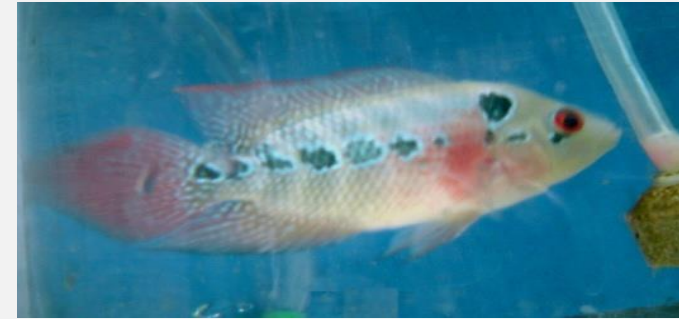
*Moina micrura* =  $29.5 \pm 2.50 \mu\text{g g}^{-1}$  dry sample

(Velu et al., 2007)

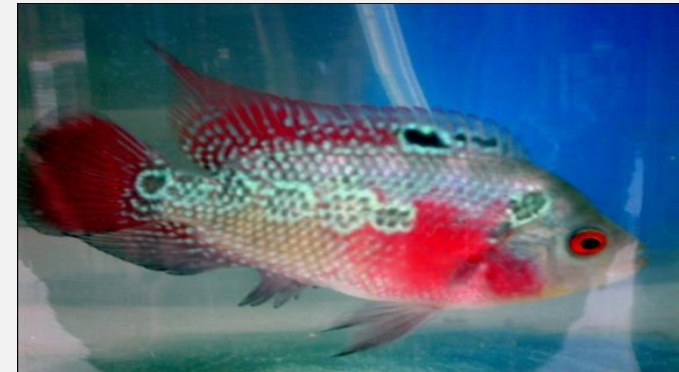
Before

After

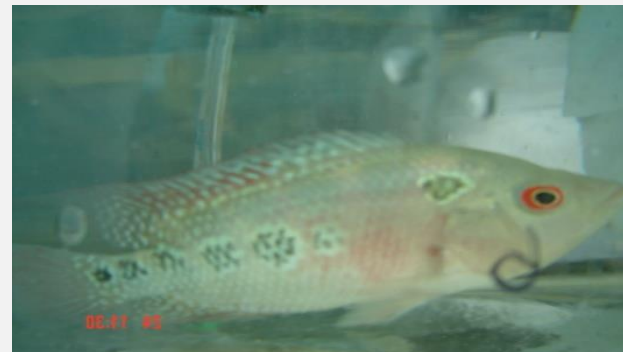
Control



*S. sirindhornae*



*Artemia*



# Current Price in Market

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- **Eggs**
  - 10,000 eggs = 150 Baht (4.6 US\$)**
  - 100,000 eggs = 1,500 Baht (46 US\$)**
  - 1,000,000 eggs (6 g) = 4,000 Baht (125 US\$)**
- **Living Adults 2 ind. = 1 Baht (15-20 days old)**
  - 65 ind. = 1 US\$**
- **Frozen Adults 100 g = 30-40 Baht (0.9-1.25 US\$)**
  - 100 g = 12,500-15,000 ind.**
  - 1 kg = 125,000-150,000 ind.**

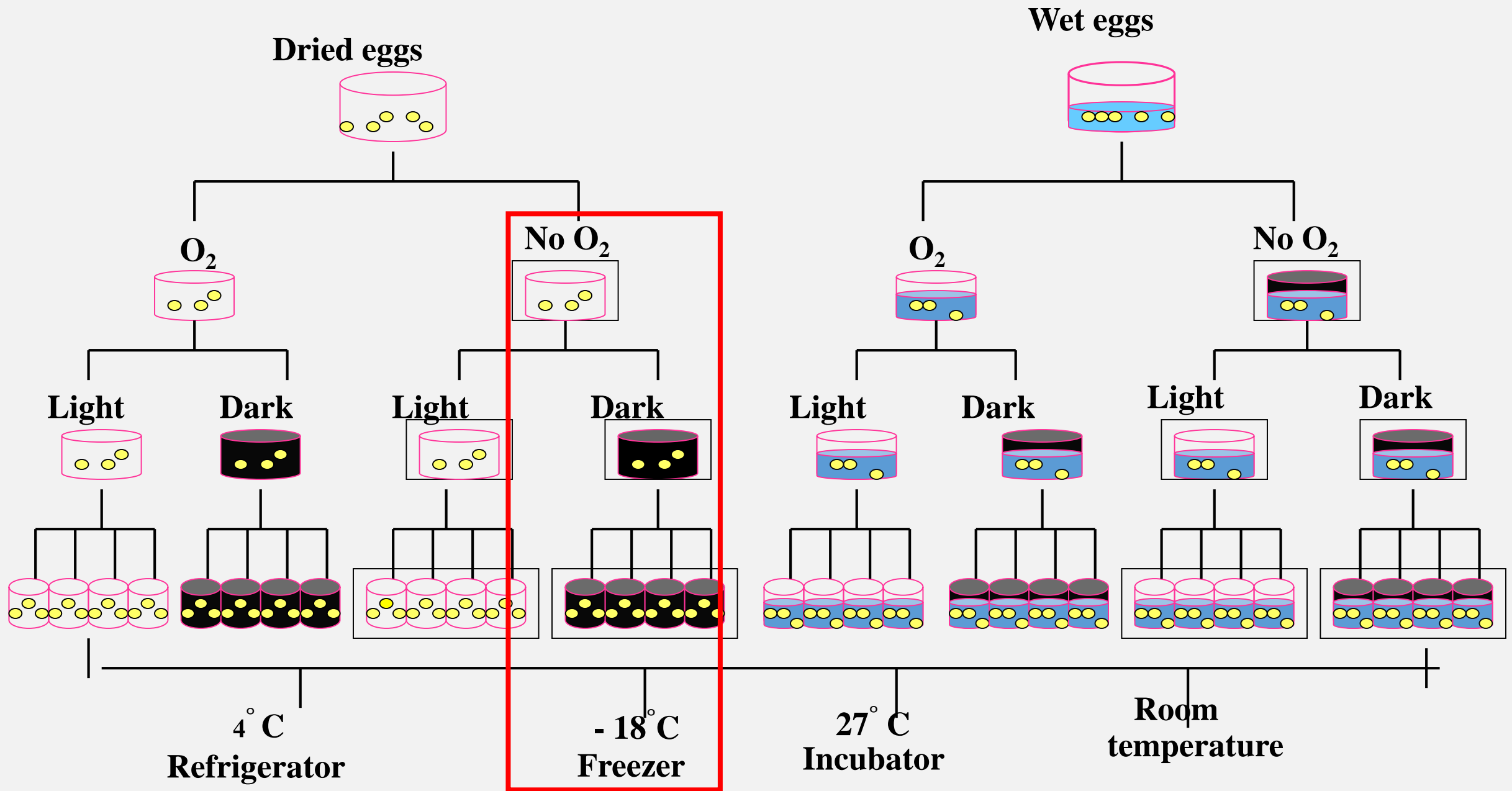


# Frozen Fairy Shrimps



100 g = 30-40 Baht  
= 0.9-1.25 US\$





The highest hatching success was recorded from eggs stored in -18 °C under dry-dark-no O<sub>2</sub> condition in both species of fairy shrimps.

# Experiments with Giant Freshwater Prawn (*Macrobrachium rosenbergii*)

---

- The experiments were conducted for 2 months using 6-month old prawns, *M. rosenbergii*.

- 5 Food ratios -> dry pellet : adult *S. sirindhornae*

Treatment 1 -> 100:0% (pure dry pellet, control)

Treatment 2 -> 25:75%

Treatment 3 -> 50:50%

Treatment 4 -> 75:25%

Treatment 5 -> 0:100% (pure *S. sirindhornae*)



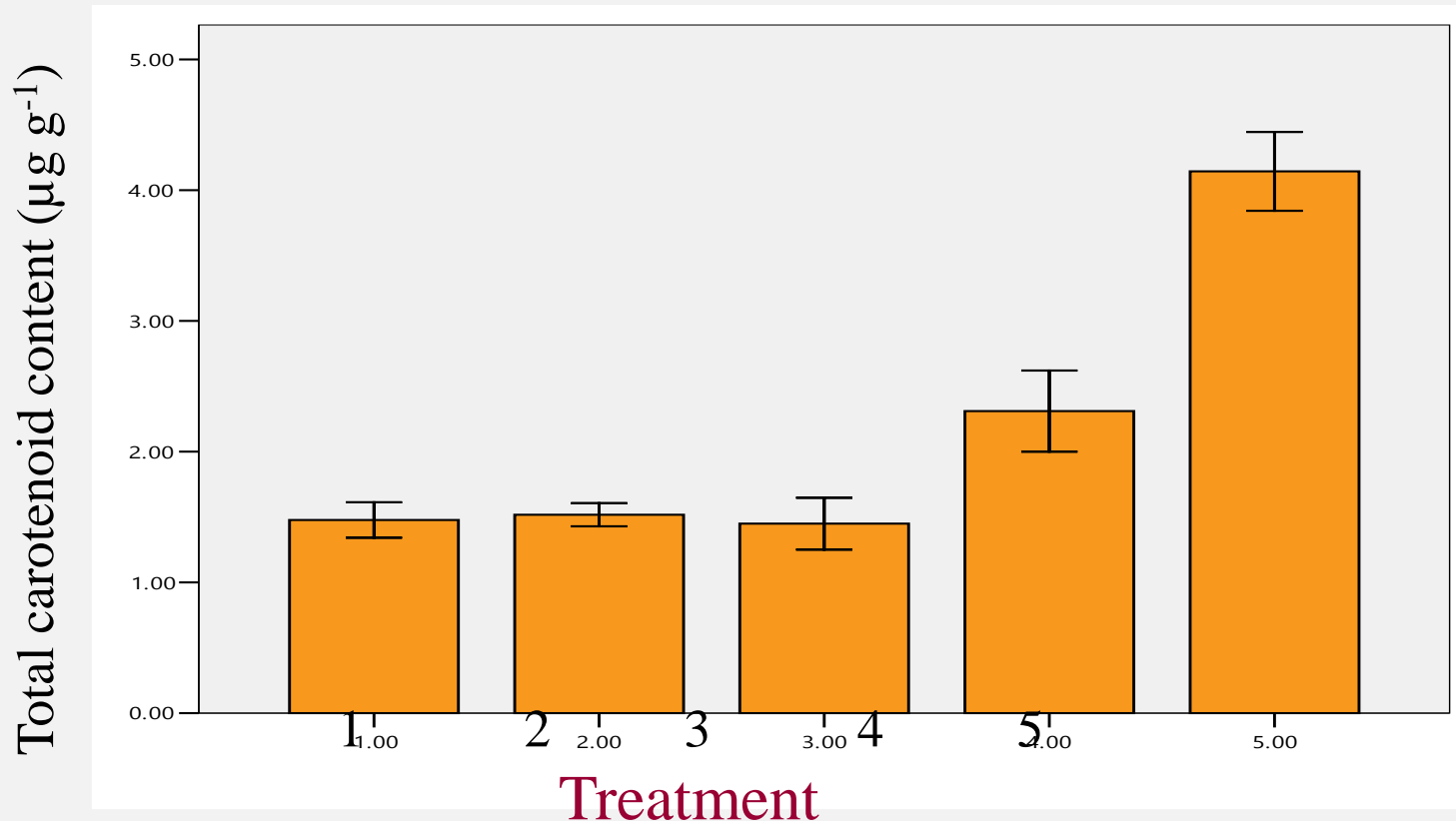
Treatment 1 -> 100:0% (pure dry pellet, control)

Treatment 2 -> 25:75%

Treatment 3 -> 50:50%

Treatment 4 -> 75:25%

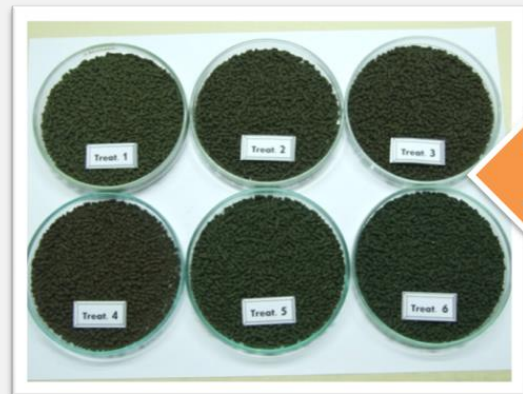
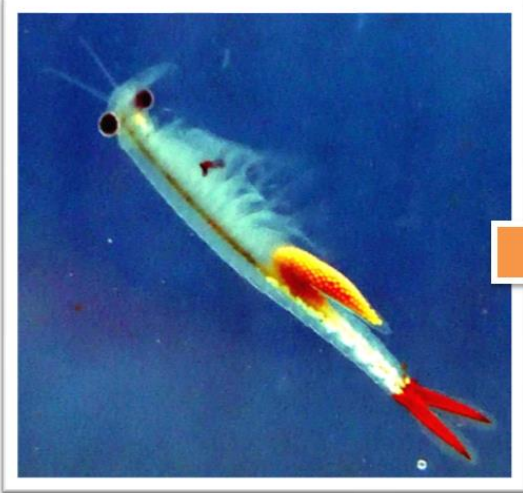
Treatment 5 -> 0:100% (pure *S. sirindhornae*)



Total carotenoid contents in the meat of *M. rosenbergii* fed with different ratios of fairy shrimps for 2 months



# งานวิจัยการนำไร่น้ำนางฟ้าสิรินธรมาผสมกับอาหารสำเร็จรูปให้ปลาหมอสีกิน



## Nutrient composition of fairy shrimp *Streptocephalus sirindhornae* nauplii as live food and growth performance of giant freshwater prawn postlarvae

S. SORNSUPHARP<sup>1</sup>, H.-U. DAHMS<sup>2</sup> & L. SANOAMUANG<sup>1,3</sup>

<sup>1</sup>Faculty of Science, Applied Taxonomic Research Center, Khon Kaen University, Khon Kaen, Thailand; <sup>2</sup>Green Life Science Department, College of Natural Science, Sangmyung University, Seoul, South Korea; <sup>3</sup>Faculty of Science, Mahasarakham University, Mahasarakham, Thailand

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### Abstract

Nutritional efficacy of fairy shrimp (*Streptocephalus sirindhornae*) nauplii, as a live food, was studied for growth performance and survival rate of giant freshwater prawn (*Macrobrachium rosenbergii*) postlarvae. A feeding experi-

*Streptocephalus sirindhornae* Sanoamuang, Murugan, Weekers and Dumont; *Branchinella thailandensis* Sanoamuang, Saengphan and Murugan; and *S. siamensis* Sanoamuang and Saengphan – have been recorded in Thailand. They belong to the phylum Arthropoda, subphylum Crustacea, class Branchiopoda and order Anostraca (Sanoamuang

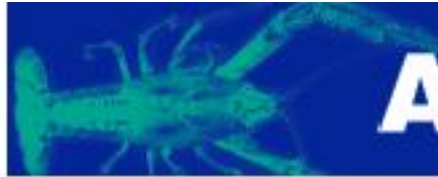
## **Clinical observations of black disease in fairy shrimps, *Streptocephalus sirindhornae* and *Branchinella thailandensis*, from Thailand and pathogen verification**

**C Saejung<sup>1</sup>, K Hatai<sup>2</sup>, S Wada<sup>2</sup>, O Kurata<sup>2</sup> and L Sanoamuang<sup>1,3</sup>**

1 Applied Taxonomic Research Center, Department of Biology, Faculty of Science, Khon Kaen University, Khon Kaen, Thailand

2 Laboratory of Fish Diseases, Nippon Veterinary and Life Science University, Tokyo, Japan

3 Faculty of Science, Mahasarakham University, Mahasarakham, Thailand



## **Bath efficacy of sodium hypochlorite, oxytetracycline dihydrate and chloramphenicol against bacterial black disease in fairy shrimp *Branchinella thailandensis***

**Chewapat Saejung<sup>1</sup>, Kishio Hatai<sup>2</sup> & La-orsri Sanoamuang<sup>1,3</sup>**

<sup>1</sup>Applied Taxonomic Research Center, Faculty of Science, Khon Kaen University, Khon Kaen, 40002, Thailand

<sup>2</sup>Laboratory of Fish Diseases, Nippon Veterinary and Life Science University, Musashino, Tokyo, 180-8602, Japan

<sup>3</sup>Faculty of Science, Mahasarakham University, Maha Sarakham, 44150, Thailand

**Correspondence:** L Sanoamuang, Applied Taxonomic Research Center, Department of Biology, Faculty of Science, Khon Kaen University, Khon Kaen 40002, Thailand. E-mail: la\_orsri@kku.ac.th



# **The *in-vitro* antibacterial effects of organic salts, chemical disinfectants and antibiotics against pathogens of black disease in fairy shrimp of Thailand**

**C Saejung<sup>1</sup>, K Hatai<sup>2</sup> and L Sanoamuang<sup>1,3</sup>**

1 Applied Taxonomic Research Center, Faculty of Science, Khon Kaen University, Khon Kaen, Thailand

2 Laboratory of Fish Diseases, Nippon Veterinary and Life Science University, Tokyo, Japan

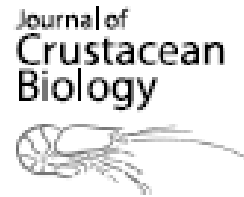
3 Faculty of Science, Mahasarakham University, Maha Sarakham, Thailand





BRILL

JOURNAL OF CRUSTACEAN BIOLOGY, 32(5), 711-726, 2012



## REPRODUCTIVE CYCLE AND GENITALIA OF THE FAIRY SHRIMP *BRANCHINELLA THAILANDENSIS* (BRANCHIOPODA: ANOSTRACA)

Sutthana Plodsomboon<sup>1</sup>, Alejandro M. Maeda-Martínez<sup>2,\*</sup>,  
Hortencia Obregón-Barboza<sup>2,\*\*</sup>, and La-orsri Sanoamuang<sup>1,\*\*\*</sup>

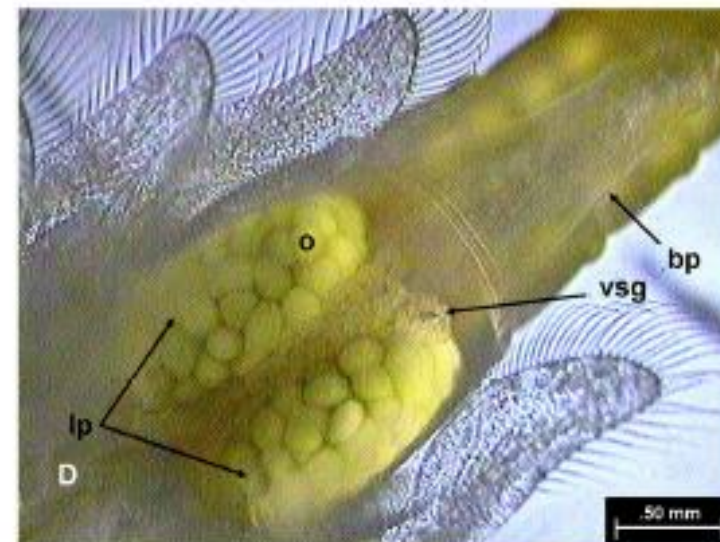
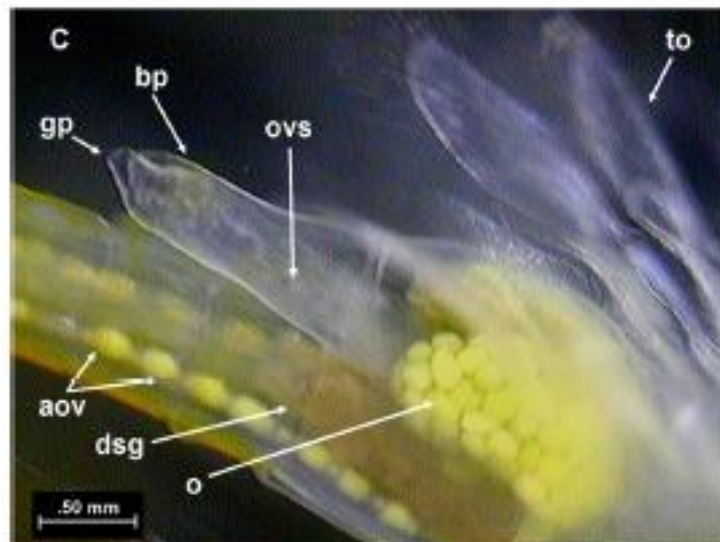
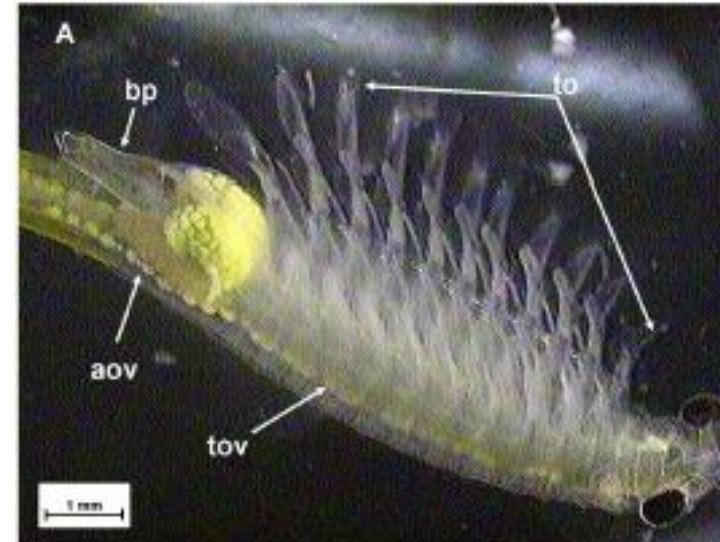
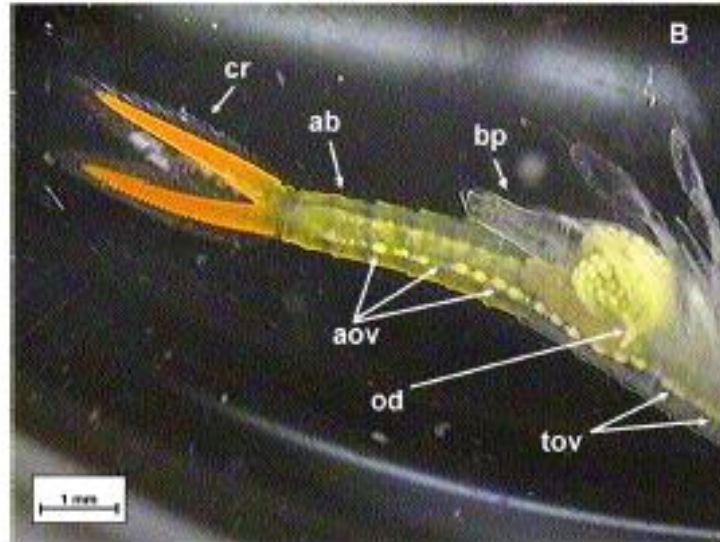
<sup>1</sup> Applied Taxonomic Research Center, Department of Biology, Faculty of Science, Khon Kaen University,  
Khon Kaen 40002, Thailand

<sup>2</sup> Centro de Investigaciones Biológicas del Noroeste (CIBNOR) Mar Bermejo 195, Col. Playa Palo Santa Rita, La Paz,  
Baja California Sur, 23096, Mexico

### ABSTRACT

Adults of three fairy shrimp species are present in Thailand from February through June in ephemeral waters (ponds, roadside canals, and rice field ditches) filled mostly by the rain. *Branchinella thailandensis* is of interest in aquaculture because it reproduces rapidly and has high nutritional value. However, no detailed studies on its reproductive biology are available. Anatomical analyses of male and female genitalia were studied with light microscopy and SEM. Shrimp were reared in the laboratory at  $28 \pm 1^\circ\text{C}$  in aerated, potable

# Reproductive Biology of *Branchinella thailandensis*



# Egg Morphology of *Branchinella thailandensis*

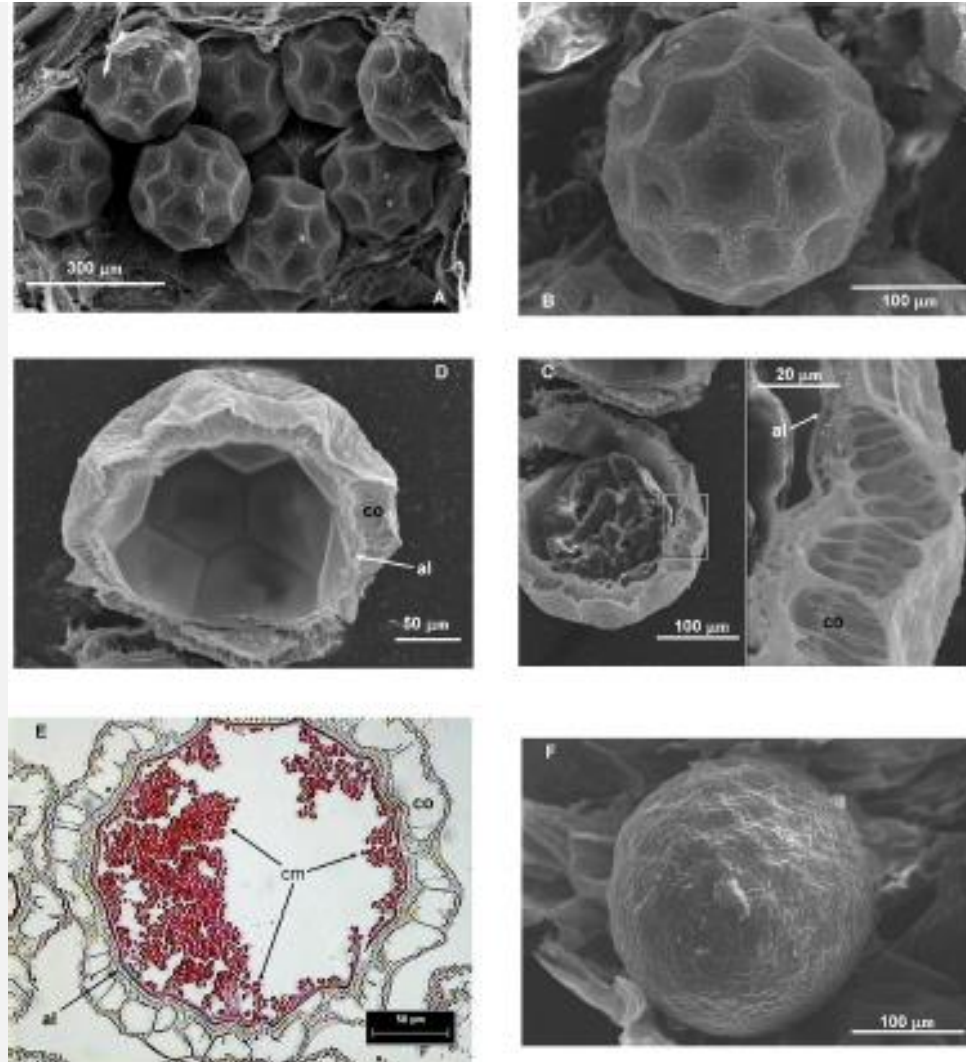


Fig. 9. Eggs of female *Branchinella thailandensis*. A-D and F, SEM micrographs; E, light microscope photograph of hematoxylin-eosin stained histological slide. A, eggs inside ovotac; B, magnified external view of typical egg; C, cracked egg showing structure of scalptated shell composed by outer cortex and



# สิทธิบัตรผลงานวิจัยไร่น้ำนางฟ้าและเห็ด



ชื่อผลงานวิจัย	แคปซูลเห็ดนางรมผสมไร่น้ำนางฟ้า
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# *Streptocephalus sirindhornae* on eBay

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Item: Fairy shrimp (*Streptocephalus sirindhornae*) 80000eggs .

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Item condition: --

Ended: Mar 02, 2010 10:07:56 EST

Bid history: [0 bids](#)

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Approximately C \$14.96

Shipping: **US \$8.00** Other Int'l Shipping (see description) | [See all details](#)  
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Fairy shrimp (...)

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# Alternative food source for ornamental fish



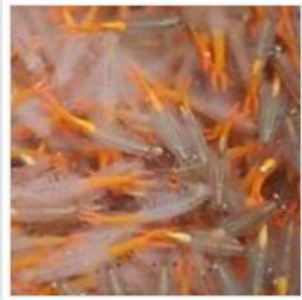
**Flowerhorn cichlids**



**Goldfish**  
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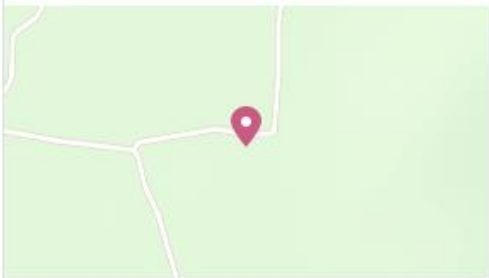
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ขอภัยหน้าร้าน ปิดปรับปรุง มารับสินค้าหน้าร้านกรุณา  
 โทรนัด

สั่งทางเวบจัดส่งปกติคะ  
 วันเสาร์ที่ 25 -อาทิตย์ที่ 26 หยุดคะ

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- 2.สั่งซื้อทาง Email smilepetmc@hotmail.com

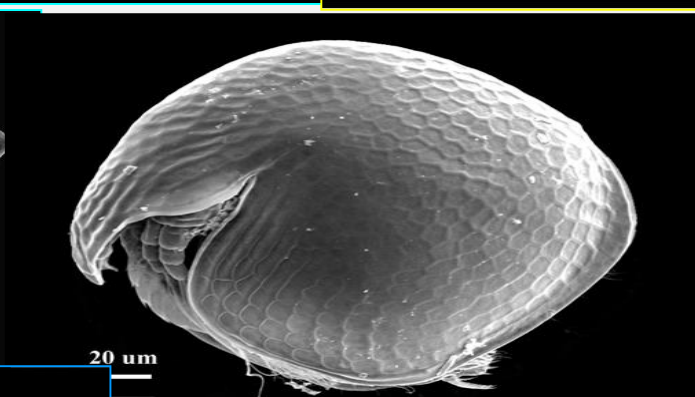
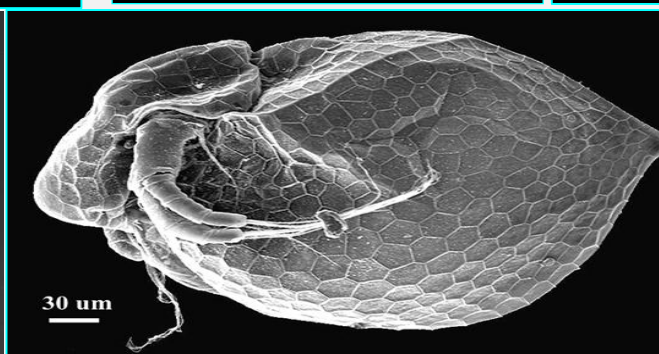
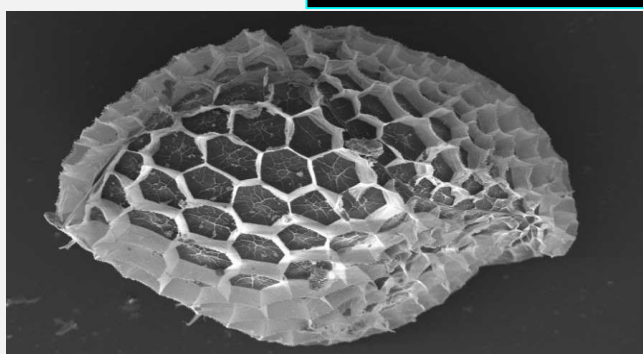
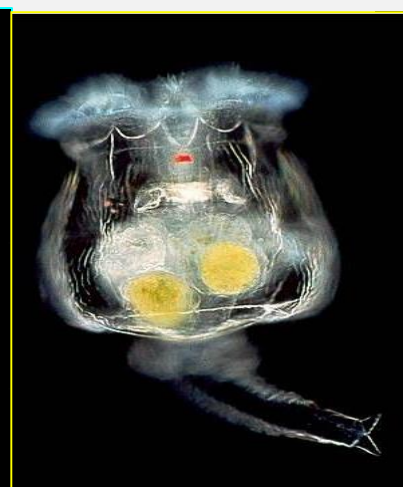
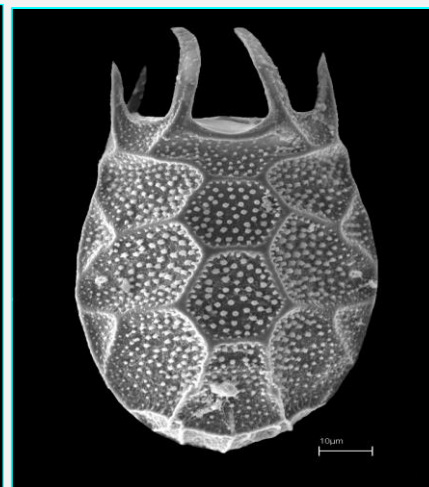
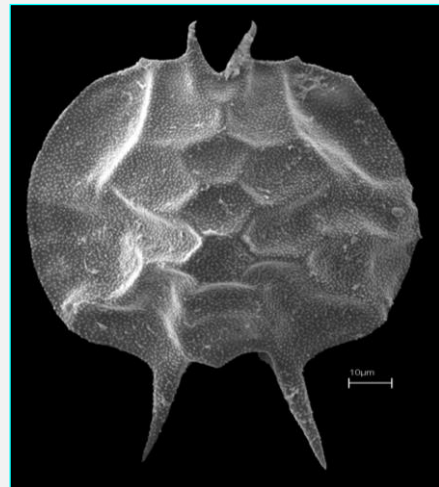
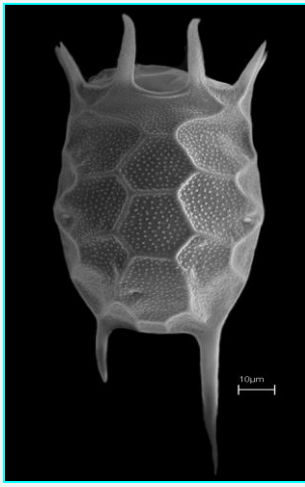
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อาหารกุ้ง K-Ghost 500 g.  
 ราคา 85.00 บ.

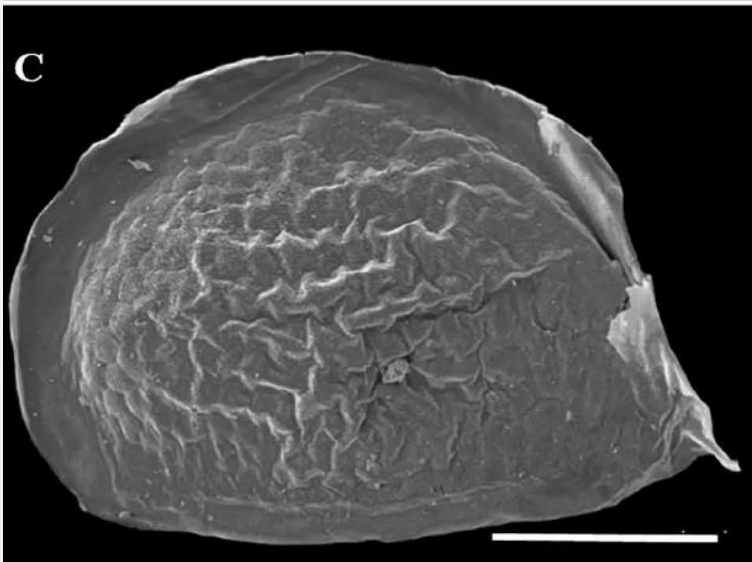
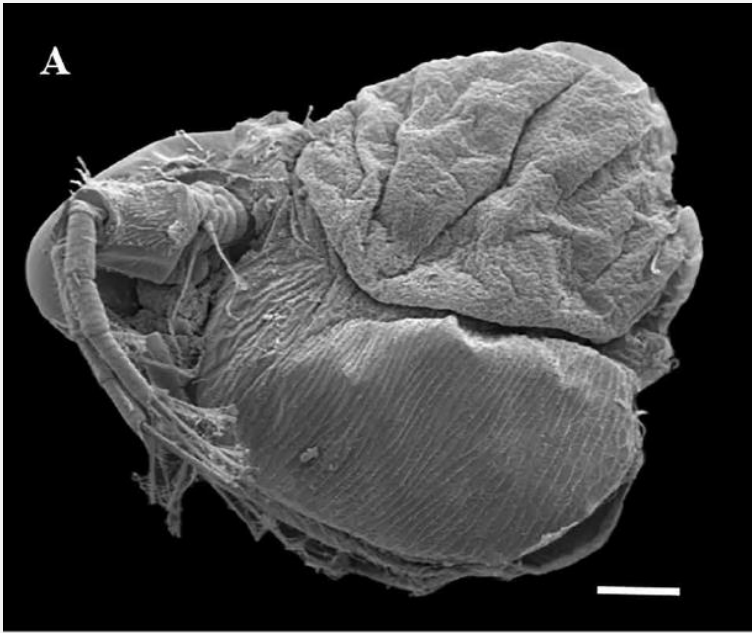


YABBY STRONG 80 g.  
 ราคา 90.00 บ.



Small and beautiful Rotifers and Cladocerans

# ไรแดงสยาม (*Moina siamensis* new species) เพื่อการค้า



# Acknowledgements



# Thank You

