NOTES ON MUSCOID DIPTERA OF PUBLIC HEALTH INTEREST

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It is difficult to evaluate the importance of human myiasis in the United States due to poor case reporting and the diverse nature of the journals in which the reports are published, viz. medical, public health and entomological. Scott (1963) documented 102 cases of human myiasis during the period 1952–62, but after interviewing physicians and entomologists, estimated that several thousand cases may actually have occurred during this period. The 102 cases were broken down by type of myiasis as follows: furuncular—37; enteric—28; ocular—12; nasal—9; aural—5; traumatic—5; genitourinary—2; creeping cutaneous—1; lymphatic—1; oral—1; and mammary lacteal—1.

In the interest of more complete reporting of myiasis, a case of furuncular myiasis is briefly detailed here. A 4-year-old child from Boulder, Colorado, was examined by a physician in Denver in July of 1975, with several lesions on both arms. Slight pressure on each papule produced a small fly larva. The larvae were brought to this Laboratory by Mr. T. Davis, Vector Control Specialist, State Department of Health, Denver, Colorado, for identification.

Three of the larvae were received alive and were placed on a white mouse carcass July 17, 1975. Pupation occurred July 28, 1975, and adults emerged August 11, 1975. The adults were found to be *Wohlfahrtia vigil opaca.*

In myiasis, three rather well-defined types of parasitism are recognized: obligate; facultative and fortuitous. Facultative myiasis is caused by flies which develop in diseased tissues, carrion or other nonliving animal or plant materials. Oviposition or larviposition by these female flies is stimulated by foul odors or discharges. Developing larvae may confine their feeding to necrotic tissue, but a few species will also invade and damage living tissue.

Larvae of a wide variety of Diptera may be ingested in contaminated fruit, vegetables or other plant and animal materials, causing fortuitous or accidental myiasis. Fortunately, few species are able to develop, or even survive, the relatively inhospitable gastrointestinal tract.

Obligate or specific myiasis producers are those which normally invade and develop in healthy tissues. Included in this group are flies of the genus *Wohlfahrtia*, family Sarcophagidae. Females of this large family commonly called "flesh flies" do not lay eggs, but deposit living young on host animals. *Wohlfahrtia* primarily parasitize the skin of young carnivores in the northern United States and southern Canada, causing considerable mortality in newborn fox and mink. Reported cases in man have usually involved infants.

The single species of *Wohlfahrtia* known to be present in the United states and Canada is *vigil. Wohlfahrtia vigil opaca* (Coquillett, 1897) has been reported from Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, South Dakota, Utah, Washington, and Wyoming. *Wohlfahrtia vigil vigil* (Walker, 1849) is found in the eastern United States.

One of the more enjoyable aspects of field work or recreational activities in the Colorado Rocky Mountains is the comparative scarcity of diurnal noxious arthropods. During Colorado tick fever studies in the Rocky Mountain National Park and adjacent areas in Larimer County, Colorado, 1974–1977, little annoyance has been experienced from day-biting insects other than an occasional *Simulium* fly or *Aedes* mosquito. Care must be exercised from March through June to prevent *Dermacentor andersoni* ticks from attaching to one's person.

Consequently, we were surprised to find biting flies exceedingly abundant and troublesome at the 9,000 ft. (2,743 meters) level in a mountain park September 4–5, 1977. While visiting Pingree Park, a campus of Colorado State University 50 miles (81 km) from Ft. Collins, the stable fly, *Stomoxys calcitrans* (Linnaeus, 1958) was biting in sufficient numbers at midday to interfere with such sedentary activities as sketching or painting. Although widely distributed in the United States and a well-known pest of domestic animals and man, we did not expect to find the species so numerous in the subalpine life zone.

Pingree Park, composed of some 1,800 acres (7285 ha), is a meadow bordered by forest-covered slopes lying at the foot of Mummy Range of the Colorado Rocky Mountains. Observations at CSU's Pingree Park weather station indicate a mean annual temperature of 35°F. Mean daily temperatures are below 40°F for around 8 months of the year and below 32°F for almost 6 months. Mean annual precipitation is about 21 inches, with most of it resulting from winter snow.

No cattle, horses or other domestic animals are maintained in Pingree Park, and concen-

trations of these animals are not present for some miles around the park. However, deer and elk are common in the area. Suitable larval breeding sites in decaying organic materials were not in evidence.

The presence of sufficient numbers of stable flies in a subalpine life zone to cause extreme annoyance to humans is considered interesting enough to report here.

We thank Lily Dong, Public Health Biologist, Vector Control Section, California Department of Health, Berkeley, California for her opinion on the specific identity of the *Wohlfahrtia*.

References Cited

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A LIGHTWEIGHT, PORTABLE, AND INEXPENSIVE BAFFLE TRAP FOR COLLECTING *CULICOIDES VARIIPENNIS* (DIPTERA:CERATOPOGONIDAE)[1,2]

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While studying the biology of *Culicoides variipennis* Coquillett, the need arose for a lightweight, portable and inexpensive trap. Hienton (1974) reviewed a variety of insect traps and discussed the effectiveness of baffles. Frost (1957 and 1958) compared collections from light traps with and without baffles and utilized baffles for the Pennsylvania insect light trap. We designed a baffle trap similar to the Pennsylvania model but with lighter construction materials, low voltage incandescent lamps, and a battery system.

This baffle trap (Figure 1) consists of a funnel, 4 baffles, a light source, a power source, and a collecting bottle. The main body of the trap (i.e., baffles and funnel) is made of 0.5 mm gauge sheet aluminum. The funnel narrows from a 27 cm top diameter to a bottom diameter of 5 cm. Two rectangular pieces of aluminum, 27 × 30.5 cm, placed perpendicular to one another form the baffles. A hardware cloth disc (6 mm mesh) 23 cm in diameter, is inserted in the funnel to exclude large insects. The baffles fit above the hardware cloth into slots cut in the edge of the funnel and are secured to the funnel by small wires inserted through holes in the lower corners of the baffles. A 1-liter glass jar, half filled with 70% ethanol, serves as a collecting receptacle. The jar is held in place with a 50 cm strap of rubber tire inner tube which is 7.5 cm wide in the center and tapers to a 2.5 cm width at either end. The ends of the strap are riveted to the funnel about midway up its sides. Two 25 milliamp, 6 volt bulbs (Radio Shack Model No. 272–1140) or one 40 milliamp, 6 volt bulb (Sylvania Model No. 6-ESB) can be used as the light source for the trap. A 5 cm diameter hole in the upper half of the baffles holds the light source. The bulb(s) are powered by four D-batteries which are taped together and connected in series. A rectangular cutout, 7 × 5 cm, in the top of the baffles accommodates this 6 volt power pack. The bulb and battery leads are connected with micro alligator clips (6.25 mm jaw opening) and the bulb(s) are positioned in the 5 cm hole in the baffles. Each battery pack could be used for a maximum of 7 nights, 12 hr/night, if recharged on alternate nights.

Forty traps were constructed by one person at a rate of one trap/hour. These traps were used for 1,210 trap nights (1 trap night is equivalent to 1 trap operated for 1 night) during the summer of 1977 in northeastern Colorado. Each trap was suspended from the horizontal arm of a 2 m metal fence post by wires connected to the upper corners of the baffles. the traps were CO_2-baited with 1.2 kg of dry ice/trap for 694 trap nights and unbaited for 516. The dry ice was wrapped in paper bags and placed on top of the baffles. Insects striking the baffles did not recover from impact, fell through the funnel, and were killed in the ethanol. A total of 114,073 *C.*

[1] The opinions and assertions contained herein are the private ones of the authors and are not to be construed as views, either official or unofficial, of the USAF.

[2] Mention of a proprietary product in this paper does not constitute an endorsement of this product by the USAF or USDA.

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