FURTHER STUDIES ON THE DIATOM FLORA OF LAKE AKIMOTO

RICHARD W. JORDAN & KAZUNORI KOMATSU

DEPARTMENT OF EARTH & ENVIRONMENTAL SCIENCES FACULTY OF SCIENCE, YAMAGATA UNIVERSITY, YAMAGATA, 990 JAPAN

In a previous study of the larger lakes on the Urabandai Plateau, cores were taken from the deepest parts of each lake in order to get a good recovery of lake sediment (Shiono 1997). From the results it was shown that the upper part of these cores were dominated by planktonic diatoms, with only a small portion at the base of each core dominated by attached, benthic and soil diatoms. The presence of these latter diatoms was interpreted as being indicative of a time when the newly developed lake was much shallower (attached and benthic diatoms) or a time, prior to the eruption of Mt. Bandai and the formation of the lakes, when the area was agricultural land (soil diatoms). The exception to this was one core from Lake Onogawa in which attached diatoms were numerous throughout the core. It has been suggested that the presence of submerged standing trees in this part of the lake may have provided a substratum for the diatoms to attach to.

In order to show that shallow waters exhibit a different diatom community structure than deeper ones, a series of new cores were taken in July 1996 around Lake Akimoto from water depths ranging from 20 metres to less than 1 metre (see Figure 1). The results (see Figure 2) show conclusively that shallow waters do indeed have a flora dominated by attached (e.g. *Cymbella minuta* var. *silesiaca*) and benthic diatoms (e.g. *N. constans* var. *symmetrica*), particularly in the case of Point C (<1 metre in water depth), which appears to be strongly affected by inflowing rivers at the eastern end of the lake. Point H (2m in water depth) is at the mouth of a small channel and is not associated with any major inflowing waters. Unlike Point C, this core is dominated by planktonic diatoms which either reflects the more stagnant conditions in this inlet or perhaps the horizontal transport of planktonic diatoms from more central parts of the lake.The cores (Point F and that of Shiono, 1997) from the deeper waters are typically dominated by planktonic species (e.g. *Cyclotella radiosa, Asterionella* spp. and *Aulacoseira lirata* var. *alpigena*), and show evidence of species succession with more *A. lirata* var. *alpigena* near the base of the core, and *Asterionella* spp. and *Diatoma tenue* var. *elongatum* near the top, and with *C. radiosa* clearly dominating the middle portion. Point B exhibits a mixture of planktonic and attached

diatoms, and so represents a sort of transition between the communities of the shallow and middle parts of the lake.

From our studies so far we have shown that there is a difference in the core assemblages from shallow and deep waters, and that at the bottom of the cores taken from deep waters there is evidence that the lakes were once much shallower than at present. In the future it is hoped that we may address three further points:

1) Is the present soil diatom community the same as the one at the base of certain cores ? i.e. Are we seeing the true pre-lake community ?
2) Are the standing trees in Lake Onogawa really providing a substratum for attached diatoms as we have suggested ?
3) Are the downcore changes in diatom community, as seen by Shiono (1997), 'events' which can be related to changes in past environmental conditions ? And if so, when did they occur and why ?

References

Komatsu, K. (1998). *Diatom paleoecology of Lake Akimoto, Fukushima Prefecture*. Unpublished Undergraduate Thesis, Faculty of Science, Yamagata University, Yamagata, Japan. 40pp.

Shiono, M. (1997). *Analysis of eutrophic processes in the Urabandai lakes using fossil diatom assemblages*. Unpublished Masters Thesis. Faculty of Science, Yamagata University. 157pp + 54pp. [in Japanese]

Figure 1: Map of Lake Akimoto showing the positions of the coring stations

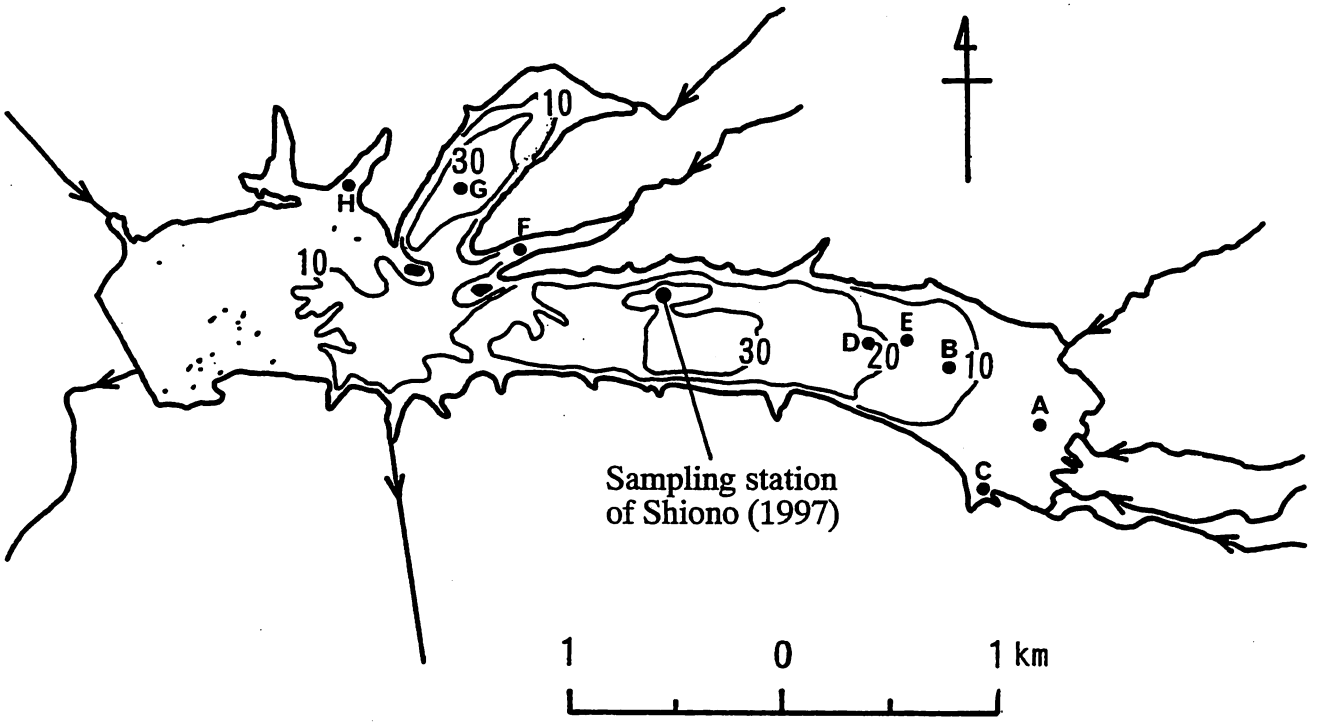


Table 1: Core information

Core name		Water depth (m)	Core description
This report	Komatsu (1998)		
A		3	silty
B	Point 3	10	lower part: coarse sand to clay upper part: medium sand to clay
C	Point 4	< 1	coarse sand to clay, occasionally with small pebbles
D		20	clayey
E		15	silt to clay
F	Point 2	20	silt to clay
G		20	silt to clay
H	Point 1	2	lower part: coarse sand to clay upper part: silt to clay
core site of Shiono (1997)	Point 5	30	lower part: silt to clay with some medium sand upper part: coarse sand to clay

Figure 2: Downcore relative abundances of key diatom species

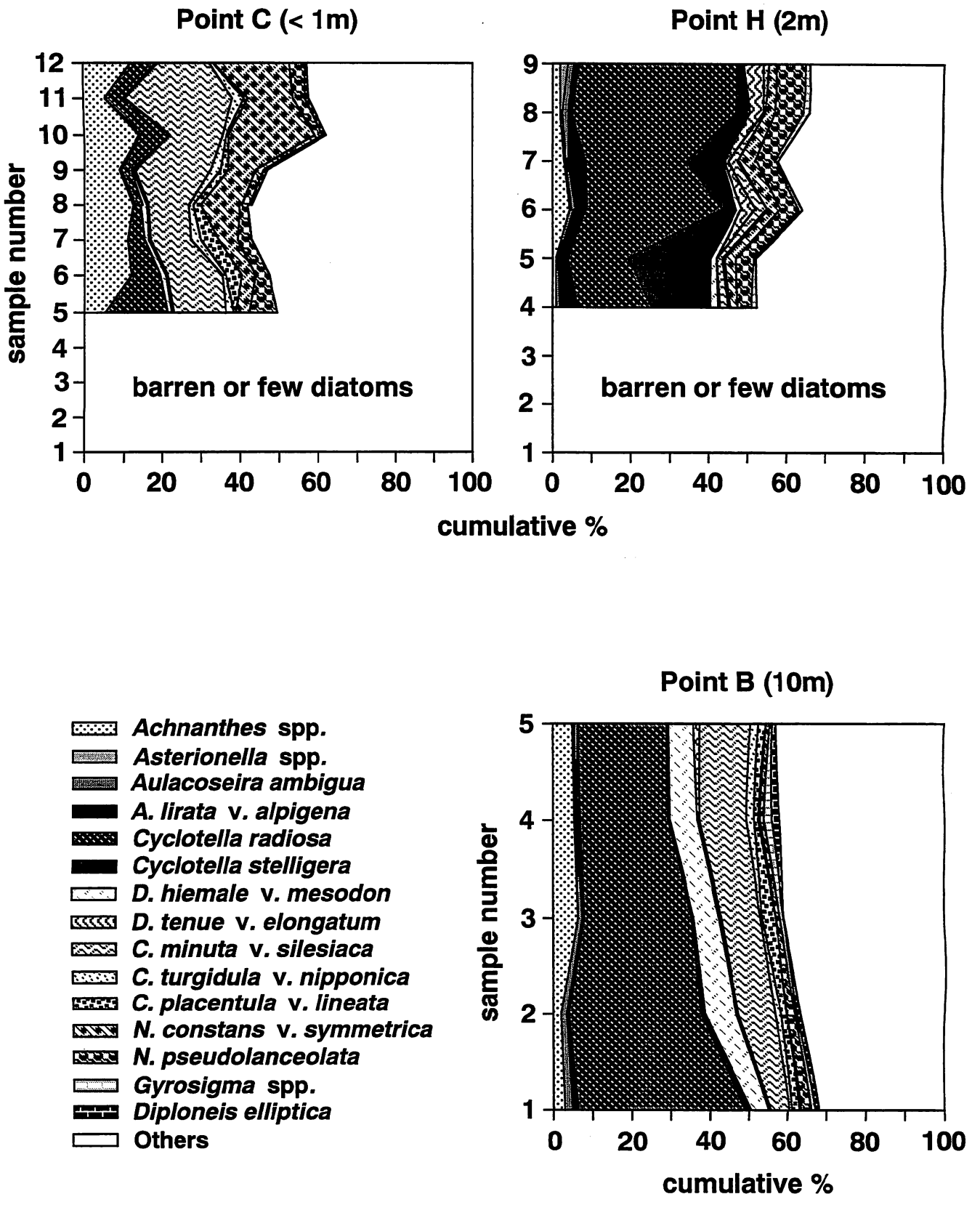
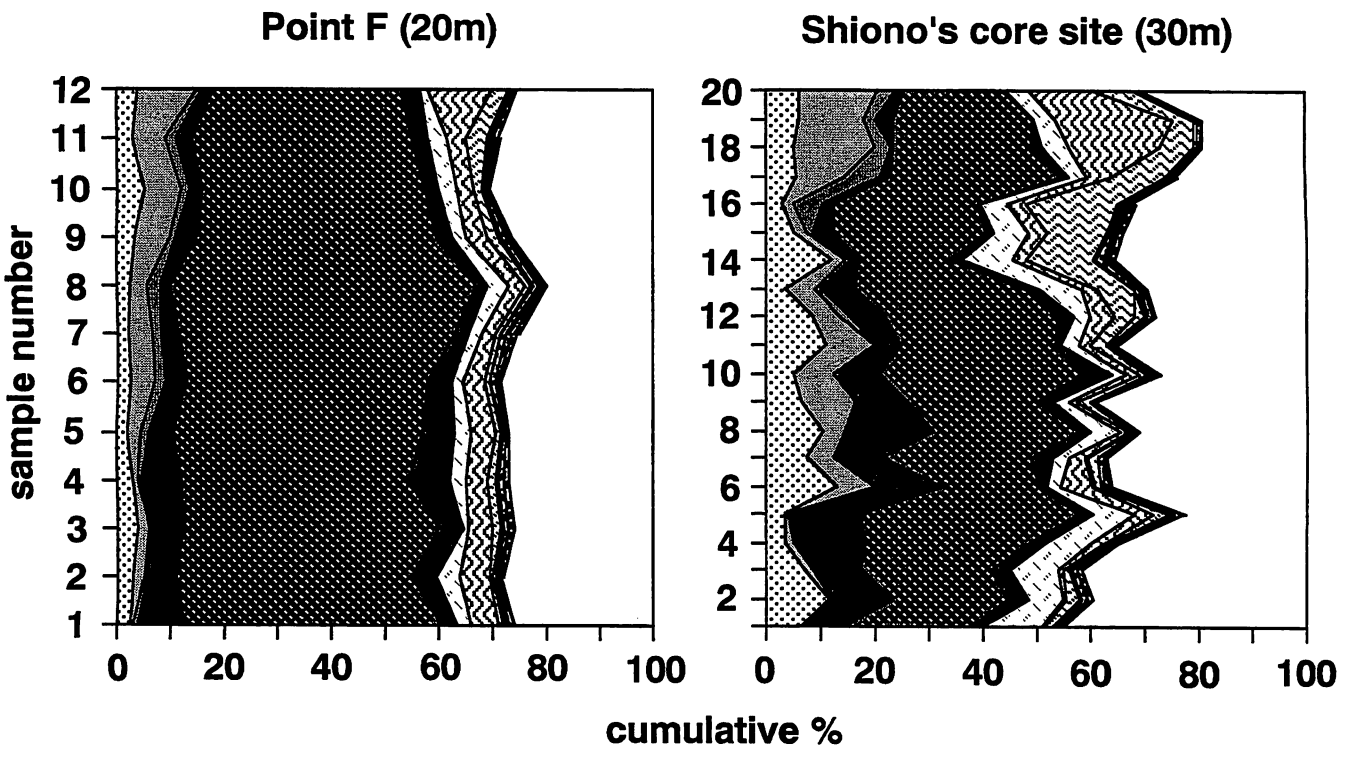


Figure 2: continued



3. 研 究 実 績

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問い合わせ先
名前：原　慶明
住所：990-0807　山形市小白川町1-4-12　山形大学理学部生物学科
電話：023-628-4610
FAX　：023-628-4625
e-mail:hara@sci.kj.yamagata-u.ac.jp