



Antarctic oases—sources of palaeoclimate information

I.N. Sokratova (1), S.R. Verkulich (1), M. Melles (2)

(1) Arctic & Antarctic Research Institute, Russia; (2) Cologne University, Germany
(sokratova@aari.nw.ru)

In addition to ice cores, containing rows of data on global climate change in Pleistocene, the Antarctic oases' lakes' and epishelf water reservoirs' bottom sediments also present uninterrupted, rather correct and often chronologically determinable paleoclimatic information from the beginning of deglaciation of these areas. The regions of Russian investigations are Bunger, Shirmacher and Larsemann Hills oases. Together with German colleagues more than 50 columns of bottom sediments from 23 local lakes and epishelf water reservoirs were collected. Their granulometric, geochemical, isotopic and diatoms analyses together with carbon dating were made. Palaeoclimatic data from Banger oasis allowed determination of the pattern of climate conditions change in this region during whole the Holocene. Relatively warm conditions existing in here from the late Pleistocene–Holocene boundary up to 7.5 Ka help to active deglaciation of this territory. Long and extensive cooling is noted for the time interval between 7.5–4.5 Ka. It was alternated by new warming period with its maximum 3 Ka, the latter finished by abrupt and short (several hundred years) cooling period about 2 Ka. Comparison with palaeoclimate interpretation based on data from Westfoll, Dry Valleys, and King George, Livingston and James Ross islands, provides some similarities: Relatively cold climate conditions in middle Holocene up to 4 Ka, considerable warming between 4 and 2.5 Ka, cooling 2 Ka. However, climatic signals in bottom sediments deposited in last 1.5 Ky are contradictory. This can be result of an effect of local specific of environment on signatures of global climate tendencies. On the other hand the observed climate signal can be distorted by inaccuracies of carbon dating. The obtained results suggest importance of detailed information on environmental change in Antarctic oases, which can allow improving of the overall pattern of the principal similarities and local differences of the climate conditions in Holocene in the Antarctic coastal zone. The study depends on support of the RFBR grant 07-05-00367.