Structural Aspects of Adhesive Disks in Parthenocissus tripiscudata

InSun Kim, Jieun Yim

Biology Department, Keimyung University, Taegu 704-701

Anatomy, morphology, and ultrastructure of adhesive disks (AD) in Parthenocissus tripiscudata have been investigated to follow the developmental pattern from the primordial to mature stages, and to determine the nature of vacuole deposits accumulated during growth. The AD became photosynthetic at the onset of development, but plastids and other cellular components soon deteriorated following the accumulation of electron dense substances. The electron dense substances, which sequestered in the vacuoles, were tannins that probably originated from the system of sER densely clustered around the tonoplasts. The highest tannin content was obtained prior to the AD adhesion to the wall surfaces. Once the attachment was established, the AD immediately underwent processes of cell death by degradation of the tonoplast and other cellular organelles. When the cell walls were crushed completely and the whole AD was pushed adaxially, virtually no space remained between the adhering wall and the mature AD, thus exhibiting firm attachment. The significance of this cytoplasmic organization in relation to the synthetic and secretory activity of the tonoplast and sER to the AD adhesion remains to be elucidated.

Key words : Parthenocissus tripiscudata, adhesive disk, vacuole, tannin, tonoplast, sER

Fig. 1. Characteristics of AD cell prior to the adhesion.
M = mitochondria, T = tannin deposit

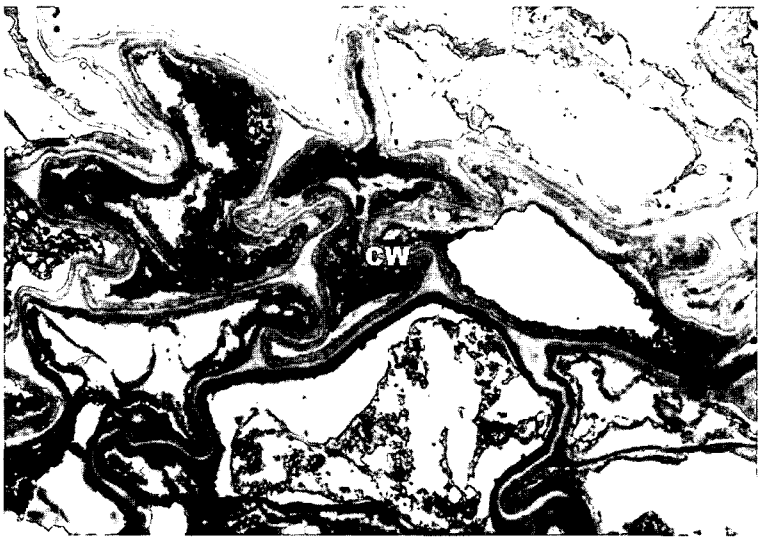

Fig. 2. Characteristics of AD cell after the adhesion to the wall surface. CW = crushed cell wall