Further Notes on the Sieve Plates of *Macrocystis pyrifera*

By

Johnson Parker

Bartlett Tree Research Laboratories, Stamford, Conn., U.S.A.

With 2 Figures

(Received September 27, 1963)

The recent article of Ziegler (1963) states that sieve plate pores of *Macrocystis pyrifera* (L.) C.A. Agardh have a diameter of 1 \( \mu \) and that those shown by Parker and Philpott (1961) have a diameter of 50 \( \text{m}\mu \). He concludes that our depicted structures are probably ordinary plasmodesmata. Since it seems just a little unfair to conclude that our work is simply a series of misrepresentations, we would like to make the following reply.

(1) If there is any doubt that we are dealing with sieve plates, we reproduce here a relatively low power view of the sieve plate (Fig. 1) from which the Fig. 1 of our original article was made. Anyone who has even an elementary acquaintance with the anatomy of this plant would recognize the structure as part of a sieve tube and not some sort of clamp connection or simple pit. Preparation for these pictures has been previously described (Parker and Philpott 1961).

(2) According to our estimates the sieve plate pores have a diameter of somewhat less than a micron, perhaps 0.3 \( \mu \), and thus a little smaller than Ziegler’s estimate. This is verified by the dimension of Fig. 1 in our original article. In Fig. 2 of our original article, the pores are indeed unusually small, but they are still at least four times as big as the diameter of plasmodesmata in a simple pit which we illustrate herewith in Fig. 2.

(3) It is sometimes argued that the structures seen in pores of sieve plates of many different kinds of plants, including the higher vascular plants, are artifacts of preparation. Observations with these marine algae

---

1 In which a micron would be 18 mm. on the print and the strand about one quarter of this or 0.25 \( \mu \) in width.
make this seem quite unlikely, although there may well be a "surge" of contents through the sieve tubes which causes accumulations against the sieve plates when the tubes are cut. However, in *Nereocystis lutkiana* it

![Image of sieve tube elements with sieve plate](image)

**Fig. 1.** Part of two sieve tube elements with a sieve plate. Pores appear filled with dark-staining material. Preserved in formalin (15%), fixed in KMnO₄ (5%), and mounted in methacrylate. Original approx. 3,000, final approx. 9,500X.

has been possible with the light microscope and brom-phenol blue-HgCl₂ stain for us to see strands on both sides of the sieve plate going out into the sieve tubes parallel to the lateral walls. This stain indicates that the