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# First record and host identification of *Echthrodelphax rufus* Olmi, 1984 in Japan (Hymenoptera: Dryinidae)

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*Echthrodelphax rufus* Olmi, 1984 is reported from the central Honshu, Japan. The female and male of the species were reared from the nymph of *Tropidocephala brunneipennis* Signoret,1860. The diagnosis and illustration of both sexes of *Echthrodelphax* species and parasitized host are presented.

**Key words**: parasitic wasp, planthopper, host record

## Data text

The genus *Echthrodelphax* Perkins, 1903 is a small group of the pincer wasp belonging to the subfamily Gonatopodinae (Hymenoptera, Dryinidae). *Echthrodelphax* has worldwide distribution and, four species are known from the Eastern Palaearctic and Oriental regions (Xu *et al.* 2013; Olmi & Xu 2015), but usually they are uncommon except *E. fairchildii* Perkins, 1903. Among them, *E. rufus* Olmi, 1984 is a peculiar species having the uniformly bright body color and the infuscate pattern on the fore wing in the female. While the life history remains unknown, the male was described based on sympatric specimens obtained together with females (Olmi 1995). One of the authors, HH was able to obtain males and females of *E. rufus* in the grasslands along the mountains in Saitama Prefecture, the central Honshu. In Japan, no species other than *E. fairchildii* was known in this genus, so, following previous studies, these males and females were considered to be of the same species. Furthermore, some parasitized planthoppers (Fig. 1) were found from the surrounding area after intensive field research for hosts. After rearing the parasitized hosts, adults of *E. rufus* were emerged and the sex association was confirmed.

Adult wasps and planthoppers were collected by net-sweeping. Each parasitized planthopper was separately kept in a small glass tube along with a piece of grass leaf. The leaf was replaced in every one or two days until the dryinid larva emerged from the host. They were maintained at room temperature until adult emerged. The male genitalia were mounted on a small slide after KOH treatment and pined together with the body. Specimens examined are deposited at the following institutes: BPBM, Bernice P. Bishop Museum, Honolulu, Hawaii, USA; ELKU, Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, Japan; SMNH, Saitama Museum of Natural History, Nagatoro, Japan; TARI, Taiwan Agricultural Research Institute, Taichung, Taiwan. The identification and the nomenclature of Dryinidae were followed Xu *et al.* (2013). The host Delphacidae was identified by the authors and confirmed by N. Ohara (ELKU).

Family Dryinidae Haliday, 1833
Subfamily Gonatopodinae Kieffer in Kieffer & Marshall, 1906
Genus *Echthrodelphax* Perkins, 1903
*Echthrodelphax rufus* Olmi, 1984 (Figs 1–9)
*Echthrodelphax rufus* Olmi, 1984: 1157; Olmi 1995: 32; He & Xu 2002: 305; Xu *et al.* 2013: 345.

**Diagnosis.** *Echthrodelphax rufus* Olmi, 1984 is distinguished from the other species of the genus by the following characters: (female) labial palp 3-segmented; head more or less granulated (Figs 2, 7); mesosoma testaceous to reddish brown (Figs 4, 5, 8); fore wing with two dark transversal bands; (male) labial palp 3-segmented; notauli posteriorly separated; dorsal process of paramere less developed, fold-shaped (Figs 6, 9); inner margin of paramere with small sensory organs.

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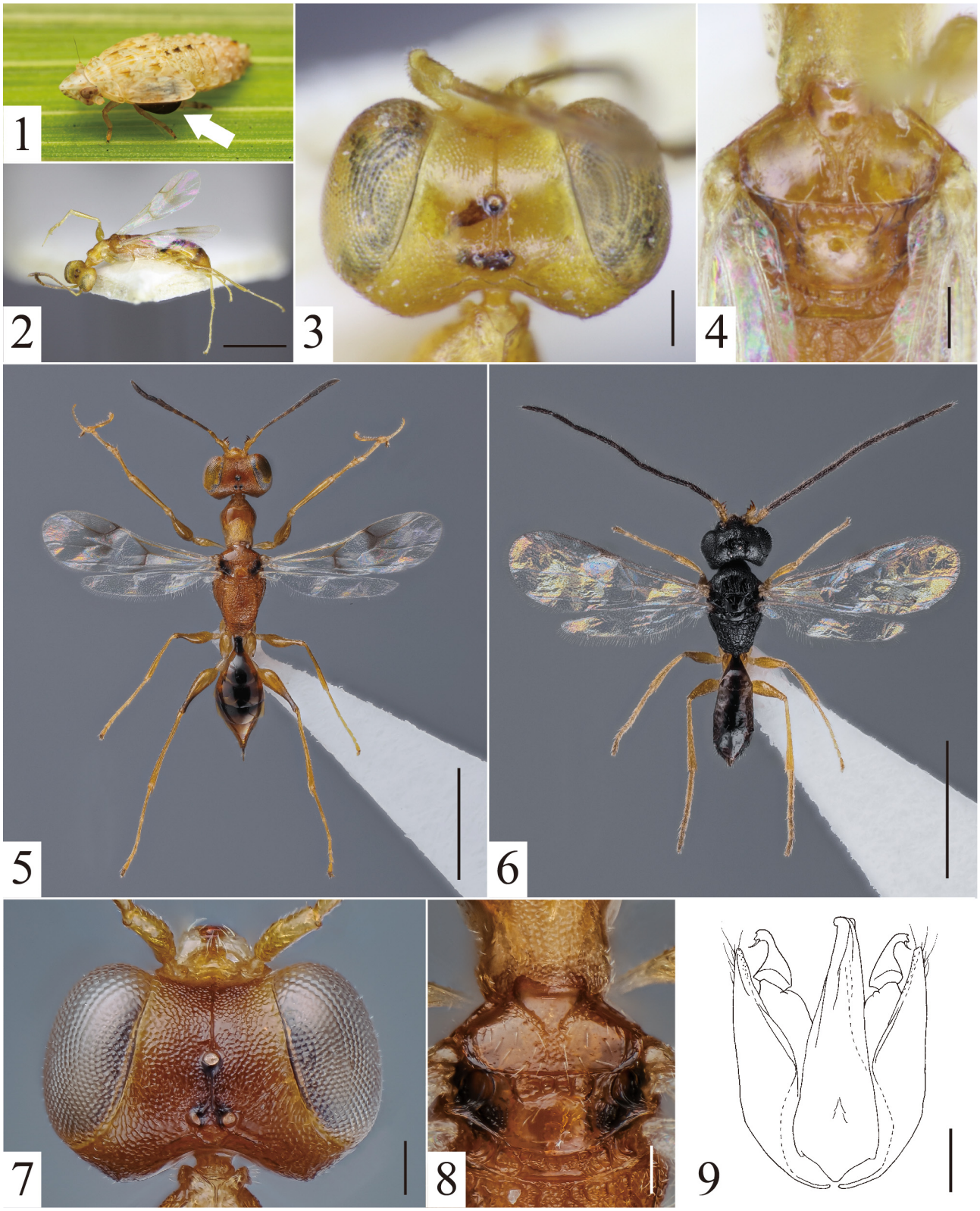


**Figures 1–9.** *Echthrodelphax rufus* and parasitized host planthopper. **1,** larva of *E. rufus* on nymph of *Tropidocephala brunneipennis*; **2–4,** holotype female from Laos (**2,** lateral habitus; **3,** head in dorsal view; **4,** mesonotum in dorsal view); **5, 7, 8,** female from Japan (**5,** general habitus; **7,** head in dorsal view; **8,** mesonotum in dorsal view); **6, 9,** male from Japan (**6,** general habitus; **9,** genitalia in dorsal view). Scale bar. 1.0 mm (**2, 5, 6**), 0.1 mm (**3, 4, 7, 8**), 0.05 mm (**9**).

**Materials examined.** Holotype ♀: "LAOS: Vientiane Prov., Gi Sion Vill., de Tha Ngone 19–26.XII.1965", "Native collector BISHOP", small slide with a chela, "HOLOTYPUS *Echrhrodelphax rufus* n. sp. 1979 M. OLMI DET." (BPBM). Other materials. 1♀ and 1♂, Taiwan, Wanfeng Hill, Taichung HS., X.1984, K.S. Lin & K.C. Chou, MsT. (TARI); 3♀ and 1♂, Japan, Saitama Pref., Yorii-machi, Fupu, Chugendaira-ryokuchi-park, 29.VIII.2022, H. Handa leg. (ELKU); 1♀, same data but 4. IX, 2022 (ELKU); 1♀, same data but, 3. IX.2023 (SMNH); 1♂, same locality and collector but parasitized nymph of *Tropidocephala brunneipennis* Signoret, 1860 collected at 3.IX.2023, adult wasp emerged at 24.IX.2023 (SMNH); 1♀, same data but adult wasp emerged 29.IX.2023 (SMNH); 1♀, same data but adult wasp emerged 8.X.2023 (SMNH).

**Distribution.** Oriental region: China (Guangdong, Shaanxi, Liaoning), Laos, Taiwan, Thailand (Xu *et al.* 2013). Palaearctic region: China (Liaoning); Japan, **new record** (C. Honshu).

**Host.** Delphacidae: *Tropidocephala brunneipennis* Signoret,1860, **new record**.

## Remarks

The total body length ranges 2.4–2.7 mm for female and 1.4–1.9 mm for male (Xu *et al.* 2013 & present study). Compared to the holotype female (Figs 2–4), females from Japan shows the following differences: the more reddish body color (Fig. 5); the more strongly granulate head (Fig. 7); the indistinct posterior margin of notauli among surface sculpture (Fig. 8). However, the body color of the examined female from Taiwan has reddish brown body color as well. No difference is observed in other respects including the male (Fig. 9). This is the first report of the Dryinidae parasitizing *T. brunneipennis* Signoret,1860 (Guglielmino *et al.* 2013). Adults and nymphs of *T. brunneipennis* are abundant at the collection site, but parasitism was very rare. Despite several hours of investigation, only a few parasitized nymphs were collected. During the field survey a small number of *Laodelphax striatella* Fallén, 1826 were also observed, but *E. fairchildii* was not found. The Palaearctic distribution of *E. rufus* has previously been recorded only in Liaoning Province of continental China, but its discovery in Honshu, Japan suggests that *E. rufus* may inhabit a wide range of temperate areas in the East Asia.

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