Late-glacial Coleoptera and the paleoclimate at Hirtles, Nova Scotia

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Paleoentomological studies of Coleoptera from a late-glacial site at Hirtles, Nova Scotia, Canada, produced a tundra-treeline to northern boreal assemblage during the interval 12,300 to 11,700 years B.P. This is one of the oldest late-glacial buried organic deposits in the Maritime Provinces of Canada and provides fossil beetle evidence for recently deglaciated environments in the region. Bark beetles indicate the presence of trees, perhaps as early as 11,900 years B.P. A comparison can be made with contemporaneous sites in central and eastern North America where coleopteran evidence suggests warmer temperatures. Coleoptera fossils demonstrate evidence of a climatic gradient from the Great Lakes to eastern Canada during this time interval possibly greater than occurs today.

INTRODUCTION

Over the past decade a number of papers have discussed the late-glacial environment of Atlantic Canada, especially in relation to the Younger Dryas event. Mott et al. (1986a), Stea and Mott (1989), Mott and Stea (1993) and Mott (1994) summarized information gathered from a number of buried organic sites in Nova Scotia and provided stratigraphic interpretation, radiocarbon chronology and pollen records that have been used to piece together a picture of late-glacial environments from about 14,000 to 10,000 years B.P. Two field guides provide additional detail (Stea and Mott, 1990; Stea et al., 1992a) and much of the information has been compiled in map format (Stea et al., 1992b). The work has resulted in a detailed analysis of deglaciated environments and evidence for active glaciers of Younger Dryas age in Nova Scotia.

Many of the buried organic sites, especially those detailed by Stea and Mott (1989) and Mott and Stea (1993), are suitable for paleoentomological analysis and have been shown to contain beetle assemblages (Mott et al., 1986b; Miller, 1989; Stea and Mott, 1990; Miller and Morgan, 1991). This paper discusses the Coleoptera fauna from Hirtles on the coast of southern Nova Scotia (Fig. 1), a late-glacial site dated from 12,300 to 11,700 years B.P.

SITE DESCRIPTION

The Hirtles site is located on the south shore of Nova Scotia west of Halifax, at 44°16'00"N; 64°15'50"W. The section consists of 15 cm of peat overlying 10 cm of silty peat which in turn overlies 15 cm of organic bearing silt (Fig. 1). Three radiocarbon dates are available for this site (Mott and Stea, 1993). A twig from the basal clay yielded an AMS date of 12,270 ± 90 years B.P. (TO-3628). Two bulk samples date the organic unit at 12,300 ± 150 years B.P. (GSC-5247) at the base and 11,700 ± 110 years B.P. (GSC-5248) at the top.

METHODS

Samples of peat and organic-rich sediment totalling 190 kg were taken in thicknesses of 5 cm (Fig. 1) following standard techniques for the study of Quaternary beetle fossils (Elias, 1994). Sample size varied depending on sediment and accessibility. All samples were submitted to standard paleoentomological analysis using a kerosene floatation technique to isolate chitinous fragments (Elias, 1994). Untreated samples and processed residues were retained for other possible analyses. Identified Coleoptera specimens were mounted on micropaleontology slides or stored in alcohol and were cata-