



## RHOPALOPSOLE ALOBATA (PLECOPTERA: LEUCTRIDAE), A NEW STONEFLY SPECIES FROM VIETNAM

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### ABSTRACT

*Rhopalopsale alobata* sp. nov., is described from a single male collected in Vinh Phu Province, Vietnam. The new species differs from all known *Rhopalopsale* species by the absence of a vesicle on abdominal sternum 9. An additional single male from Lao Cai Province, Vietnam is tentatively identified as *Rhopalopsale sinensis* Yang & Yang. These two species are the first representatives of family Leuctridae to be recorded from Vietnam.

**Keywords:** Plecoptera, Leuctridae, *Rhopalopsale*, new species, Vietnam

### INTRODUCTION

Klapálek (1912) proposed genus *Rhopalopsale* for a new Taiwanese species, *R. dentata*. Illies (1966) includes 13 species in the genus but 18 more have subsequently been described (Kawai 1967, 1968, 1969; Harper 1977; Zwick 1977; Yang & Yang 1991a, 1991b, 1993, 1994, 1995a, 1995b; Yang et al. 2004; Yang & Li 2006), and a few have been transferred to other genera (Zwick 1977; Shimizu 2000), leaving a current list of 28 species (Appx. 1). The genus has been reported from the Philippine Islands, Ryukyu Islands, Taiwan and Japan and from mainland Asia in China (Fujian, Guangdong, Guizhou, Hubei, Shaanxi, Zhejiang), Bhutan and Nepal. No current records are known from the Southeast Asian peninsula.

In this study we report the discovery of a previously unrecognized *Rhopalopsale* species collected in Vietnam; this species differs from all known *Rhopalopsale* species in lacking a vesicle on male sternum 9. We also report an additional male specimen, from another locality in Vietnam, which we tentatively identify as *R. sinensis* Yang & Yang. Specimens used in this study are deposited in the Royal Ontario Museum, Toronto (ROM).

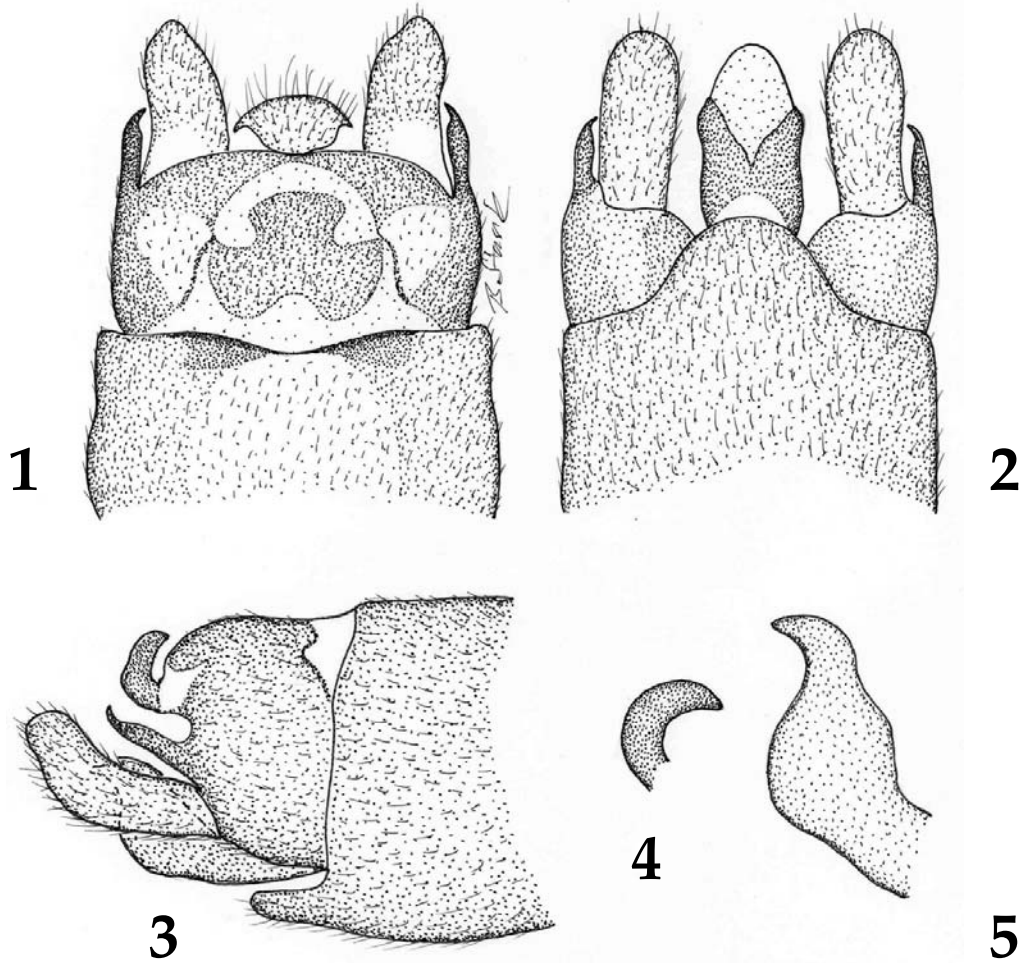
### RESULTS AND DISCUSSION

#### *Rhopalopsale alobata*, sp.n. (Figs. 1-5)

**Material examined.** Holotype ♂ from Vietnam, Vinh Phu, Tam Dao Hill Station, lower waterfall of stream flowing through town, UV light, 11 May 1996, B. Hubley, D.C. Darling, ROM 961030. Holotype deposited in the ROM.

**Adult habitus.** Head brown, lighter toward margins. Large, longitudinal, dark brown pattern extending from occiput through ocelli to anterior frons and labrum. Area forward of compound eye and anterolateral to posterior ocelli pale. Wing membrane pale brown, veins lighter except R vein dark brown. Legs pale brown without distinctive pattern.

**Male.** Macropterous, Forewing length 5.5 mm. Vesicle absent (Figs. 2-3). Posterior margin of tergum 9 sclerotized, slightly lobed and emarginate (Fig. 1). Tergum 10 with mesal sclerotized plate bearing a rounded posteromedian protrusion and lateral wings. Posterolateral processes strongly sclerotized, finger-like in shape, curving inward at tip in dorsal



Figs. 1-5. *Rhopalopssole alobata* male structures. 1. Male terminalia, dorsal aspect, 2. Male terminalia, ventral aspect, 3. Male terminalia, lateral aspect, 4. Epiproct, lateral aspect, 5. Subanal probe, lateral aspect.

aspect (Fig 1), broad basally, narrowed to tip and curved upward in lateral aspect (Fig. 3). Subanal probe sinuate in lateral aspect with hook-like tip (Figs. 3, 5), base of probe strongly sclerotized in ventral aspect (Fig. 2), and apex membranous. Epiproct a simple curved process (Figs. 3-4), obscured in Fig. 1 by position of subanal probe.

**Female.** Unknown.

**Larva.** Unknown.

**Etymology.** The species name refers to the absence of a ventral vesicle on segment 9.

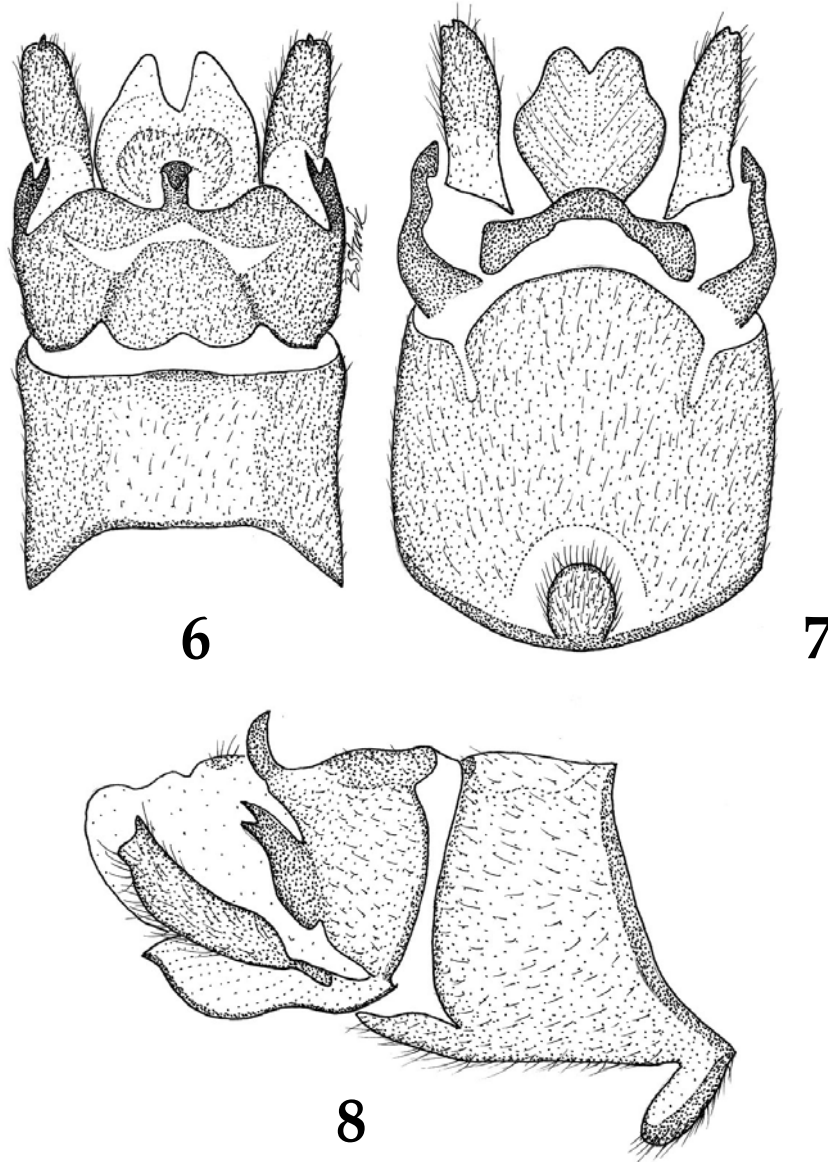
**Diagnosis.** This species is similar to *R. xui* Yang, et al. (2004), but lacks a vesicle on the base of sternum 9. *R. alobata* and *R. xui* are similar in that the lateral

processes of tergum 10 are simple finger-like, non bifurcate structures, but differ in that these structures in *R. alobata* curve inward at the tip in dorsal aspect and also curve more dorsad than in *R. xui* in lateral aspect.

***Rhopalopssole sinensis* Yang & Yang**  
(Figs. 6-8)

*Rhopalopssole sinensis* Yang & Yang, 1993:237. Holotype ♂ (Insect Collection, Beijing Agricultural University), Maolan, Guizhou, China

**Material examined.** Vietnam: Lao Cai, Sapa, Muong



Figs. 6-8. *Rhopalopssole sinensis* male structures. 6. Male terminalia, dorsal aspect, 7. Male terminalia, ventral aspect, 8. Male terminalia, lateral aspect.

Hoa Ho River, 6 May 1995, D. Currie, B. Hubley, J. Swann, ROM 956013, 1 ♂ (ROM).

**Remarks.** Figures 3-5 in Yang & Yang (1993) show lateral and dorsal aspects of the male terminalia and ventral aspect of the subanal probe for this species. The lateral process of tergum 10 is bifurcate, and only slightly narrowed at the apex, and tergum 10 is shown with a large mesal sclerite. Our specimen is in close agreement in lateral process structure, but the

mesal sclerite on tergum 10 is more chordate in shape (Figs. 6-8). The Vietnamese specimen may represent a species distinct from *R. sinensis* but that can only be determined by direct comparison with the holotype.

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**Appendix 1. *Rhopalopssole* species list with known distributions.**

<i>R. aculeata</i> Harper, 1977	Nepal
<i>R. alobata</i> n. sp.	Vietnam
<i>R. amamiensis</i> Kawai, 1964	Japan
<i>R. apicispina</i> Yang & Yang, 1991a	Hubei, China
<i>R. baishanzuensis</i> Yang & Li, 2006	Zhejiang, China
<i>R. basinigra</i> Yang & Yang, 1995a	Zhejiang, China
<i>R. bispina</i> (Wu, 1949)	Fujian, China
<i>R. dentata</i> Klapálek, 1912	Taiwan
<i>R. elongata</i> (Kawai, 1967)	Japan
<i>R. femina</i> Kawai, 1969	Philippine Islands
<i>R. flata</i> Yang & Yang, 1995b	Zhejiang, China
<i>R. furcata</i> Yang & Yang, 1994	Shaanxi, China
<i>R. gladifera</i> Zwick, 1977	Bhutan
<i>R. gutianensis</i> Yang & Yang, 1995a	Zhejiang, China
<i>R. hamata</i> Yang & Yang, 1995a	Zhejiang, China
<i>R. japonica</i> Okamoto, 1922	Japan
<i>R. longicerca</i> Kawai, 1968	Ryukyu Islands
<i>R. longispina</i> Yang & Yang, 1991b	Zhejiang, China
<i>R. magnicerca</i> (Jewett, 1958)	Nepal; Bhutan
<i>R. malayana</i> (Banks, 1920)	Philippine Islands
<i>R. palawana</i> (Jewett, 1958)	Philippine Islands
<i>R. recurvispina</i> (Wu, 1949)	Fujian, China
<i>R. shaanxiensis</i> Yang & Yang, 1994	Shaanxi, China
<i>R. shimentaiensis</i> Yang, Li & Zhu, 2004	Guangdong, China
<i>R. sinensis</i> Yang & Yang, 1993	Guizhou, China; Vietnam
<i>R. spiniplatta</i> (Wu, 1949)	Fujian, China
<i>R. subnigra</i> Okamoto, 1922	Japan
<i>R. xui</i> Yang, Li & Zhu, 2004	Guangdong, China
<i>R. zhejiangensis</i> Yang & Yang, 1995a	Zhejiang, China

**REFERENCES**

- Harper, P. 1977. Capniidae, Leuctridae, and Perlidae (Plecoptera) from Nepal. *Oriental Insects*, 11:53-62.
- Illies, J. 1966. *Katalog der rezenten Plecoptera. Das Tierreich* 82:XXX+631 pp.
- Kawai, T. 1967. Plecoptera (Insecta). *Fauna Japonica. Biogeographical Society of Japan, Tokyo*. 211 pp.
- Kawai, T. 1968. Stoneflies from Thailand and India with descriptions of a new genus and two new species. *Oriental Insects*, 2:107-139.
- Kawai, T. 1969. Stoneflies (Plecoptera) from Southeast Asia. *Pacific Insects*, 11:613-625.
- Klapálek, F. 1912. Plecoptera I, *In: H. Sauter's Formosa-Ausbeute. Entomologische Mitteilungen* 1:342-351.
- Shimizu, T. 2000. *Paraleuctra* (Insecta: Plecoptera: Leuctridae) from Japan, with taxonomic notes on the Japanese Leuctridae. *Species Diversity*, 5:285-303.
- Yang, D. & Z. Li. 2006. A new species of *Rhopalopssole* (Plecoptera: Leuctridae) from China. *Entomological News*, 117:433-436.
- Yang, D. & J. Yang. 1991a. New species of Plecoptera from Hubei. *Journal of Hubei University*, 13:369-372.
- Yang, D. & J. Yang. 1993. New and little-known species of Plecoptera from Guizhou Province (III). *Entomotaxonomia*, 15:235-238.
- Yang, D. & J. Yang. 1995a. Plecoptera: Leuctridae. Pp: 20-24. *In: Zhu, T. [ed.]. Insects and macrofungi of Gutianshan, Zhejiang. Zhejiang Sciencetech Press.*

Harrison, A.B. & B.P. Stark 2008. *Rhopalopsale alobata* (Plecoptera: Leuctridae), a new stonefly species from Vietnam. *Illiesia*, 4(7):76-80. Available online: <http://www2.pms-lj.si/illiesia/Illiesia04-07.pdf>

Hangzhou, China 327 pp.

Yang, D. & J. Yang. 1995b. Plecoptera: Leuctridae. Pp: 61-62. *In*. Wu, H. [ed.]. Insects of Baishanzu Mountain, Eastern China. China Forestry Publishing House. Beijing, China 586 pp.

Yang, J. & D. Yang. 1991b. One new species of *Rhopalopsale* from Zhejiang. *Journal of Zhejiang Forestry College*, 8:78-79.

Yang, J. & D. Yang. 1994. Two new species of *Rhopalopsale* (Plecoptera: Leuctridae) from Shaanxi. *Entomotaxonomia*, 19:189-191.

Yang, D., W. Li & F. Zhu. 2004. Two new species of *Rhopalopsale* (Plecoptera: Leuctridae) from China. *Entomological News*, 115:279-282.

Zwick, P. 1977. Ergebnisse der Bhutan-Expedition 1972 des Naturhistorischen Museums in Basel. (Plecoptera) *Entomologica Basiliensia*, 2:85-134.

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