OPERATIONAL AND SCIENTIFIC NOTES

A HANDY, INEXPENSIVE DEVICE FOR DISPENSING INSECTICIDE DUST AND GRANULES IN SMALL QUANTITIES [1]

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In the use of household insecticides, selective application procedures may be neglected by the home owner because of lack of suitable equipment, even though insects such as cockroaches can often be controlled by directing the appropriate insecticide into the cracks or crevices where the pests are hiding.

Fussell (1970 personal communication) developed a method for application of granules to cracks and crevices for cockroach control using a plastic wash bottle with a plastic hose extension. However, the device required two hands to operate, and plugging of the long plastic hose was a problem.

Plastic squeeze bottles such as those used for dispensing mustard, mayonaise, or catsup have been found to be excellent dispensers for dispensing small quantities of insecticide dust or granules. Figure 1 shows such a plastic squeeze bottle labeled, for safety, "Insecticide." In figure 2 the insecticide granules are shown coming out of the nozzle of the dispenser. The correct nozzle opening is obtained by cutting off the tip; the farther back the tip is cut off, the larger the opening. While holding the dispenser parallel to the floor and squeezing it an evenly distributed pattern of dust or granules emerges. Only one hand is required to operate it, and the small cone nose is perfect for introduction of dust or granules to cracks or crevices. The plastic dispensers cost very little, are readily available, and are very easy to fill. Normal precautions, such as proper labeling should, of course, be observed.

FIG. 1.—Plastic squeeze-bottle insecticide dispenser.

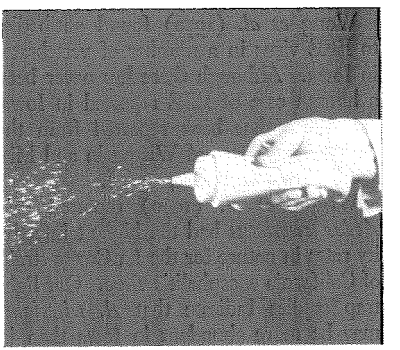

FIG. 2.—Squeeze-bottle dispenser in action.

[1] The opinions and assertions contained herein are those of the author and are not to be construed as official or as reflecting the views of the Navy Department or the Naval Service at large.

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CALLOTIA N. SUBG. OF *CULICOIDES* (DIPTERA, CERATOPOGONIDAE)

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DIAGNOSIS. *Callotia,* new subgenus, is proposed for those species of *Culicoides* with wings without spots; with macrotrichia except on the subcosta and basal cells, and second radial cell as long as the first one. Females with three functional spermathecae. Male genitalia (Fig. 1.): ninth tergum with long apicolateral processes; apodemes very long, straight or curved, without strictures. *C. saevus* Kieffer, 1922 is the type of the subgenus. This also includes *tauricus* Gutzevich, 1959, *ibericus* Dzhafarov, 1964, *micromaculithorax* Khalaf, 1957, *sejfadieni Dzhafarov,* 1958, *albipennis* Smith and Swaminath, 1932 (non Kieffer) and perhaps *slovacus* Oezagh, 1969 (male unknown). *Callotia* n. subgenus has a palearctic distribution. The name *Callotia* is pro-

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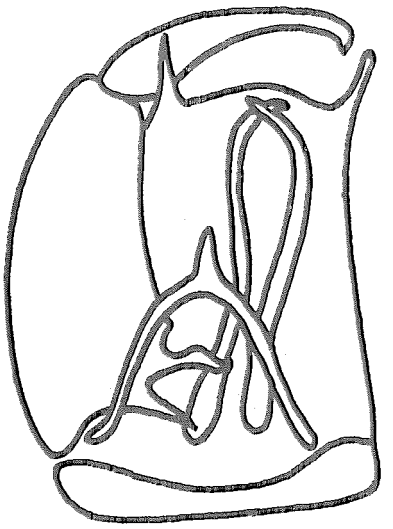

FIG. 1.—*Culicoides saevus* Kieffer, male genitalia

posed to honor Prof. J. Callot, Director of the Institute of Parasitology, Faculty of Medicine, Strasbourg, France.

DISCUSSION. The species of the subgenus *Selfia* Khalaf, 1954 have also wings without spots but the female lacks an apparent spermatheca; in the male genitalia the parameres are united in a single plate. In the subgenus *Trithecoides* Wirth and Hubert, 1959 the wings show outstanding dark spots with a long and pale second radial cell. The similarity with *Callotia* n. subgenus refers to the presence of three functional spermathecae. Using the male genitalia characters *Callotia* n. subg. can be separated from the subgenus *Selfia* because in this one the parameres form a single plate. In the subgenus *Trithecoides* the parameres are much curved and have a basal enlargement.

FEEDING OF ADULT *CHIRONOMUS RIPARIUS* MEIGEN

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Although adult Chironomidae are apparently capable of feeding, especially on liquids, there are few references in the literature indicating that they do. Malloch (1915) observed females of *Chironomus riparius* Meigen feeding on fly specks in Urbana, Illinois, and indicated that "many species" resort to flowers for nourishment (nectar?) in the summertime. He did not name any of these species and his observations have apparently not been confirmed. Lieux and Mulrennan (1956) suggested that adults of *Glyptotendipes paripes* (Edwards), though not known to feed, probably consume some water as adults.

While rearing *C. riparius* Meigen in the laboratory it was noticed that adult midges appeared to be "tasting" the droplets of water which were splashed along the walls of their glass-jar cages. Individuals encountering a droplet of water were seen to touch the water with their mouthparts, immediately withdraw them, and walk along the cage until another water droplet was encountered. Here the behavior was repeated.

Since Malloch had indicated that midges resort to flower nector for food material and that *C. riparius* adult females were observed to feed, a sucrose-water syrup was prepared as a nectar substitute and smeared along the inside walls of the cages. When this material was present, definite changes in midge behavior were seen. Instead of moving from droplet to droplet in apparent random fashion, individual insects were observed to insert their mouthparts into a droplet of syrup and remain motionless for a lengthy period of time (sometimes up to 30 seconds). When the mouthparts were finally withdrawn from the syrup the activity was repeated at two or three successive syrup droplets until the insect was apparently satisfied.

While such behavior indicated that the insects were actually feeding it did not guarantee that the syrup was being ingested. To confirm this, two test food solutions were prepared and made available to the insects. One solution consisted of sucrose-water syrup which was colored a deep blue with commercial food coloring (U.S. certified food coloring in water and propylene glycol). The other solution contained only tap water colored with the same material. Strips of paper towel were dipped in each of these solutions and suspended inside the glass-jar cages.

Midges offered this food choice gave immediate confirmation that *C. riparius* does feed as an adult (in captivity at least) and that some sort of discriminatory taste is employed. Midges landing on the strips of paper which had been dipped in the colored syrup behaved in a manner identical with that shown when the uncolored syrup was provided. In this situation, however, the thoracic and abdominal regions of the insects were noted to turn a deep blue color as the syrup was ingested. Both sexes fed readily and voided brilliant blue specks on the cage walls within 24 hours of feeding. In subsequent tests, red and green colored syrups were also ingested as readily.

The behavior of those midges landing on the strips of paper which had been dipped in colored water only was consistent with that observed when only droplets of water were present on the cage walls. In no case were any of these midges

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