

## A New Species of the Genus *Dryopomorphus* HINTON (Coleoptera, Elmidae, Larainae) from Laos

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**Abstract** A new species of the genus *Dryopomorphus*, *D. laosensis* sp. nov., is described from Laos. This species is similar to the Japanese species *D. extraneus* HINTON, and differs from it in the short median lobe and parameres. The function of the cavities on sternite III is discussed. All the species of this genus are listed with Zoobank LSID in the appendix.

### Introduction

The genus *Dryopomorphus* HINTON, 1936 is represented by 13 species from Japan, Malaysia, and Thailand (see appendix). No species of the genus has been recorded from the Indochina region.

In the present paper, we describe a new species of the genus from northern Laos. The function of the cavities on sternite III, which is thought to be a synapomorphy of the genus, is discussed based on SEM observation. In addition, all the species of this genus are listed with Zoobank LSID in the appendix.

### Materials and Methods

General observation and dissection were made under a stereoscopic microscope (Leica MZ95). Microstructures were observed, under a microscope (Olympus BH-2), of the dissected part mounted on hollow slides with pure glycerine. After observation, the dissected parts were mounted on slides with Canada Balsam. Some structures were observed with an SEM (Hitachi S-225) after coating with gold.

Morphological abbreviations used in measurement are as follows: PL—length of pronotum; PW—width of pronotum; EL—length of elytra; EW—width of elytra; TL = PL + EL. The average is given in parentheses after the range.

The holotype and some paratypes designated in this paper will be preserved in the Ehime University Museum, Matsuyama (EUMJ), and other paratypes in the Naturhistorisches Museum, Wien (NMW) and National Museum of Natural Science, Taiwan.

Technical terms of the genitalia follow KODADA and JÄCH (2005).

### Taxonomy

#### *Dryopomorphus laosensis* sp. nov.

(Figs. 1–4)

*Type series.* Holotype, male (EUMJ), “Phou Pan, 1750 m Xam neua, Laos 16~21-VI-2003 M. Sato leg.”. Paratypes, 5 males & 1 female (EUMJ, NMW), same data as for the holotype; 5 males (EUMJ, NMW), “WaterFall, 5 km W of BanSaleui 1350 m XamNaua, Laos 5-V-2002, M. Sato”; 1 female (EUMJ), “28 km W of Saleui XamNeua, Laos 23-VI-2003 M. Sato leg.”; 3 males (National Museum of Natural Science, Taiwan), “Laos: Xamneua State a creek near Saleui & Ph. Pan, alt. 1453 m, 20°13'07.1"N 103°59'58.9"E 20~23-V-2004. ML Jeng leg.”

*Description.* Male (Fig. 1). Body elongate, slightly convex dorsally; dorsal surface densely covered with short adpressed yellowish setae and longer suberect black setae. Coloration of body blackish brown, but antennae, anterior corners of pronotum and legs reddish brown.

Head slightly convex dorsally. Eyes large, semicircular; the distance between eyes about 2.4 times as long as eye's diameter. Antennae (Fig. 3A) short; approximate ratio of each antennomeres ( $n=1$ ) as 16.7 : 7.7 : 2.0 : 1.3 : 2.0 : 1.3 : 1.0 : 2.0 : 2.0 : 2.0 : 2.7. Maxillary palpi (Fig. 4A) cylindrical, truncate at apices. Labial palpi (Fig. 4B) short, shallowly concave in apical margin. Pronotum trapezoidal, straight in lateral margin; anterior corners projecting anteriorly, depressed dorsally; median sulcus reaching about basal 1/2 of PL; sublateral sulci reaching about basal 1/3; disc gently convex

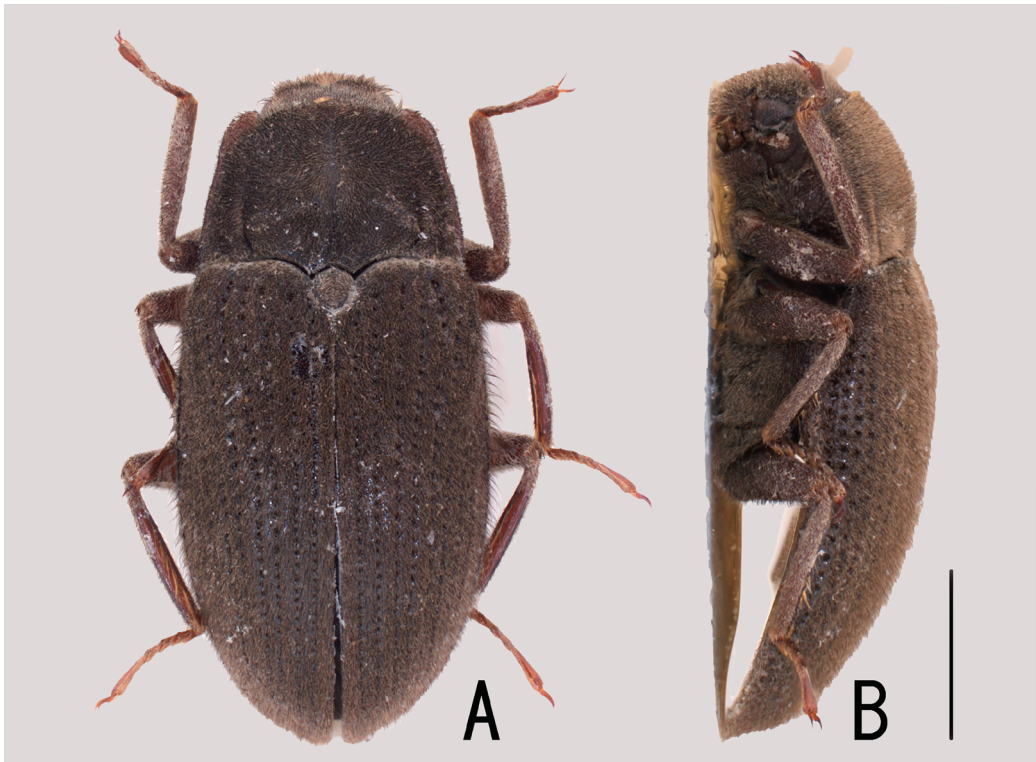


Fig. 1. Holotype of *Dryopomorphus laosensis* sp. nov. in dorsal (A) and lateral (B) views. Scale=1.0 mm.

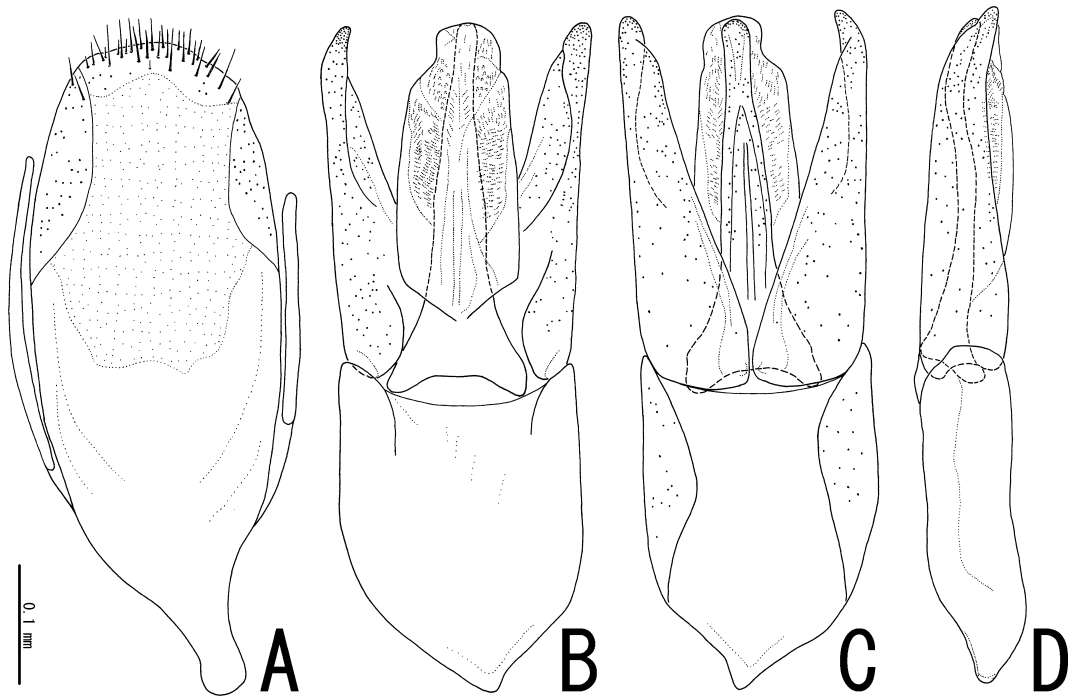


Fig. 2. Male genitalia of *Dryopomorphus laosensis* sp. nov. — A, Sternite IX; B–D, aedeagus in ventral (B), dorsal (C), and lateral (D) views.

dorsally; PW/PL 1.41–1.55 (1.46). Scutellum semicircular. Elytra oblong, subparallel-sided near base to apical 1/3; disc gently convex dorsally, with ten striae in each elytron; intervals flat; humeri feebly projecting; EL/EW 1.53–1.62 (1.56); EL/PL 2.55–3.00 (2.70); EW/PW 1.14–1.23 (1.18); TL/EW 2.11–2.18 (2.14).

Sternite IX (Fig. 2A) moderately sclerotized, oval, bearing short setae in apical part. Aedeagus (Fig. 2B–D) about 0.6 mm; phallosome slightly asymmetrical, wide, gently tapered basally, about 0.94 times as long as parameres; parameres symmetrical, evenly tapered posteriorly, rather pointed at apices; median lobe a little longer than parameres, slender, evenly tapered apically, rounded at apex; endophallus membranous, cylindrical, closely covered with minute furrows.

**F e m a l e.** Sexual dimorphism indistinct in external feature; PW/PL 1.42; EL/EW 1.51; EL/PL 2.58; EW/PW 1.21; TL/EW 2.10. Sternite VIII (Fig. 3B) well sclerotized, trapezoidal, with a long and stout median strut. Ovipositor (Fig. 3C) relatively short; stylus oblong, relatively small; apical parts of coxite long and slender; approximate ratio of stylus, coxite and valvifer ( $n=1$ ) as 1.0 : 10.0 : 14.7.

**Measurements.** Male ( $n=9$ ): TL 3.90–4.15 (4.02) mm; PW 1.55–1.68 (1.59) mm; PL 1.00–1.10 (1.09) mm; EL 2.80–3.05 (2.93) mm; EW 1.80–1.95 (1.87) mm. Female ( $n=1$ ): TL 4.30 mm; PW 1.70 mm; PL 1.20 mm; EL 3.10 mm; EW 2.05 mm.

**Remarks.** Judging from the characteristics of male genitalia (symmetrical and slender parameres) and the setae of the dorsal surface (densely covered with longer suberected setae), this species seems to be more related to Japanese species than to Malaysian and Thailand species. In particular, this species is similar to *Dryopomorphus extraneus* HINTON in body size and similar shape of body outline and male genitalia, but differs from it in the following characteristics: phallosome long, about

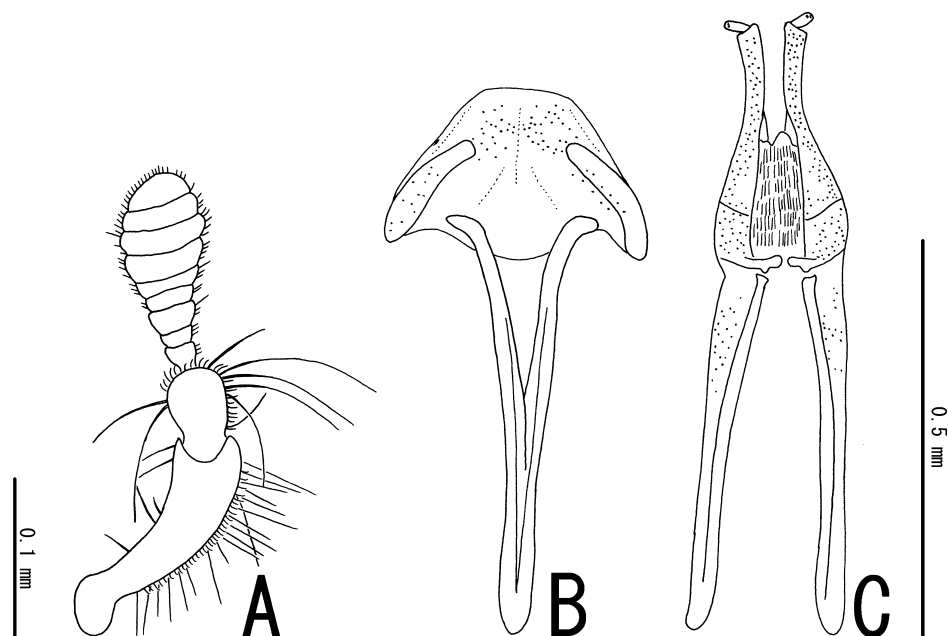


Fig. 3. Male antenna (A) and female genitalia (B, C) of *Dryopomorphus laosensis* sp. nov. — B, Sternite VIII; C, ovipositor.

0.9 times the length of parameres (short in *extraneus*, about 0.7 times the length of parameres); median lobe short and slender with rounded apex (long and robust with pointed apex in *extraneus*); sternite IX oval (elongate in *extraneus*).

### Discussion

The cavities on abdominal sternite III in both sexes are exclusively present in all *Dryopomorphus* species, and were thought to be synapomorphic to the genus (SPANGLER, 1985). None of the other members of Elmidae or even of Dascilloidea has been reported possessing such peculiar cavities (GREBENNIKOV & LESCHEN, 2010). The function of the structure, however, was not clearly understood. HINTON (1971) suspected they were the openings of some as yet confirmed defensive glands or pheromonal organs, whereas CROWSON (1981) inferred that the specialized cavities may function as mycangia, an adaptation for a symbiotic relationship with algae.

We observed the cavities on sternite III of *Dryopomorphus extraneus* HINTON and *D. laosensis* sp. nov. in detail by SEM. It appears that the cavities are not likely to be mycangia, as evidenced by the total absence of any fungal spores in the cavities. In addition, the openings of the cavities are covered with long and irregularly arranged setae which hide the entrance (Fig. 4C, E) and thus obstruct any spores getting in and out of the cavities.

The occurrence of mycangia has been documented in many beetle lineages, but most of the cases, except those in Curculionidae and Attelabidae, were not supported by solid evidence but only on inference based on the fungus-feeding habits (GREBENNIKOV & LESCHEN, 2010). Exoskeletal pits with uncertain function, termed “pseudomycangia” by these authors, were rarely reported in water beetles, with two exceptions of hydraenid *Nucleotops* in South Africa and elmid *Dryopomorphus* in East and

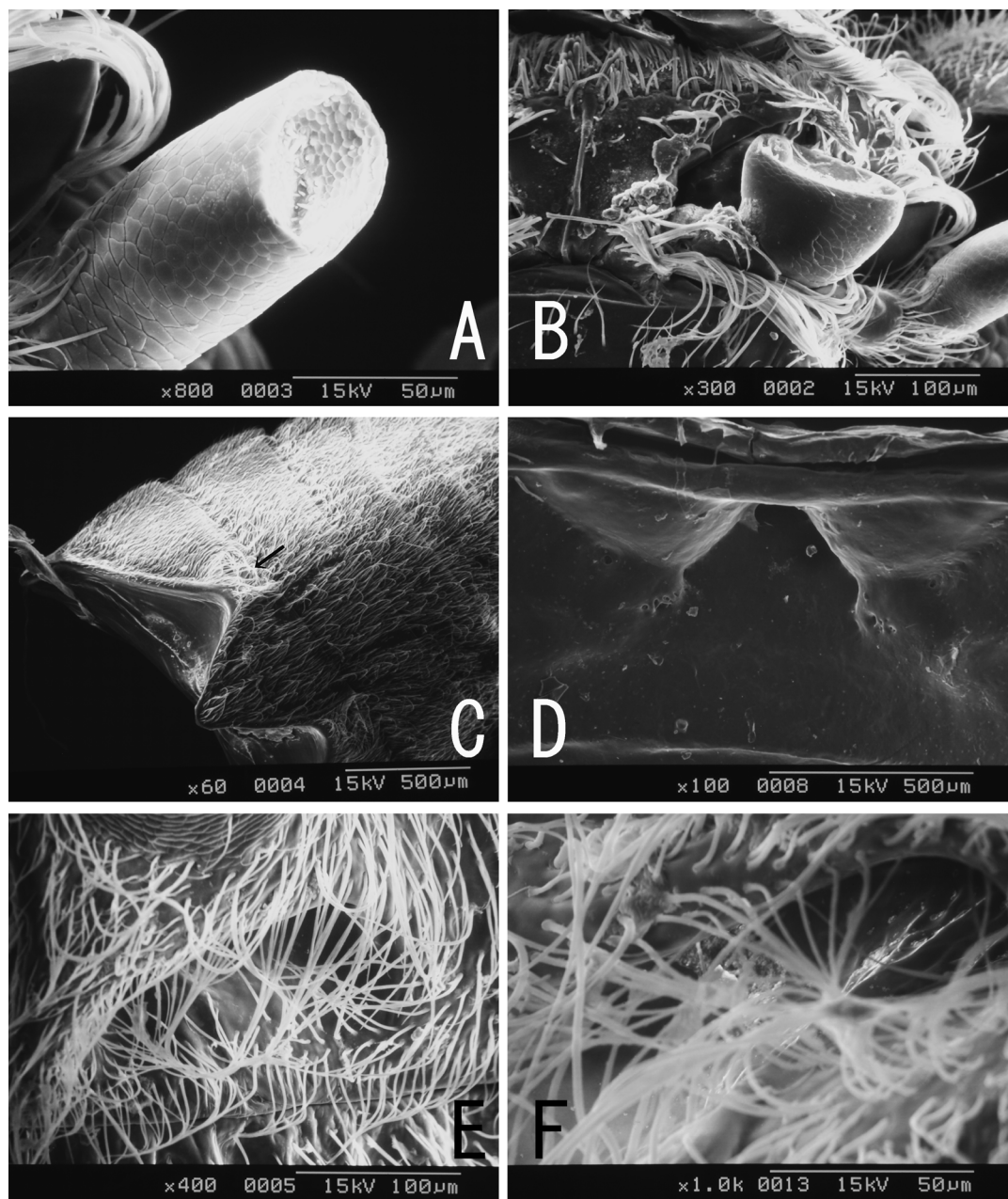


Fig. 4. *Dryopomorphus laosensis* sp. nov. — A, Apex of maxillary palpus; B, labial palpus; C, abdominal ventrites, arrow indicates the cavity on sternite III; D, inner surface of sternite III; E, opening of cavity on sternite III; F, interior part of cavity on sternite III.

Southeast Asia. The latter mainly dwell in submerged accumulations of plant debris or mud with roots along the stream bank, or on submerged wood in shaded forest streams (YOSHITOMI & SATÔ, 2005; ČIAMPOR *et al.*, 2012). Whether they are mycophagous, xylophagous or algophagous is not clear. Ac-

cordingly, it is premature to conclude *Dryopomorphus* is a fungus-feeder and then further infer the pits on their abdominal ventrites are mycangia. Though our study primarily ruled out the mycangial function of the cavities, the true function remains unanswered and requires future investigation.

### Acknowledgements

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### 要 約

吉富博之・M.-L. JENG：ラオス産ハバビロドロムシ属（コウチュウ目ヒメドロムシ科）の1新種。—— アジアから13種が知られていたハバビロドロムシ属 *Dryopomorphus* HINTON の1新種をラオスから記載した。また、本属が有する第3腹節の特有な凹みについて観察し、その機能について考察した。

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### Appendix: Species List of the Genus *Dryopomorphus* with ZooBank LSID

*Dryopomorphus* HINTON, 1936

urn:lsid:zoobank.org:act:DA3C08C4-E8D2-4405-B36E-EB9678521A10

*Dryopomorphus amami* YOSHITOMI et M. SATÔ, 2005

urn:lsid:zoobank.org:act:9E49928B-E646-478F-98DE-A6577EB4BEA7

*Dryopomorphus bishopi* HINTON, 1971

urn:lsid:zoobank.org:act:29997022-C27B-4065-B2F0-AE116AB32708

*Dryopomorphus extraneus* HINTON, 1936

urn:lsid:zoobank.org:act:C139EB91-9E2B-439E-BB1E-B2456FBEA204

*Dryopomorphus grandis* ČIAMPOR, ČIAMPOROVÁ-ZAŤOVIČOVÁ et KODADA, 2012

urn:lsid:zoobank.org:act:10E85D6F-3FA2-475A-BC7C-4D001230A1E9

- Dryopomorphus hendrichi* ČIAMPOR et KODADA, 2006  
urn:lsid:zoobank.org:act:84BF1422-F97C-4772-B7E9-06130B64C7AD
- Dryopomorphus jaechi* ČIAMPOR, ČIAMPOROVÁ-ZAŤOVIČOVÁ et KODADA, 2012  
urn:lsid:zoobank.org:act:A55CF4BA-38E3-45A7-A3E5-80190914CFD6
- Dryopomorphus laosensis* sp. nov.  
urn:lsid:zoobank.org:act:D11B3540-8845-429C-BA66-22D8AA86F413
- Dryopomorphus memei* ČIAMPOR, ČIAMPOROVÁ-ZAŤOVIČOVÁ et KODADA, 2012  
urn:lsid:zoobank.org:act:420BA3D7-46CC-4ADF-BD97-551F75535A58
- Dryopomorphus nakanei* NOMURA, 1958  
urn:lsid:zoobank.org:act:6F6BB4BE-E538-45C9-8070-6C072F374C4E
- Dryopomorphus pekariki* ČIAMPOR, ČIAMPOROVÁ-ZAŤOVIČOVÁ et KODADA, 2012  
urn:lsid:zoobank.org:act:62177612-1434-4EED-9DFF-1F9BA31779E6
- Dryopomorphus sarawacensis* ČIAMPOR, ČIAMPOROVÁ-ZAŤOVIČOVÁ et KODADA, 2012  
urn:lsid:zoobank.org:act:58DF38DF-997B-4F76-BFB0-9672A61ABC34
- Dryopomorphus satoi* SPANGLER, 1985  
urn:lsid:zoobank.org:act:67BD8722-1325-45FC-8F62-B76586CF3543
- Dryopomorphus siamensis* KODADA, 1993  
urn:lsid:zoobank.org:act:BC213C1C-3F1E-4984-9E9C-25413EE8CA01
- Dryopomorphus yaku* YOSHITOMI et M. SATÔ, 2005  
urn:lsid:zoobank.org:act:1818B24D-05A3-424C-A8DA-E079FDD29E74

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