



## *Prochetostoma expandens* (Diptera: Tephritidae) sp. n., a fruit parasite of *Ilex integra* Thunberg (Aquifoliaceae) in Japan

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### Abstract

The third species of the genus *Prochetostoma*, developing in the fruits of *Ilex integra* Thunberg, has been reported six times in Japan since 1985 but has not been described. We here describe adults and immatures of this species as *P. expandens* sp. n. Based on the adult morphological characters, *P. expandens* is suggested to be the sister species of *P. bhutanicum* Han. Two possible morphological synapomorphies of these two species are proposed. We also investigated a large number of larvae of *P. expandens* collected from fruits of *I. integra*. Detailed information about the life history is presented: oviposition takes place under the skin of immature fruits of *I. integra* in spring; larvae consume fruit tissue in summer and autumn; single fully matured larva escapes from the fruit and drops down to the ground for pupation; and adults emerge in the subsequent spring.

**Key words:** Chetostomatina, life history, phylogeny, taxonomy, Trypetini

### Introduction

*Prochetostoma* Han was initially recognized as an undescribed genus of the subtribe Chetostomatina (Trypetinae, Trypetini) (Han 1992, 1999) and then was formally described based on two Asian species (Han 2006). The existence of a third species was suggested when the formal description of the genus was made (Han 2006). This species has been reported six times in Japan as an unidentified genus and species (Sasaki *et al.* 1985; Ichita 1996; Iwase *et al.* 2000; Sueyoshi 2000, 2005a, b).

Three major lineages, *Parastenopa* Hendel, the *Chetostoma* group, and *Prochetostoma*, are suggested within the subtribe Chetostomatina (Han 2006). A possible sister group of *Prochetostoma* is the *Chetostoma* group of genera (Han & Ro 2009). The relationship between these genera was supported both by morphological (Han 2006) and molecular data (Han & McPheron 1997, 1999; Han 2000; Han & Ro 2002, 2009). The genus *Parastenopa* is suggested as a possible sister group to the clade including *Prochetostoma* and the *Chetostoma* group, and its monophyly is supported by three autapomorphies (Han 2006). The monophyly of *Prochetostoma* however was not clearly supported by any unambiguous apomorphies (Han 2006).

The new Japanese species was stated to be a fruit parasite of *Ilex integra* Thunberg (Aquifoliaceae) in Japan (Han 2006) being the only host record reported for *Prochetostoma*. Although a number of pest insects or parasites of *Ilex* are known (Yukawa & Masuda 1996; Galle 1997; Japanese Society of Applied Entomology and Zoology 2006), it is an unusual host record for Tephritidae. Four species of *Parastenopa* are currently known to be associated with *Ilex* (Han 1998). *Anomoia pusilla* (Hering, 1938) and *A. purmunda* (Harris, 1780) has been reared from the fruits of *Ilex* (Han 1998; Sasaki *et al.* 1985). Sueyoshi (2005a) also reported the host record of the new *Prochetostoma* species (as a undescribed genus and species) prior to the current publication.

We here describe this new species of *Prochetostoma* based on the specimens obtained from the previous Japanese studies. We also discuss the phylogenetic relationships among the species of *Prochetostoma* and describe the life history of the new species.