

Examination of Type Material for *Aulacoseira pfaffiana* (Bacillariophyceae) with Special Reference to the Position of Its Rimoportula

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Abstract Syntype material of *Melosira pfaffiana* Reinsch (= *Aulacoseira pfaffiana* (Reinsch) Krammer) was examined using LM and SEM. The pseudoseptum is very shallow and a rimoporula is easily observed from outside using either LM or SEM. Only one rimoportula exists, located near the sulcus. This taxon was dominant at Hana-no-ego and Ko-hana-no-ego moor in Yaku-shima island, Japan, which is very rare in Japanese high moor.

Key words: rimoportula, *Melosira pfaffiana*, Rabenhorst

Introduction

Melosira pfaffiana Reinsch was described in Rabenhorst's exsiccata set (no. 1912: Rabenhorst 1866 in 1861–1878), which included three figures and a description. Reinsch (1867) also provided a description for this taxon. The description and figures provided by Reinsch (1867) differ slightly from those in Rabenhorst no. 1912, but the locality is the same and hence the material may be the same. The date on the title page of the journal for Reinsch (1867) is given as 1866 but the 'Vorwort' is dated November 1866 so it is unlikely that it was published in that year. The publication date should be 1867.

Krammer (1991) and Krammer in Krammer & Lange-Bertalot (1991) examined these exsiccata specimens and provided LM and SEM photographs for of this taxon. Krammer (1991) also proposed the new combination *Aulacoseira pfaffiana* (Reinsch) Krammer for *Melosira pfaffiana*.

For the identification of *Aulacoseira* species, the morphological characters of the rimoportulae, such as its position relative to the sulcus, number, and form, are very useful (Likhoshway and Crawford 2001, Tuji & Houki 2004). Since Krammer (1991) and Krammer in Krammer &

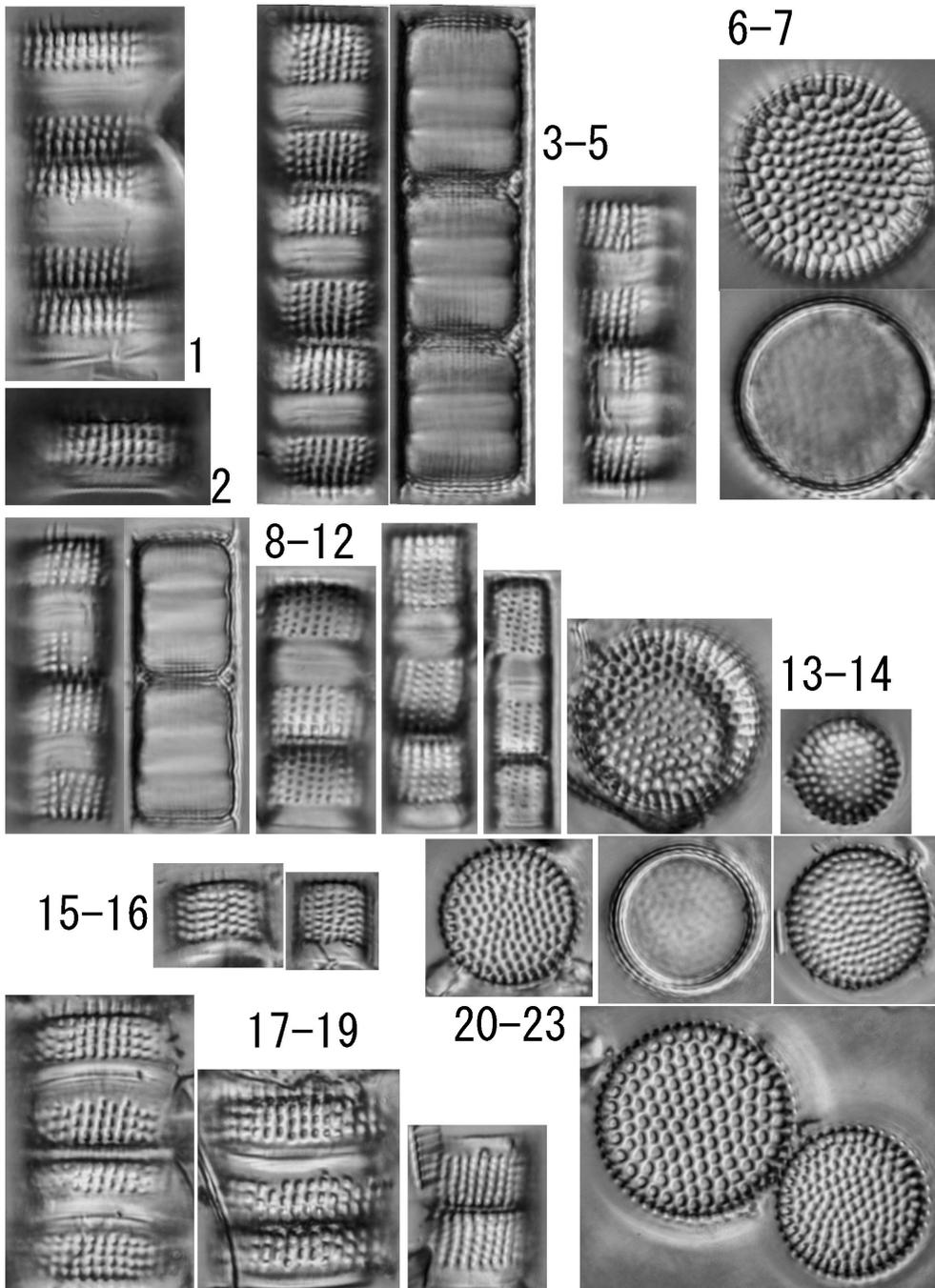
Lange-Bertalot (1991) did not provide observations on the rimoportulae, this is undertaken in this study.

Material from Yakushima island was also examined.

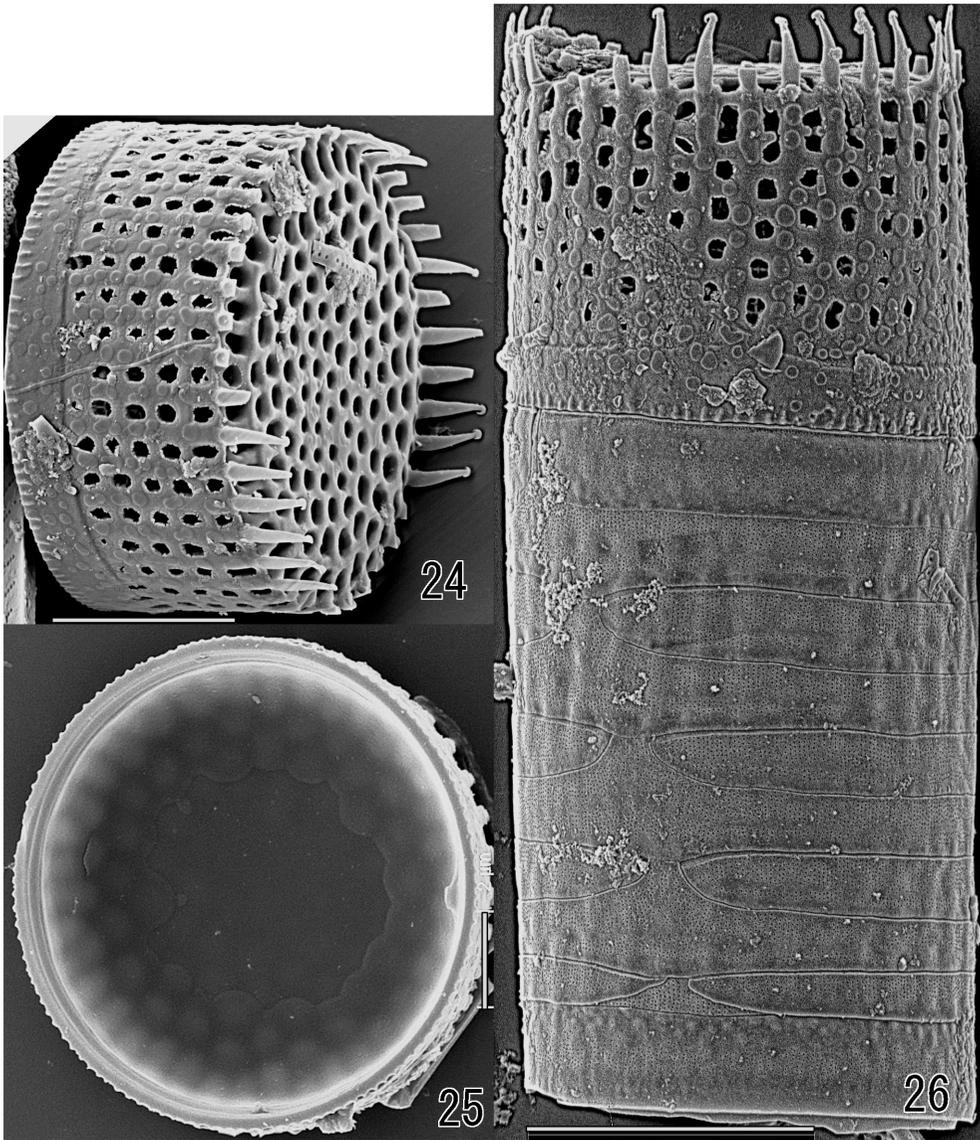
Materials and Methods

Reinsch description of *M. pfaffiana* appeared on the label for packet no. 1912 of Rabenhorst's *Die Algen Europas* (Rabenhorst, 1861–1878). Decas 189–190, which includes packet no. 1912, was published in 1866 (Kociolek 2004). Along with the description, the locality is given as "In per sylvis ductis fossis sempiternae humidis sylvae Sebaldianae (Reinsforst) infra 'Kalkreuth' in Franconia", dated "25. Sept. 1864". The packet contains dried material and three figures.

We also examined the following Japanese specimens for this taxon. The sampling stations Hana-no-ego and Ko-hana-no-ego moor at Yakushima Island, which exists in the southern part of Japan, both being the most southeast high moor in Japan. The samples (TNS-AL-55454–55458 in TNS) were collected on the 8th December 2003 by A. Tuji. Conductivity at the sampling area was 22–26 $\mu\text{S}/\text{cm}$ and pH was 4.2–4.7



Figs. 1–23. *Aulacoseira pfaiana* (Reinsch) Krammer. 1–14. *Die Algen Europas*. No. 1912. (Syntype). 1–7. DIC. 8–14. LM. 15–23. Yakushima Island, Japan. DIC.



Figs. 24–26. *Aulacoseira pfaffiana* (Reinsch) Krammer. 24–26. *Die Algen Europas*. No. 1912. (Syntype). SEM. 24. Frustule with areolae and spines. 25. Frustule with shallow pseudoseptum and rimoportula. 26. Frustule and band morphology.

Results and Discussion

The specimens had frustules 4–15 μm in width and 4–8 μm in depth. On the valves, the mantle striae occur in straight rows, parallel or slightly oblique to the perivalvar axis, 12–15 str./10 μm with 16–18 puncta/10 μm (Figs. 1–23). The pseudoseptum is very shallow, not visible under LM

(Figs. 7, 21). The colla (the area without puncta) is developed, the ratio of colla height/mantle height is 0.2–0.5 (Figs. 1–5, 8–12, 15–19). The valve face is areolated, similar to that of *Aulacoseira distans* (Ehrenb.) Simonsen. The central part of the valve face areolae are circled, those on the edge of valve face elongated (Figs. 6–7, 13–14, 20–23). These two forms of areolae are

illustrated on the original figure in Reinsch in Rabenhorst (1861–1873) and Reinsch (1867); it is a very important character for the identification of this taxon. Spines exist on each costa of valve-mantle junction (Figs. 24, 26, 27, 30, 32). The tip of each spine has an anchor like form (Figs. 24, 26, 32). Only one rimoportula occurs near the pseudoseptum (Fig. 28). Since the pseudoseptum is very shallow, the rimoportulae can be easily observed using LM (Figs. 7, 21) and SEM (Figs. 25, 27, 30, 31).

The specimens from Yakushima Island have the same diagnostic characters as *A. pfaffiana* described above. This taxon was dominant in the sampling stations. Its dominance is very rare in Japanese high moors. The high moors in Yakushima Island are in the southeast of Japan, and may affect the diatom flora.

Aulacoseira pfaffiana (Reinsch) Krammer
Nova Hedwigia 52: 94. 1991.

Basionym: *Melosira pfaffiana* Reinsch in Rabenh. Die Algen Europa's exsiccatae. No. 1912. 1866.

Synonym: *Melosira pfaffiana* Reinsch Abh. Senckenberg. Naturf. Ges. 6: 137, pl. XX:C:III; Algenfl. Franken: 11, pl. I. fig. II. 1867 (1866).

Type locality: Franconia: near Erlangen, Germany.

Syntype (exsiccata): no. 1912 in W!, BM.

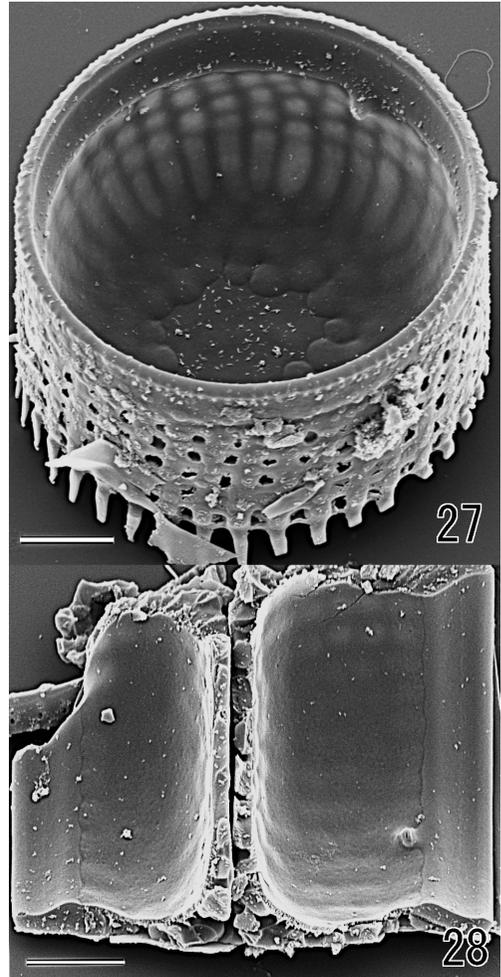
Isosyntype slide: W!, BM!, TNS! from a syntype in W.

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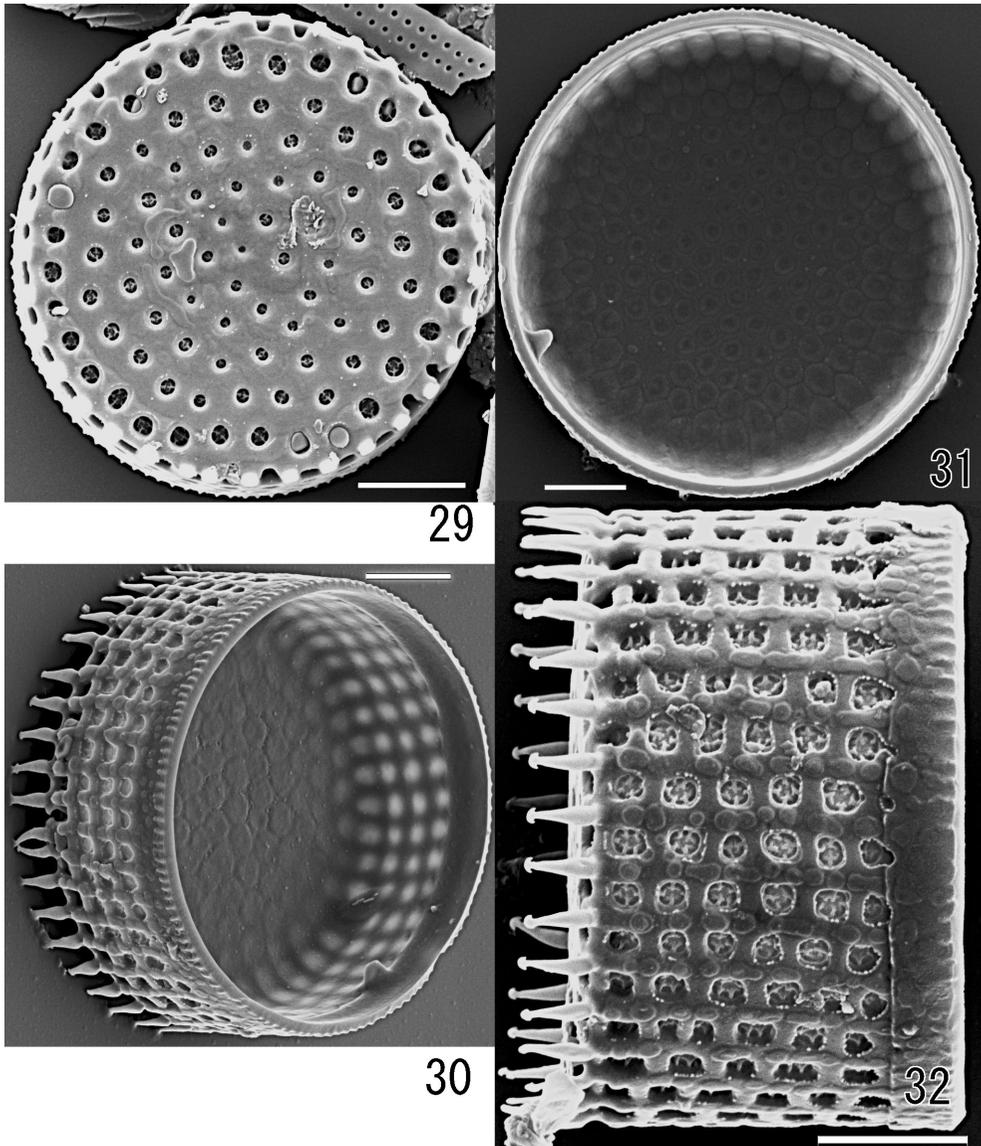
Figs. 27–28. *Aulacoseira pfaffiana* (Reinsch) Krammer. 27–28. Die Algen Europas. No. 1912. (Syntype). SEM. 27. Frustule with shallow pseudoseptum and rimoportula. 28. Rimoportula located near pseudoseptum.

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Figs. 29–32. *Aulacoseira pfaffiana* (Reinsch) Krammer. 29–32. Yakushima Island, Japan. SEM. 29. Areolated valve face. 30. Rimoportula located near pseudoseptum. 31. Frustule with shallow pseudoseptum and rimoportula. 32. Frustule with areolae and spines.

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Susswasseralgen und die Diagnosen und Abbildungen von ein und f. *Abhandlungen der Naturhistorischen Gesellschaft zu Nurnberg*. Nurnberg 1866. 2: 238 pp., 13 pls.

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