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FIRST CANADIAN RECORD OF *HEXACOLA NEOSCATELLAE* (HYMENOPTERA: FIGITIDAE: EUCOILINAE), A PARASITOID OF THE SHORE FLY, *SCATELLA STAGNALIS*

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ABSTRACT

This paper documents the first occurrence of *Hexacola neoscatellae,* a shore fly parasitoid, in Canada. The discovery of *H. neoscatellae* is significant because currently there are no suitable biological control agents available for shore fly control to the floriculture industry.

Scatella stagnalis Fallen (Diptera: Ephydridae) is a worldwide cosmopolitan species (Zack and Foote 1978). This species of shore fly is commonly found in greenhouses where it breeds on algae growing on the potting mix, pots, benches and floors. Shore flies have been traditionally identified as a nuisance pest to greenhouse workers and consumers of potted crops (Vanninen and Koskula 1998). Recently, *S. stagnalis* has been implicated as a vector of plant pathogens, increasing the incidence of root disease. Goldberg and Stanghellini (1990) documented the acquisition and aerial transmission of *Pythium aphanidermatum* (Edson) by shore flies from infected to healthy plants in greenhouses. Adult shore flies also cause indirect damage to ornamentals by leaving fecal spots on the foliage, thus reducing the aesthetic value of the plant (Lindquist et al. 1994). The use of chemicals has been the cornerstone for insect control in greenhouses. However, the floriculture industry has experienced a reduction in both the number and classes of traditional pesticides available because fewer products are being registered and many older products are not being registered again. There are also growing health and environmental concerns influencing this reduction. The trend toward an increased use of biological controls for management of other crop pests is another incentive to move away from the application of chemicals to control shore flies. As yet, there are few effective shore fly control alternatives available (Vanninen and Koskula 1998).

In our greenhouses where shore flies exist, yellow sticky-card monitoring revealed a resident population of a *Hexacola* sp. *Hexacola neoscatellae* Beardsley is known to be a parasitoid of Ephydridae (Beardsley 1989). These specimens (Fig. 1) from our greenhouses were identified as *Hexacola neoscatellae* Beardsley by Matthew Buffington (Texas A. & M. University) and John W. Beardsley (University of Hawaii). We report here that specimens from our greenhouse were observed parasitizing shore fly larvae and pupa (Figs.2-3). Previously, *H. neoscatellae* has only been identified from greenhouses at University of California Riverside, and occurs naturally throughout Hawaii (Beardsley 1989). It is likely *H. neoscatellae* arrived in our greenhouses by being carried on nursery stock.

Another species, *Hexacola hexatoma* (Hartig), has been reported to parasitize shore flies (Gill and Sanderson 1998). However, according to Göran Nordlander (pers. comm.), this association is likely due to a misidentification of *H. neoscatellae* as *H. hexatoma*, a well-known parasitoid of frit flies (Diptera:

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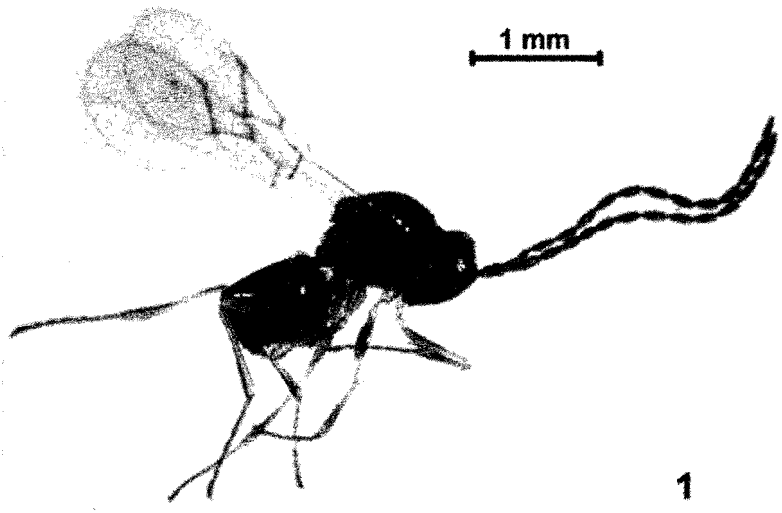
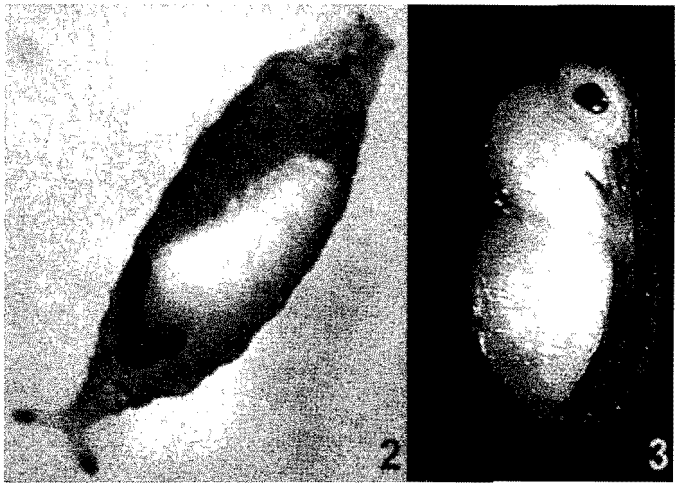


FIG. 1. *Hexacola neoscatellae*: 1, Adult.



FIGS. 2-3. *Hexacola neoscatellae*: 2, shore fly pupal case containing the developing wasp (white) and the remnants of the dead shore fly pupa (black); 3, parasite dissected from the shore fly pupa.

Chloropidae). Beardsley's (1989) comparison of *H. neoscatellae* to *H. hexatoma* indicates that these species differ in a number of morphological characteristics, such as: the antennae are not pale basally and do not have a clearly defined six-segmented club with rhinaria on all six segments; the back of the head is not discernibly striate and the basal hair ring of the gaster is not dense. Therefore, we find it possible that *H. neoscatellae* has either been misidentified as *H. hexatoma* or these two distinct species have an overlapping host range. In either case, and with regards to our findings, specimens of *H. hexatoma* that have been confirmed as a parasitoid of shore flies should be viewed as suspicious and specimens should be reevaluated to determined its correct identification to resolve this issue.

This population of *H. neoscatellae* found in Vineland Station, Ontario (43°11NN; 79° 24NW), is the first to be documented within Canada. This discovery provides a potential new biological control agent that once introduced, could sustain itself and maintain *S. stagnalis* below nuisance levels at little or no cost to greenhouses operators. Optimal parameters for rearing (e.g., temperature, light, relative humidity, host rearing) and the testing of the biological control potential of this parasitoid is being determined. Voucher specimens of this species are now housed at Canadian National Insect Collection, ECORC-AAFC, Ottawa.

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