



<http://dx.doi.org/10.11646/zootaxa.3620.3.7>

<http://zoobank.org/urn:lsid:zoobank.org:pub:4D90384E-CFB6-43E7-B9CD-5CC4422A18BE>

## ***Orchidophaga gastrodiacola* Kato, 2006, is *Chyliza vittata* Meigen, 1826 (Diptera: Psilidae): discussion on its taxonomy and biology**

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### **Abstract**

Morphological features of a Japanese fly that develops in orchids, *Orchidophaga gastrodiacola* Kato, 2006, assigned to the family Scathophagidae, are reviewed and this species is proposed as a junior synonym of *Chyliza vittata* Meigen, 1826, of the family Psilidae. Morphological features of specimens from Japan correspond well with those from European. Japanese specimens of this transpalearctic species utilize buds and stems of the achlorophyllous mycoheterotrophic *Gastrodia elata* Blume. This association is an exceptional habitat in comparisons to other congeners and European specimens of the same species.

**Key words:** Deliniinae, host plants, Japan, Orchidaceae, phytophagous insects, stem-miner

### **Introduction**

*Orchidophaga gastrodiacola* Kato, 2006, was described as a new genus and species in the family Scathophagidae (Kato *et al.* 2006). Kato *et al.* (2006) assigned it to the subfamily Deliniinae chiefly based on molecular data (DNA COI gene). As they noted, however, this is an unusual delinine fly in morphology: proclinate orbital setae present, no frontal setae, no vibrissa, enlarged palpus without distinct setae, and no katepisternal seta. Hitherto *O. gastrodiacola* has been known only from the type locality in the Nagano Prefecture, Honshu, Japan (Kato *et al.* 2006).

The larva of this fly is a stem borer of *Gastrodia elata* Blume (Orchidaceae) (Kato *et al.* 2006). Species of five dipteran families are known to develop in orchids: Agromyzidae, Cecidomyiidae, Psilidae, Scathophagidae, and Syrphidae (Hering 1957; Sasakawa 1961; de Jong 1999; Kato *et al.* 2006; Uechi *et al.* 2011). Some agromyzid and cecidomyiid pest species have been well studied since they infest flowers and fruits of economically important orchids, causing harmful damage to them (Hasegawa *et al.* 1987; Sugiura *et al.* 1997; Tokuda *et al.* 2002). The latter three families have been less well studied in this context.

*Gastrodia elata* is known in Japan from Hokkaido to Kyushu; it also occurs in China (Satomi 1982). It is cultivated for the root which is used as a traditional herbal medicine in China. The plant species is registered as nearly threatened or endangered to extinction in 21 of the 47 prefectures of Japan (Association of Wildlife Research & Envision Conservation Office 2012). Considering the conservation of local populations and the economic importance of this orchid, it is imperative to know the insects associated with this orchid. We suspect that some of these insects may affect reproduction of the orchid.

I had a chance to examine the type series of *O. gastrodiacola*, deposited in the Kyoto University Museum, Kyoto, and to receive a series of additional specimens of this species that were reared from *G. elata* in Hokkaido and Honshu. Examination of these specimens showed that *O. gastrodiacola* is not a scathophagid but a psilid fly, *Chyliza vittata* Meigen, known to develop in orchids in the Palearctic Region. Herein, I re-describe it and discuss its taxonomic status, geographic distribution, and biology.