

Short Communication

NEW RECORDS OF AEMODOGRYLLINAE (ORTHOPTERA: RHAPHIDOPHORIDAE) FROM CAVES OF LAOS WITH DESCRIPTION OF *Eutachycines cassani* Chopard MALE

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Abstract

New samples of Aemodogryllinae collected in cave habitats from Laos are reported with the description of the unknown male of *Eutachycines cassani* (Chopard, 1954). The distribution of Aemodogryllinae in Laos includes, at present, *E. cassani* in the Central Laos, two species of the genus *Paradiestrammena*, *P. vitalisi* (Chopard, 1919) in the Northern part of the country; *P. vernalis* (Gorochov, 1998) in the Central Laos, and one representative of the genus *Diestrammena* (Brunner and Wattenwyl, 1888) from caves of Northern Laos close to the border with the Vietnam.

Keywords: *Eutachycines*, Aemodogryllinae, Cave crickets, Laos, Rhaphidophoridae

Geotags: Laos, [N17°37'449” – E 105°08'809” | N 17°26'670” – E 104°56'900” | N 20°42'032” – E 102°41'602”]

INTRODUCTION

Four of the seven living subfamilies of Rhaphidophoridae (Aemodogryllinae, Rhaphidophorinae, Troglophilinae, and Tropidischinae) are widespread in Asia (Di Russo and Rampini, 2005; Eades *et al.*, 2012). Two of these (Troglophilinae and Tropidischinae) occur in the Japanese archipelago with a few species, with only one of them showing cavernicolous habits. The remaining two subfamilies are present in epigeal and subterranean habitats of the Far East with several genera and species. Aemodogryllinae was established by Jacobson to include the genus *Aemodogryllus* Adelung, which is now considered a synonym of the genus *Diestrammena* (Brunner and Wattenwyl, 1888). For a long time this subfamily was included in Rhaphidophorinae, from which it differs in the shape of the fastigium

vertices, the metatarsi and the genitalia (Storozhenko, 1990).

The subfamily Aemodogryllinae includes at present 12 genera and about 165 species whose distribution goes from northern India (Assam) to Korea, Japan, and Siberia (Vladivostok) to the North, and from the Indochinese region to Indonesia and Philippines to the South. In particular only two species of Aemodogryllinae were listed for the Laos territories: *Eutachycines cassani* (Chopard, 1954) and *Paradiestrammena vitalisi* (Chopard, 1919).

In this note we report the identification of new samples of Aemodogryllinae collected in caves of Laos, with the description of the male of *Eutachycines cassani*, unknown until now.

METHODS

All the specimens studied here were collected and preserved in alcohol 90% by Helmut Steiner during his speleological visit in Laos in

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2003. The specimens were studied using a stereomicroscope Leica MZ 12.5. All the measurement of dimensions are in millimeter. Photos were taken with a digital camera, Nikon

Coolpix 5000. Pictures and the distribution map were processed using a digitiser board WACOM CTH 461 and Adobe Photoshop CS3 Extended Version 10.0.

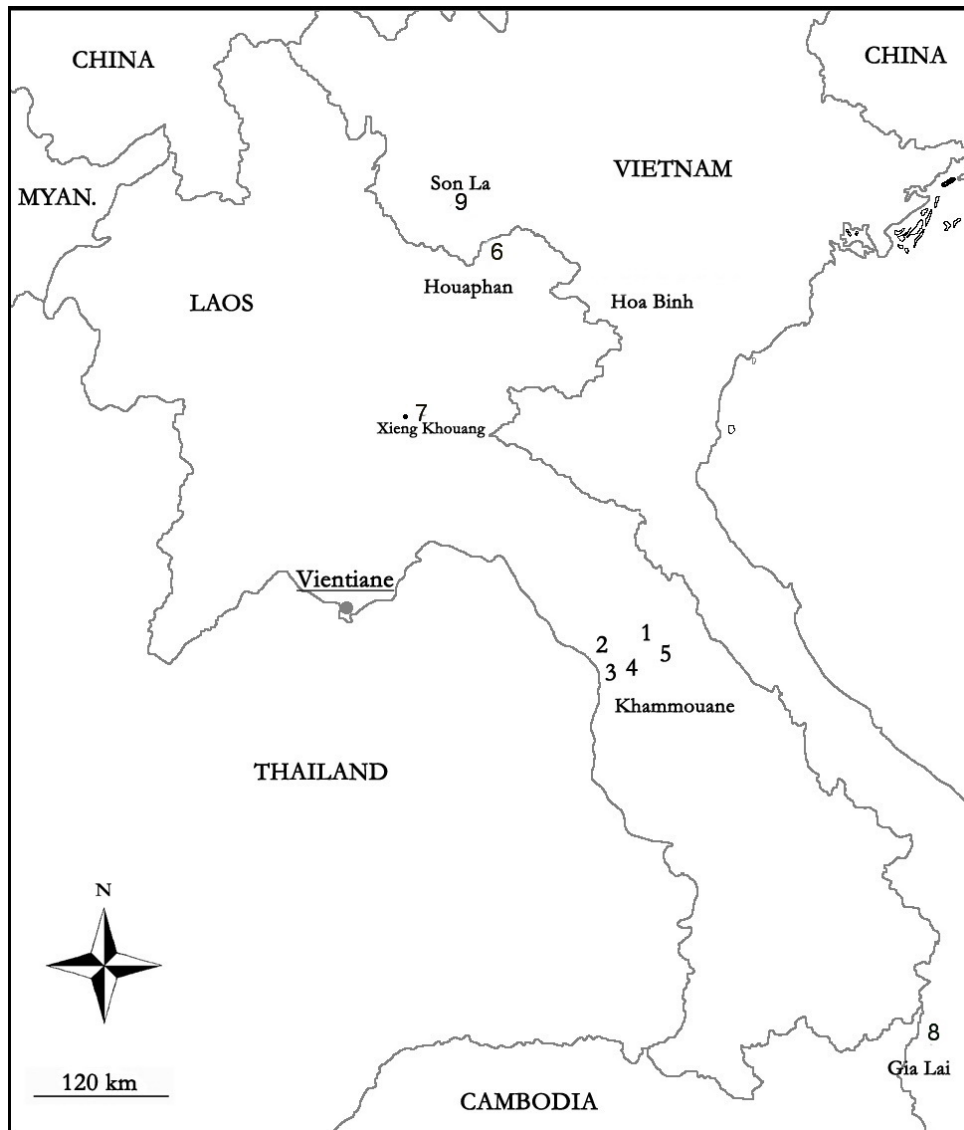


Figure 01. Distribution of cave species of Aemodogryllinae in Laos. 1, 2 – *Eutachycines cassani*; 1, 3, 4, 5 – *Paradiestrammena vernalis*; 6 – *Diestrammena* sp.; 7 – *Diestrammena vitalisi*; 8 – *Paradiestrammena vernalis* (Vietnam, Gia Lai province); 9 – *Diestrammena sonlaensis* (Vietnam, Son La province).

RESULTS

(1) *Eutachycines cassani* n. comb. (Chopard, 1954)

Eutachycines Storozhenko, 1990 – Type species: *Diestrammena feai* Chopard, 1915, by original designation. This species was described in 1954 by

Chopard as *Diestrammena*, on the basis of only one female specimen collected in the Marie Cassan cave by Cassan in 1948.

Material examined – Laos, Gnommalat, Khammouane, Grotte Marie Cassan, N17°37'449" – E 105°08'809", 24.02.2003, H. Steiner leg. - 1 M; Tham Nha Kay Khia, N17°32'951" – E 104°48'764", 01.03.2003, H. Steiner leg. - 2 nymphs.

Description of male. Size relatively big, coloration uniformly yellowish. Head without rostral tubercles and eyes. Tergites of thorax as in Figure 02.a. All femora unarmed; fore tibia with 4 ventral spines and 1 condicular short spine; middle tibia with 2 ventral spines and 2 condicular long spines; hind tibia with 30-31 dorsal spines. Hind tarsi with first article showing an apical spine.

Abdomen with medial projections. Tenth tergite transverse with two brief lateral lobes separated by a large concavity (Figure 02.b). Genital plate trapezoidal with posterior edge slightly concave and medially globular (Figure 02.c).

Genitalia in dorsal view with median lobe elongated of conical shape. It shows that lateral sclerites are well developed (Figure 02.d). In ventral view, a sclerotized plate horseshoe-shaped is present at the bottom of the median lobe; the plate shows two lateral triangular processes with diverging apexes (Figure 02.e). Lateral view as in Figure 02.f. Measures (mm): Body length: 15.5, Pronotum: 5.0, fore femur: 14.5, fore tibia: 17.0, middle femur: 14.0, middle tibia: 17.5, hind femur: 24.0, hind tibia: 29.0, hind tarsus 11.0, 1°art.: 5.5, cerci: 10.

(2) *Paradiestrammena vernalis* Gorochov, 1998. This species was described in 1954 by Chopard as *Diestrammena*, on the basis of only one female specimen collected in the Marie Cassan cave by Cassan in 1948.

Material examined – Laos, Gnommalat, Khammouane, Grotte Marie Cassan, *Paradiestrammena* Chopard, 1919 – Type species: *Diestrammena gravelyi* (Chopard, 1916), by original designation.

This species (Figure 02.g) described by Gorochov in 1998, was initially considered to be limited to some forested areas of Central Vietnam (Gia Lai Province). Examination of leg spinulation and shape of genital apparatus (Figure 02.h), allowed us to attribute our samples to this species.

Material examined – Laos: Thakhek, Khammouane, Tham En, N 17°26'670" – E 104°56'900", 28.02.2003, H. Steiner leg. - 1 M; Ban Tham, Khammouane, cave unnamed at Ban Tham, N 17°25'993" - E104°51'834", 27.02.2003, H. Steiner leg. - 2 M, 1F; Gnommalat, Khammouane, Grotte Marie Cassan, N 17°37'449" – E 105°08'809", 24.02.2003, H. Steiner leg. - 1M; Gnommalat, Khammouane, Tham Kamuk, N 17°37'907" – E 105°07'461", 19.02.2003, H. Steiner leg. - 4 Nymphs.

(3) *Diestrammena* sp.

Diestrammena Brunner and Wattenwyl, (1888)

Type species: *Locusta (Rhopidophora) marmorata* De Haan, 1842 = *Diestrammena japonica* Blatchley, 1920 by original designation.

After examination of some external characters such as spinulation of leg and genital apparatus we can attribute the following samples to the genus *Diestrammena*. However the lacking of both adult male and female in the samples did not allow us to make an exact taxonomic identification.

Material examined – Laos, Muong Ngoi, Tham Kang, N 20°42'032" – E 102°41'602" 14.03.2003, H. Steiner leg., - 2 nymphs; Tham Pha Keaw, N 20°42'026" – E 102°41'772", 14.03.2003, H. Steiner leg., - 2 nymphs.

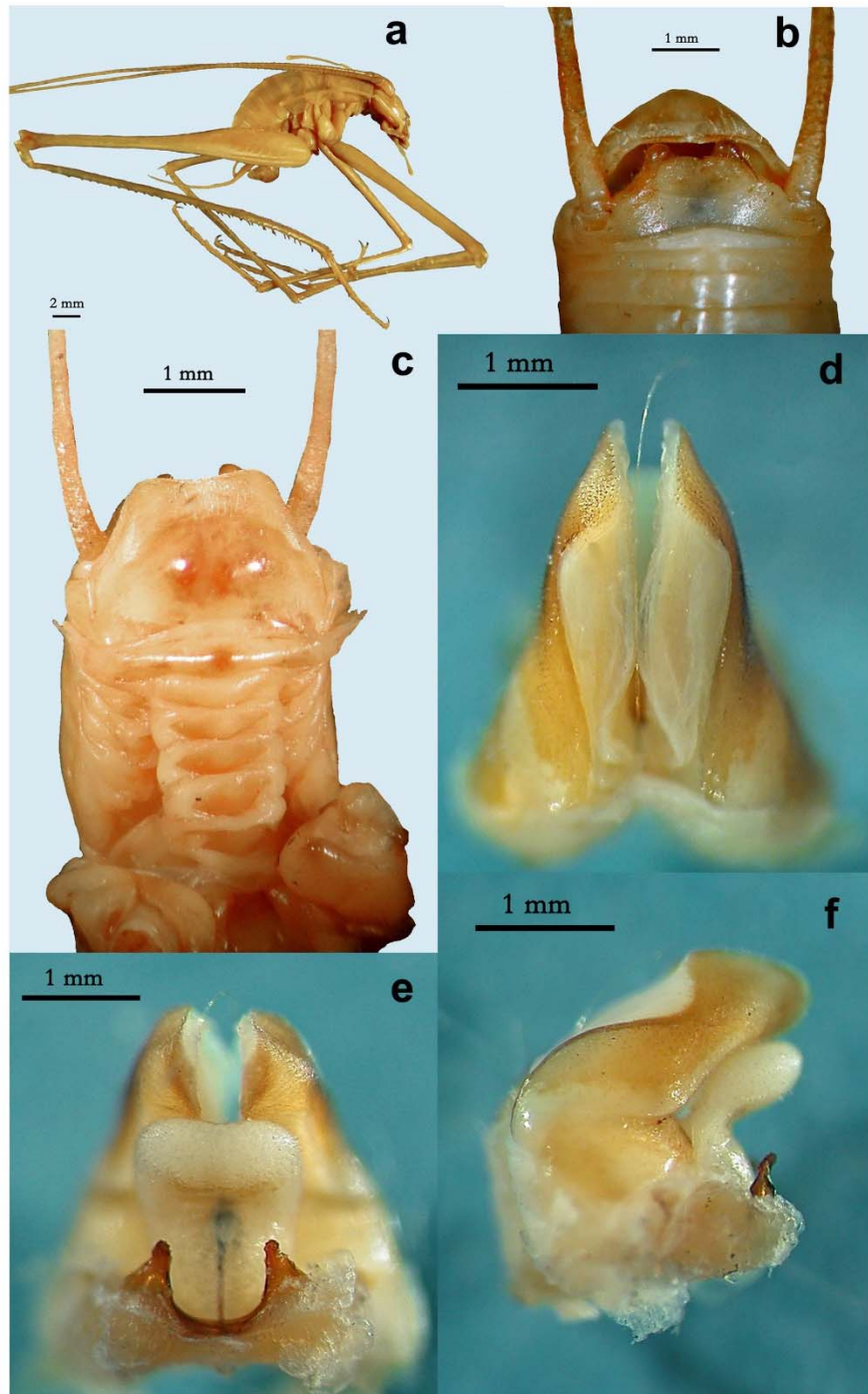


Figure 02. (a–f). *Eutachycines cassani*: (a)–Male habitus; (b) – X tergite, dorsal view; (c) – subgenital plate and sternites, ventral view; (d) – genitalia, dorsal view; (e) – genitalia, ventral view; (f)–genitalia, lateral view.

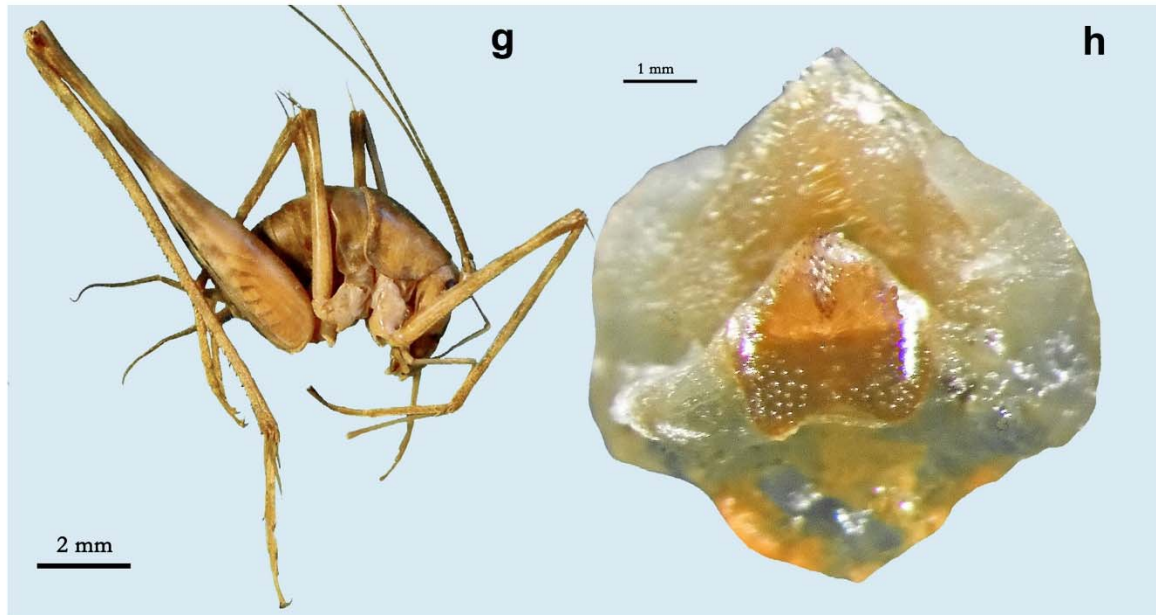


Figure 02. (g–h). *Paradiestrammena vernalis*: g – Male habitus; h – genitalia, dorsal view.

DISCUSSION

In this note on the Aemodogryllinae from caves of Laos, we can confirm the presence of *Eutachycines cassani* in the Marie Cassan cave reporting also the description of the unknown male of this species. The lack of eyes as well as the pale coloration of the body and the relative elongation of all the appendages account for a developed troglomorphy of this species, as found in the congeneric species *E. caecus* from caves of Assam (Chopard, 1924) and in *Diestrammena ominocaeca* (Gorochov et al., 2006) recently described from China.

Presently, the distribution of Aemodogryllinae in Laos includes: *E. cassani* in the Central Laos, two species of the genus *Paradiestrammena*, *P. vitalisi*

(Chopard, 1919) in the Northern part of the country, *P. vernalis* in the Central Laos, and one representative of the genus *Diestrammena* from caves of the Northern Laos close to the border with the Vietnam (Figure 01).

As previously outlined, *P. vernalis* is a forest species endemic of the Central Vietnam (Gia Lai province). The records reported here from Central Laos could indicate a strong dispersal capability of this species. It is relevant to notice the coexistence of *P. vernalis* with *E. cassani* in the same cave (Marie Cassan cave), which suggests a different exploitation of the cave habitat by these two species. While *E. cassani*, showing apparent troglomorphic features, is a clear cave-adapted species, the morphology of *P. vernalis* suggests an epigeal life style. Caves probably represent only a

daily or seasonal shelter for this species. A similar situation was reported by Chopard (1924) for the Lakandong cave in Assam, where *Eutachycines caecus* lives together with the less cave adapted species *E. brevifrons frieli* (Chopard, 1924). Furthermore other similar cases of syntopic occurrence in caves have been recorded in Europe in species pairs of the genera *Dolichopoda* and *Troglophilus* (Bernardini *et al.*, 1997; Taylan *et al.*, 2011). In these cases the cave-adapted species of *Dolichopoda* accomplish their life cycle inside the cave habitat almost entirely depending on its resources (De Pasquale *et al.*, 1995). On the other hand, *Troglophilus* species are known to use caves as a winter shelter, while they complete their life cycle in epigeal habitats, where reproduction also occurs (Pehani *et al.*, 1997; Di Russo *et al.*, 2008). Regarding the two samples of *Diestrammena* here reported, the lack of adult specimens did not allow us to identify them at the species level. However, the shape of the genital apparatus seems enough to place these samples close to *Diestrammena sonlaensis* (Gorochov, 1990), an endemic cave species of the Northern Vietnam (Son La province), close to Laos border (Figure 01).

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