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The first vouchered milliped records for Prince Edward Island and additional new records from the Maritime Provinces of Canada (Arthropoda: Diplopoda)

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Abstract. Four milliped species, substantiated by preserved voucher samples, are reported from Prince Edward Island, Canada. All are introduced European species that now occur widely in both Canada and the United States, and the panglobal Asian paradoxosomatid, *Oxidus gracilis* (C. L. Koch, 1847), is listed as probable. *Choneiulus palmatus* (Némec, 1895) (Julida: Blaniulidae) is newly recorded from New Brunswick, and four representatives of the Julidae are cited from Nova Scotia. Discovery of *Cylindroiulus punctatus* (Leach, 1815) (Julidae) in this province constitutes the second record from both Canada and North America, the other being in Newfoundland.

Key words. Prince Edward Island, Nova Scotia, New Brunswick, Julida, Polydesmida, *Cylindroiulus*.

Introduction

While the territories – Nunavut, the Yukon, and the Northwest Territories – are uninvestigated and may not even harbor any because of their cold, (sub)arctic locations in the interior of North America, all the Canadian provinces are known to harbor both native and introduced millipeds except Prince Edward Island (PEI) (Jawłowski 1939; Kevan 1983; Shelley 1988, 2002; Hoffman 1999). The introduced European julidan, *Cylindroiulus caeruleocinctus* (Wood, 1864), has been cited from PEI in general (Kevan 1983; Shelley 1988, 2002), and while plausible, there is neither a specific locality nor a voucher sample. Situated in the Gulf of St. Lawrence, ~28.2 km (17.6 mi) across Northumberland Strait from New Brunswick, PEI is expected to contain a depauperate diplopod fauna consisting primarily of introduced species, both because of its detached location and because of the amount of forested land that has been cleared. However, documenting provincial inhabitants with localities and voucher samples, housed in a permanent repository, is still desirable, and we also report new records from Nova Scotia and New Brunswick.

Prince Edward Island is the smallest Canadian province, with a total area of 566,560 hectares (1.4 million acres; 2,195 sq mi); its landscape includes non-arable wet lowlands in the west, gently rolling hills in central and eastern regions, and areas that are relatively flat. At the onset of European settlement in the early 1700s, a pine/hardwood, “Acadian forest” covered around 98% of its surface, but by 1900, only about 30% of the Island remained forested, primarily in southwestern and northeastern areas. Because of emigration in the early 20th century, forests expanded by 1990 to cover about 48% of the surface area, mostly east of Charlottetown and west of Summerside, but by 2000, they were again in decline. The Forest Inventory that year found that the total forested area had fallen to 45% in 2000, largely because of conversions to agriculture and developments in rural areas. As of May 2011, approximately 44.3% (250,986 hectares; 620,000 acres) of PEI was listed as “cleared for agricultural use.” Of the original Acadian forest, perhaps only a few thousand hectares remain, primarily in isolated vestiges in non-arable areas. Efforts are under way to conserve these, the most notable being Royalty

Oaks, a 4.05 hectare (10 acre) protected area on the outskirts of Charlottetown near the Hillsborough River, and MacPhail woods in Orwell (www.gov.pe.ca; www.historicplaces.ca).

Based on known distributions in Canada and northern North America (Shelley 1988, 1990, 2002), three species, one penicillate and two chilognaths, are plausible for PEI. The first, *Polyxenus lagurus* (Linnaeus, 1758), almost certainly is there but because of its minute size is difficult to see with the unaided eye and best recovered from Berlese extracts. The two chilognaths, both in the order Chordeumatida, are *Trichopetalum lunatum* Harger, 1872 (Trichopetalidae), and *Underwoodia iuloides* (Harger, 1872) (Caseyidae); both occur in Newfoundland and Nova Scotia and to some degree enclose PEI. The latter species is large enough to be hand collected, but *T. lunatum* is also minute and retrievable from berlesates. As native North American millipeds inhabit detritus of deciduous forests, naturalists on PEI should search for these species in the few remaining forested remnants.

From 2006-2011, MES sampled millipeds on PEI, primarily in agricultural fields, and accordingly found only European introductions. She also discovered two males, two females, and one juvenile of the pantropical Asian tramp species, *Oxidus gracilis* (C.L. Koch, 1847) (Polydesmida: Paradoxosomatidae), with a tropical plant purchased at a store in Charlottetown in October 2006. These specimens are deposited in the North Carolina State Museum of Natural Sciences, Raleigh, USA (NCSM); this species may have escaped and become established on PEI, but it can only be cited as probable at present. Additionally, she collected three species in Nova Scotia, one of which, *C. punctatus* (Leach, 1815), is the second record from Canada and all of North America. We document these millipeds herein, all being collected by MES unless stated otherwise; diagnostic illustrations are available in Blower (1985). Other repository codens are CMNC, Canadian Museum of Nature, Ottawa, Ontario, Canada; FSCA, Florida State Collection of Arthropods, Division of Plant Industry, Gainesville, FL, USA; and USNM, National Museum of Natural History, Smithsonian Institution, Washington, DC, USA.

Julida: Julidae

Cylindroiulus caeruleocinctus (Wood, 1864)

Localities. *Prince Edward Island.* Harrington, pitfall trap in potato/clover field, M, 3 juvs., 19 May 2006 (NCSM); and in soil in hedgerow, juv., 22 June 2006 (NCSM). Stratford, in field around carrot bait, M, 8 May 2007 (NCSM). Canoe Cove, potato field, juv., 29 May 2007 (NCSM); and in soil in field around carrot bait, F, juv., Spring 2008 (NCSM). Hazelbrook, in carrot bait for wireworms, F, 31 May 2007 (NCSM); and in carrot bait for wireworms, F, 10 June 2008, D. Carragher (NCSM). **First Definite Provincial Records.**

Nova Scotia. Queens Co., Summerville, F, juv., 16 May 2009, M. E. Millard (NCSM).

Cylindroiulus latestriatus (Curtis, 1845)

Localities. *New Brunswick. York Co.,* St. Croix, F, D. Calder (FSCA).

Nova Scotia. Shelburne Co., Lockeport, F, E. L. Bousfield (CMNC).

Cylindroiulus punctatus (Leach, 1815)

Locality. *Nova Scotia. Queens Co.,* Summerville, ~27 F, juvs., large numbers invading home near shore, 16 May 2009, M. E. Millard (NCSM). **New Provincial Record.**

Ophiulus pilosus (Newport, 1843)

Localities. *Prince Edward Island.* Cymbria, climbing on outside of home, 2F, 15 October 2007 (NCSM). **New Provincial Record.**

Nova Scotia. Queens Co., Summerville, F, 16 May 2009, M. E. Millard (NCSM).

Julida: Blaniulidae

Choneuiulus palmatus (Némec, 1895)

Localities. *Prince Edward Island.* Charlottetown, very large numbers in basement of new home in wooded area, 2M, F, 29 April 2011 (NCSM). **New Provincial Record.**

New Brunswick. Fredericton, "emerging from eyes and red spots on potatoes sent to PEI," 2M, F, 12 January 2007, R. Peters (NCSM). **New Provincial Record.**

***Nopoiulus kochii* (Gervais, 1847)**

Locality. *Nova Scotia. Halifax Co.*, Halifax, 4 specimens, 24 February 1947, A. D. Pickett (USNM).

Polydesmida: Polydesmidae

***Polydesmus inconstans* Latzel, 1884**

Locality. *Prince Edward Island*. Stratford, in field around carrot bait, M, 8 May 2007 (NCSM). **New Provincial Record.**

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