



(RESEARCH ARTICLE)



New lumbricid records (Oligochaeta: Lumbricidae) in Ontario, Canada while searching for the invasive Asian "jumping worms" (Megascolecidae)

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Abstract

Recent collections have provided seven new county records of terrestrial earthworms in the province of Ontario, Canada. *Allolobophora chlorotica* in one county, *Dendrobaena octaedra* in one county, *Dendrodrilus rubidus* in one county, *Eisenia fetida* in one county, *Lumbricus castaneus* in one county, *Octolasion cyaneum* in one county and *O. tyrtaeum* in one county. These collections were made in an attempt to expand the range of invasive Asian "jumping worms" (Megascolecidae).

Keywords: Oligochaeta; Lumbricidae; Earthworms; Ontario

1. Introduction

The Asian "jumping worms" (Oligochaeta: Megascolecidae) are expanding their range in Canada. The first literature report was from the Ojibway Prairie in Essex County, Ontario [1]. I have been studying them in Canada for over a decade although my first research on these species was in the southeastern United States in the late 1960s [1,2,3]. There have been citizen reports for years claiming they are present in various regions. During some of my lectures this past year, several participants told me they had "jumping worms" in areas where pheretimoids had not been previously recorded. I asked them to bring samples to the presentation from their gardens and/or fields. In some cases, I told them I would come and collect samples when they informed me that adults were present. Since these species overwinter as cocoons, it was necessary to give the juveniles/hatchlings time to mature for reliable identification. Here are the results from several recent collections from areas (counties) where certain species had never been reported.

So far, none of these situations have produced "jumping worms". Photographs and video from several sources have turned out to be lumbricids, which are the normal species found in Ontario. Nevertheless, a number of these collections have yielded new distribution records and range extensions. Many of the reports of pheretimoid earthworms in Ontario should be treated as suspect until actual specimens can be verified by a recognized earthworm taxonomist [24]. Reynolds reported 33 species from Canada, recent collections have added four additional species from Ontario which brings the Canadian earthworm species to 37 (8 native and 29 invasive) [3,4,5,6,7].

2. Material and Methods

The earthworms were dug from compost piles, under debris and stream banks where the property owners claimed they had seen "jumping worms" the previous year. Collection data included location, date, co-ordinates, soil temperature, elevation and collectors. The samples were brought back to the laboratory, preserved and identified to species with the

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age classification. Voucher specimens are deposited in the collections of the New Brunswick Museum, 277 Douglas Avenue, Saint John, New Brunswick, Canada.

3. Results

The results of the recent collections are listed below. New county records are indicated by an asterisk (*). The polynomial x-x-x after the species name indicates the number of juveniles-aclitellate adults-clitellate adults (for an explanation see age classification in Reynolds [4,8]).

3.1. Grey County

Hanover, 261075 Grey Road 28, 44. 06910, - 81.00529, elevation 264 metres asl, farm under debris, digging, stream bank, July 2, 2024, collectors Patti Tufford and John W. Reynolds (Figure 1).

**Allolobophora chlorotica* [9], 0-2-2; *Aporrectodea rosea* [9] 0-1-1; *Aporrectodea turgida* [10] 8-6-4; *Dendrodrilus rubidus* [9] 0-0-2; *Lumbricus rubellus* [11] 14-1-15; *Lumbricus terrestris* [12] 0-1-0; **Octolasion tyrtaeum* [9] 0-0-1.



Figure 1 The locations (●) and one of the habitat photos in Hanover, Grey County, Ontario

3.2. Wellington County

Clifford, 42 James Street East, 43.58495°, -80.58689°, elevation 471 metres asl, farm and part of a nursery, compost piles, July 2, 2024, collectors Vic Palmer and John W. Reynolds (Figure 2).

Aporrectodea tuberculata [14] 0-0-3 tail regenerates; *Aporrectodea turgida* [10] 1-2-8; **Dendrobaena octaedra* [9] 0-0-1; **Eisenia fetida* [9] 21-5-4; **Lumbricus castaneus* [9] 0-0-1; *Lumbricus rubellus* [11] 0-0-4; *Lumbricus terrestris* [12] 0-0-1.



Figure 2 The locations (●) and one of the habitat photos in Clifford, Wellington County, Ontario

3.3. Middlesex Co

Thames Centre, 42.98464 °, -81.05752 °, elevation 1053 metres asl, agricultural field and flower garden, 11 Oct 2023, collector Norma Peel.

Aporrectodea trapezoides [13] 1-1-2; **Octolasion cyaneum* [9] 0-0-1

Middlesex Co., Thamesford, 5356 Cobble Hills Road, 43.07523 °, -81.05344 °, elevation 1000 metres asl, 11 Oct 2023, collector Anne Marie Hollestelle.

Aporrectodea trapezoides [13] 0-0-1; *Dendrodrilus rubidus* [9] 0-0-1; *Lumbricus terrestris* [12] 1-0-2.

Middlesex Co., Thorndale, 21214 Missouri Road, 43.07476 °, -81.14264 °, elevation 1000 metres asl, 11 Oct 2023, collector Shirley Hancon.

Aporrectodea turgida [10] 1-1-2; *Dendrodrilus rubidus* [9] 0-0-1.

3.4. Niagara Region (County),

Grimsby, 20 Glengrove Avenue, 43.19377 °, -79.53013 °, elevation 276 metres, garden, 30 May 2024, collector Donna Allington.

Aporrectodea tuberculata [14] 1-0-0; **Dendrodrilus rubidus* [9] 1-0-0.

Niagara Region, Beamsville, 4182 Mountain Road, 43.16072 °, -79.47760 °, elevation 232 metres asl, compost where *E. fetida* was introduced 20 years ago and vegetable garden adjacent to compost, 30 May 2024, collector Arlene Jordan.

Aporrectodea rosea [9] 0-0-2; *Aporrectodea tuberculata* [14] 1-1-1; **Eisenia fetida* [9] 0-0-1.

4. Discussion

Every couple of weeks I receive photographs and/or specimens sent by people claiming to have invasive Asian "jumping worms." In nearly every case what they have are the introduced European Lumbricidae which are the normal earthworms found throughout Canada [4,6,7]. Nevertheless, these specimens frequently produce new distributional records.

The first survey of earthworms in Ontario was by Reynolds [8] based on 384 collection sites including all but Rainy River and Timiskaming Counties. Subsequently, six collections were obtained from Rainy River County [15]. Several other papers have increased the knowledge of the species distribution in Ontario, Lanark and Victoria Counties [16], Wellington County [17], and Essex County [18].

In Grey County, six earthworm species have been previously recorded: *Aporrectodea rosea*, *A. tuberculata*, *A. turgida*, *Dendrodrilus rubidus*, *Lumbricus rubellus* and *L. terrestris* [1,8]. Collections in this paper have added *Allolobophora chlorotica* and *Octolasion trytaeum* to the Grey County list of recorded earthworm species.

The previous collections from Middlesex County produced the following species: *Allolobophora chlorotica*, *Aporrectodea rosea*, *A. trapezoides*, *A. tuberculata*, *A. turgida*, *Dendrodrilus rubidus*, *Eiseniella tetraedra*, *Lumbricus castaneus*, *L. rubellus* and *L. terrestris* [1,8,19,20,21]. Collections in this paper added *Octolasion cyaneum* to the county records.

In Niagara Region (County), seven earthworm species have been previously recorded: *Allolobophora chlorotica*, *Aporrectodea rosea*, *A. tuberculata*, *A. turgida*, *Eiseniella tetraedra*, *Lumbricus rubellus* and *L. terrestris* [8]. Collections in this paper have added two additional species to the county list: *Dendrodrilus rubidus* and *Eisenia fetida*.

Nine earthworm species have been previously recorded from Wellington County: *Aporrectodea icterica*, *A. rosea*, *A. trapezoides*, *A. tuberculata*, *A. turgida*, *Dendrodrilus rubidus*, *Lumbricus rubellus*, *L. terrestris* and *Octolasion trytaeum* [1,8,17,22,23]. Collections in this paper added three additional species to the county records: *Dendrobaena octaedra*, *Eisenia fetida* and *Lumbricus castaneus*.

5. Conclusion

Many citizen scientists claim to have the invasive Asian "jumping worms" in their gardens, fields or on their property. It is difficult to identify specimens to species from photographs, since external identifying taxonomic characters may be on several aspects of the individual. The final species identification should be left to a scientist who specializes in earthworms, as frequently internal dissection is required for an accurate determination.

Compliance with ethical standards

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Disclosure of conflict of interest

The author declares no conflict of interest.

Data available within the article or its supplementary materials

The author confirms that the data supporting the findings of this study are available within the article [and/or] its supplementary materials, e.g. the collections of the New Brunswick Museum.

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Author's Short Biography

John Warren Reynolds Ph.D., LLB is a semi-retired soil biologist with 55 years of earthworm research experience. The results can be found in over 540 books and journal articles. He specializes in oligochaete taxonomy, nomenclature, ecology and biogeography throughout the world, but primarily in North America.