



## **Late Glacial palaeoenvironments at Hijkermeer (The Netherlands) reconstructed using fossil chironomids, pollen, and diatoms**

O. Heiri (1), **A.F. Lotter (1)**, W.M. Peeters (1), S. Engels (1,2), W.Z. Hoek (3) and H. Cremer (1)

(1) Dept. Palaeoecology, Utrecht University, Budapestlaan 4, 3584 CD Utrecht, The Netherlands; (2) Dept. of Quaternary Geology and Geomorphology, Vrije Universiteit Amsterdam, De Boelelaan 1085, 1081 HV Amsterdam, The Netherlands; (3) Dept. of Physical Geography, Utrecht University, Heidelberglaan 2, 3508 TC Utrecht, The Netherlands

Hijkermeer is a small, ca. 1.6 m deep lake in Drenthe, The Netherlands. In Spring 2003, a 13.5 m long sediment sequence reaching back to the Late Glacial period was cored in the lake center. Fossil chironomids, pollen, and diatoms were analyzed to reconstruct palaeoenvironmental changes in and around Hijkermeer during the late glacial period (ca. 14,700-11,500 BP). Pollen assemblages in the Hijkermeer sediments show a good agreement with other published late-glacial pollen records from the Netherlands and allow a first age assessment of the sequence. Sediments with low organic matter content were deposited in Hijkermeer before the Allerød (i.e. before ca. 13,900 cal. BP) and during the Younger Dryas (ca. 12,650-11,500 cal. BP), whereas the organic content is distinctly higher in the Allerød (ca. 13,900-12,650 cal. BP) and Holocene (after ca. 11,500 cal. BP) sequences. Diatom assemblages in the organic-rich sediments are dominated by a number of benthic species such as *Cymbella sile-siaca*, *Pinnularia interrupta* and *Tabellaria flocculosa*. No diatoms were found in the pre-Allerød and Younger Dryas sediments, possibly due to dissolution of the frustules. Chironomid assemblages featured a high proportion of temperate/lowland taxa such as *Pseudochironomus*, *Tanytarsus pallidicornis*-type and *Dicrotendipes* during most of the Bølling/Allerød interstadial and the early Holocene. During the Younger Dryas stadial, many of these warm-adapted taxa disappeared and chironomids typical of alpine and subalpine environments such as *Protonypus*, *Heterotrissocladius grimshawi*-type, and *Stictochironomus* colonized Hijkermeer. The Older Dryas (ca.

14,050-13,900 cal. BP) sediments are characterized by a minor increase in *Microtendipes* and *Tanytarsus lugens*-type in the record, two taxa with a temperate/subalpine and a subalpine/alpine distribution, respectively. A chironomid-July air temperature transfer-function applied to the Hijkermeer chironomid record reconstructs increasing July air temperatures between 14 and 16°C before the Older Dryas, temperatures of ca. 16-16.5°C for most of the Allerød, temperatures of 13-14°C during the Younger Dryas and again warmer temperatures of 15.5-16°C during the earliest Holocene. Furthermore, two centennial-scale temperature decreases of ca. 1.5-2°C are reconstructed during the Bølling/Allerød interstadial, which, based on the preliminary dating of the record, show a good chronological agreement with the Aegelsee and Gerzensee Oscillations described from Central Europe.