

Type Examination of *Synedra delicatissima* W.Sm. and Its Occurrence in Japan

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Abstract A holotype specimen of *Synedra delicatissima* W.Sm. housed in the Dr. Henri van Heurck Museum, Antwerp (AWH) was examined using scanning electron microscopes (SEMs) and a light microscope (LM). Our observations are consistent with the original descriptions given by Smith (1853) and Patrick & Reimer (1966). Japanese specimens from Lake Kizaki (Nagano Prefecture) and a pond in Tsukuba were belonging to this taxon.

Key words: *Synedra delicatissima*, holotype, Lake Kizaki.

Introduction

Two morphological types of *Synedra delicatissima* W.Sm. have been discussed by Patrick & Reimer (1966) and Krammer & Lange-Bertalot (1991). Patrick & Reimer (1966) present an original drawing of their proposed lectotype, based on an isotype slide (BM22475) housed in the Natural History Museum, London (BM). Krammer & Lange-Bertalot (1991) examined an isotype specimen and present a photograph of this taxon. Since this photograph is quite different from the drawing presented by Patrick & Reimer (1966), there has been a certain amount of confusion on the taxonomy of *Synedra delicatissima* W.Sm.

Materials and Methods

The following materials were examined in the present study.

1. A raw material numbered Pg74 #1 in the W. Smith collection sampled from Lough Neagh by Dr. Dickie in 1850 and housed in the Dr. Henri van Heurck Museum, Antwerp (AWH) (holotype),

2. A lectotype slide (BM22475) housed in

BM,

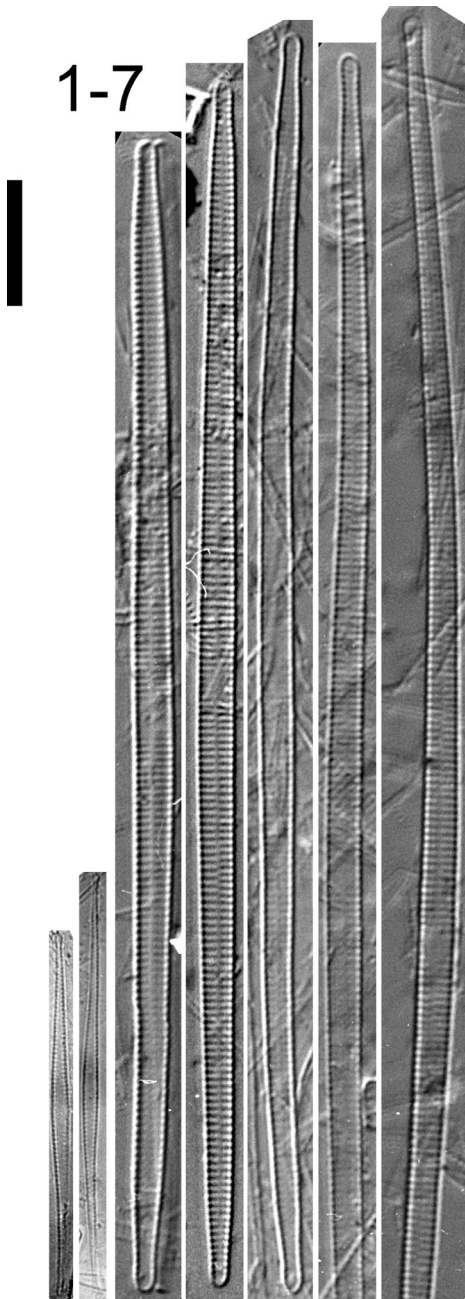
3. A raw material sampled from Lake Kizaki (Nagano Prefecture) by A. Houki on April 5, 2000 (TNS-AL-54215) housed in TNS (Department of Botany, National Science Museum, Tokyo), and

4. A raw specimen sampled from a pond in Cyuo-Koen, Tsukuba by M. Watanabe on July 11, 2004 (TNS-AL-55500 in TNS).

Results and Discussion

Two *Synedra* taxa were observed by light microscopy (LM) on the lectotype slide (BM22475), the first of which is 30–60 μm long and shows 14–17 striae per 10 μm (Figs 1–2). This taxon was dominant in the specimen, and is consistent with the description and photograph provided by Krammer & Lange-Bertalot (1991). The second taxon observed on the lectotype slide has long frustules (150–250 μm) and a coarse density of striae (10–11 striae per 10 μm) (Figs 3–7). This species, though not dominant, is nevertheless common on the slide and is consistent with the description and drawings presented by Patrick & Reimer (1986).

Smith (1853) was the first to describe *S. deli-*



Figs. 1–7. Specimens from a lectotype slide of *Synedra delicatissima*. BM22475. Bar = 10 μm . 1–2. *Synedra* sp. (*Synedra delicatissima* sensu Krammer & Lange-Bertalot (1991)). 3–7. *Synedra delicatissima* W.Sm.

catissima, and includes a description of the density of the striae (striae 28 in .001": about 11 striae per 10 μm) and length (.0048" to .0092": about 120–230 μm). This description and the figures presented by Smith (1853) are more consistent with the description and a figure in Patrick & Reimer (1986) than with those in Krammer & Lange-Bertalot (1991).

These two *Synedra* taxa were also observed by scanning electron microscopy (SEM) in the holotype specimen (Figs 8–15). *S. delicatissima* has two large rimoportulae, one at each end of the frustule (Figs 12–13, 15). A closed band with punctum is also seen in Fig. 14. Another taxon, *S. delicatissima* sensu Krammer & Lange-Bertalot (1991), shows one rimoportula per frustule and should belong to the genus *Fragilaria* (Figs 8–11).

The specimens from Lake Kizaki (Figs 16–21) and from a pond in Tsukuba were identified as *S. delicatissima*. *S. delicatissima* is expected to exist in many Japanese lakes and ponds (Tanaka 2002).

***Synedra delicatissima* W.Sm.**, Synops. Brit. Diat. 72. pl. XII. f. 94. 1853. (Figs 12–21)

Holotype: Pg74 #1 in the W. Smith collection in AWH. (Figs 12–15)

Type locality: North Ireland, Lough Neagh, Antrim.

Lectotype: BM22475 in BM designated by Patrick & Reimer (1986). (Plate 5, Fig. 2 in Patrick & Reimer 1986; Figs 3–7).

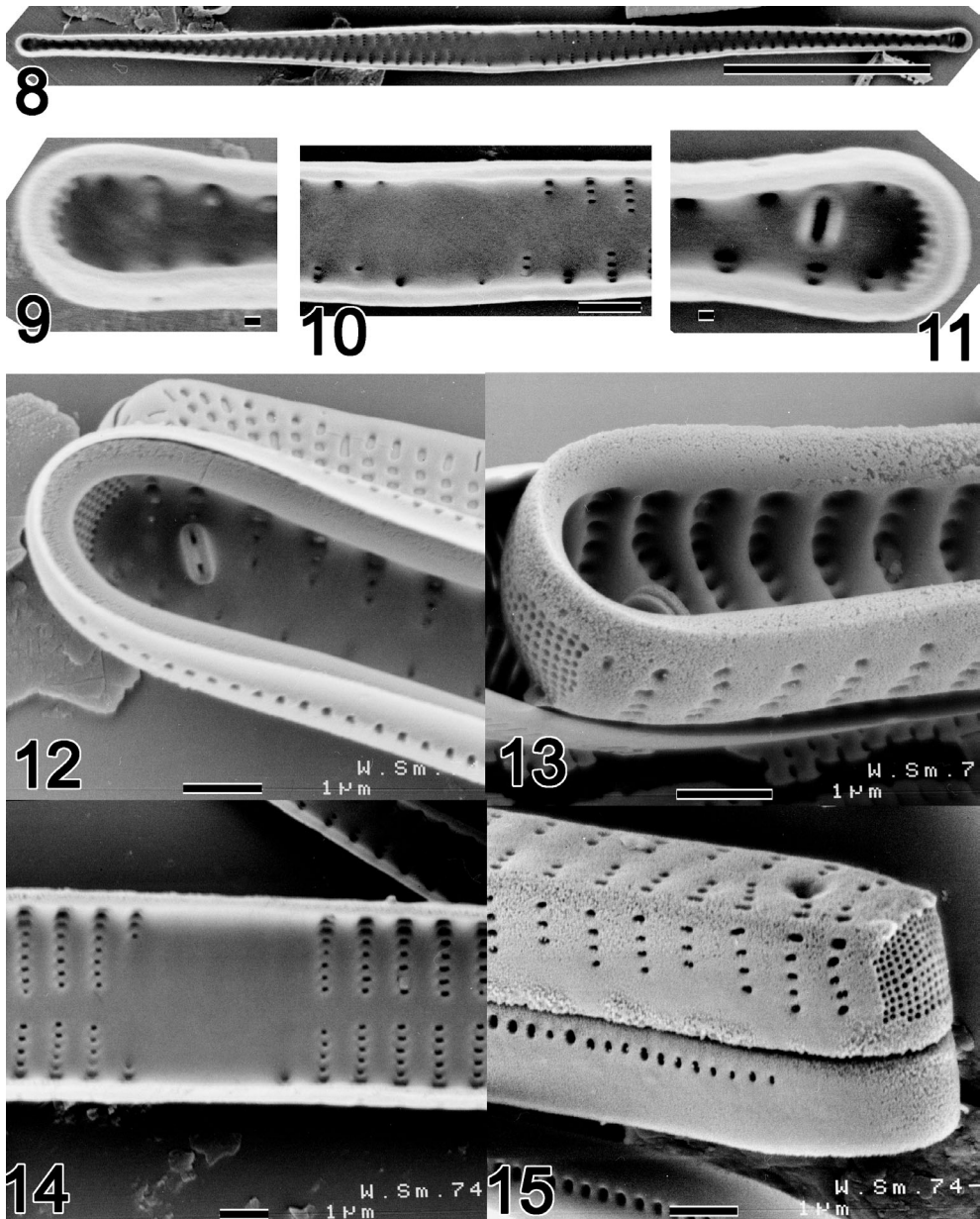
Synonym: *Fragilaria delicatissima* (W.Sm.) Lange-Bert., Nov. Hedw. 33: 746. 1980.

non: *Fragilaria delicatissima* (W.Sm.) Lange-Bert. sensu Krammer & Lange-Bertalot, Bacill. 2/3. pl. 115. f. 13. 1991.

Hab.: Lake Kizaki, Nagano Prefecture (TNS-AL-54215), a pond in Cyuo-Koen, Tsukuba, Ibaragi (TNS-AL-55500).

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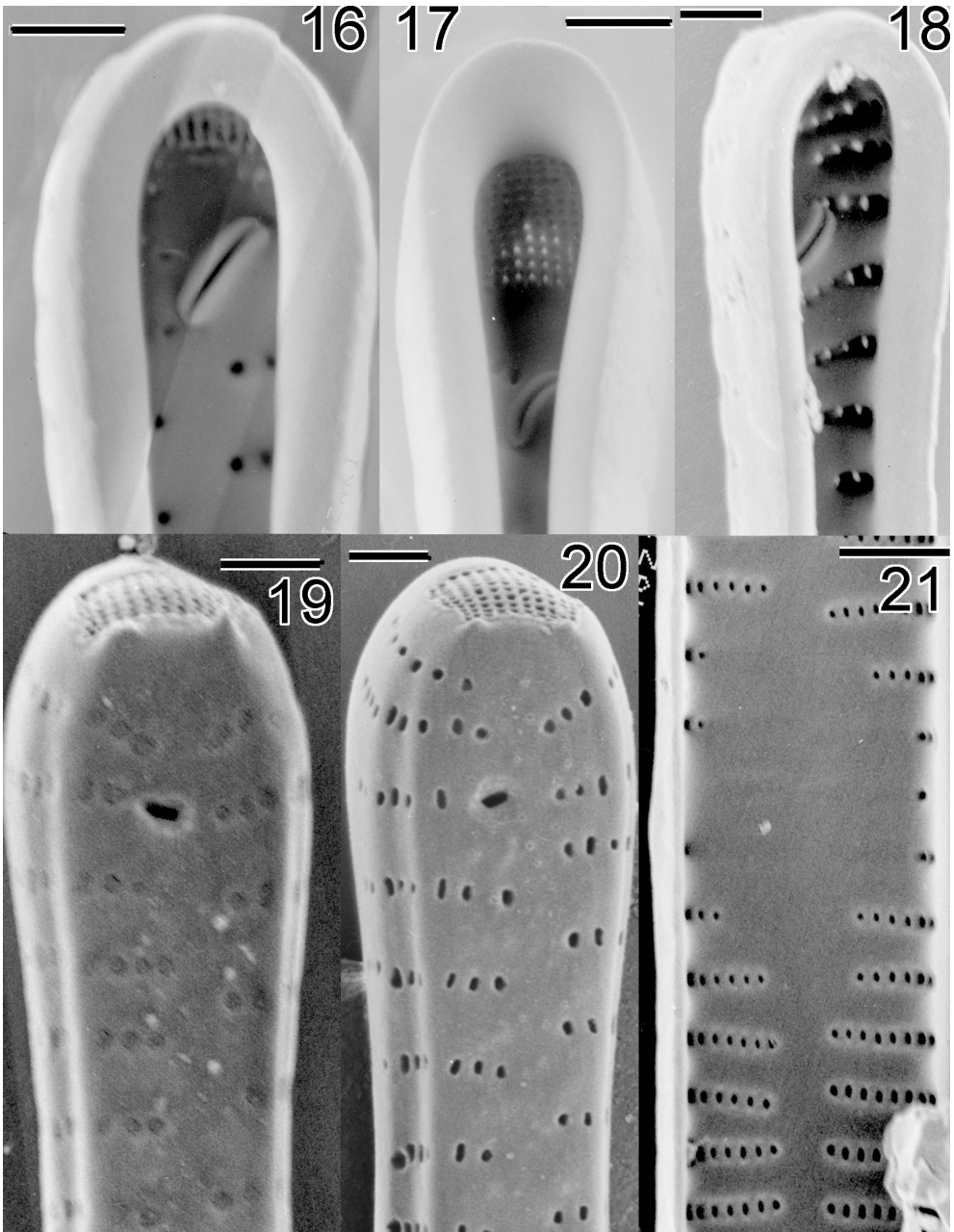


Figs. 8–15. Specimens from a holotype raw material of *Synedra delicatissima*. Pg74#1 in the W.Smith collection. 8–11. *Synedra* sp. (*Synedra delicatissima* sensu Krammer & Lange-Bertalot (1991)). 8. Bar=10 μm . 9, 11. Bar=0.1 μm . 10. Bar=1 μm . 12–15. *Synedra delicatissima* W.Sm. Bar=1 μm .

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Figs. 16–21. *Synedra delicatissima* W.Sm. A specimen from Lake Kizaki (Nagano Prefecture). TNS-AL-54215. Bar=1 μ m.

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