Semiconical Covers in Valves of *Navicula teneroides* HUSTEDT

Hideaki TAKANO

*Navicula teneroides* HUSTEDT の棚殻内面の半円錐形の被覆
高野秀昭

**Abstract**

Cells of *Navicula teneroides* HUSTEDT were cultivated in Petri dishes for some months. Some valves were carrying semiconical membranous covers at one or both poles of the valve interior. The shadow of the cover was vaguely seen by transmission electron microscope. The cover was clearly seen by scanning electron microscope. The existence of those covers may be peculiar to this diatom at present. Some type-specimens of it mounted by HUSTEDT himself offer similar shadows in the light microscopic photographs.

**Key index words**

benthic diatom, *Navicula teneroides*, internal semiconical covers, shadows of the covers, siliceous membrane.

A bottle of seawater with muddy particles was taken on the tidal flat near the entrance of the Yahagi-furukawa River in Atsumi Bay, Aichi Prefecture, Japan, in the autumn of 1984, for the purpose of raising some benthic diatoms in culture solution. By keeping some of them in Petri dishes for several weeks, the author obtained a mass of a small naviculoid diatom prominently growing. This small *Navicula* formed short straight belt-shaped chains on the bottom of the dishes. The cells of them were fixed with glutaraldehyde, washed with pure water, and decomposed with sulfuric acid and oxalic acid. Those valves washed in water were observed by transmission electron microscope (TEM) and scanning electron microscope (SEM). This experiment was performed in February and March, 1985, at the Tokai Regional Fisheries Research Laboratory in Tokyo. (The name of the laboratory has been changed since April 1989: the National Research Institute of Fisheries Science of the Fishery Agency.)

**Dimension of valves**

The small naviculoid diatom was identified with *Navicula teneroides* HUSTEDT. According to the description by HUSTEDT (1956 and 1962), valves of this diatom are 9-12 μm long and 4.5 μm wide, with transapical striae ca. 24 in 10 μm. By the present author’s measurement with the TEM negative films, valves are 11.5-14.0 μm long and 6.0-6.5 μm wide. The transapical striae near the margin are 17-20 in 10 μm, which are slightly coarser than the HUSTEDT’s description. However, the composition of the valve face is quite similar to *N. teneroides* with a row of areolae on both sides of the axial area and two rows each of areolae are there out of the lyra-shaped thickening.

**Semiconical Covers in Valves**

The colonies of *N. teneroides* grown in Petri dishes were straight belt-shaped (Fig. 1). Dark shadows were often found in TEM-micrographs at the pole and the valve centre (Fig. 2). Although anything making the shadow on valve centre was never seen in SEM-images, the semiconical triangular
covers lying at a pole or both poles were clearly seen in SEM-images (Figs. 3-6). The thin membranous covers may be siliceous. They cover the terminal ends of the lyra-shaped thickenings with the rows of areolae along the axial area. Those covers were constructed in some valves at one pole or both poles. Therefore, we can suppose that many covers may be removed during acidizing and washing the valves with pure water, or otherwise, only the older valves possibly carry the membranous covers. However, there is no evidence for those supposition at present.

Shadow of Covers in Type-specimens

The recent publication completed by Simonen (1987) indirectly allows us to know something at home about the specimens collected by Hustedt. Among the nine valves of *N. teneroides* shown in the 'Catalogue,' pl. 654, figs. (photographs) 1-9, the figs. 5 and 6 are evidently carrying the shadow of membranous covers at the poles.

As those semiconical covers are essentially different from 'septum' and 'pseudoseptum' so far known inside of valves of some diatoms, it may be better to name it 'membranous cover' as described in this article.

References


要約

1984年秋に、瀬戸内海の矢作古川河口の近くの干潟の海水を持ち帰り、培養液を加えてペットリ皿に入れておいたら、その中に真円な帯状の群体をつくる1種が増殖し、これをNavicula teneroides Hustedtと同定した。藻殻の内面をSEMで見ると、1極または両極に、薄膜状で半円球形の被覆をもったものが多くあった。このような被覆について、これまで記述された例は無いようである。極部にある被覆の形状は、TEMのフィルムでもその部分が黒ずんでいるので認めることができる。また、光学顕微鏡でも感覚できるように、Hustedtの基準標本写真集（Simonens, 1987）のplate 654, figs. 1-9の写真のうち、figs. 5と6の2つの藻殻の両極にこの被覆膜の形が明らかに認められる。この被覆膜はやはり珪酸質であろうが、これまで知られた藻殻内面の隔壁や偽隔壁とは異なった薄膜状のものである。

Hideaki TAKANO : 1798-35 Sakasai, Kashiwa-shi, Chiba-ken, 277 Japan. 高野秀昭 : 千葉県柏市逆井1798-35 〒277
Fig. 1. Colony of *Navicula teneroides* (SEM).  Fig. 2. A valve (TEM).
Figs. 3-6. Valves interior (SEM). Some valves carry the membranous cover at the poles.