

## REFERENCES

- EWY, G. A., KAPADIA, G. G., YAO, L., LULLIN, M., & MARCUS, F. E. (1969). *Circulation*, **39**, 449-453. Plasma digoxin data was supplied by the authors.
- GIBALDI, M., NAGASHIMA, R., & LEVY, G. (1969). *J. pharm. Sci.*, **58**, 193-197.
- HARRIS, P. A., & RIEGELMAN, S. (1969). *Ibid.*, **58**, 71-75.
- RESCIGNO, A., & SEGRE, G. (1966). *Drugs and Tracer Kinetics*, New York: Blaisdel Publishing Company.
- RIEGELMAN, S., LOO, J. C. K., & ROWLAND, M. (1968). *J. pharm. Sci.*, **57**, 117-123.

## A rapid photographic method for the determination of vein-islet number and stomatal index of leaves

The use of the camera lucida to assess stomatal index and palisade ratio is convenient and rapid but for the determination of vein-islet number, the usual low power (10X) objective gives too small a field ( $\sim 1 \text{ mm}^2$ ). To obtain a wider field for a more accurate count of the vein-islets it is necessary to use objectives of much lower magnification, e.g. 2.5X or even 1X, at which the islets appear very small and numerous. Tracing from a camera lucida then becomes tedious.

A simple photographic technique which obviates camera lucida tracing is now described. A wide area of leaf is photographed and in addition a permanent record of the specimen is obtained. After it has been cleared in chloral hydrate, the leaf sample is photographed through a microscope using 2.5X or 1X objectives. Concurrently, photographs of a stage micrometer (0.1 mm) are made at the same magnification. The negative film after processing is viewed in a microfilm reader when an enlarged image of the vein-islets can be seen. An exact enlarged area of  $1 \text{ mm}^2$  is obtained from the photographed micrometer scale. As the film is negative the veinlets appear white on a black background. This facilitates viewing and reduces eye-strain and the veinlets can thus be traced with ease and rapidity and from a large area of leaf.

Leaf samples were photographed on a Leitz Ortholux microscope fitted with the Orthomat automatic camera using both 1X and 2.5X objectives. Kodak Panatomic X or Plus X negative films were used. When projected through a Kodagraph Film Reader, Model MPE, the final magnifications of the images were approximately 80X and 210X respectively and the areas of leaf included within a standard  $24 \times 36$  mm film frame were slightly over  $24 \text{ mm}^2$  for the 1X objective and  $6 \text{ mm}^2$  for the 2.5X objective.

The method was also suitable for the determination of stomatal index, using the 10X objective.

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