

A TIME-SAVING DEVICE FOR ADULT MOSQUITO BIOASSAYS¹

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Testing adult mosquitoes for susceptibility to insecticides is often a lengthy procedure involving many steps. The insects must be removed from holding cages, counted and placed in exposure chambers, and then transferred to observation containers.

In our laboratory adults are tested by exposing them to filter paper discs pretreated with various concentrations of insecticide (Georghiou and Metcalf, 1963; Georghiou and Gidden, 1965). The method involves the separation of CO₂-anesthetized adults into groups of 20 and their transfer with a glass suction tube to shell glass vials lined with the filter papers discs. We have recently developed a device which allows for the direct transfer of adults into the exposure vials while the mosquitoes are being counted. Use of this device effectively eliminates one step in the procedure thus reducing the handling time by about one third.

The device (Fig. 1) consists of a 12 cm.

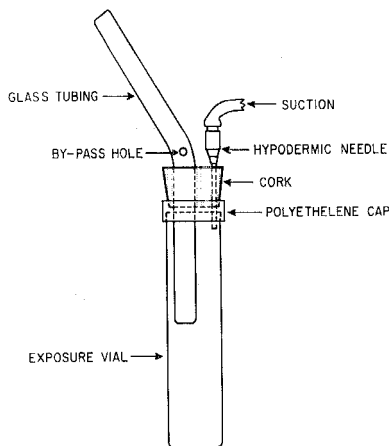


FIG. 1.—Diagram of mosquito aspirator device.

piece of glass tubing (6 mm I.D.) bent at an angle of 145 degrees and inserted through a cork stopper (24 mm top diameter, 15 mm in length). A 3.5 cm section of a hypodermic needle (15 gauge) is likewise inserted through the cork. Flexible tubing is attached to the base of the hypodermic needle. A hole, 2 cm in diameter, is made in a polyethylene cap which fits snugly around the lip of the exposure vial. The cap is glued around the lower edge of the cork so the device is firmly held in place when fitted on the vial. Light vacuum is applied via the flexible hose drawing the insects gently through the glass tubing and into the vial. Improved control of vacuum suction is gained by opening a by-pass hole in the glass tubing which can be partially or fully closed by touch during the operation. The use of this device is limited to laboratories equipped with a vacuum line; since air passes through the vial containing the insecticide-treated filter paper, aspiration by mouth should be avoided.

Although developed for mosquitoes, the device can be suitably adapted for use on a variety of insect species. Insects can be selectively drawn into the testing chamber making it unnecessary to separate them by species, sex or number beforehand.

References

- Georghiou, G. P. and Gidden, F. E. 1965. Contact toxicity of insecticide deposits on filter paper to adult mosquitoes. *Mosq. News* 25(2): 204-08.
- Georghiou, G. P. and Metcalf, R. L. 1963. A bioassay method and results of laboratory evaluation of insecticides against adult mosquitoes. *Mosq. News* 21(4):328-37.

WIRTHOMYIA, A NEW SUBGENUS OF *CULICOIDES* (DIPTERA: CERATOPOGONIDAE)

L. VARGAS

Wirthomyia Vargas, new subgenus of *Culicoides* is proposed to include *Culicoides segnis* as type, *reconditus*, *riouxi*, *bottimeri* and *stilobezzioides*. These species are nearctic and palearctic. Male genitalia characters are stressed.

DIAGNOSIS. Female: Eyes separated. Thorax without notable markings, only the humeral pits are outstanding. Wings unmarked, densely covered with gray macrotrichia. Basal cell with numerous macrotrichia. The stalk of M₁₊₂ much shorter than the first radial cell in *reconditus*. Two spherical spermathecae, unequal in size, of about 40-60 μ in. max. width; a pair of internal sclerites of irregular outline.

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Male genitalia: Basistyles broad, without mesad pilosity; ventral apodeme prominent, well developed; not foot-shaped; both apodemes of about the same size. Dististyles nearly straight, base slightly swollen, apex not clubbed or hooked. Parameres almost straight, tip curved, hairy. Aedeagus arched, narrow, with a very short median process, roots well separated. Ninth tergite distally narrow, with long apicolateral processes slightly curved, distal margin almost straight, with a row or patch of hairs, without notch or this very small. Ninth sternite broad, with a broad median cleft. Membrane with or without spicules.

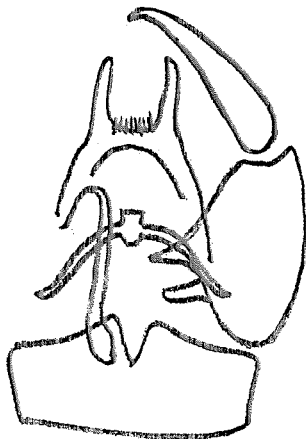


FIG. 1.—*Culicoides segnis*. Type species of *Wirthomyia* n. subgenus.—Male genitalia.

Species included: Type of *Wirthomyia* n. subgen: *segnis* Campbell and Pelham-Clinton, 1960. British Isles, Poland, Tchechoslovaquia.

reconditus Campbell and Pelham-Clinton, 1960.

British Isles, Switzerland.

riouxi Callot et Krémer, 1961. France, Switzerland.

bottimeri Wirth and Blanton, 1955. U.S.A.

stilobezzioides Foot and Pratt, 1954. U.S.A.

LIFE HABITS. *C. stilobezzioides* bites man, is strongly ornithophilic, being most active about dusk, it is a possible intermediate host of a *Haemoproteus* of the purple finch.

DISCUSSION. The subgenus is named after the distinguished Culicoidologist Dr. W. W. Wirth.

A more detailed study of the male genitalia characters is the basis for grouping the species of *Culicoides* in a more rational relationship. Eventually it may be possible to correlate these characters with the external characters of the female which now are difficult to interpret. It is most probable that the chaetotaxy of the

thorax may show a typical pattern useful in determination of genera and subgenera.

The absence of pilosity on the inner side of the basistyle distinguishes *Wirthomyia* n. subgen. from the subgenera *Culicoides* s. str., *Hoffmania* and *Anilomyia*. *Selfia* and *Monoculicoides* have fused parameres. *Macfiella* has a pronounced medial formation on the aedeagus and this is not so simple.

Beltranmyia and *Trithecooides* do not have ventral apodemes. In *Oecacta*, *Diphaomyia* and *Mataemyia* the ventral apodeme is foot-shaped. Parameres are more simple in *Pontoculicoides*. The simplicity of the aedeagus separates *Wirthomyia* n. subgen. from *Drymodesmia* and *GlaPhiromyia*.

The unmarked wings of the female, the absence of outstanding markings on the mesonotum are useful to distinguish *Wirthomyia* n. subgen. from *Oecacta*, *Hoffmania*, *Beltranmyia* and *Monoculicoides*.

Trithecooides, as the name points out and *Pontoculicoides* have three spermathecae.

A DISPOSABLE ADULT MOSQUITO BIOASSAY CAGE

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Field bioassays often employ caged adult mosquitoes. A disposable cage (Fig. 1) was developed to avoid the problems of high initial cost and potential contamination encountered with reusable metal cages. The cage is similar in shape to one described by Rathburn *et al.* (1969).

The body of the cage is constructed from three cardboard rings. An inner ring is 6.030 inches inside diameter x 1-3/4 inches wide x 0.108-inch wall thickness, and two outer rings are 6.250 inches inside diameter x 5/8 inches wide x 0.090-inch wall thickness.¹ A 3/8-inch hole is punched in the center of the inner ring before the cage is assembled. Nylon net (approximately 18 x 18 mesh, varied according to need) is cut to size and held over the ends of the wide ring by the two narrow, larger diameter rings. Mosquitoes are gently aspirated into the cage and the hole is plugged with a cotton dental roll which is then moistened with water or a sugar solution.

¹ Knife-cut paper cores, Tubes and Cores, Inc., 1075-22nd Street, San Francisco, California 94107.