

AN IMPROVED CARBON DIOXIDE STICKY CYLINDER TRAP¹

R. F. SCHOEPNER AND R. H. WHITSEL

San Mateo County Mosquito Abatement District, Burlingame, California

Assessment of airborne female populations of *Leptoconops torrens* Tns. in a given locality had been difficult and unreliable prior to the development of the carbon dioxide sticky cylinder trap (Whitssel and Schoepner, 1965a). The authors recognized that some modifications of this trap were needed to improve its effectiveness for future utilization.

It appeared that during a year of a large emergent population, workers would be unable to record large collections of attracted females from numerous trap locations on a regular schedule. A reduction in the surface area was necessary. The presence of the pole, to which the cylinder was attached, was thought to influence attracted females. Improvements in the manner by which this trap was fastened to the pole removed any possible influence thought to affect collections. In addition, frequent collections from the sticky cylinder traps indicated a tendency of the gnats to be grouped in large numbers on the sheltered side of the cylinder, adjacent to the supporting pole, while few specimens were captured on the wind-exposed surface of the trap. To demonstrate this behavior, a wind-oriented attractant trap was constructed to allow free rotation of 360° (Rogers, *et al.*). These studies related that female gnats sought sanctuary on the sheltered side of an attractant trap during increased wind speeds (above 5 m.p.h.).

MODIFICATIONS. A reduction of the trap surface area by one-half facilitated ease of counting adults during periods when attracted female populations were at peak numbers. This aliquot sampling of the original collection surface was accom-

plished by placing Tanglefoot² on three 2-inch horizontal bands as shown in Figure 1. A plywood template allowed the workers to apply the tree banding adhesive quickly and uniformly with the aid of a 2-inch spatula. Dados were cut at both ends of the template so as to receive the four 1½-inch plywood strips elevated (approximately ¼-inch) above the working surface. Cleaning the template will be facilitated greatly if it is constructed as recommended and properly protected with a wood sealer such as polyurethane or varnish.

The sheet of kraft paper was cut so that the length was greater than the circumference of the cylinder. This provided

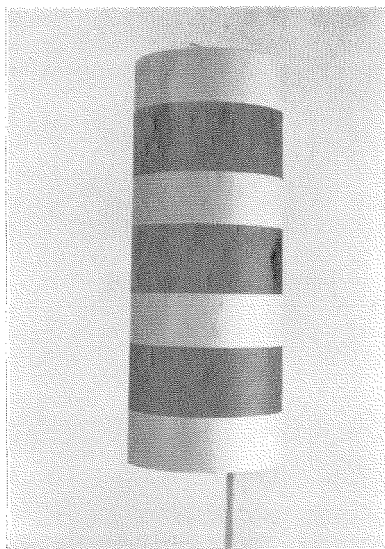


FIG. 1.—Carbon dioxide sticky cylinder trap. Black bands denote areas where sticky adhesive was applied.

¹ These studies were supported by a grant of matching funds from the California State Department of Public Health and the San Mateo County Mosquito Abatement District.

² Tanglefoot Company, Grand Rapids, Michigan.

an over-lap whereby the sheets could be held in place on the cylinders by the adhesive. The cylinder used was a standard stovepipe 12 inches long and 5 inches in diameter. A piece of 1/2-inch mesh hardware cloth was soldered inside the cylinder 2 1/2 inches above the lower opening to support the package of dry ice used to supply the carbon dioxide attractant.

A further improvement was the manner in which the cylinder was attached to the 2 x 2 inch pole. Bolts with wing nuts were used to secure the cylinder to the pole at a position below the level of the hardware cloth insert. The wing nut fastening provided workers with a quick and easy method to remove the cylinders should one desire to examine specimens in the laboratory. Transport of the cylinders to and from the trapping areas was aided by the use of a large carton in which cylinders were supported horizontally by wooden dowels, and locked in position with finishing nails.

An aerosol form of the tree banding adhesive was applied to some cylinders with the anticipation that both time and product could be saved. Unfortunately, this technique proved to be unsatisfactory because the solvent, chloroform, used in the aerosol form of the adhesive acted as a repellent to the female adults.

STANDARDIZATION. Standards have been established for the employment of the attractant trap at times when meteorological conditions favor optimum flight (Whitsel and Schoepner, 1965b, 1966). Recommended standards included trap placement, quantity of attractant, and duration of assessment period. An hourly evaluative

index was prepared for airborne collections from these modified traps for coastal areas in California. A similar index for inland topography awaits further studies. Apparent differences in behavior of adult gnats in coastal and central valley areas were reflected by attractant trap collections. At the Sacramento Valley site, during 60 trap hours, 1.8 percent of the total collections were males. In contrast, trap collections from a coastal area were composed of 0.05 percent males in 185 trap hours. The high percentage of males recorded on the traps in the Sacramento Valley indicates males were attracted to the female concentrations in the proximity of the carbon dioxide traps. In the coastal areas, unlike the Sacramento Valley, male swarms were common, and males were rarely contiguous with females in flight other than in swarming locations.

It is the desire of the workers that the introduced modifications of this inexpensive trap will improve its value as a tool in field studies with *L. torrens* and certain other biting flies.

References Cited

- ROGERS, C. J., SCHOEPPNER, R. F., and WHITSEL, R. H. 1967. A wind oriented attractant trap. *Jour. Econ. Ent.* (In press)
- WHITSEL, R. H., and SCHOEPPNER, R. F. 1965a. The attractiveness of carbon dioxide to female *Leptoconops torrens* Tns., and *L. kerteszi* Kieff. *Mosq. News* 25(4):403-410.
- WHITSEL, R. H., and SCHOEPPNER, R. F. 1965b. Progress report of the black gnat, *Leptoconops torrens* Tns. research project. San Mateo Co. Mosq. Abate. Dist. 26 pp. mimeo.
- WHITSEL, R. H., and SCHOEPPNER, R. F. 1966. Summary of biology and control methods of the valley black gnat, *Leptoconops torrens* Tns. *Vector Views* 13(3):17-24.