constant compartment. The utility of AMS to study the transport of aluminum in plants has been demonstrated. The sensitivity of the technique allows standard plant cell experimental manipulation techniques to be applied to agriculturally relevant cultivars. This allows a direct understanding of aluminum toxicity in agriculture at a cellular level.

REFERENCES


1Physics Department, University of British Columbia, Vancouver, British Columbia, Canada
2Botany Department, University British Columbia, Vancouver, British Columbia, Canada
3Triumf, Vancouver, British Columbia, V6T 2A3 Canada
4Department of Biochemistry, Simon Fraser University, Burnaby, British Columbia, Canada
5Racah Institute of Physics, Hebrew University, Jerusalem, Israel 91904

RADIO CARBON AMS DATING OF THE THERMOPHILOUS MOLLUSC SHELLS FROM PETER THE GREAT GULF COAST, RUSSIAN FAR EAST

GLENN A. JONES,1 YAROSLAV V. KUZMIN2 and VLADIMIR A. RAKOV3

We have studied the 14C age of thermophilous molluscs (*i.e.*, species that were not found alive in the area since the 1930s, but occur now ca. 500 km southward) in Peter the Great Gulf, northwestern Sea of Japan. The 14C AMS dating of individual shells of three thermophiles, *Andara subcrenata* (Lischke), *A. inaequivalvis* (Bruguère) and *Meretrix lusoria* (Röding), based on 1994 fieldwork around Vladivostok and the Posiet Bay. The shell samples were collected from both coastal outcrops and shell middens of the Early Neolithic Boisman culture. The *Yoldia johanni* individual shell collected alive in the Wrangel Inlet in 1932 (submitted for dating by K. A. Lutaenko 1994) gave the range 505 ± 30 BP (OS-3024). This value is the reservoir correction for the area and should be applied to all the ages shown here.

The results of 14C dating may be subdivided into three groups in terms of age. The first and largest group contains 14C dates corresponding to the Holocene Climatic Optimum. There are all the dates made on *Meretrix lusoria* shells: Vostok Bay (submitted by G. A. Evseev 1994), 6460 ± 50 BP (OS-3032); Boisman 1, 5690 ± 45 BP (OS-3030); Boisman 2, 6070 ± 35 BP (OS-3031), and 6140 ± 40 BP (OS-3033). The majority of both *Andara subcrenata* and *A. inaequivalvis* samples also have similar ages: Talmi Lagoon core, 4760 ± 30 BP (OS 2319) and 4770 ± 30 BP (OS-2320); Talmi Lagoon section, 5320 ± 45 BP (OS-3020); Troitsa Inlet, 6280 ± 35 BP (OS-3029), and 7010 ± 55 BP (OS-3021). The second group (shells of *A. inaequivalvis*) corresponds to Subboreal and Early Subatlantic periods: Amur Bay, 2750 ± 35 BP (OS-3023); Usuri Bay, 1760 ± 45 BP (OS-3022). The third group is represented by only one date (*A. inaequivalvis*) and may be considered as modern (ca. 100 14C yr old due to reservoir correction of ca. 500 yr): Amur Bay, 690 ± 25 BP (OS-3025).

The first results of 14C AMS dating of thermophiles on Peter the Great Coast show that *A. inaequivalvis* does not appear to be restricted to the mid-Holocene; rather, the dates obtained seem to suggest that it may still be alive in the area. Previously, the results of conventional 14C dating gave only mid-Holocene dates (see review in Lutaenko 1993).