

New fossil diatoms from Ontario. II. *Achnanthes duthii* sp. nov., *Achnanthes undulatus* sp. nov., and *Neidium distincte-punctatum* Hustedt var. *major* var. nov.\*

M. R. SREENIVASA

Department of Biology, University of Waterloo, Waterloo, Ontario, Canada.

Accepted December 14, 1970

Three new taxa of diatoms, *Achnanthes duthii* sp. nov., *Achnanthes undulatus* sp. nov., and *Neidium distincte-punctatum* Hustedt var. *major* var. nov., are described from a sediment core obtained from Sunfish Lake, Waterloo County, Ontario.

Phycologia, 10(1): 79-82 (1971)

**Introduction**

Sunfish Lake, Waterloo County, Ontario is a small meromictic lake of 8.3 ha in area and a maximum depth of 20 m. Its limnology has been described by Duthie and Carter (1970). The surface waters are moderately alkaline with about 125 mg/l CaCO<sub>3</sub> and a pH of about 8.5. Because of the pronounced concavity of the lake basin, the littoral region is very narrow but dense patches of *Chara* spp. occur in places.

A sediment core of nearly 5 m in length was obtained for paleolimnological investigation. Over 300 taxa of diatoms have been identified from the core (Sreenivasa, 1970) and three taxa, described herein, proved to be new to science. *Achnanthes duthii* sp. nov. and *Achnanthes undulatus* sp. nov. occurred in low numbers in samples between 30 cm and 70 cm from the top of the core. *Neidium distincte-punctatum* Hustedt var. *major* var. nov. occurred in large numbers at a depth of 320 cm in the core. None of the new taxa have been found in recent collections. Paleolimnology, diatom sequence of the core, and its interpretation is in preparation.

***Achnanthes duthii* sp. nov.**

Valva elliptico-lanceolata vel lineari-lanceolata; extremis abtuse-rotundatis. Rapho-valva: area exiali plane lanceolata, raphe tenui, extremis proximalibus leviter dilatatis et extremis distalibus unilateraliter flectis. Valva sine raphe: pseudo-raphae anguste lineari-

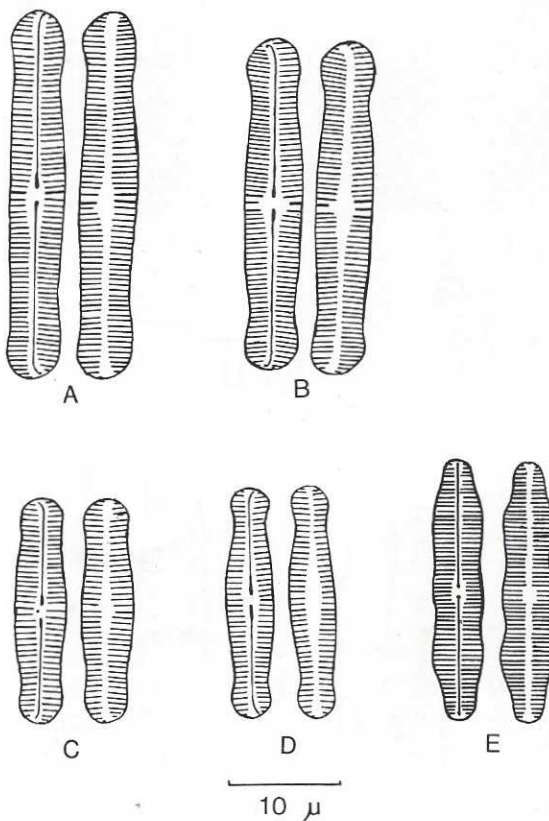


FIG. 1. A-D, *Achnanthes duthii* sp. nov. E, *Achnanthes undulatus* sp. nov.

\* From Ph.D. thesis, University of Waterloo, Waterloo, Ontario, 1970.



lanceolata; area centrali leviter dilatata et extrimis distalibus unilateraliter flectis. Longitudo 20–33  $\mu$ ; latitudo 4.4–5  $\mu$ . Striis 20–24/10  $\mu$ , leviter radialibus vel parallelis, leviter latioribus et longius distantibus ad centrum quam alibi (Fig. 1 A–D; Fig. 2 A–C). Our slide number SFL 5. HOLOTYPE: accession number CANA 8408, National Museum of Canada, Ottawa. LOCALITY: Waterloo; Sunfish Lake. COLLECTORS: H. R. N. Eydt and H. C. Duthie, 1967.

Valve elliptical lanceolate to linear lanceolate, ends obtusely rounded. Raphe valve: axial area of raphe valve distinctly lanceolate, raphe

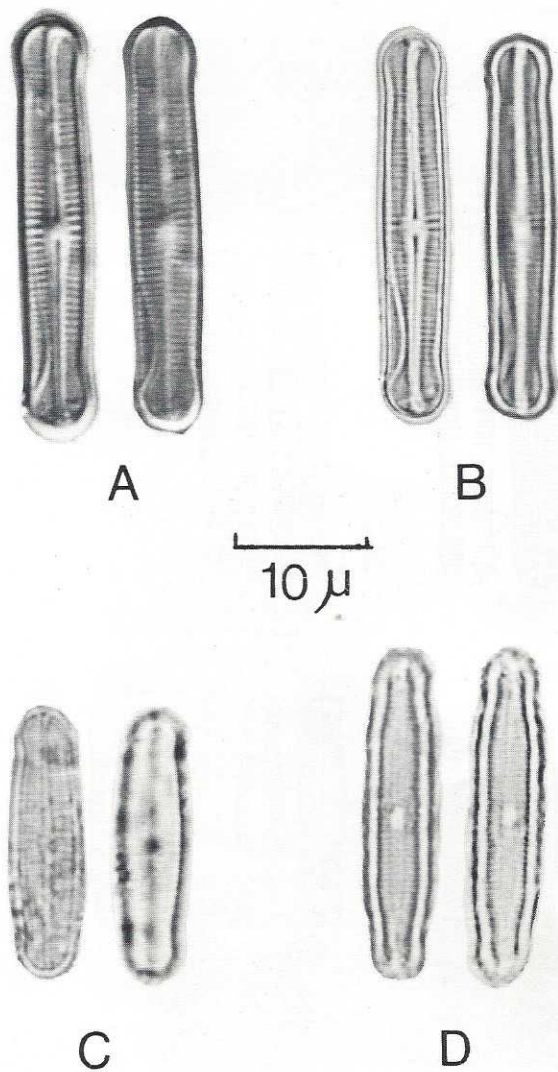


FIG. 2. A–C, *Achnanthes duthii* sp. nov. D, *Achnanthes undulatus* sp. nov.

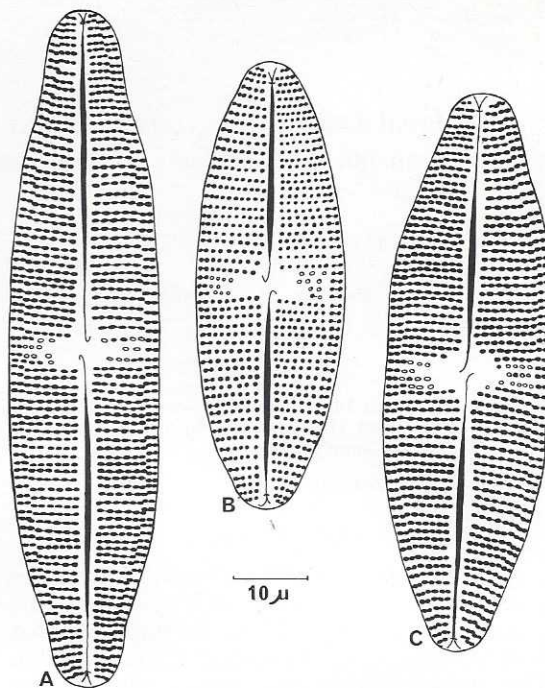


FIG. 3. A–C, *Neidium distincte-punctatum* Hustedt var. *major* var. nov.

thin, proximal ends slightly enlarged, distal ends unilaterally bent. Rapheless valve: pseudo raphe narrowly linear lanceolate slightly widened at the central area and unilaterally bent at the distal ends. Length 20–33  $\mu$ , width 4.4–5  $\mu$ , striae 20–24/10  $\mu$ . Striae slightly radial to parallel; slightly broader and farther apart at the center than elsewhere.

This taxon resembles *Achnanthes nollii* (Bock, *Nachr. Naturw. Mus. Aschaffenburg*, 38: 54–56, pl. 5, fig. 7–9, 1953); it differs in that the axial area is more lanceolate rather than linear and the terminal raphe pores are unilaterally bent rather than straight. This taxon is slightly larger in size and the striae are far fewer in number than in *A. nollii* (see Patrick, R. and Reimer, C. W., 1966, p. 253, pl. 16, fig. 7–8).

This taxon is very similar to *Achnanthes lata* Hust. in general appearance, but differs from it in its slightly larger size; in the number of striae, which are far less; the median striae are thicker and far apart; and in the absence of irregular longitudinal lines crossing the striae.

**Achnanthes**

Valva linearis-...  
apicibus pro...  
paratis a valva...  
centrali longitud...  
proximalibus ext...  
tis. Valva sine...  
centrali longitud...  
leviter lato. Lon...  
23–25/10  $\mu$ , plus...  
(Fig. 1 E, 2 D).  
accession number...  
Canada, Ottawa.  
COLLECTORS: H.

Valve linear...  
late sides. End...  
trate set off fro...  
area linear, c...  
tangular. Raph...  
ly bulbous, d...  
valve: axial an...  
longitudinally...  
broad. Length...  
23–25/10  $\mu$ , m...  
in both the valv...

This taxon d...  
arity with any...  
*Achnanthes*...  
sp. nov. occur...  
from the top o...  
zone C<sub>3</sub> of the...  
(*Fagus*). Domi...  
are *Cyclotella*...  
*Stephanodiscus*...  
assemblages at...  
be alkaline and

**Neidium**

Valvae elliptica...  
rostratis, obtuse...  
leviter decrecenti...  
Extremis proxim...  
praebentibus unc...  
rapho-axe. Area...  
proximalia et d...  
bifurcatis et tes...  
transverse ellipt...  
leviter radialibus...  
vergentibus 9–11...  
63–90  $\mu$ , latitud...  
Our slide number...  
ber CANA 8408...  
tawa. LOCALITY...  
TORS: H. R. N. E.

Valves ellipti...  
ly rounded sub...  
slightly oblique



***Achnanthes undulatus* sp. nov.**

Valva linearis-lanceolata, lateribus leviter triundulatis; apicibus protractis, subrostratis vel rostratis disparatis a valva. Rapho-valva: area axiali lineari, area centrali longitudinaliter rectangulari, raphe tenui, proximalibus extremis leviter bulbosis, distalibus rectis. Valva sine raphe: area axiali lineari, recta: area centrali longitudinaliter rectangulari, et extremo distali leviter lato. Longitudo 23.5  $\mu$ , latitudo 4.4  $\mu$ , striis 23–25/10  $\mu$ , plus minusve parallelis in utraque valva (Fig. 1 E, 2 D). Our slide number SFL 3. HOLOTYPE: accession number CANA 8409, National Museum of Canada, Ottawa. LOCALITY: Waterloo; Sunfish Lake. COLLECTORS: H. R. N. Eydtt and H. C. Duthie, 1967.

Valve linear lanceolate with slightly triundulate sides. Ends protracted, subrostrate to rostrate set off from the valve. Raphe valve: axial area linear, central area longitudinally rectangular. Raphe fine with proximal ends slightly bulbous, distal ends straight. Rapheless valve: axial area linear straight, central area longitudinally rectangular, distal ends slightly broad. Length 23.5  $\mu$ , breadth 4.4  $\mu$ , striae 23–25/10  $\mu$ , more or less parallel throughout in both the valves.

This taxon does not seem to have any similarity with any species described.

*Achnanthes duthii* sp. nov. and *A. undulatus* sp. nov. occurred between 30 cm and 70 cm from the top of the core, which is related to zone C<sub>3</sub> of the pollen sequence (*Tsuga* and *Fagus*). Dominant species associated with them are *Cyclotella glomerata*, *C. kutzingiana*, and *Stephanodiscus hantzschii*. From the overall assemblages at these levels the water seems to be alkaline and mesotrophic to eutrophic.

***Neidium distincte-punctatum* Hust. var. major var. nov.**

Valvae elliptico-lanceolatae, extremis subrostratis vel rostratis, obtuse rotundatis. Raphe leviter obliqua, leviter decrecenti prope extrema distalia et proximalia. Extremis proximalibus diverse cruvis, nonnunquam praebentibus uncos proximales in raphibus, tenuiores rapho-axe. Area axiali leviter angustiore ad extrema proximalia et distalia. Distalibus extremis raphis bifurcatis et tenuioribus axe raphis. Area centrali transverse elliptica vel paene quadrangulata. Striis leviter radialibus et ad extremitates parallelis vel convergentibus 9–11/10  $\mu$ ; puncta 12–14/10  $\mu$ , longitudo 63–90  $\mu$ , latitudo 19–24  $\mu$  (Fig. 3 A–C, Fig. 4). Our slide number SFL 32. HOLOTYPE: accession number CANA 8410, National Museum of Canada, Ottawa. LOCALITY: Waterloo; Sunfish Lake. COLLECTORS: H. R. N. Eydtt and H. C. Duthie, 1967.

Valves elliptical lanceolate with broad, bluntly rounded subrostrate to rostrate ends. Raphe slightly oblique, narrowing slightly near the

distal and proximal ends. Proximal ends curved in opposite direction, some show proximal raphe hooks; these are thinner than the raphe axis. Distal raphe ends diforcate, also thinner than raphe axis. Axial area slightly narrower at the distal and proximal ends, central area transversely elliptical to nearly quadrangular. Striae slightly radial becoming parallel to convergent at the very ends. Length, 63–90  $\mu$ , width 14–24  $\mu$ , striae 9–11/10  $\mu$ , puncta 12–14/10  $\mu$ .

This taxon is closely related to *Neidium distincte-punctatum* Hustedt, but is larger and the valve ends are boarder. Hustedt gives length, 40–45  $\mu$ , width 16  $\mu$ , striae 11/12–10  $\mu$  (Hustedt, 1930, p. 247, fig. 386).

The illustration of *Neidium distincte-punctatum* Hustedt in Stoermer (1963) reveals a length of 60  $\mu$ , width 18  $\mu$ , striae 12/10  $\mu$ .

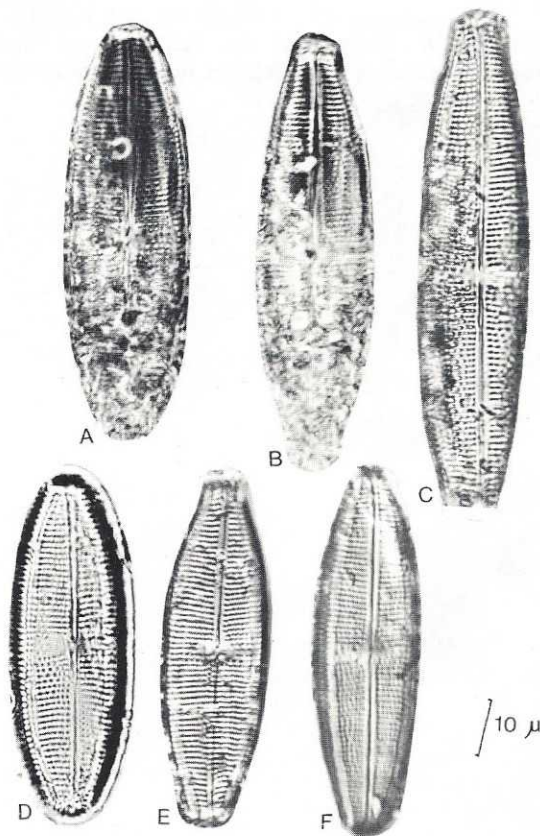


FIG. 4. A–F, *Neidium distincte-punctatum* Hustedt var. major var. nov.

