SHORT COMMUNICATION

Two species of *Prosorhynchoides* Dollfus, 1929 (Bucephalidae: Bucephalinae) from Mekong giant catfish (*Pangasianodon gigas* Chevey) from Mekong River, Chiangrai Province

Watchariya Purivirojkul[1] and Prapaisiri Sirikanchana[2]

Abstract

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Two species of *Prosorhynchoides* Dollfus, 1929 (Bucephalidae: Bucephalinae) from Mekong giant catfish (*Pangasianodon gigas* Chevey) from Mekong River, Chiangrai Province
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Two species of bucephalids were found in intestine of Mekong giant catfish (*Pangasianodon gigas* Chevey) collected from Mekong River, Chiang Khong district, Chiangrai Province. *Prosorhynchoides* sp.1 is characterised by a rhynchus without tentacle. The tegument covered with spines. The mouth opening is located posteriorly third of body, opening into sac-like intestine. Ovary is pretesticular. Testis is slightly larger than ovary. *Prosorhynchoides* sp.2 is different from *Prosorhynchoides* sp.1 in not having spine on the tegument and the presence of two groups of spines adjacent to both sides of the rhynchus; the size of the ovary and testes is almost equal.

Key words : *Pangasianodon gigas*, parasite, Mekong river, Thailand, *Prosorhynchoides*

[1]M.S.(Fisheries Science), Department of Zoology, Faculty of Science, [2]M.S.(Zoology), Assoc. Prof., Department of Fishery Biology, Faculty of Fisheries, Kasetsart University, Chatuchak, Bangkok 10900 Thailand.
Corresponding e-mail : fsciwyp@ku.ac.th
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บทคัดย่อ

วัชริยา ภูรีวิโรจน์กุล[1] และ ประไพสิริ สิริกาญจน[2]

ปรสิตในสกุล *Prosorhynchoides* Dollfus, 1929 (Bucephalidae: Bucephalinae) ที่พบในปลาบึก (*Pangasianodon gigas* Chevey) จากแม่น้ำโขง จังหวัดเชียงราย

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ผลการศึกษาพบปรสิตตัวแบน 2 ชนิดในกลุ่ม bucephalids (Digenea: Bucephalidae) ในลำไส้ของปลาบึก (*Pangasianodon gigas* Chevey) จากแม่น้ำโขง อำเภอเชียงของ จังหวัดเชียงราย ได้แก่ *Prosorhynchoides* sp.1 มีลักษณะเด่นคือ rhynchus ไม่มีหนวด (tentacle) ผิวตัวปกคลุมด้วยหนาม ช่องปากอยู่ค่อนไปทางด้านท้ายของลำตัว ลำไส้มีลักษณะเป็นถุง รังไข่อยู่ทางด้านหน้าของอัณฑะ มีขนาดเล็กกว่าอัณฑะเล็กน้อย และปรสิต *Prosorhynchoides* sp.2 ซึ่งต่างจาก *Prosorhynchoides* sp.1 โดยจะไม่มีหนามบริเวณผิวตัว แต่มีกลุ่มของหนาม 2 กลุ่มอยู่บริเวณ 2 ข้าง ของ rhynchus ซึ่งไม่พบหนาม 2 กลุ่มใน *Prosorhynchoides siamensis* n. sp. และรังไข่มีขนาดใกล้เคียงกับอัณฑะ

[1]ภาควิชาสัตววิทยา คณะวิทยาศาสตร์ [2]ภาควิชาชีววิทยาประมง คณะประมง มหาวิทยาลัยเกษตรศาสตร์ จตุจักร กรุงเทพฯ 10900

Mekong giant catfish, *Pangasianodon gigas*, is the largest freshwater catfish of the world. The Mekong giant catfish can only be naturally found along the Mekong River. Mekong giant catfish is an endangered species in Convention on International Trade in Endangered Species of wild fauna and flora (CITES). The number of this fish caught in Thailand at Chiang Khong district, Chiangrai province, has decreased from 69 fishes in 1990 to 20 fishes in 1999 (Mengumphan, 2000). In 2005, only 2 fishes were caught. This indicated that the population of the Mekong giant catfish has decreased rapidly because the male and female spawners were heavily caught. Most of caught fishes were sold to restaurant and in the market at a very high price. However, a breeding program of this fish species has been successfully implemented (Mengumphan, 2000). The Department of Fisheries released Mekong giant catfish larva to many reservoirs. For ecological reasons, the Mekong giant catfish is considered as an exotic or introduced species in some rivers, and might be the cause of some changes in the ecology of the rivers. The most important change concerns the parasite outbreak caused from the released giant catfishes to the same or related species fishes in the natural aquatic habitat and/or from the fishes in natural basins to the released fishes. Parasites have been dispersed along with their fish hosts when the fish are translocated to new places (Lerssutthichawal, 1999).

Some scientists have studied ectoparasites in Mekong giant catfish; 2 isopods were found from gill and skin of Mekong giant catfishes, namely *Alitropus typus* and *Corallana grandiventra* (Thonguthai, 1991). No monogenean species were found on *P. gigas* (Lerssutthichawal, 1999). However, there are no reports about endoparasites in *P. gigas*. So the result from this study will be useful as the basic data for management Mekong giant catfish resource in the future.

Materials and Methods

Three males and three females of Mekong giant catfish (*Pangasianodon gigas*) caught in 2004-2005 from the Mekong River, Chiang Khong District, Chiangrai Province were used in the study. Weight of the males was 152, 159, 213 while the females were 252, 225 and 287 kilograms. The total length of these fishes were 2.3, 2.3, 2.3, 2.5, 2.32 and 2.68 meters, respectively. The fish were examined for intestinal parasites. The intestine was removed from body cavity and the contents were then examined under the microscope. The parasites collected were fixed in 70% ethanol for 24 hours. Specimens were stained with Mayer's hydrochloric carmine, dehydrated and

mounted in Canada balsam.

Measurements of the parasites were given in micrometers, with their ranges and averages. Drawings were made with the aid of a camera lucida device. Photography of whole specimens were carried out by using a binocular microscope. The specimens were deposited at Aquatic Parasitology Collection of Department of Zoology, Kasetsart University, Thailand. Identification and classification of the species were done using Yamaguti (1958), Bykhovskaya - Pavlovskaya *et al*. (1964), Hoffman (1970) and Overstreet and Curran (2002)

Results

Two species of parasites were found in the intestine of Mekong giant catfishes. Both were in genus *Prosorhynchoides* (Digenea:Bucephalidae). *Prosorhynchoides* sp.1 was found in all fish samples, while *Prosorhynchoides* sp.2 was found in two fishes caught in the year 2005. The number of specimens collected is shown in Table 1. *Prosorhynchoides* sp.1 in each sample was between 25-240 and the number of *Prosorhynchoides* sp.2 in each sample was between 4-12. Morphological details of the parasites examined are given below.

1. *Prosorhynchoides* sp.1 (Figure 1)

Description

Body very small, elliptical, with maximum width at post-oral region, 1100-1700 x 554-857 (1373 x 692) μm. The tegument was covered with spines except posterior region (about 1/6 of body length from posterior). Rhynchus sucker-like, anterior end of body, size 169-262 x 161-250 (211 x 202) μm. The mouth opening posterior third of body, leading to the pharynx and sac-shaped intestine. Pharynx spherical, 97-150 x 99-153 (121 x 124) μm. Intestinal caecum short, sac-like, 363-605 x 97-182 (461 x 136) μm. Gonads middle third of body. The ovary pretesticular, spherical shape, 193-277 x 161-248 (238 x 196) μm. Two oval testes, 227- 350 x 134-211 (284 x 172) μm were oblique in posterior half of body. Cirrus sac long, 299-462 x 63-102 (376 x 79) μm. Seminal vesicle oval, 106-165 x 48-73 (133 x 59) μm. Pars prostatica straight, 162-257 x 23-37 (208 x 29) μm. Cirrus projected into genital atrium near posterior end of body. Vitellaria situated near the sucker, consisted of 11-14 large follicles. Uterus loops extend from under the muscular sucker to the posterior end of testis, containing numerous golden brown, operculate- eggs, oval shaped, 14-21 x 5-8 (17 x 6) μm. The excretory vesicle not observed. The excretory pore was found at posterior end.

Data regarding specimens

Type host: Mekong giant catfish (*Pangasianodon gigas* Chevey)

Site of infection: intestine

Type locality: 100º 24′ 38″ S; 20º 15′ 50″ E, Mekong River, Chiang Khong district, Chiang Rai Province, Thailand.

Number of parasite examined : 10

Type depository: Holotype KUSCID 4701

Table 1. Mekong Giant Catfish biological data and number of parasites, *Prosorhynchoides* sp.1 and *Prosorhynchoides* sp.2 from each fish.

No.	Caught date	Sex	Weight (kg)	Length (m)	Number of *Prosorhynchoides* sp.1	Number of *Prosorhynchoides* sp.2
1	29/4/2004	Male	152	2.3	240	0
2	30/4/2004	Male	159	2.3	206	0
3	2/5/2004	Female	252	2.5	36	0
4	6/5/2004	Female	225	2.32	25	0
5	27/4/2005	Male	213	2.3	238	4
6	1/5/2005	Female	287	2.68	221	12

2. ***Prosorhynchoides*** **sp.2** (Figure 2)

Description

Body very small, elliptical, with maximum width at post-oral region, 1140-1670 x 552-864 (1412 x 709) µm. The tegument without spines. Rhynchus sucker-like was at anterior end of body, 145-237 x 140-230 (190 x 185) µm. Two groups of spines were situated laterally of the rhynchus. Each group consisted of 10-12 spines with various sizes between 26-83 (55) µm in length. The mouth opening was at the posterior third of body, leading to the pharynx and sac-shaped intestine. Pharynx spherical, 83-147 x 83-141 (115 x 112) µm. Intestinal caecum sac-like, short, 307-499 x 130-

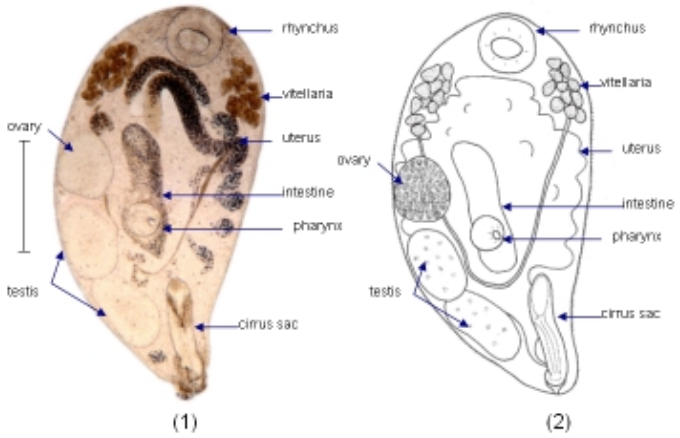

Figure 1. ***Prosorhynchoides*** **sp.1 (1) photograph (2) drawing; Scale-bar 0.5 mm.**

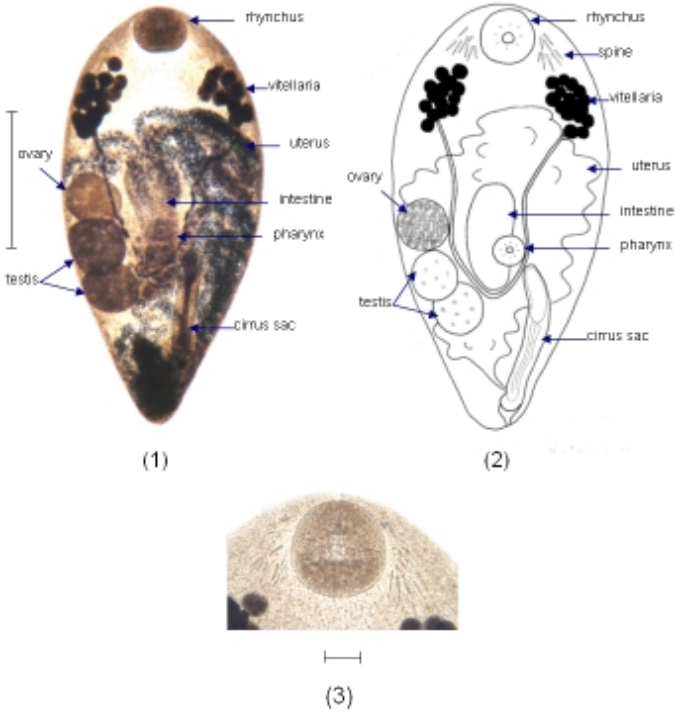

Figure 2. ***Prosorhynchoides*** **sp.2 (1) photograph (2) drawing; Scale-bar 0.5 mm. (3) spine; Scale-bar 0.1 mm.**

184 (403 x 153) µm. Gonads located at middle third of body. The spherical ovary pretesticular, 129-192 x 138-198 (161 x 169) µm. Two testes ovoid 151- 205 x 140-202 (175 x 172) µm were oblique in posterior half of the body. Cirrus sac long, 417-640 x 61-90 (529 x 73) µm. Seminal vesicle oval, 107-154 x 50-77 (128 x 64) µm. Pars prostatica straight, 241-416 x 18-26 (327 x 22) µm. Cirrus projected into genital atrium near posterior end of body. Vitellaria located latterally of the sucker, consisted of 14 large follicles. Uterus loops occupying from under the muscular sucker to the posterior end of testis, containing numerous golden brown operculate-eggs, oval shaped, 14-22 x 5-8 (18 x 7) µm. The excretory vesicle was not observed. The excretory pore was found at posterior end.

Data regarding specimens

Type host: Mekong giant catfish (*Pangasianodon gigas* Chevey)

Site of infection: intestine

Type locality: 100º 24′ 38″ S; 20º 15′ 50″ E, Mekong River, Chiang Khong district, Chiang Rai Province, Thailand.

Number of parasite examined : 10

Type depository: Holotype KUSCID 4802

Discussion

In our study, we found ectoparasite, *Alitropus typus* as reported by Tonguthai (1991) but did not find any monogean. However, Alitropus typus is not specifically found only in *P. gigas*, it could found commonly in many species of fishes from water resource (Tonguthai, 1991). We did not find any endoparasite in *P. gigas* muscle, only two species of digenetic trematodes in family Bucephalidae were found in the *P. gigas* intestine.

The Bucephalidae Poche, 1907 are digenetic trematodes found in the intestines of marine, brackish water and freshwater fishes. Bucephalids differ from all other digeneans in the configuration of their terminal genitalia, the presence of a ventrally located mouth and the presence of as anterior attachment rhynchus that is not associated with the digestive system (Bott and Cribb, 2005).

In Mekong river, *Prosorhynchoides gracilescens* was reported in fish from the Cuulong river (Te, 1998). The morphology of these two species was similar to *P. gracilescens* and *P. pusilla*. In Laos, Scholz (1991) found *P. karvei* in *Xenentodon cancila* intestine from Nam Ngum reservior. However, the size of rhynchus compared with body size of *P. karvei* was very different from that in these two species.

Prosorhynchoides sp.1 and *Prosorhynchoides* sp.2 are placed in family Bucephalidae, genus *Prosorhynchoides* Dollfus, 1929 (Syns.: *Bucephalopsis* Diesing, 1855; *Neobucephalopsis* Dayal, 1948; *Bucephaloides* Hopkins, 1954) according to the rhynchus not having tentacle. The mouth is on the midventral surface of body, opening into the sac-like intestine. Ovary pretesticular. Seminal receptacle absent. Two testis oblique. Cirrus-sac conspicuous, located posteriorly, containing internal seminal vesicle and male duct. Male duct consisting of extensive pars prostatica and distal ejaculatory duct leading into genital atrium. Uterus usually coiling throughout the body. Distal portion of uterus entering genital atrium. Vitelline follicle located in fore body. These two species are also morphologically different from *P. gracilescens* (Rudolphi, 1819) of salmonid fish (Bykhovskaya - Pavlovskaya *et al*., 1964) and *P. pusilla* (Stafford, 1904), which was found in the intestine of *Stizostedion vitreum, Micropterus dolomieui, Etheostoma nigrum, Lepomis cyanellus, L. humilis, Pimephales promelas, Esox lucius, Ictalurus melas, Perca flavescens* (Bangham,1944, 1955; Cooper, 1951; Hoffman, 1970; Lyster, 1939; Meyer, 1958; Van Cleave and Mueller, 1934). The mouth opening positions of *P. gracilescens* and *P. pusilla* are about half of the body length while in *Prosorhynchoides* sp.1 and *Prosorhynchoides* sp.2 are about 2/3 of body length. The presence of spines on the tegument and near the rhynchus are two remarkable differences of these two *Prosorhynchoides* species (Table 2). In author's opinion, *Prosorhynchoides* sp.1 and *Prosorhynchoides* sp.2 might be new species because they differ from the previously described species of this genus.

Table 2. Morphology difference between *Prosorhynchoides* sp.1, *Prosorhynchoides* sp.2, *P. gracilescens* and *P. pusilla*.

Morphology	*Prosorhynchoides* sp.1	*Prosorhynchoides* sp.2	*P. gracilescens*	*P. pusilla*
Length	0.84-1.02 mm.	1.14-1.67 mm.	1.2-2.2 mm.	0.79 mm.
Width	0.42-0.55 mm.	0.55-0.86 mm.	0.4-0.7 mm.	0.23 mm.
Size of muscular sucker	0.21 x 0.2 mm.	0.19 x 0.19 mm.	0.185 x 0.205 mm.	0.13 x 0.14 mm
Position of mouth opening	2/3 from anterior	2/3 from anterior	1/2 from anterior	1/2 from anterior
Pharynx	0.05 mm. Wide 0.07 mm. long	0.121 mm. Wide 0.124 mm. long	0.125 mm. Wide 0.09 mm. Long	0.04 mm. Wide 0.04 mm. long
Ratio of intestine length: width	5.3 : 1	2.54 : 1	1.43 : 1	1.79 : 1
Ratio ovary : testis	2 : 3	1 : 1	2 : 3	1 : 1
Ratio of testis length: width	2.45 : 1	1 : 1	1.5 : 1	1 : 1
Egg	0.015-0.021 x 0.005-0.007 mm.	0.014-0.022 x 0.005-0.008 mm.	0.018-0.029 x 0.013-0.021 mm.	0.017-0.019 x 0.009-0.01 mm.
Has group of spine laterally of the rhynchus	-	+	-	-
Organ	Intestine	Intestine	Intestine,stomach, Pyrolic caeca	Intestine

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