

## SCIENTIFIC NOTES

### A SIMPLE APPARATUS FOR FORCED COPULATION OF MOSQUITOES

RONALD E. WHEELER  
Department of Entomology  
University of Maryland  
College Park, Maryland

In various studies on the physiology of reproduction in aedine mosquitoes the McDaniel-Horsfall (1957) technique of forced copulation is indispensable and most probably is applicable

to all Culicidae. The present note describes a very simple adaptation of it which makes the procedure more precise (eliminates hand vibrations) and frees the operator to perform additional

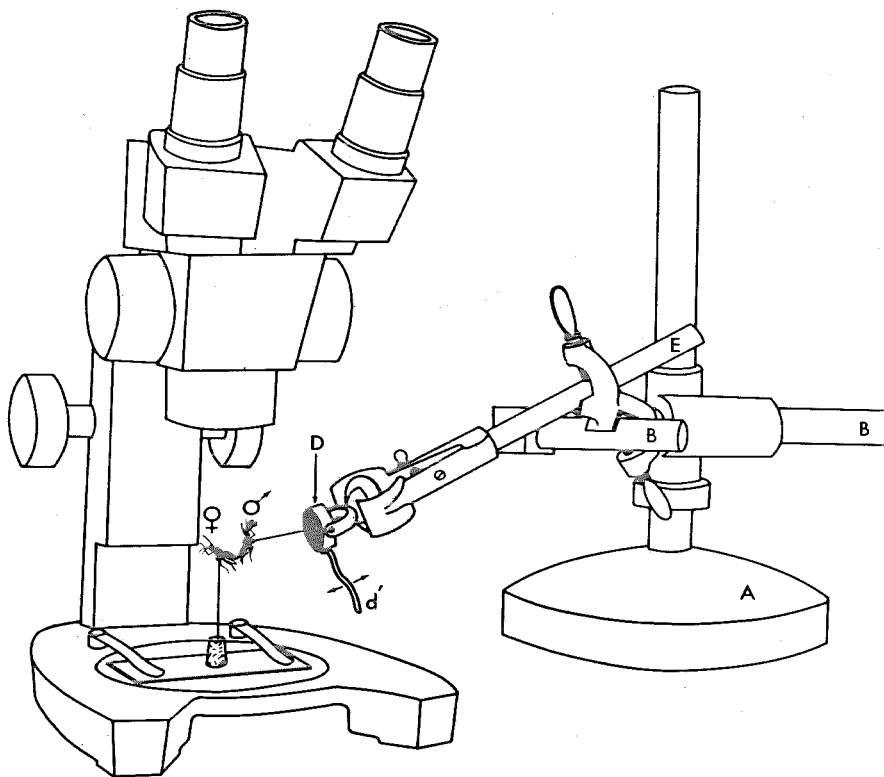


FIG. 1.—Arrangement of force copulating apparatus showing stereoscopic microscope, cork with female-bearing pin, male-bearing pin inserted into adjustable holder (D), fine adjustment arm (d') extension clamp (E), clamp holder (C), side arm (B), and sturdy ring stand (A).

tasks. A large series of mosquitoes can be prepared and quickly processed.

The mesonotum of each cold-anesthetized male and female mosquito is glued ("Dek-adhese" plastic cement, manufactured by Donald Tulloch, Box 17, Chadds Ford, Pennsylvania) to the head of a No. 1 or 2 insect pin. The female-bearing pin is inserted into a cork glued to a microscope slide, so that the mosquito's body axis is in a horizontal plane. The female is centered and focused upon at approximately 15 times magnification with a stereoscopic microscope using low illumination. The male-bearing pin is inserted into an adjustable "pinned insect" holder (Fig. 1, D). This adjustable holder consists of a simple cork disk with 2 set-screws at each pole, allowing it to be turned within a U-shaped cradle that is held firmly in a clamp (E). A small metal arm (d') on the adjustable holder is very desirable. Movements of arm B give horizontal control, movements of the extension clamp E and C give gross vertical movements, and movements of the small arm d' allow for fine vertical movements of the male.

The final attitude for copulation of the pair is accomplished by simultaneously moving the

male up or down with handle d' and by orienting the female until their terminalia meet. This technique allows one to bring the mosquitoes into a coital position with great accuracy and to leave them in this position with a minimum of disturbance. It should be noticed that the male is presented facing the female at an angle of about 90°, which allows one to observe successful copulation in *Aedes aegypti* (L.). The clamps and side arm assembly should be set just tight enough to allow only free manual movement. After the initial arrangement of the apparatus, only minor adjustments are required for subsequent matings.

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#### Reference

MCDANIEL, I. N., and HORSFALL, W. R. 1957. Induced copulation of aedine mosquitoes. *Science* 125:745.

#### A NEW RECORD OF *Simulium (Psilozia) encisoï* VARGAS AND DÍAZ NÁJERA, IN CALIFORNIA

MELVIN M. BOREHAM  
California State Department of Public Health  
Bureau of Vector Control, Fresno

On February 15, 1962, several collections of blackfly larvae and pupae were made from rocks and dead vegetation in small streams near Parker Dam, San Bernardino County, California. These collections contained many specimens of *Simulium* *vargasi*, *S. aureum*, and about 15 larvae and pupae of an unidentified species having 20 respiratory filaments. The unidentified material, including two adult females which were subsequently reared

from pupae in the laboratory, was sent to Dr. Alan Stone at the U. S. National Museum and determined as *S. encisoï* Vargas and Díaz Nájera. The previously known distribution of this species was restricted to the states of Hidalgo and Michoacan in central Mexico. The material has been deposited in the collections of the U. S. National Museum and of the author.

"The INSTITUTE OF ZOOLOGY OF THE UNIVERSITY OF PAVIA announce with profound regret the sudden death in Rome on October 22, 1962, of **Professor Carlo Jucci**, for some 30 years Ordinary Professor of Zoology in the Faculty of Mathematical, Physical and Natural Sciences, Gold Medalist of Merit of Learning of Culture and of Art. In giving the sad announcement the Institute of Zoology recalls the high merits of this renowned Scientist and incomparable Teacher." (Sent in by J. B. Kitzmiller, who added, "Professor Jucci was the original force behind all of Frizzi's work with the cytogenetics of *Anopheles*.")