First records of ensign wasps (Hymenoptera: Evaniidae) and their cockroach host (Blattodea: Blatellidae) in Manitoba

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Abstract – We provide the first record of Evaniidae in Manitoba with the discovery of *Hyptia harpyoides* Bradley and the first published record of its host, *Parcoblatta virginica* (Brunner von Wattenwyl), in the province.

Introduction

Ensign wasps (Hymenoptera: Evaniidae) are solitary egg predators of cockroach oothecae (Blattodea). There are 21 extant genera and 580 extant described species of Evaniidae, with the majority of diversity occurring in tropical regions (Yu *et al.* 2011; Mullins *et al.* 2012). There are 65 known species of *Hyptia* in the New World, only ten of which are recorded from North America including Mexico (Deans 2005). Species of *Hyptia* attack a wide variety of cockroaches across different subfamilies, but are common predators of saprophagous wood cockroaches in the genus *Parcoblatta* (Blattellinae).

Only two species of Evaniidae have been reported from Canada: *Hyptia harpyoides* Bradley and *Hyptia thoracica* (Blanchard) (Mullins *et al.* 2012). The known distribution of these two species is vague, with *H. thoracica* reported from Ontario and *H. harpyoides* only specified as collected in Canada (Deans 2005). Evaniids have never been recorded specifically from Manitoba, which is not surprising given that native cockroaches are rarely collected in this region (Vickery and Kevan 1985). Recent field trips to Whiteshell Provincial Park in Manitoba led to the discovery of two specimens of *H. harpyoides*. Additionally, one of the known hosts of this species, *Parcoblatta virginica* (Brunner von Wattenwyl), was subsequently discovered in the Wallis-Roughley Museum of Entomology at the University of Manitoba, which is also a new record for the province.

Materials and Methods

Evaniids were collected from Star Lake Research Station using sweep nets and aspirators in August 2013 and 2014. The species of Evaniidae was determined using the key in Deans *et al*. (2013). All specimens are deposited in the Wallis-Roughley Museum of Entomology, Department of Entomology at the University of Manitoba.

New Manitoba records

EVANIIDAE

Hyptia Illiger 1807

Hyptia harpyoides Bradley, 1908

Material Examined. CANADA: MB: Star Lake; Whiteshell Provincial Park; 49.743140, -95.258295; 26.viii.2013, sweep net, **1**♀; coll: Daniel L. Klassen. CANADA: MB: Star Lake; Whiteshell Provincial Park; 49.752718, -95.256714; 23.viii.2014, aspirator, **1**♂; coll: S. Steinmann.

Distribution. This species is found in Canada (Manitoba and Ontario) and throughout the eastern and midwestern United States (Deans 2005).

BLATTELLIDAE

Parcoblatta Hebard, 1917

Parcoblatta virginica (Brunner von Wattenwyl, 1865)

Material Examined. CANADA: Manitoba, Great Falls Generating Station on the Winnipeg River near Pointe du Bois; 27.vi.1997; coll. D. Wytrykush.

Distribution. This species is found in northeastern United States (Vickery and Kevan 1985) and in Ontario (Vickery and Scudder 1987) and Manitoba, Canada.

Discussion

Hosts of *H. harpyoides* include *P. virginica*, *P. pennsylvanica* DeGeer and *P. uhleriana* (Saussure) (Edmunds 1952; Smith 1998). None of these species have been recorded west or north of North Dakota. Here we report the first record of an evaniid wasp, *H. harpyoides*, and its host, *P. virginica*, from Manitoba. This is the most northerly record

for both of these species. Although there has been extensive entomological research in Manitoba for over 120 years dating back to the time of Norman Criddle, these species have only been recently collected. *Parcoblatta virginica* is saprophagous, feeding on decaying organic matter, and is commonly found in ground litter, under rotting logs or residing in hollow trees. Thus, the boreal shield ecozone of Whiteshell Provincial Park provides suitable habitat for this cockroach. This species has been previously recorded from northern North Dakota, only a few hundred kilometres from the Whiteshell Provincial Park, and thus these new records may represent range expansions given the similarity in climate between North Dakota and Manitoba.

Finally, the discovery of *P. virginica* in the Wallis-Roughley Museum of Entomology, a relatively large university insect collection, highlights the importance of museums for both taxonomic and environmental research. This specimen was collected 18 years ago but this new record has not been published until the writing of this manuscript. Museums, including regional and university collections, provide important long term documentation of species, their habitats, and changes in species distributions through time and space (Wiggins *et al*. 1991). As climate and habitats continue to become altered through anthropogenic activities, museums become increasingly important to understand how these environmental changes affect extant organisms. Thus, long term funding of museums should be a high priority for governments interested in understanding the impacts of environmental change.

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References

Bradley, J.C. 1908. The Evaniidae, ensign flies, an archaic family of Hymenoptera. Transactions of the American Entomological Society 34: 101–194.

Deans, A.R. 2005.Annotated catalog of the World's ensign wasp species (Hymenoptera: Evaniidae). Contributions of the American Entomological Institute 34: 1–164.

Deans, A.R., M.J. Yoder, and K. Dole. Evanioidea Online – catalog of information about evanioid wasps (Hymenoptera). [Accessed 18 November, 2013] [http://evanioidea.info/public/clave/show/608].

Edmunds, L.R. 1952. Some notes on the habits and parasites of native wood-roaches in Ohio (Orthoptera: Blattidae). Entomological News 63: 141–145.

Mullins, P.L., R. Kawanda, J.P. Balhoff, and A.R. Deans. 2012. A revision of *Evaniscus* (Hymenoptera, Evaniidae) using ontology-based semantic phenotype annotation. Zookeys 223: 1–38.

Smith, D.R. 1998. Evaniidae (Hymenoptera) in the mid-Atlantic states: seasonal occurrence and identification. Proceedings of the Entomological Society of Washington 100: 275–285.

Vickery, V.R., and D.K.McE. Kevan. 1985. The grasshoppers, crickets, and related insects of Canada and adjacent regions. Ulonata: Dermaptera, Cheleutoptera, Notoptera, Dictuoptera, Grylloptera, and Orthoptera. The Insects and Arachnids of Canada, Part 14. Agriculture Canada, Publication 177. Ottawa. 918 pp.

Vickery, V.R., and G.G.E. Scudder. 1987. The Canadian orthopteroid insects summarized and updated, including a tabular checklist and ecological notes. Proceedings of the Entomological Society of Ontario 118: 25–45.

Wiggins, G.B., S.A. Marshall, and J.A. Downes. 1991. The importance of research collections of terrestrial arthropods. A brief prepared by the Biological Survey of Canada (Terrestrial Arthropods). Entomological Society of Canada, Supplement, Bulletin 23(2). 16 pp.

Yu, D.S., K. Horstmann and C. van Achterberg. 2011. Taxapad: scientific names for information management. Biological and Taxonomical Information: Ichneumonoidea 2011, CD. Taxapad, Vancouver, BC.