

remains darker than in hybrids where the green form of *S. alata* was used.

Having grown the Okefenokee Swamp *S. minor*, the red-mouthed *S. alata* and red form of *S. alata* (with the green lid which is red-veined) for more than ten years I have known for some time that their distinctive characteristics are not the result of growing conditions. They come

true from seed if the plants are selfed and it is now evident that their distinctive characteristics are passed on to at least some of their hybrids and in some cases with very striking results.

In all cases the plants are grown outside in full sun. Winters here are very mild with rare frosts.

(See color photos, page 67.)

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## A Photographic Study of the Rapid Movements of Stalked Glands of the Cape Sundew *Drosera capensis*

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The movement of stalked glands and leaves of sundews is well known. The first record of modes of behavior of stalked glands and leaf blades in the genus *Drosera* can be traced to Dr. Roth in 1782 (Lloyd, 1942). Lloyd documented slow leaf blade movement of *D. capensis* in a sequence of frames from a time-lapse motion picture. Bopp and Weber (1981) have published photographs of slow leaf blade bending of *D. capensis* in a hormone regulation study. Williams (1976) reported on rapid stalked gland movement and slow leaf bending movement in photographs of *D. intermedia* taken by James Kowalchuk. In our present study we present photographs of *D. capensis* (Figure 1) which show the rapid stalked gland response (Figure 2) to the presence of an ether anesthetized fruit fly (*Drosophila melanogaster*).

An anesthetized fruit fly was placed on the lateral extreme of the outer discal stalked glands of a *D. capensis* leaf blade (Figure 2a). The terminology is that of Lloyd (1942) reporting on the work of Behr who divided the stalked glands of *D. rotundifolia* into three groups progressing from the 1. marginal glands, 2. the outer discal glands, to the 3. discal or central group of glands. In one hour (Figure 2b) the fly had been coated with mucilage and had been carried medially

a short distance by the extreme outer discal glands. At two hours (Figure 2c) the fly has been carried to the lateral margin of the discal or central glands. The extreme bending of the outer discal glands became apparent and the bending of the marginal glands can be seen. During the next two hours (Figures 2e and f) the position of the fly did not change appreciably; however, the progressive bending of the marginal glands continued. In a period of five hours the fruit fly was carried from a lateral position to a central position on the leaf blade and the outer discal and marginal glands have shown extreme bending.

The plants were two year old cuttings in 7.5 cm plastic pots containing a peat-vermiculite mix. The plants were grown in a glass case with a loose fitting cover and two 20 watt cool white fluorescent lights 5 cm from the top of the plant and 10 cm from the top of the pot. The plants were watered from the base with 1 to 2 cm of deionized water and allowed to dry slightly before the next watering. Between photo taking sessions the plants were covered with a glass beaker in order to maintain high humidity.

The photographs were made using a Canon F1 camera and Kodak Panatomic X film. The *D. capensis* habit photograph (Figure 1) was made using a 25 mm exten-

sion tube and a 50 mm macrolens with a lens to subject distance of 2 cm. The plant was 9 cm from a masked Sunpack ring flash. The gland movement series (Figs. 2-7) involved the use of a bellows extended 105 mm with a 50 mm macrolens at a distance of 2 cm from the lens to the subject and two flashes—one direct 30 cm from the subject and one reflected from a white card 20 cm from the subject. All exposures were f16 and 1/60 sec. Negatives were printed on Kodak Polycontrast Rapid II RC F paper.

#### Literature Cited

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- Lloyd, F. E. 1982. The carnivorous plants. Chronica Botanica Company, Waltham, Mass.
- Williams, S. E. 1976. Comparative sensory physiology of the Droseraceae—the evolution of a plant sensory system. *Proc. Amer. Phil. Soc.* 120 (3): 187-204.

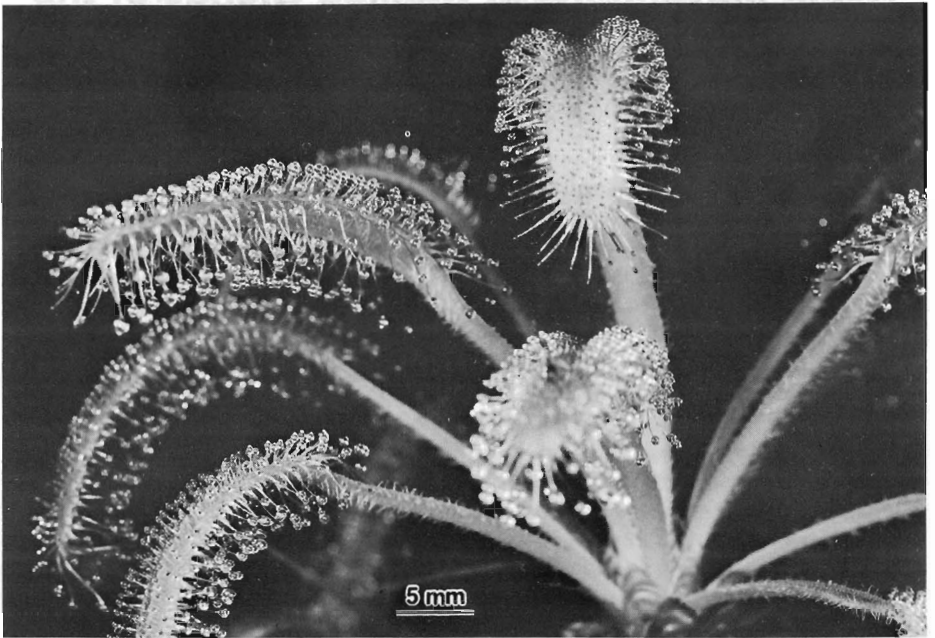
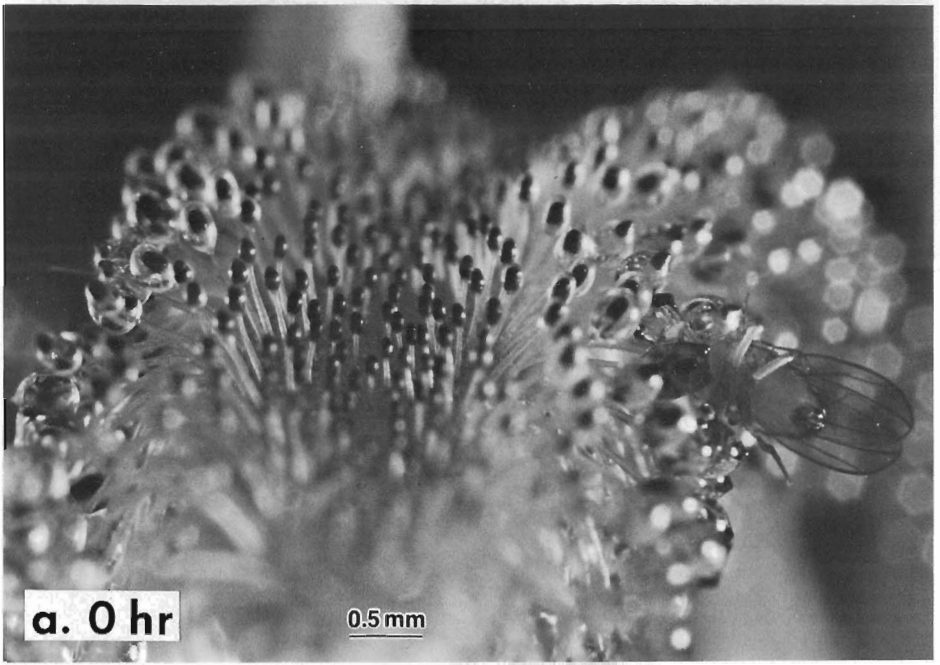


Figure 1. A two-year old cutting of *Drosera capensis* grown under lights in an artificial soil mix.



Figs. 2-7. Stalked gland movement of *Drosera capensis* in response to an anesthetized fruit fly during a five hour period.





