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Pseudoleptonema tansoongnerni new species (Hydropsychidae: Trichoptera) with species list of Trichoptera from Li Phi Falls, Mekong River, southern Laos

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Abstract

A new species named *Pseudoleptonema tansoongnerni* **n. sp.** is presented along with a list of Trichoptera from Li Phi falls, Mekong River, southern Laos. *Pseudoleptonema tansoongnerni* **n. sp.** is described and figured based on adult males and females. It is distinguished from the others by its forewing pattern and color, which is yellowish brown.

Key words: Oriental Region, Southeast Asia, caddisfly, Macronematinae

Introduction

The genus *Pseudoleptonema* Mosely 1933 is a small genus in the subfamily Macronematinae (Hydropsychidae). Fourteen species of *Pseudoleptonema* have been reported, with 5 of these species recently transferred from *Trichomacronema* to *Pseudoleptonema* (Oláh 2013) (Table 1). In Laos, only one species of the genus *Pseudoleptonema* is known, *P. quinquefasciatum* Martynov 1935. Hoang *et al.* (2005) redescribed males and described females of *P. quinquefasciatum* and *P. supalak*. The larvae and pupae of *P. quinquefasciatum* and *P. supalak* were described by Prommi *et al*. 2006.

The Mekong River is an international river meandering from Tibet through southwestern China, Myanmar, Laos, Thailand, Cambodia, and Vietnam, eventually entering the South China Sea. Before the Mekong River crosses the border from Laos into Cambodia, many islands occur in the river. Between the 2 islands Don Sanlat and Donkhon, the Mekong River drops more than 30 meters, the resulting falls are called Li Phi (Somphamit). The biodiversity of aquatic insects in the river is very high. However, studies of Trichoptera in the river are limited (Mekong River Commission 2010). This report covers part of a Trichoptera biodiversity survey along the Mekong River in the Lower Mekong basin.

Materials and methods

The caddisfly specimens were collected by a UV pan light trap (12-V, 10-W) near the river overnight at Li Phi (Somphamit) Falls. The Trichoptera specimens were preserved in 70% ethanol and manually sorted afterwards. Male genitalia for all species and female genitalia of the new species were cut and macerated by heating in 10% KOH at 60ºC for 30–60 minutes. Except for the new species, only male insects were identified in this study. The identified specimens of species, other than those described here as new, are deposited in the Department of Fishery and Coastal Resources, Faculty of Science and Industrial Technology, Prince of Songkla University, Surat Thani campus.

For new species, the male and female genitalia and right forewings were drawn by compound microscopy with a drawing tube, first with pencil and then with ink. The holotypes and paratypes are stored in 70% ethanol and are

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deposited at Princess Maha Chakri Sirindhorn Natural History Museum (PSUNHM), Prince of Songkla University, Hat Yai Campus, Hat Yai District, Songkhla Province, Thailand. Some paratypes are deposited in the collection of Hans Malicky (CHM), Pongsak Laudee (CPL), and the Clemson University Arthropod Collection (CUAC).

TABLE 1. World species of genus *Pseudoleptonema* (Hydropsychidae: Macronematinae) and their national distributions. Besides the records from original descriptions of these species, records from Laos (Malicky 2010a), Myanmar (Wityi *et al*. 2015), Thailand (Bunlue *et al*. 2012; Malicky 2010a; Nuntakwang *et al*. 2007), and Vietnam (Hoang *et al*. 2005, 2006; Malicky 2010a) are included.

Taxa	Countries
P. ceylanicum Hagen 1858	Sri Lanka
P. ciliatum (Ulmer 1926)	China (Guangdong)
P. egena Oláh 2013	Vietnam
P. elegans (Ulmer 1926)	China (Guangdong)
P. erawan Malicky & Chantaramongkol 2001 in Malicky *et al*. 2001	Thailand
P. godapitigama Schmid 1958	Sri Lanka
P. kalukandama Schmid 1958	Sri Lanka
P. maganos Oláh 2013	Vietnam
P. paniae (Malicky & Chantaramongkol 1991)	Thailand, Myanmar
P. quinquefasciatum Martynov 1935	India, Laos, Myanmar, Nepal, Thailand, Vietnam
P. shanorum (Schmid 1964)	India
P. sinuatum Ulmer 1906	Borneo
P. supalak Malicky & Chantaramongkol 1998 (in Malicky 1998)	Thailand, Vietnam
P. tamdao (Malicky 1998)	Thailand, Vietnam

Taxonomy

***Pseudoleptonema tansungnerni* n. sp.**
(Figs. 1–8, 11–12)

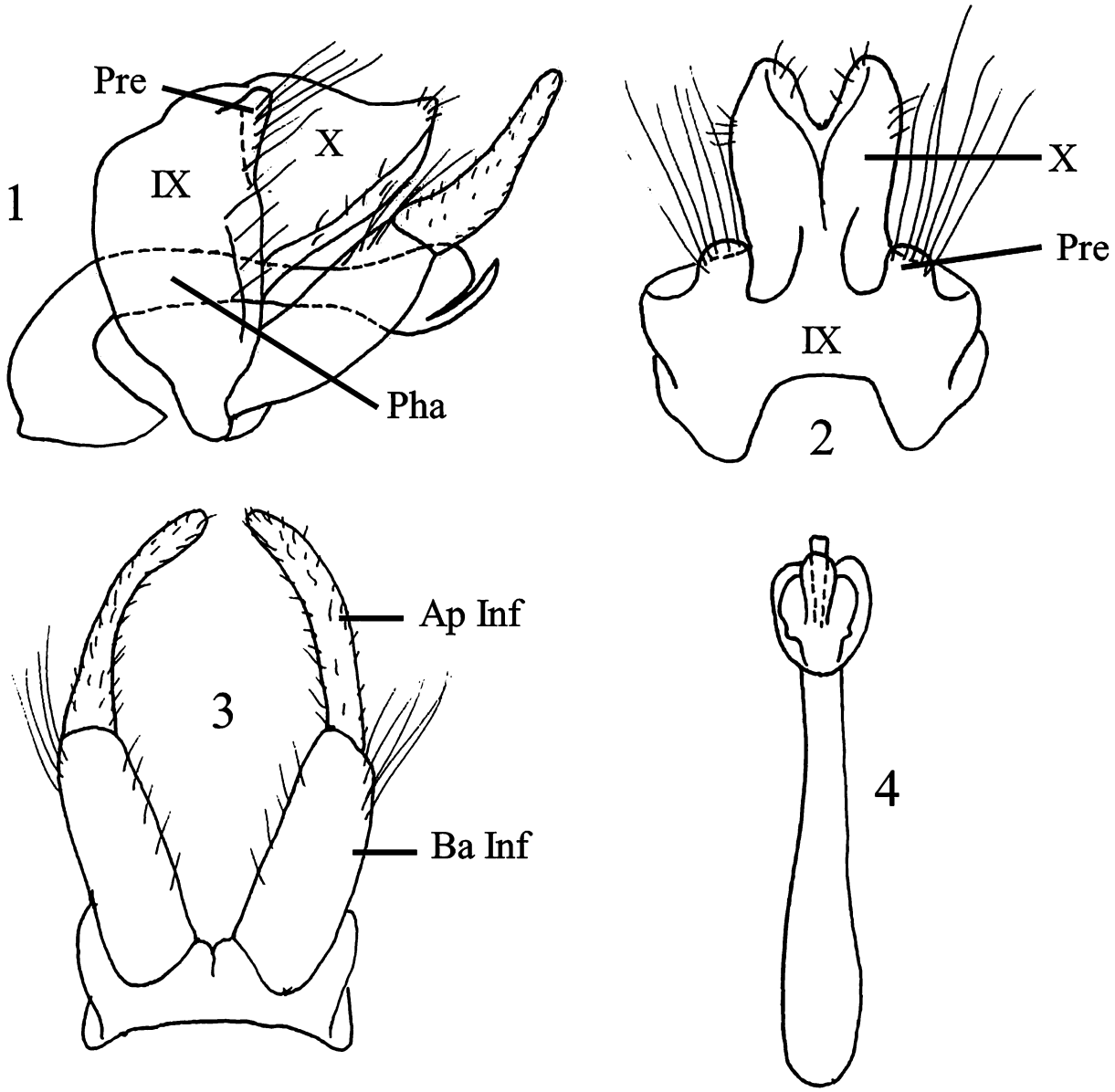
Type material. Holotype male (PSUNHM). **Laos:** Muang Khong Village, Don Klon Island, Li Phi Falls, Mekong River, 13°57'27"N, 105°55'27"E, 77 m a.s.l., 16 April 2016, leg. Pongsak Laudee.

Paratypes: Same data as holotype, 54 males and 39 females: 4 males and 4 females (CHM), 20 males and 20 females (CPL), 10 males and 10 females (PSUNHM), and 20 males and 5 females (CUAC).

Etymology. Named for Asst. Prof. Jaroon Tansoongnern, Dean of the Faculty of Liberal Arts and Management (during 2010-2012), Prince of Songkla University, Surat Thani Campus.

Description. Length of each male forewing 8–9 mm (n = 5); length of each female forewing 6–6.5 mm (n = 5); specimens in alcohol with head, thorax, and abdomen yellowish; wings yellowish brown with dark brown markings.

Male genitalia (Figs. 1–4). In lateral view (Fig 1), segment IX (IX) vertically elliptical, longitudinally short dorsally and ventrally and long laterally, anterior margin convex, posterior margin nearly straight; preanal appendages (Pre) small, triangular with long setae; segment X triangular with small setae apically, ridge and small setae apicoventrally. Inferior appendages about 1.5 times as long as segment X, divided into 2 parts equally long, basal part (Ba Inf) thicker than apical part (Ap Inf); phallus axe-like, vertically enlarged basally, slender in middle, bulging apically with pointed spine apicoventrally. In dorsal view (Fig 2), preanal appendages squat, subrectangular, with long setae apically; segment X subrectangular with V-shape incision apically for 1/3 of its length, diverging branches rounded apically. In ventral view (Fig. 3), basal segments of inferior appendages cylindrical with long setae laterally, apical segments thinner than basal segments, curved inward and with numerous short setae; phallus clavate, bulky apically.



FIGURES 1–4. Male genitalia of *Pseudoleptonema tansoongnerni* **n. sp.** 1, left lateral; 2, dorsal; 3, ventral; 4, phallus, ventral. Ap Inf = apical segment of an inferior appendage (paired), Ba Inf = basal segment of an inferior appendage (paired), IX = abdominal segment IX, Pha = phallus, Pre = preanal appendage (paired), X = abdominal segment X.

Male forewings yellowish brown, with 4 transparent bands crossing or nearly crossing wing from anterior to posterior, subapically with fist-like transparent area surrounded by dark brown area, this dark color extending basad in median vein (Figs. 5, 11).

Female genitalia (Figs. 6–7). In lateral view (Fig. 6), segment X yellowish with row of long setae marginally. Segment XI with 2 dorsal and 1 ventral papillae widely separated, small setae marginally. In ventral view (Fig. 7), segment X oval with long and short setae marginally. Ventral plates with numerous long setae anterior marginally, connected at its base.

Female forewings yellowish brown with transparency band and small dark brown area (Figs. 8, 12).

Diagnostic. The male and female genitalia of *P. tansoongnerni* **n. sp.** appear very similar to those of *P. quinquefasciatum*. However, these species can be very easily distinguished by the following characteristics: 1) the body of *P. quinquefasciatum* is black, but the body of *P. tansoongnerni* **n. sp.** is yellowish brown; 2) the forewing color and wing pattern of *P. quinquefasciatum* is black with white bands, but the male and female forewings of *P.*

tansoongnerni **n. sp.** are yellowish brown and black with a pattern similar to that of *P. quinquefasciatum* but with a large transparent region subapically not seen in *P. quinquefasciatum.* Photographs of male and female forewings of *Pseudoleptonema quinquefasciatum*, *P. tansoongnerni*, and *P. supalak* are provided for comparison (Figs. 9–14).

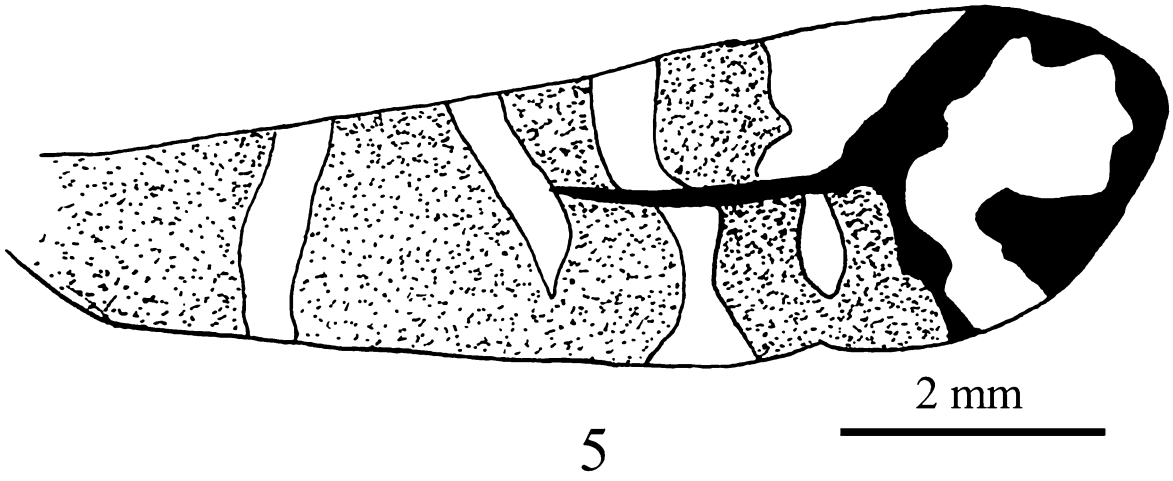
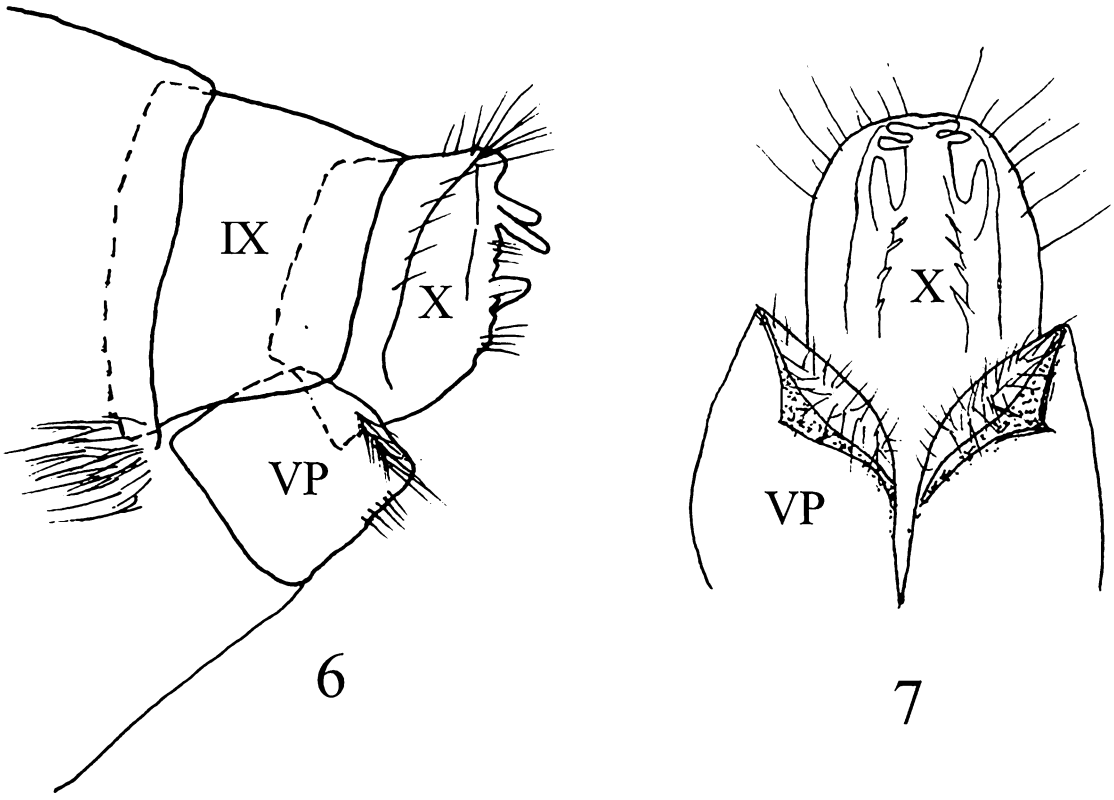


FIGURE 5. Male right forewing of *Pseudoleptonema tansoongnerni* **n. sp.**, dorsal.



FIGURES 6–7. Female genitalia of *Pseudoleptonema tansoongnerni* **n. sp.** 6, left lateral; 7, ventral. IX = abdominal segment IX, VP = ventral plate (paired), X = abdominal segment X.

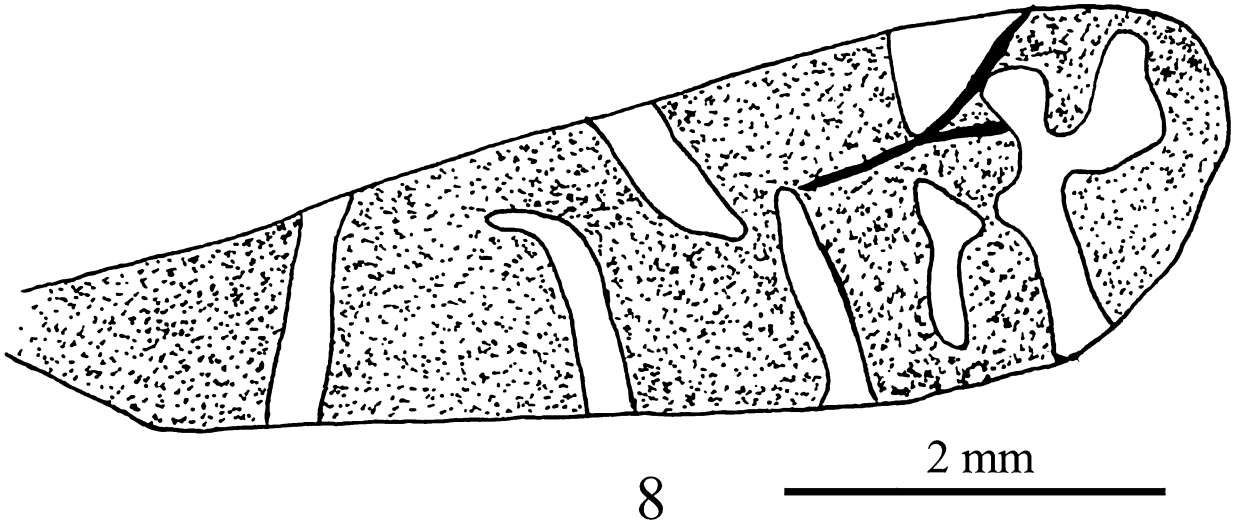


FIGURE 8. Female right forewing of *Pseudoleptonema tansoongnerni* **n. sp.**, dorsal.

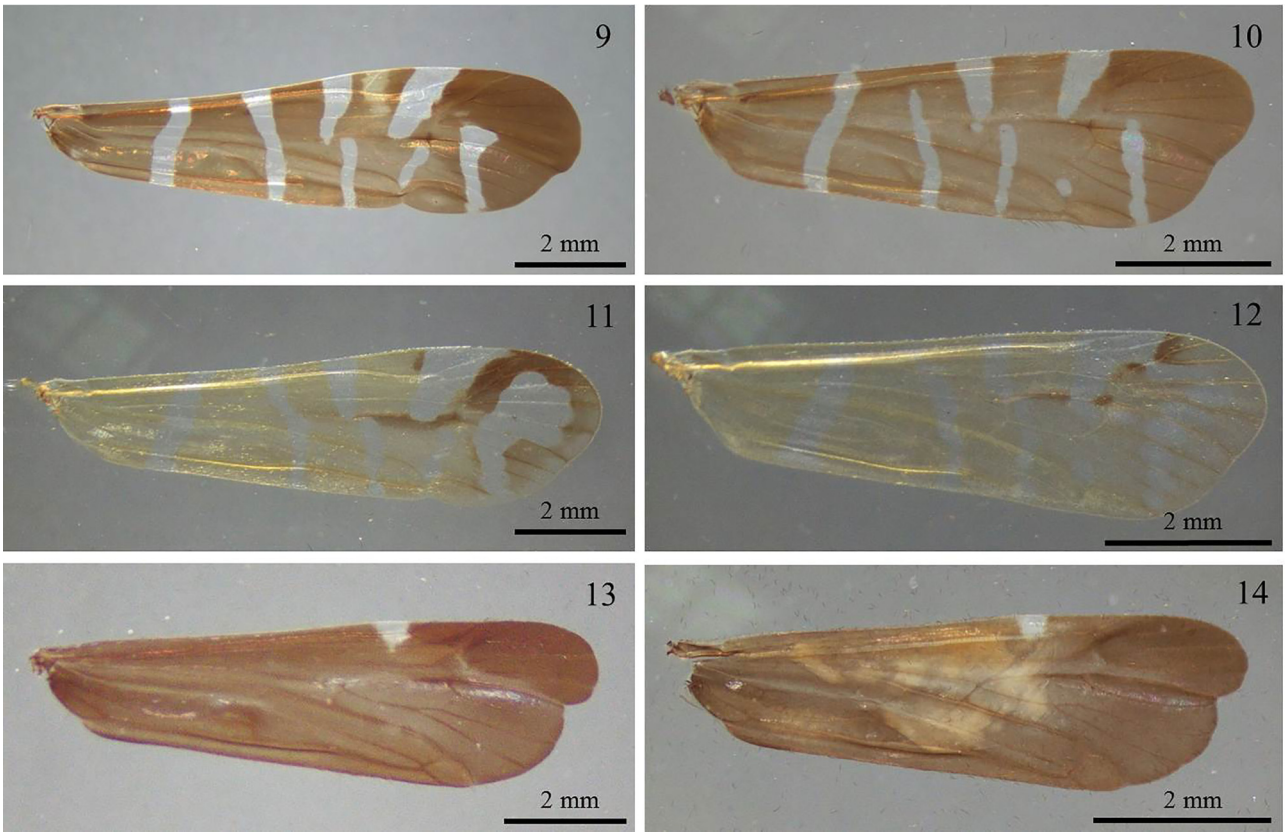


FIGURE 9–14. Right forewing of *Pseudoleptonema* spp. 9, male right forewing of *P. quinquefasciatum*. 10, female right forewing of *P. quinquefasciatum*. 11, male right forewing of *P. tansoongnerni*. 12, female right forewing of *P. tansoongnerni*. 13, male right forewing of *P. supalak*. 14, female right forewing of *P. supalak*.

Faunistic data of Trichoptera from Li Phi Falls, Mekong River, Southern Laos

At Li Phi Falls the whole Mekong River drops more than 30 meters. The Trichoptera species at these falls are remarkable. At least 20 species in 6 families of Trichoptera were identified (Table 2). The occurrence of

Trichoptera species in the falls was discussed by authors such as Laudee *et al*. (1999), Malicky (2010a); Bunlue *et al*. (2012), and Laudee and Malicky (2014). *Chimarra chiangmaiensis* Chantaramongkol & Malicky 1989, *Pseudoneureclipsis ramosa* Ulmer 1913, *Psychomyia thienemanni* Ulmer 1951, *Cheumatopsyche lucida* Ulmer 1907, *Macrostemum indistinctum* Banks 1911, and *Oestropsyche vitrina* Hagen 1859 are wide-spread in Southeast Asia and also are found in the falls. Trichoptera which are found in the higher elevations of Thailand, Laos, Cambodia, and Vietnam were also observed at the falls, including *Paduniella wangtakraiensis* Malicky & Chantaramongkol 1993, *Ecnomus alkaios* Malicky & Chantaramongkol 1997a, *E. alkmene*, *E. dikla* Malicky 2009, *Cheumatopsyche caieta* Malicky & Chantaramongkol 1997b, *Hydropsyche augeias* Malicky & Chantaramongkol 2000, *Adicella iole* Malicky & Chantaramongkol 2002 in Malicky *et al*. 2002, *Ceraclea helena* Malicky & Laudee 2002 in Malicky *et al*. 2002, *C. hersilia* Malicky & Changethong 2002 in Malicky *et al*. 2002, and *Triaenodes narkissos* Malicky 2005b. In addition, *Potamyia jinhongensis* Li & Tian 1996 in Tian *et al*. 1996, which was described from China (Yunnan), was found at the falls and recorded for the first time south of China. According to previously recorded distributions, ten described species captured in this study were previously unknown for Laos, namely *P. ramosa*, *Pseudoneureclipsis kaineus*, *P. wangtakraiensis*, *P. thienemanni*, *E. alkaios*, *E. alkmene*, *E. dikla*, *Hydropsyche augeias*, *P. jinhongensis*, *A. iole*, and *T. narkissos* (Table 2).

TABLE 2. Trichoptera species collected on 16 April 2016 at Li Phi Falls, Mekong River, Don Klon, Muang Klong, Laos; their previously reported distributions by countries (islands or provinces); and bibliographic references for those previously reported distributions. * = new species record for Laos.

FAMILIES and species	Countries (Islands/Provinces)	References for distributions
PHILOPOTAMIDAE		
Chimarra chiangmaiensis Chantaramongkol & Malicky 1989	Cambodia, Indonesia (Bali), Laos, Malaysia (Peninsular), Thailand, Vietnam	Malicky 2010a, 2014; Laudee & Prommi 2011; Bunlue *et al*. 2012; Prommi & Thamsenanupap 2012; Malicky *et al*. 2014
PSEUDONEURECLIPSIDAE		
**Pseudoneureclipsis ramosa* Ulmer 1913	Afghanistan, Cambodia, India, Indonesia (Bali, Java, Lombok, Sumatra), Malaysia (Peninsular), Myanmar, Nepal, Thailand, Vietnam	Malicky 2006, 2007, 2009, 2010a, 2014; Armitage & Arefina-Armitage 2009; Bunlue *et al*. 2012; Malicky *et al*. 2014, 2016
**Pseudoneureclipsis kaineus* Malicky & Bunlue 2004 in Malicky *et al*. 2004	Thailand	Malicky *et al*. 2004
PSYCHOMYIIDAE		
**Paduniella wangtakraiensis* Malicky & Chantaramongkol 1993	Thailand, Vietnam	Malicky 2010a; Bunlue *et al*. 2012
**Psychomyia thienemanni* Ulmer 1951	Cambodia, Indonesia (Java, Sumatra), Malaysia (Peninsular), Thailand, Vietnam	Malicky 2007, 2010a, 2014; Laudee & Prommi 2011; Malicky *et al*. 2014
ECNOMIDAE		
**Ecnomus alkaios* Malicky & Chantaramongkol 1997a	Cambodia, Thailand	Malicky 2010a, 2014
**Ecnomus alkmene* Malicky & Chantaramongkol 1997a	Thailand	Malicky 2010a
**Ecnomus dikla* Malicky 2009	Vietnam	Malicky 2010a
HYDROPSYCHIDAE		
Cheumatopsyche lucida Ulmer 1907	Borneo, India (Nicobar Islands), Indonesia (Bali, Java, Sumatra), Laos, Philippines (Tawi Tawi, Romblon: Sibuyan), Thailand, Vietnam	Malicky 2007, 2010a, 2010b, 2014; Thapanya *et al*. 2013; Malicky *et al*. 2014, 2016; Laudee & Prommi 2016; Prommi *et al*. 2016
Cheumatopsyche caieta Malicky & Chantaramongkol 1997b	Laos, Thailand, Vietnam	Oláh & Johanson 2008; Malicky 2010a; Bunlue *et al*. 2012; Prommi *et al*. 2016

.....continued on the next page

TABLE 2. (Continued)

FAMILIES and species	Countries (Islands/Provinces)	References for distributions
**Hydropsyche augeias* Malicky & Chantaramongkol 2000	Thailand	Malicky 2010a; Prommi *et al*. 2016
Macrostemum indistinctum Banks 1911	Cambodia, China, India, Indonesia (Sumatra), Laos, Malaysia (Peninsular), Sri Lanka, Thailand, Vietnam	Flint 2003; Hoang *et al*. 2005; Nuntakwang *et al*. 2007; Malicky 2007, 2010a, 2014; Prommi & Thamsenanupap 2012; Oláh 2013; Yang *et al*. 2016
Oestropsyche vitrina Hagen 1859	Borneo, China (Guangdong, Guangxi, Guizhou, Zhejiang), Indonesia (Bali, Java, Sumatra), Laos, Malaysia (Peninsular), Philippines (Mindanao), Thailand	Mey 1998; Yang *et al*. 2005, 2016; Nuntakwang *et al*. 2007; Malicky 2007, 2010a; Malicky *et al*. 2011, 2014
Pseudoleptonema tansoonerni* **n. sp.		this study
**Potamyia jinhongensis* Li & Tian 1996 in Tian *et al*. 1996	China (Yunnan)	Yang *et al*. 2005, 2016
LEPTOCERIDAE		
**Adicella iole* Malicky & Chantaramongkol 2002 in Malicky *et al*. 2002	Thailand	Prommi & Chantaramongkol 2005; Malicky 2010a
Ceraclea helena Malicky & Laudee 2002 in Malicky *et al*. 2002	Laos, Thailand, Vietnam	Armitage *et al*. 2005; Nuntakwang *et al*. 2007; Malicky 2010a
Ceraclea hersilia Malicky & Changethong 2002 in Malicky *et al*. 2002	Laos, Thailand	Nuntakwang *et al*. 2007; Malicky 2010a; Laudee & Prommi 2011
Oecetis empusa Malicky & Chaibu 2000 in Malicky *et al*. 2000	Cambodia, Laos, Thailand, Vietnam	Malicky 2005a, 2010a, 2014; Nuntakwang *et al*. 2007; Laudee & Prommi 2011; Thapanya *et al*. 2013
**Triaenodes narkissos* Malicky 2005b	Thailand	Malicky 2010a; Prommi & Thamsenanupap 2012

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