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A FIRST RECORD OF *Fissimentum* Cranston & Nolte (DIPTERA: CHIRONOMIDAE) IN PENINSULAR MALAYSIA

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ABSTRACT

A new record of *Fissimentum* Cranston & Nolte (Diptera: Chironomidae), *Fissimentum* sp by its immature stage has been recorded from upstream of Tampik River Pahang, Malaysia for the first time and been described at larval stage. This genus is distinguished from others by having a mentum with a distinct cleft mid, with 6 segmented antenna, in combination with louterborn organs at the apex of segment 2 or 3. Mandible remarks with large seta subdentalis and lacking of pecten mandibularis and seta interna. Descriptions, diagnosis and line drawings of larva material are provided. A brief note on the ecology of the genus is also given.

Keywords: *Fissimentum,* Chironomidae, Chironominae, river, Peninsular Malaysia, new record

ABSTRAK

Satu rekod baru genus *Fissimentum* Cranston & Nolte (Diptera: Chironomidae), *Fissimentum* sp telah ditemui di hulu Sungai Tampik Pahang, Malaysia buat pertama kali dan telah dihuraikan berdasarkan peringkat larva. Genus ini dibezakan dengan mempunyai mentum yang terbelah dengan mendalam di bahagian tengah, mempunyai 6 segmen antena serta organ louterborn di hujung segmen 2 atau 3. Mandibel genus ini mempunyai seta subdentalis yang besar dan tidak mempunyai pektin mandibularis dan seta interna. Huraian, diagnosis dan ilustrasi lukisan larva diberikan. Satu huraian ringkas mengenai ekologi genus ini turut disertakan.

Kata kunci: *Fissimentum*, Chironomidae, Chironominae, sungai, Semenanjung Malaysia, rekod baru

INTRODUCTION

Fissimentum belongs to Chironominae subfamily. This genus is characterized by having a cleft or deeply sunken pair of median teeth, with 6 segmented antenna and presence of louterborn organ at apex of segment 2 or 3; and mandible lacking of pecten mandibularis and seta interna, but with huge seta subdentalis (Epler et al. 2013). *Fissimentum* larvae resembles *Nilodosis* Kieffer based on distinct cleft mentum (Tang & Yamamoto 2012). However, generic placement remain tentative until life history association is assured (Epler et al. 2013). *Fissimentum* was first reported from southern USA and Neotropics by Roback (1966) as "Tendipedini genus A". Later in 1996, this genus was introduced by Cranston and Nolte (1996) based on *Fisssimentum dessiccatum* from Central Brazil. To date, this is the only species described from complete life history by rearing the larvae. This genus was reported to occur in Southern USA (Epler 2001), Central and South America including foothills of

Andes (Roback 1966), lowland areas and coastal plains in Brazil, as well as Australia (Cranston & Nolte 1996). A larva also has been found in sandy-bedded stream in southern Thailand (Epler et al. 2013). However, information on *Fissimentum* from Southeast Asia is very poor. Despite Chironomidae having high number of species in freshwater aquatics, no data regarding its taxonomy and distribution within Malaysia has been published. Based on previous available studies, this genus has never been recorded in Peninsular Malaysia. This study is reporting a new finding of *Fissimentum* in Peninsular Malaysia within high elevation stream, Tampik River Pahang, and to describe the taxonomy of *Fissimentum* larva. However, due to the lack of associated larval, pupal and adult material, the work on the taxonomy of *Fissimentum* is incomplete.

STUDY AREA

Tampik River is one of the tributaries of Benus River which located in highland area (459 m a.s.l) in Pahang, Malaysia. The river habitat is characterized by cobble and sandy substrates, shallow and clean water and almost fully vegetated. The upstream part of the river is located within secluded area and far from villages and chalet areas. According to Department of Environment Malaysia (DOE), Tampik River is classified as class I based on Malaysian water quality index (WQI) which can be considered as excellent water quality and in pristine condition.

MATERIALS AND METHOD

The chironomid samples were collected using Surber net and the samples trapped in the net were rinsed through ±250 µ pore size net to separate from debris and fine sediment. Samples were preserved in ethanol (70%). The material examined was mounted on slides, following procedure outlined by Andersen et al. (2013) and Cranston (2000). Chironomid specimens were

macerated in warm 10% solution of potassium hydroxide (KOH) for 10-15 minutes to dissolve soft tissue. The specimen then passed through glacial acetic acid for 10 minutes to neutralize before mounting with formaldehyde resin (water based) as permanent slide. Chironomid samples were identified to genus level following Andersen et al. (2013) and Epler (2001).

RESULT AND DISCUSSION

Chironominae - Chironomini
Fissimentum Cranston & Nolte (1996)

Fissimentum larva was found in Tampik River Pahang, a small excellent water quality tributary. The river is characterized by moderate flowing and clear water and almost surrounded by vegetation cover. It is a shallow river (<1m depth) and cobbles and sand were dominant substrate. Only one specimen of *Fissimentum* larva was recorded from 194 individual chironomid collected. Based on the finding, *Fissimentum* lives in sandy substrate within pristine area and most likely adapted to cool temperature in high elevation stream (22-23º C).

Material Examined

Tampik River, Pahang, Malaysia, 03º 19’ 15.6” N; 101º 50’ 41” E, 459 m a.s.l., larval, 15. I. 2015, Siti Hafizah A. Remarks: Stream, high elevation stream, vegetated, sandy substrate.

Diagnostic characters

The larvae can be differentiated from other Chironomini by having very clear mid cleft mentum, 6 segmented antenna with lauterborn organs at the apex of segment 2 or 3 and mandible with huge seta subdentalis but without pectin mandibularis and seta interna.

Description

Larval (n=1). Medium sized, about 5 mm long. Dark coloured head capsule. 2 eyes spot at each side of the head.
Antenna: 6 segmented; each successive segment shorter than the preceding. Small lauterborn organ at the apex of segment 3. Blade extending not longer than segment 4. Ring organ in apical third of segment 1.
Labrum: SI plumose; SII long, simple; SIII short, simple. Premandible with 2 pointed teeth and strong premandibularis brush.
Mandible: Dorsal tooth absent; strong apical tooth with 3 small compact inner teeth. Pecten mandibularis and seta interna absent. Seta subdentalis huge and broad.
Mentum: Distinct cleft in mid-mentum; with a total of 7 pairs of teeth. 4th lateral teeth higher than the rest of teeth. Ventromental plate circular-shaped, not elongated with no striae.
Maxilla: Broad; long maxillary palp.
Body: Lateral and ventral tubules absent. Anterior and posterior parapods with simple claws. Procercus about as high as wide, bearing 6 anal setae. Supraanal setae a bit shorter than anal setae.

Key to *Fissimentum* Cranston & Nolte 1996

Key to *Fissimentum* Cranston & Nolte 1996 is obtained from Epler et al. (2013) and some changes have been added to the existing key and labeled with '[ ]' accordingly with the specimen's morphology.

1. Labrum with SI partially or fully plumose, SII never blade-like. Labral lamella present and usually well-developed. Pectin ephipharyngis plate wide, distally toothed or divided into 3, usually toothed, rarely finger-like. Dorsal tooth of mandible present or absent; pectin mandibularis almost always well-developed, rarely absent.....2

- Labrum with SI and SII almost invariably simple, frequently blade-like; rarely SI divided into 3-5 slender lobes. Labral lamella usually absent. Pectin ephipharyngis plate single scale, sometimes large and distinctly toothed, more commonly small, without distinct tooth though sometimes lobed or serrate. Pectin mandibularis usually absent or reduced to 1 or few lamellae.....*Harnischia* complex of tribe Chironomini

2. Ventromental plates bar-like, in near contact medially. Insertation of seta subdentalis dorsal.....tribe Pseudochironomini.....3
- Ventromental plates very variable but rarely bar-like and near median contact. Insertation of seta subdentalis ventral.....4

3. Maxillary lacinia bifid. Procerci arising from separate base. Basal segment of antenna longer, AR about or more 1.0. Mentum with 2nd lateral tooth small, sometimes partially fused to 1st lateral tooth. SI on separate bases.....*Pseudochironomus*
- Maxillary lacinia simple. Procerci fused at base. Basal segment of antenna shorter, AR < 1.0. Mentum with 2nd lateral tooth fused to 1st lateral tooth. SI setae on common base.....*Manoa*

4. Mentum shining black; 1st lateral tooth extremely broad and extended. Setae submenti short. Seta interna well developed. Separate frons, clypeal and labral sclerites.....*Hyporhygma*
- Mentum brown [or dark brown]; 1st lateral tooth not broad or extended. Setae submenti long. Mandible lacking pectin mandibularis and seta interna. Dorsal head sclerites differ.....5

5. Mentum with simple median tooth; 1st lateral tooth lower than 2nd. Mandible with 4 inner teeth; seta subdentalis narrow and straight. Pectin ephipharyngis scales distally tooth. Clypeal and labral sclerite fused into single sclerite.....*Kribiodorum*

- Mentum with double, medially deeply divided median tooth; [4th lateral tooth higher than other teeth]. Mandible with 3 inner teeth; seta subdentalis broad, long and sinuous. Pecten ephipharyngis plate simple. Clypeal sclerite fragmented, labral sclerite small, medial to SI seta.....*Fissimentum* (Figure 1-7)

Remarks

Ventromental plates are circular, not elongated as reported. Lauterborn organ only exist at segment 3. Thus, there is a possibility that this specimen may represent a new species.

Distribution

Florida and Texas Southern USA, Costa Rica, Puerto Rico, Brazil, Australia, southern Thailand and Peninsular Malaysia.

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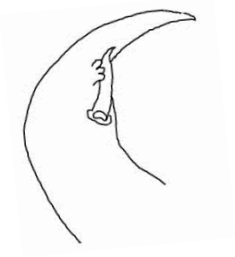

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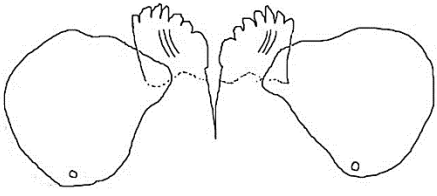

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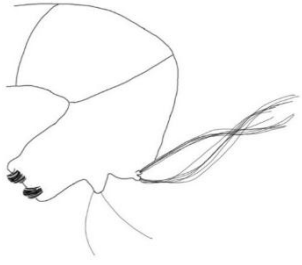

Figs 1-7. (1) Head capsule and eyes spot (photographed with 10x magnification) (2) 6 segmented antenna (3) SI setae (4) Mandible (5) Premandible with brush (6) Mentum and ventromental plate (7) Anal segments (drawing using intuos4 professional pen tablet)

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