

AN IDEAL AVIAN HOST FOR LABORATORY COLONIES OF ORNITHOPHILIC MOSQUITOES<sup>1</sup>WAYNE A. ROWLEY AND ALBIN W. ANDERSON<sup>2</sup>Department of Zoology and Entomology,  
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Gerberg (1970) lists 86 species of mosquitoes maintained in laboratories throughout the world. Although this list is far from complete, it indicates the extent to which mosquitoes are used in research. Maintenance of a colony of mosquitoes requires that females have access to a vertebrate blood meal on a regular schedule. Thus, host animals must also be maintained in or near the laboratory. This is not a significant problem for species of mosquitoes requiring mammalian blood: guinea pigs are excellent hosts for many zoophilic mosquitoes. Maintaining birds in a

laboratory for species of mosquitoes requiring avian blood is more difficult. No single species of bird has the same advantages as a laboratory host as do guinea pigs with regard to rearing and acceptability by mosquitoes. Chicks are the avian host of choice of many researchers who work with ornithophilic species of mosquitoes. But chicks grow rapidly and are awkward to restrain and introduce to a mosquito colony when they are only a few weeks old. In our experience pigeons have not been satisfactory hosts because only a small percentage of *Culex* mosquitoes in our laboratory (*C. tarsalis* and *C. pipiens pipiens*) take blood from them. Moreover, they are unpleasant to maintain in a laboratory. Other birds, from day-old chicks (destroyed after each feeding) to parakeets, have been used as hosts for ornithophilic mosquitoes, but most have significant disadvantages either in cost, maintenance, or mosquito acceptance.

In an effort to locate an ideal host for *Culex* mosquitoes, *Coturnix* quail (Figure 1) were used with highly satisfactory results. The *Coturnix* quail, a native gamebird of Europe and Asia, is about the size of a bobwhite (160-175 g.) when full grown. This bird is a routine experimental animal in vertebrate physiology at Iowa State

<sup>1</sup> Journal Paper No. J-6672 of the Iowa Agriculture and Home Economics Experiment Station, Ames, Iowa. Project No. 1788.

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FIG. 1.—Adult female *Coturnix* quail.

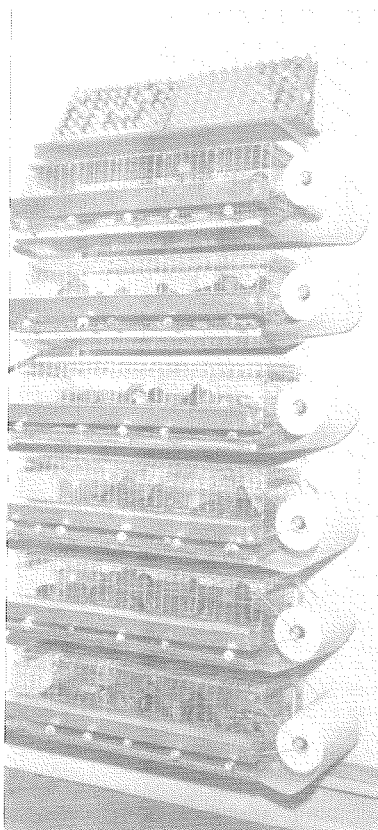


FIG. 2.—Series of sani battery quail cages. Each battery maintains up to 10 quail.

and other universities. In addition to physiology, the *Coturnix* quail is used in research in such disciplines as embryology, genetics, pharmacology, and nutrition. The availability of *Coturnix* quail and the ease with which they are maintained in a laboratory make them an ideal host candidate for ornithophilic mosquitoes. In addition to their small size, they have a light plumage and are easily restrained for introduction into colony cages. Moreover, both *C. tarsalis* and *C. pipiens pipiens* readily take blood from these birds.

Quail and inexpensive equipment for the care and housing of them are available from commercial suppliers. Figure 2 shows a series of sani battery cages (Marsh Farms, Garden Grove, California) available in single units to accommodate up to 10 quail each. These cages can be suspended from a ceiling in a storage closet or attached to a wall with adjustable shelving. Sani battery cages come supplied with a paper

belt for easy cleaning; soiled paper can be rolled up, torn off, and thrown away each day, thus eliminating odor, scraping and washing of cages, and accumulating droppings in which flies can breed.

To feed mosquitoes, an adult quail is restrained in a small wire-mesh cage then placed inside a 45 x 45 x 60 cm. Gerberg mosquito cage. Generally, quail are introduced into the colony before the beginning of a 90 min twilight period programmed into our rearing facilities. Quail remain with the colony during the night and are removed the next morning. Most females of both *C. tarsalis* and *C. pipiens pipiens* feed to repletion when exposed to quail under these conditions. In one check, 189 of 200 female *C. pipiens pipiens* took a blood meal 5 days after emergence from pupae collected in the field.

For ease in handling, cleanliness, and acceptability by *Culex* mosquitoes, *Coturnix* quail are unusually good hosts for laboratory colonies of ornithophilic species of mosquitoes. A quail manual (Marsh Farms) provides instructions for incubating, feeding, sexing, and preventing disease in laboratory colonies of *Coturnix* quail. Researchers rearing quail must remember that special care is required to provide temperature control during the first 2 weeks. Quail are mature and begin laying eggs at about 6 weeks.

#### Literature Cited

GERBERG, E. J. 1970. Manual for Mosquito rearing and experimental techniques. Amer. Mosq. Control Assoc. Bull. No. 5.

X- AND GAMMA RAYS COMPARED AS STERILANTS FOR MALE *Culex pipiens quinquefasciatus* SAY<sup>1</sup>

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*Culex pipiens quinquefasciatus* Say (= *fatigans* Wiedemann) is one of the species of mosquitoes most likely to be controlled with a sterile-male release program. Investigations into the possibility of using this method of control have been conducted all over the world in the past few years. Ramakrishnan *et al.* (1962) reported that male sterilization was obtained with 7,000 R of gamma rays. Krishnamurthy *et al.* (1962) in a small-scale

<sup>1</sup> Mention of a proprietary product in this paper does not constitute an endorsement of this product by the USDA.

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