



## Freshwater leech (Annelida: Hirudinida) distribution in the Canadian Province of Newfoundland and Labrador and adjacent regions: check-list, new records, new pigmentation forms, and Pleistocene refugia

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### Abstract

The freshwater leeches (Hirudinida) in the Province of Newfoundland and Labrador were investigated by examining the literature, the Canadian Museum of Nature and the United States National Museum of Natural History records, and a leech survey. New pigmentation forms are described for *Erpobdella punctata* (Leidy) and *Erpobdella obscura* (Verrill). This is the first published record for *Haemopis lateromaculata* Mathers in Canada. Four species (*Glossiphonia elegans* (Verrill), *Helobdella modesta* (Verrill), *Erpobdella punctata*, and *Erpobdella obscura*) were found in both Labrador and Newfoundland with *Erpobdella obscura* common in Labrador and the other three species common in Newfoundland. Seven other species of leeches were less abundant in Newfoundland with 6 of these species very restricted in distribution. The abundance of leech species in Newfoundland and the paucity of leech species in Labrador suggested that the island species were present in a Pleistocene refugium associated with Newfoundland or the Grand Banks. Post-Pleistocene barriers to leech mobility are examined, and possible timing of colonization events is proposed in this model.

**Key words:** Annelida, Leeches, Hirudinida, Glossiphoniidae, Haemopidae, Hirudinidae, Erpobdellidae, Newfoundland, Labrador, pigmentation patterns, Pleistocene refugia, new record

### Introduction

The geographical distribution of fauna and flora on islands has been of fundamental interest in biology. In addition, islands affected by the Pleistocene glaciers provide opportunities to understand colonization under rapidly changing environments. Pertinent to understanding eastern Canadian freshwater fauna in postglacial environments are studies by Dadswell (1974), Schmidt (1986) and Underhill (1986). Island leech (Hirudinida) fauna were noted by Moore (1922) for Île de la Madeleine (2 species), Gates and Moore (1970) for Sable Island (3 species), Richardson (1943) for Prince Edward Island (8 species), Davies (1979) for Île d'Anticosti (4 species), and Pawlowski (1948) for St-Pierre and Miquelon (2 species). The largest of the islands in eastern Canada is Newfoundland (Newfoundland Island) where 8 species of leeches were noted (Pawlowski 1948, Davies 1973, 1979).

Several leech studies addressed the problems of colonization of the islands. Davies (1979) suggested a passive route by sea currents for Île d'Anticosti colonization. Blanchard (1896) and Richardson (1943) suggested birds as vectors for 5 of the species, as well as 3 species (Haemopidae and Erpobdellidae) colonizing the island by transportation on debris. Since these papers were published, events including sea-level changes (Fairbanks 1989, Peltier 2002), glacial forebulge (Hetherington *et al.* 2003), and the timing of recessional stages since the Last Glacial Maximum (LGM) about 18000–20000 radiocarbon years before present, taken as