

SEM-OBSERVATION OF DEVELOPING PLANT ORGANS USING DEEP-FROZEN SPECIMENS

The SEM-observation of plant material normally requires dehydrated, dry specimens coated with carbon or metal. Unfortunately, the standard drying methods (including the critical-point-drying-technique) often cause shrinking and deformation of the specimen surface; therefore, SEM-studies on plant ontogeny are rather difficult, material- and time-consuming. Experiments using deep-frozen specimens have been carried out in England and in the USA, but have proved not satisfying.

Recently, a new preparation technique working with shock-frozen specimens has been developed by ALDRIAN at the Technical University of Graz (Austria). This technique, originally devoted to checking the water content of concrete, was tested and applied to living plant material by the present communicators. As a test object the Malayan gesneriad *Monophyllaea horsfieldii* was chosen. Studying in special the inflorescence and calyx development, the results proved by far superior to those obtained by conventional SEM-preparation methods. As it appears this technique can be successfully employed in ontogenetical and morphological studies of any kind working with living material.

The preparation procedure and the required equipment is as follows:

1. Living material is dissected and the specimen is mounted onto a copper stub.
2. The specimen is plunged into liquid nitrogen.
3. The shock-frozen specimen is transferred under a protective hood via a lock into a pre-cooled, high vacuum-preparation apparatus and coated with carbon and gold.
4. From here the specimen is moved into a special transfer chamber (retention of low temperature and high vacuum) and transferred into the SEM, the specimen stage of which is cooled by liquid nitrogen.—A. Weber, M. Hesse, Botanisches Institut, Rennweg 14, A-1030 Wien, Austria.—A more extensive version in German was printed in *Beitr. elektronenmikroskop. Direktabb. Oberfl.* 14 (1981) 625-630, 8 fig.