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CULICOIDES SPP.¹ ATTRACTED TO PASTURED CALVES IN NEW YORK STATE: EVIDENCE OF A HEMATOPHAGOUS GUILD?²

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In eastern North America, 10 and possibly 11 species of biting midges, *Culicoides* spp., have been reported to seek or take blood from large mammals other than man (Humphreys and Turner 1973, Schmidtmann et al. 1980). We report here information concerning biting midges attracted to Holstein calves at 5 widely separated dairy farms in greater New York state, and advance the possibility that the cohort of common species observed represents an ecological guild.

Calves used to attract host-seeking *Culicoides* were tethered individually to pasture fence-

lines during calm evenings on 26 dates in June, July and August 1978 and 1979. Host-seeking specimens landing on the hair coat of an animal were captured by using a battery-powered vacuum aspirator to take a series of 30-sec samples, one each from the legs, back, belly and head (including the inside and outside of the ears). The sample series were started 30 min before nautical sunset, at sunset and thereafter at 30 or 60 min intervals until 2 hr after sunset. Thus, a total of 536 samples, 134 from each anatomical region, were taken. Because of differences in animal size and tractability, personnel making catches, and climatic conditions, the numbers of specimens captured from each farm and each region of host anatomy were not compared by statistical methods.

The numbers of female *Culicoides* captured are listed by farm, species, and region of host anatomy in Table 1. Five of the 6 species observed were captured at all 5 farms; "eastern" *C. variipennis* (Coquillett) was captured at 4 farms. These 6 species do not reflect taxonomic groupings below the generic level, but each possesses the pattern of antennal pit-sensillae common to other biting midges that blood feed from large mammals (Jamnback 1965). Except for *C. obsoletus* (Meigen), *C. biguttatus* (Coquillett), and *C. stellifer* (Coquillett) that were captured from legs, which possibly were air-borne and destined for the underside of the abdomen, the observed host-attack patterns agreed closely with the activity of biting midges attracted to pastured livestock in southcentral New York in 1976 (Schmidtmann et al. 1980).

The uniformity of species captured at each farm is notable in several respects. First, those biting midges that blood feed from pastured cattle are clearly identified apart from the ca. 25 other species present in inland areas of New York state (Jamnback 1965). Second, it can be inferred that pastured cattle on other farms in New York, and perhaps throughout the Northeast region, are exposed to similar blood-feeding attack. Third, the common presence of 5 to 6 species at each location appears to represent an ecological "guild," that is, "a group of species that exploit the same class of environmental resources in a similar manner" (Root 1967). The presence of other dipteran species-groups (guilds?) that blood feed from a common class of vertebrates has been discussed by Downes (1971). Since the ecologic and economic importance of hematophagous Diptera is closely associated with blood-feeding

¹ (Diptera: Ceratopogonidae).

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Table 1. *Culicoides* spp. attracted to calves on dairy farms in greater New York State.

Farm: Location	Sampling data ^{1,2,3}	Anatomical region	No. specimens captured					
			<i>C. obsoletus</i>	<i>C. stellifer</i>	<i>C. biguttatus</i>	<i>C. venustus</i>	<i>C. varripennis</i>	<i>C. spinosus</i>
Snider Allegany County, Southwestern New York	6	Legs	4	2	0	0	1	0
	27	Head	0	0	0	9	0	3
	108	Belly	383	181	201	9	86	0
		Back	0	0	0	24	0	54
Nordlund Cattaraugus County, South- western New York	8	Legs	1	15	44	11	0	0
	46	Head	1	0	0	13	0	11
	184	Belly	10	199	237	23	0	0
		Back	0	0	0	50	0	9
Abend Onondaga County, Central New York	4 ⁴	Legs	26	0	0	0	0	0
	17	Head	0	0	0	0	0	0
	68	Belly	787	23	9	4	1	0
		Back	0	0	0	8	0	9
Huntley St. Lawrence County, Northern New York	4	Legs	1	2	2	0	0	0
	24	Head	0	0	0	0	0	1
	96	Belly	6	25	29	0	1	0
		Back	0	0	0	1	0	1
Pomerville Addison County, Western Vermont	4	Legs	3	3	17	0	0	0
	80	Head	0	0	0	0	0	3
		Belly	5	306	647	2	6	0
		Back	0	0	5	4	0	62
Totals	26	Legs	35	22	63	11	1	0
	134	Head	1	0	0	22	0	18
	536	Belly	1191	734	1123	38	94	0
		Back	0	0	5	87	0	135

¹ No. sample dates.² No. sample series.³ No. samples taken.⁴ Samples may also have included a few *C. sanguisuga* (Coquillett), a species morphologically similar to *C. obsoletus*. Specimens were lost in mail transit between New York and Maryland and therefore could not be re-examined.

behavior, the presence of such groups or guilds warrants consideration.

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A LIGHTWEIGHT BATTERY-POWERED ASPIRATOR FOR COLLECTING RESTING MOSQUITOES IN THE FIELD¹

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The collection of mosquitoes during the resting phase of their behavior is undoubtedly the most efficient means of obtaining a representative sample of the population of many species, as well as the most productive method of obtaining blood engorged specimens for host identification studies. Many exophilic nuisance and vector species rest among grassy and shrubby vegetation and on the foliage of bushes (Service 1976). Various devices have been constructed to sample mosquitoes from these areas. Many have narrow openings for the mosquitoes to enter and are unsuitable for efficient sampling in grasses and low herbage-

ous growth where mosquito densities may be low.

One exception is the model described by Dietrick (1961) that is commercially available as the *D-VAC*. It has a large opening (34.3 cm diam) and is powered by an air cooled 2-cycle gasoline engine. The *D-VAC* is very efficient in collecting small insects.

The disadvantages of the *D-VAC* are its weight (12.5 kg), noise, vibration, exhaust from the engine, and the need to carry gasoline for frequent refueling.

A large, but lightweight, battery-powered aspirator has been designed by G. F. O'Meara (Florida Medical Entomology Laboratory, personal communication). Basically, his device is a 121 cm long \times 37.5 cm diam cylinder of aluminum with a clear vinyl nosecone in the front, and a net collecting bag mounted in the center of the tube. This device is quiet, portable, and efficient in collecting mosquitoes and other small insects from low foliage. The main disadvantage of this design is that most of the parts are not easily obtained and it must be fabricated by an experienced machinist.

The battery-powered aspirator described below (Figure 1) combines the light weight (less than 5 kg), portability, and efficiency of the aspirators mentioned above while being constructed from easily obtained parts with a minimum of tools or expertise (parts and suppliers listed in Table 1). The total cost of



Fig. 1. Battery powered aspirator in use.

constructing this aspirator is approximately \$80 (not including bags and batteries) compared to \$590 for a backpack model *D-VAC*.

The apparatus, shown diagrammatically in Figure 2, consists of a 61 cm (24 in) long \times 34.3 cm (13.5 in) inside diam tube fabricated by a local sheet metal shop from 24 g aluminum, and a 61 cm (24 in) long \times 34.3 cm (13.5 in)

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