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First record of *Bombus rufocinctus* Cresson
(Hymenoptera: Apidae: Bombini) in Pennsylvania

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Abstract. *Bombus rufocinctus* Cresson (Hymenoptera: Apidae: Bombini) is reported from Pennsylvania for the first time, **new state record**. A single female specimen was collected in a multi-colored bucket trap in 2017. This new record fills in gaps in the known range of this species in northeastern North America.

Key words. Red-belted bumble bee, bucket trap, new record.

Introduction

Bombus rufocinctus Cresson is a short-tongued bumblebee that exhibits a wide variety of color patterns, making them often hard to identify without looking at microscopic characteristics (Williams et al. 2014). This species is commonly found throughout its known range, which includes Alaska, Arizona, California, Colorado, Idaho, Illinois, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Dakota, Ohio, Oregon, South Dakota, Utah, Vermont, Washington, West Virginia, Wisconsin, and Wyoming (Hatfield et al. 2015; Ascher and Pickering 2017). Donovan and vanEngelsdorp (2010) did not report *B. rufocinctus* in their Pennsylvania bee checklist and other sources such as Mitchell (1962) and Williams et al. (2014) have shown that previously *B. rufocinctus* was only found in the adjacent states of Ohio, West Virginia, New York, and New Jersey.

The Pennsylvania Department of Agriculture (PDA) Division of Entomology conducts surveys each year for the detection and monitoring of invasive insect pests throughout Pennsylvania. These surveys focus primarily on wood-destroying pests and other pests of specialty crops such as tomatoes. The PDA tomato survey is designed to catch invasive Lepidoptera such as *Spodoptera litura* (Fabricius), *Helicoverpa armigera* (Hübner) and *Chrysodeixis chalcites* (Esper) (Lepidoptera: Noctuidae). The bucket traps used with this and similar surveys have proven useful in the monitoring of *Bombus* species and other members of the family Apidae (Spears et al. 2016). The PDA bucket traps were screened for *Bombus* (Hymenoptera: Apoidea: Apidae) after the inclusion of the rusty patched bumblebee, *Bombus affinis* (Cresson) on the critically endangered species list (United States Fish and Wildlife Service 2017). It was during these screening efforts to detect populations of *B. affinis* that *B. rufocinctus* was found for the first time in Pennsylvania.

Materials and Methods

Various dry and sticky traps and lures were placed across 31 Pennsylvanian counties in or around crops in June 2017 and serviced every two weeks until November 2017. Traps were baited with specific pheromone compounds designed to lure insects, generally at a generic or species level, limiting bycatch. Locations were chosen based on host commodities available (to potentially cover surveys for pests of other hosts) and risk of importation of pests. Traps were preferentially placed among the crops or peripherally

otherwise. Traps were hung from existing hardware in fields, typically trellises or wires, or on a T-post sunk to a height of approximately five feet.

Results

A single female specimen was collected in Erie County, Pennsylvania on July 31, 2017 at 42.19450815°N, 79.7887643°W in a multi-colored bucket trap (white bottom, yellow middle, green top) (Pherocon, Adair, OK) baited with lure for *Helicoverpa armigera* (Hübner) (Lepidoptera: Noctuidae) hung in a tomato (*Solanum lycopersicum* L.) vineyard. The specimen's identity was confirmed via morphological analysis through a standard light microscope by Sam Droege (United States Geological Survey) and deposited in PDA's collection (PADA).

Discussion

Taking into consideration that only a single worker bee was collected, there is not enough evidence to state whether there is an established population of *B. rufocinctus* in Pennsylvania. As Erie is a border county to both Ohio and New York, and the detection site is less than two kilometers from the New York border, it is possible that its origin is from a colony in another state. Further collection efforts would be required to determine if this specimen is from an established Pennsylvanian colony, as certain members of *Bombus* have been documented to travel up to 10 kilometers during foraging (Williams et al. 2014).

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Literature Cited

- Ascher, J. S., and J. Pickering. 2017.** Discover Life bee species guide and world checklist (Hymenoptera: Apoidea: Anthophila). Available at <http://www.discoverlife.org/20/q?search=Bombus+rufocinctus>. (Last accessed December 2017.)
- Donovall, L. R., and D. vanEngelsdorp. 2010.** A checklist of the bees (Hymenoptera: Apoidea) of Pennsylvania. *Journal of the Kansas Entomological Society* 83(1): 7–24.
- Hatfield, R., S. Jepsen, R. Thorp, L. Richardson, and S. Colla. 2015.** *Bombus rufocinctus*. The IUCN red list of threatened species 2015: e.T21215145A21215305. Available at <http://dx.doi.org/10.2305/IUCN.UK.2015-2.RLTS.T21215145A21215305.en>. (Last accessed December 2017.)
- Mitchell, T. B. 1962.** Bees of the Eastern United States II. Technical Bulletin (North Carolina Agricultural Experiment Station) 152–557.
- Spears, L. R., C. Looney, H. Ikerd, J. B. Koch, T. L. Griswold, J. P. Strange, and R. Ramirez. 2016.** Pheromone lure and trap color affects bycatch in agricultural landscapes of Utah. *Environmental Entomology* 45: 1009–1016.
- United States Fish and Wildlife Service. 2017.** Rusty patched bumble bee *Bombus affinis* 10 January 2017. Available at <https://www.fws.gov/midwest/endangered/insects/rpbb/factsheetrpbb.html>. (Last accessed December 2017.)
- Williams, P., R. Thorp, L. Richardson, and S. Colla. 2014.** Bumble bees of North America. Princeton University Press; Princeton, New Jersey. 135 p.

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