# Host and host location of *Atoreuteus striatus* Foerster (Hymenoptera: Braconidae: Opiinae)

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*Abstract:* Thirteen specimens of the extremely rare parasitoid *Atoreuteus striatus* Foerster were reared from twig galls of *Forsythia* × *intermedia* Zab. containing puparia of *Chyliza leptogaster* (Panzer) (Diptera: Psilidae). *A. striatus* is recorded for the first time from The Netherlands.

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## Introduction

*Atoreuteus striatus* Foerster, 1862, is considered an extremely rare hymenopteran (Fischer, 1972), of which only two specimens were known: the male holotype of *A. striatus*, collected in Aachen (W. Germany) and a second specimen, also a male that was deposited in the collection of the National Museum of Natural History, Leiden. The latter was reared from a *Fraxinus*-pole collected in Belgium, near the Dutch border (St. Pietersberg) by Br. V. Lefeber in 1986 (unpublished). In May 1990, however, we reared 13 additional adults (5 females and 8 males) of this parasitoid from twig galls of *Forsythia* × *intermedia* Zab. containing puparia of *Chyliza leptogaster* (Panzer) (Diptera: Psilidae). These specimens of *A. striatus* are deposited in the collections of both institutions mentioned above. The taxonomical position of *A. striatus* is controversial; Fischer (1972) includes this species in the genus *Diachasma* Foerster, 1862, but Wharton (1988) has transferred it back to *Atoreuteus* Foerster, 1862.

## Material

Twig galls of *Forsythia* were thought to be caused by *Agrobacterium radiobacter* subsp. *tumefaciens* (E. F. Smith & Town) Keane et al. (Docters van Leeuwen, 1982) but according to Sinclair & al. (1987) the galls are attributed to a *Phomopsis* sp. (Fungi: Deuteromycotina: Coelomycetes). Unidentified species of *Phomopsis* have been associated with galls on many plant and tree species such as *Jasminum nudiflorum* Lindl., *Ligustrum vulgare* L., *Acer* spp. and *Quercus* spp. However, the early investigations reporting success in inoculation experiments were never corroborated (Sinclair & al., 1987). In a preliminary screening for insects as possible causal agents, 114 galls, varying in size from 2.5 × 3.5 cm to 0.3 × 0.5 cm, were collected on 7 April and an additional 65 galls on 21 May 1990 from a *Forsythia* shrub in the backyard of the first author in Bennekom, The Netherlands. The shrub (height = 2.75 m, radius = 2.50 m) has a shady, humid, northerly exposure and was infested for more than 10 years with numerous galls on the nodes of its twigs. Older galls consist of clumps of rootlike tuberculous outgrows and may reach a size of 3 × 5 cm. New galls may consist of only one rootlike outgrowth as small as 0.3-0.5 cm.

From the first sample, 35 of the larger galls were dissected and 8 of the dipteran puparia found, were reared individually under laboratory conditions. Puparia (up to three per gall) were mostly found in larger galls (fig. 1), of

Fig. 1. Dissected gall of *Forsythia* showing a puparium of *Chyliza leptogaster*.

which some were partially deteriorated. On the inside of these galls, the presence of puparia was often indicated by the dark brown boring dust produced by the dipterous larvae. Remaining galls were placed in plastic containers with a transparent lid for rearing any additional insects. From the second sample of galls, 5 dipteran puparia were collected from 25 galls; remaining galls were again placed in plastic containers.

In addition, 25 galls of variable sizes, but mostly of 3 × 5 cm, were collected in the backyard of the second author at Waarder on 22.v.1990, and placed in containers to rear any additional specimens.

## Results and discussion

Several insect species inhabited the *Forsythia* twig galls, among them chloropids, acari, a heteropteran and a cynipoid, *Ganaspis* sp. (det. Dr. G. Nordlander, University of Agricultural Sciences, Uppsala), which is probably a parasitoid of the chloropids. The rearing of the dipteran puparia yielded several adults of *Chyliza leptogaster* (Panzer) (syn.: *C. scutellata* F.) (Diptera: Psilidae) and of the rare *A. striatus*. Identification of the host was carried out by Mr. J. W. van Zuijlen and Dr. P. J. van Helsdingen (both of the National Museum of Natural History, Leiden) wheras *A. striatus* was identified by the second author. From the collection of 8 puparia of the psilid, 5 adults of the opiinid emerged while three additonal adults emerged from the galls kept in the rearing container. Of *C. leptogaster*, 7 female and 5 male adults were obtained. No parasitoid adults emerged from the second sample of galls containing 5 puparia, but the galls placed in the rearing container yielded four additional males and one female of *A. striatus* and one male and four females of *C. leptogaster*. No insects emerged from the galls collected at Waarder. After opening of the galls no infestations were found.

*A. striatus* (fig. 2) is an internal parasitoid of *C. leptogaster*-larvae. It probably is univoltine and overwinters in the puparia of its host, inside the twig galls. Under laboratory conditions, the parasitoid still emerged from galls collected on 21 May. Under natural conditions, it may therefore have its main flight period in June or later. *A. striatus* is new for the fauna of The Netherlands. *C. leptogaster* is distributed all over Europe, Algeria and Tunesia. In The Netherlands, flight occurs from mid-May to the beginning of July (Van der Goot & Van Veen, 1987).

As many galls of very small size (0.3-0.5 cm) on the twig nodes did not contain any larvae of the

dipteran, *C. leptogaster* is not the cause of the galls of *Forsythia* but a secondary feeder on their tissue. This was corroborated by the absence of this dipteran in the galls collected in Waarder.

*Chyliza leptogaster* has also been reared from stems of the bird's-nest orchid, *Neottia nidus-avis* (L.) and from galls of *Spiraea opulifolius* L. of which it was considered the cause, because no other insect species emerged from them (Scholtz, cited in Hennig, 1941; Smith, 1989). In view of our findings and the indications that galls may also be caused by micro-organisms, these citations may well be erroneous.

Fig. 2. Male specimen of *Atoreuteus striatus*.

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