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The ground beetles (Coleoptera: Carabidae) of the Maritime Provinces of Canada: review of collecting, new records, and observations on composition, zoogeography, and historical origins

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Abstract

The Carabidae of Nova Scotia and New Brunswick are surveyed. The collecting history of the family in the region is reviewed. New records of 20 species are reported, 6 from New Brunswick and 15 from Nova Scotia. Six species are newly recorded in the Maritime Provinces (New Brunswick, Nova Scotia, and Prince Edward Island) as a whole. Six species are removed from the faunal list of Nova Scotia and one from the faunal list of New Brunswick. Consequently, 282 species of Carabidae are now known from Nova Scotia, 273 species from New Brunswick, and 329 from the Maritime Provinces as a whole. A new and earlier timeline (1942) is reported for the introduced Palearctic carabid, *Bembidion properans* (Stephens), in North America. The status of *Stenolophus carbo* Bousquet in the region is reviewed and its presence in Nova Scotia is considered doubtful. The historical origins of the Maritime fauna are discussed based on studies of post-glacial Coleoptera. These indicate at least three colonization phases, some elements of which are still apparent in the contemporary fauna. Elements of the native Nova Scotia fauna not found in New Brunswick (26 species), may represent colonization from New England across post-glacial land bridges and island chains. Elements of the native fauna found in New Brunswick and not Nova Scotia (31 species), may represent species that have reached the eastward limit of their distribution for climatic or environmental reasons; or that have found the Northumberland Strait and/or the isthmus of Chignecto an obstacle to geographical dispersal; or represent widely distributed boreal species (6 species) that should be sought in Nova Scotia. Eighteen species of Nova Scotia carabids have been recorded only from Cape Breton Island, two of which are known in Atlantic Canada solely from there. Although Cape Breton is separated from the mainland by the 1.5 km wide Strait of Canso, the number of flightless, native carabids present is proportionally greater than that in Nova Scotia overall, or the Maritime Provinces as a whole. Despite differences in land mass and distance to the neighbouring mainland, the faunas of Cape Breton, Prince Edward Island, and insular Newfoundland, exhibit similarities in size and composition, although Newfoundland's fauna has twice the proportion of Holarctic species. Cape Breton's carabid fauna is diminished compared to the neighbouring mainland, having only 57% of the native species. This may represent an island-associated diminution, the paucity of collecting, or a combination of both, although in comparison with other groups of Coleoptera the Carabidae appear relatively well represented. Within Atlantic Canada, New Brunswick has the lowest proportion (8.8%) of introduced carabids and the highest proportion (83.2%) of native, Nearctic species. Given the potential utility of carabids as bioindicators, and the wide range of disturbance to which the environment of the Maritime Provinces has been subjected, further research on this diverse group of beetles would be desirable.

Key words: Coleoptera, Adephaga, Carabidae, New Brunswick, Nova Scotia, Maritime Provinces, Canada, biodiversity, biogeography

Introduction

The family Carabidae (ground beetles) represents a species-rich lineage of Coleoptera second only to the Staphylinidae (rove beetles) in terms of their representation in Atlantic Canada. Investigators commencing with W. Kirby (1837) have reported them from the region, and many carabid specialists including C.H. Lindroth, A. Larochelle, H. Goulet, and Y. Bousquet have contributed to an understanding of the region's fauna. Although Lindroth (1963a) analyzed the composition, zoogeography, and origins of the Newfoundland Carabidae in great detail, the fauna of the Maritime Provinces (New Brunswick, Nova Scotia, and Prince Edward Island) has not been subject to the same scrutiny. In that spirit, the intent of the present paper is to take a step in that direction, adding new species records and contributing insights toward an understanding of the composition, zoogeography, and origins of the region's carabid fauna. In this paper, new records are reported from New Brunswick and Nova Scotia. (Majka et al. in press) have similarly treated the fauna of Prince Edward