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A new species, *Agapetus kaengkrungensis* (Trichoptera: Glossosomatidae) from Kaeng Krung National Park, southern Thailand with the distribution map of the genus in Thailand

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Abstract

The male of a new species of caddisfly, *Agapetus kaengkrungensis* n. sp. (Glossosomatidae) is described and illustrated from Kaeng Krung National Park, Surat Thani Province, southern Thailand. *Agapetus kaengkrungensis* n. sp. is distinguished from other species by the characters of segment IX and inferior appendages. The distributions of the *Agapetus* spp. of Thailand are mapped and discussed.

Key words: diversity, Oriental Region, caddisfly

Introduction

Three genera of Glossosomatidae are known from Thailand including *Glossosoma* Curtis 1834, *Agapetus* Curtis 1834, and *Padunia* Martynov 1910. A fourth genus *Cariboptila* Flint 1964 has also been reported in Thailand, but its occurrence outside of the Caribbean region is disputed (Robertson & Holzenthal 2013).

With at least 187 extant species, the genus *Agapetus* is the most diverse in the family Glossosomatidae and subfamily Agapetinae and is reported from all continents other than Africa, South America, and Antarctica (Morse 2020). At least 47 species have been reported from the Oriental region (Morse 2020), with 15 of those species recorded from Thailand (Malicky 2010; Malicky & Chantaramongkol 1992, 2009; Malicky et al. 2006; Mey 1996). They include *A. abdeel* Malicky & Chantaramongkol 2009, *A. atuus* Malicky & Chantaramongkol 1992, *A. cenomarus* Malicky & Chantaramongkol 1992, *A. dangorum* Oláh 1988, *A. esinertus* Malicky & Chantaramongkol 1992, *A. gonophorus* Mey 1996, *A. gotgian* Oláh 1988, *A. halong* Oláh 1988, *A. lalus* Malicky & Chantaramongkol 1992, *A. phorkys* Malicky & Nuntakwang 2006 (in Malicky et al. 2006), *A. quordus* Malicky & Chantaramongkol 1992, *A. seheliel* Malicky 2012, *A. vercondarius* Malicky & Chantaramongkol 1992, *A. viricatus* Malicky & Chantaramongkol 1992, and *A. voccus* Malicky & Chantaramongkol 1992.

Most of the *Agapetus* spp. in Thailand were described from northern Thailand, with only one species (*A. cenomarus*) described from northeastern Thailand. The genus *Agapetus* has not been reported previously from southern Thailand (Prommi 2007, Laudee & Malicky 2014).

This article describes a new species of *Agapetus* from southern Thailand, bringing the total number of known species of the genus in Thailand to 16. The distributions of *Agapetus* species in Thailand are discussed and mapped.

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Materials and Methods

The collecting site is in Kaeng Krung National Park which is in the Phuket Range, part of the Tenasserim Ranges. The forest type is tropical evergreen forest subtype moist evergreen forest. The study site is a first-order stream with substrate dominated by cobble and sand.

Caddisfly specimens were collected with a UV pan light trap (12 V, 10 W) set beside the stream overnight at the location and the time indicated below. Samples were preserved in 70% ethanol, then manually sorted from other insects. Male genitalia of the new species were excised and muscle tissue was macerated by heating in 10% KOH at 60°C for 30 minutes. Pencil templates of the male genitalia of the new species were drawn using a compound microscope equipped with a drawing tube, then final vector-graphics were prepared from the templates with Adobe Illustrator© software.

The holotype is stored in 70% ethanol and deposited in the Princess Maha Chakri Sirindhorn Natural History Museum, Prince of Songkla University, Hat Yai Campus, Hat Yai District, Songkhla Province, Thailand (PSUNHM). Terminology for genitalic structures follows that of Etnier et al. (2010). Data for *Agapetus* spp. from Thailand were compiled from publications referenced above and the Trichoptera collections of Dr. Pongsak Laudee and Prof. Dr. Hans Malicky. The distributions of Agapetus spp. were plotted on a map of Thailand.

Taxonomy

Glossosomatidae

Agapetus **Curtis 1834 [Type species** *Agapetus fuscipes* **Curtis 1834, by subsequent designation of Westwood (1840)].**

***Agapetus kaengkrungensis* n. sp.**
Figs 1A–1D

Diagnosis. The male genitalia of the new species are similar to those of *A*. *abbreviatus* Ulmer 1931 found in Java, Indonesia, but can be distinguished from them by characters of segment IX and the inferior appendages. In *A*. *abbreviatus*, the posterodorsal end of segment IX is truncate in lateral view, but it is slightly downcurved and acute apically in the new species. The inferior appendages of *A*. *abbreviatus* are oval in lateral view, but those of the new species are long and rectangular, each with a short, apically rounded process apicoventrally. In ventral view, each inferior appendage of the new species has a pointed spine ventromedially and two stout spines apically, but has no spine ventromedially and is pointed apically in *A*. *abbreviatus*.

Description. Length of each male forewing 3.0 mm. Specimens in alcohol with head, thorax, abdomen, legs, and forewings dark brown.

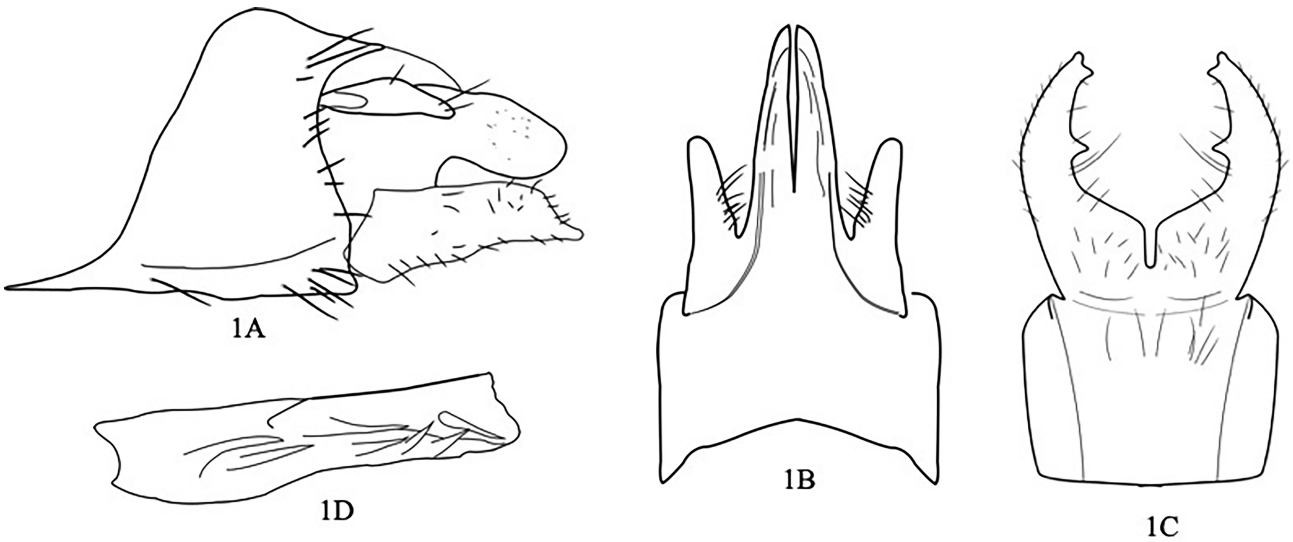

FIGURE 1. Male genitalia of *Agapetus kaengkrungensis* n. sp. 1A, left lateral. 1B, dorsal. 1C, ventral. 1D, phallus, left lateral.

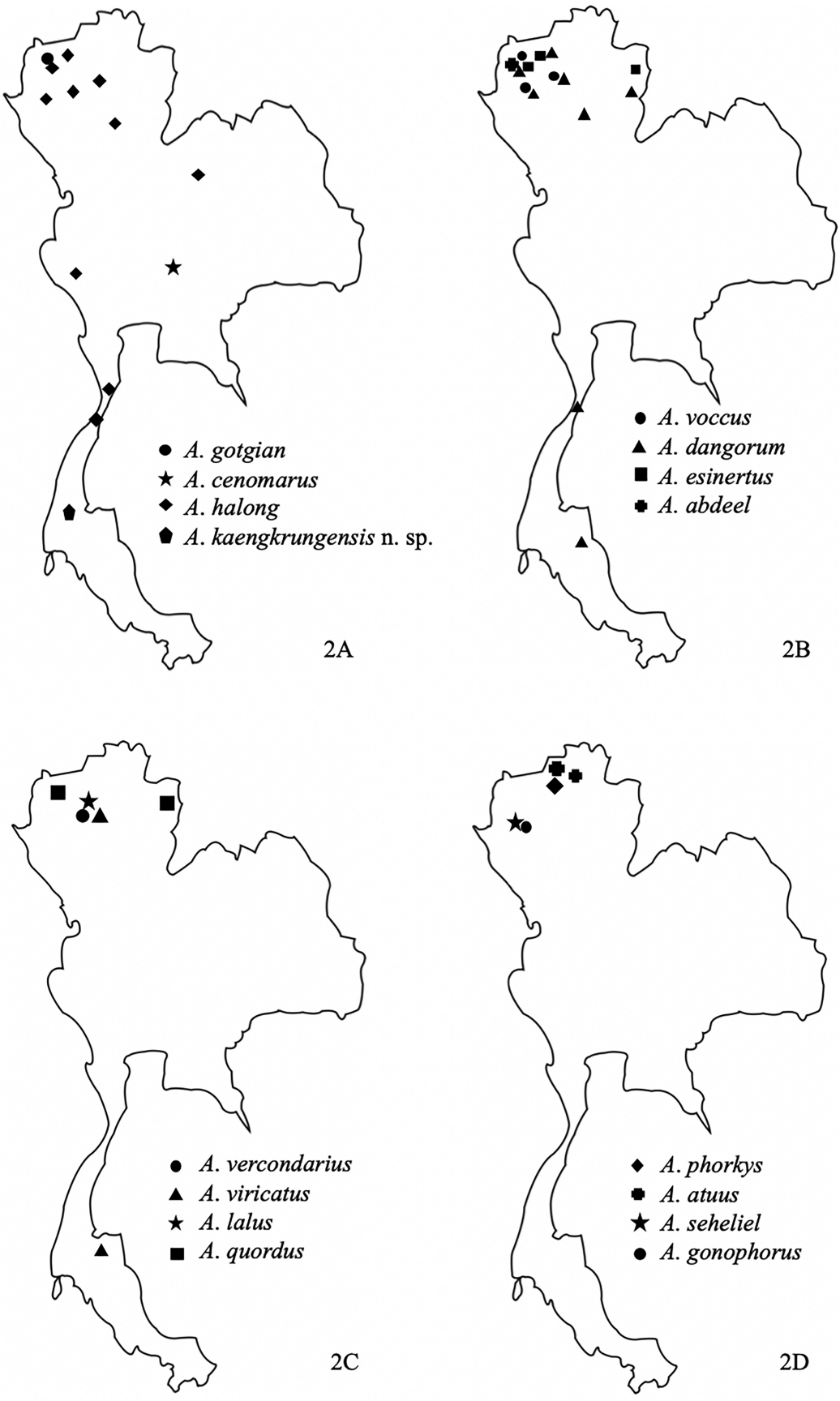

FIGURE 2. Distribution map of *Agapetus* spp. in Thailand. (Data on the map are from the references and the collections of Dr. Pongsak Laudee and Prof. Dr. Hans Malicky)

Male genitalia (Figs. 1A–1D). Segment IX in lateral view subrectangular with very long process anteroventrally and long process posterodorsally (Fig. 1A); in dorsal view, quadrate with broad and shallow concavity anteriorly (Fig. 1B); nearly square in ventral view (Fig. 1C). Preanal appendages long, finger-like, rounded apically in lateral view (Fig. 1A); in dorsal view, finger-like with tuft of setae dorsolaterally, rounded apically (Fig. 1B). Segment X in lateral view, subrectangular basally, large and bulbous subapically (Fig. 1A); in dorsal view, long, subtriangular with narrow mesal incision 3/4 of its length (Fig. 1B). Inferior appendages in lateral view, long, subrectangular, entirely setose, each with short, apically rounded process apicoventrally (Fig. 1A); in ventral view, claw-like with pointed projection ventromesally and two stout and acute projections apically (Fig. 1C). Phallus long, regular, blunt apically with seven sclerotized spines on the retracted subphallic membranes. (Fig. 1D).

Type material. Holotype male (PSUNHM). Thailand: Surat Thani Province, Kaeng Krung National Park, Khlong Yan River, 9°19'13"N, 103°49'54"E, ca. 59 m a.s.l., 28.ix.2019, leg. Solomon Boga Valdon.

Etymology. The species is named for the type locality, Kaeng Krung National Park.

Distribution of *Agapetus* spp. in Thailand

Sixteen species of *Agapetus* including the new species are now recorded from Thailand (Figs 2A–2D). Most of our country's *Agapetus* spp. have been reported from northern Thailand. *Agapetus halong* is a widespread species which is found from northern Thailand through western Thailand, northeastern Thailand, and the Thai Peninsula, and this species is recorded also from Vietnam, which is in the same Indochinese sub-region of the Oriental Region (Armitage et al. 2005; Malicky 2010). *Agapetus dangorum* is also a widespread species which is found from northern Thailand through the Thai Peninsula and also has been recorded from Vietnam (Armitage et al. 2005; Malicky 2010). However, this species has not been recorded from the Malay Peninsula (Malicky 2010). *Agapetus gotgian* and *A. gonophorus* also inhabit both northern Thailand and Vietnam (Malicky 2010; Armitage et al. 2005). Recently a collection of caddisflies from hill evergreen forest in Tai Rom Yen National Park demonstrated that *A. viricatus*, previously known only from northern Thailand, was found in southern Thailand where the elevation is 900–1200 m a.s.l. Nine species of *Agapetus* spp. are endemic, having been reported from only northern Thailand (Indochinese sub-region), including *A. abdeel*, *A. atuus*, *A. esinertus*, *A. lalus*, *A. phorkys*, *A. quordus*, *A. seheliel*, *A. vercondarius*, and *A. voccus*. Insofar as we know, the new species *A. kaengkrungensis* is endemic to southern Thailand which is in the Sundaic sub-region of the Oriental Region.

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