

Morphological re-description *Pseudopecoeloides tenuis* (Digenea: Opecoelidae) that infects the marine fish *Alepes melanoptera* (Actinopterygii: Carangidae) in the South China Sea

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Abstract:

In this work, I investigated the digenean parasites of marine fish, *Alepes melanoptera*, in the Malaysian Sea coast for the first time. Fishes were collected throughout a five months period from local fishermen in Terengganu. A total of 325 fish specimens were subsequently examined for parasites using conventional methods under a dissecting microscope. The examination included gills, pharynx, body cavity and visceral organs (stomach, intestine, liver, swim bladder and gonads). Worms recovered were fixed and preserved using methods commonly applied. A total of one species belonging to the genus *Pseudopecoeloides* Yamaguti, 1940 was identified. Morphological description of *Pseudopecoeloides tenuis* Yamaguti, 1940 was provided, together with its prevalence and mean intensity. The calculated overall infection prevalence (%) and mean intensity values were 0.30 % and 1, respectively. This data is the first on the digenean parasite fauna of *A. melanoptera* collected from the Malaysian coastal waters of the South China Sea. *P. tenuis* Yamaguti, 1940 is new parasite record for Malaysia.

Keywords: Marine fishes, Digenetic trematodes, Opecoelidae, South China Sea, Malaysia.

Introduction

Alepes melanoptera Swainson, 1839 (Carangidae) is a shore carangid fish, widely distributed in the South China Sea. This is an important commercial fish in Malaysia and other countries along the South China Sea. From the other hand, it is a carnivorous fish feeding on shrimps and copepods (Matsunuma et al., 2011). Parasites play a very important part in the lives of their hosts (Dogiel, 1964). Marine fishes are an important source of animal protein for human consuming and the impact of parasites on their populations is well documented (Williams and Jones, 1994). In addition, the possibility risk of transmission of zoonotic diseases through the consuming of parasitized fish, could cause public health problems (Sakanari, 1990; and Williams and Jones, 1994). Digenean parasites primarily infect gastro-intestinal tract in marine

fish, and their life history involves two to four hosts (Barnes, 1980). Parasitic fauna of *A. melanoptera*, and other marine fish from Malaysia are poorly known. Until recently, there were no data on the digenetic trematodes of this fish species.

During March to June 2014, an investigation was carried out to document digenetic trematodes of marine fishes in the South China Sea coastal waters at Terengganu, Malaysia. A total number of 325 fishes were examined during the period out of which only one fish was infected with metazoan parasites. This paper documents for the first time the prevalence and intensity of the digenetic parasite *Pseudopoceloides tenuis* Yamaguti, 1940 in *A. melanoptera* fish in the Malaysian coastal waters of the South China Sea.

Material and Methods

Digenetic parasites were isolated from the marine fish species *Alepes melanoptera*. A total of 325 specimens were collected from the South China Sea at Malaysia (Terengganu region), during the period from March to June 2014. Fishes were caught by gill nets and transported fresh to the Parasitology laboratory in the Institute of Tropical Aquaculture (AKUATROP) located at the University Malaysia Terengganu. After opening their abdomen, digenetics were washed out and collected from the intestine (Cribb & Bray, 2010). These digenetics were fixed in 0.85% normal saline, flattened with minimal cover slip pressure, and stained with aceto-carmin stain. The specimens were then dehydrated in an alcohol gradient series (Weesner, 1968; Andres et al., 2014; Besprozvannykh et al., 2016). Identification of the digenetic was carried out based on a scheme provided by (Yamaguti 1971 and Aken'Ova et al., 2009). The measurements of the good specimens were made by advanced Nikon microscope (Eclipse 80i) equipped with a digital camera (in micrometers). Drawings were made under an Leica microscope (DM750) equipped with a camera lucida. Prevalence (P) and mean intensity (M) were determined following some previous studies Morgolis et al. (1982), Aragort and Moreno, (1997), Bush et al. (1997) and Rózsa et al. (2000)

Results

Family: Opecoelidae Ozaki, 1925

Genus: *Pseudopoceloides* Yamaguti, 1940

Pseudopoceloides tenuis Yamaguti, 1940 (Fig. 1)

Measurements based on one whole-mounted mature specimen from one host. Body elongate, slender, smooth, unarmed, subcylindrical, somewhat constricted at gonad levels, longer than wide 3477 µm in length, 254 µm in width at level of ovary; fore-

body 600 μm in length; oral sucker ventroterminal, subspherical, comparatively large, larger than ventral sucker 249 μm in length, 219 μm in width; pharynx well developed, large, spherical 108 μm in length, 97 μm in width; oesophagus short 107 μm in length, 17 μm in width, caeca long and narrow, double, terminate at posterior extremity of body and opening into excretory vesicle; intestine bifurcated in forebody, an intestinal bifurcation to ventral sucker 111 μm in length; mouth subterminal; ventral sucker subspherical, smaller than oral sucker, and close together, in anterior of body, near anterior extremity, situated on long peduncle 95 μm in length, 88 μm in width; gonads entire, subspherical, separate, tandem, in median at middle of hind-body, testes double, post-ovarian, anterior testis 164 μm in length, 120 μm in width; posterior testis 168 μm in length, 111 μm in width; post-testicular region 112 μm in length; ovary pretesticular 97 μm in length, 76 μm in width; uterus winding in inter-cecal field between preovarian shell gland and intestinal bifurcation; post-uterine region 1078 μm in length; cirrus-sac absent; seminal vesicle unclad, long, tubular, elongate and saccular at posterior end, extends from about level of intestinal bifurcation to level posterior to ventral sucker 105 μm in length, 58 μm in width; the duct connecting seminal vesicle with the hemaphroditic duct is short; ductus ejaculatorius, genital atrium small; genital pore sinistrally submedian, anterior to intestinal bifurcation, level with posterior edge of pharynx, posterior to oral sucker; anterior extremity to genital pore 357 μm in length; excretory vesicle extending to posterior testis, giving rise to paired collecting vessels at its anterior end, I-shaped; narrow, terminal; excretory pore terminal; vitellaria circumcecal, fields limited to hindbody, extending from level posterior to ventral sucker almost to posterior extremity; anterior extremity to vitellarium 1112 μm in length; posterior extremity to vitellarium 27 μm in length; eggs oval, somewhat big in size, 35 μm in length, 19 μm in width.

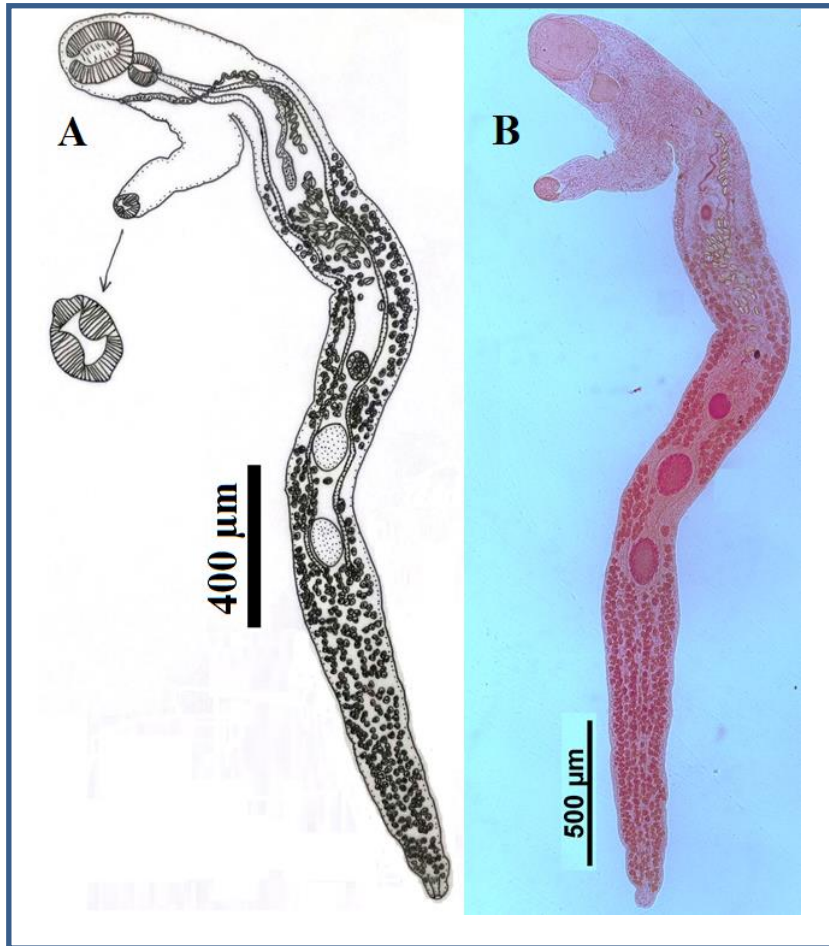


Figure 1: *Pseudopecoeloides tenuis* Yamaguti, 1940 ex *Alepes melanoptera*. A. Whole-mount ventral view. B. Specimen stained with alum-carmin and photographed by advanced microscope. All scale bars are in micrometres.

Host: *Alepes melanoptera*

Site: intestine

Locality: Terengganu, Malaysia.

Prevalence: 0.30%

Intensity: 1

Discussion:

In this study, we report the detection of one species of digenetic trematodes in marine fishes of *A. melanoptera* from the east coast of Malaysia in the state of Terengganu. This is a commonly reported digenetic trematode from *A. melanoptera*

(Parukhin, 1966, Parukhin, 1967, Parukhin, 1976, and Wang, 1987). However, the current study is the first report and description of the genus *Pseudopecoeloides* Yamaguti, 1940 in *Alepes* sp. from Malaysia.

It is interesting to compare the results of the current study with those fishes collected from the other Seas. Morphologically, the description of *P. tenuis* under this work agreed in many respects, such as the shape of general body and suckers; location of genital pore, testes, ovary, vitellaria; and with *P. tenuis* as described by Yamaguti, 1940 and Aken'Ova et. al., 2009, but clearly differed in measurements. Remarks: the overall size of the body, measurements of all organs. The other differences are most likely as a result of fixation and may therefore not be taxonomically significant. Comparison of my material with the previous descriptions showed them to be basically similar.

In the current study, *P. tenuis* was described from the intestine of *A. melanoptera* which was collected from the Terengganu coastal water. This trematode was reported by Aken'Ova et. al., 2009 from the Pyloric caeca and intestine of *Priacanthus macracanthus* in Moreton Bay, southeastern Queensland, while in Japan it was recorded from the intestine of *Pseudopriacanthus nipponicus* (Yamaguti, 1958). From the other hand, this digenean has been recorded from *Priacanthus hamrur* New Caledonia.

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الخلاصة

في هذا العمل ، قمت بالتحقيق في الطفيليات ثنائية العائل digenean للأسماك البحرية Alepes melanopectera، في بحر الصين الجنوبي في ماليزيا لأول مرة. تم جمع الأسماك خلال فترة خمسة أشهر من الصيادين المحليين في ولاية تيرنجانو. تم فحص إجمالي 325 عينة سمكية بحثاً عن الطفيليات باستخدام الطرق التقليدية تحت مجهر التشريح. وشمل الفحص الخياشيم والبلعوم وتجويف الجسم والأعضاء الحشوية (المعدة والأمعاء والكبد والمثانة الهوائية والغدد التناسلية). تم تثبيت الديدان المكتشفة وحفظها باستخدام طرق شائعة الاستخدام. تم تحديد ما مجموعه نوع واحد ينتمي إلى جنس Pseudopecoeloides Yamaguti، 1940. وتم تقديم الوصف المورفولوجي لطفيل Pseudopecoeloides tenuis Yamaguti، 1940 جنباً إلى جنب مع معدل إنتشاره ومتوسط شدة كثافته. و كان معدل انتشار العدوى الإجمالي المحسوب (%) وقيم متوسط شدة الكثافة 0.30% و 1 على التوالي. هذه البيانات هي الأولى عن الطفيليات ثنائية العائل لسمكة A. melanopectera التي تم جمعها من المياه الساحلية الماليزية لبحر الصين الجنوبي. وهذا تسجيل جديد لطفيل P. tenuis في ماليزيا.