IDENTIFICATION OF BLOODMEALS FROM MOSQUITOES COLLECTED IN LIGHT TRAPS AND DOG-BAITED TRAPS

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ABSTRACT. Bloodmeals from mosquitoes collected in both light and dog-baited traps were analyzed by capillary precipitin tests to determine host source. Nuisance mosquitoes, particularly *Culex salinarius*, were quite evident in the light trap material. This species exhibited a wide range of hosts whereas *Aedes vexans* demonstrated a strong preference for human and canine hosts. *Culex quinquefasciatus* and *Culex salinarius* comprised the bulk of blooded mosquitoes collected in the dog-baited trap. Both of these species fed extensively on canine hosts but other mosquitoes, particularly *Mansonia perturbans* and *Anopheles atropos* demonstrated a preference for other mammalian hosts as well as dogs.

INTRODUCTION. As part of an in-depth canine dirofilariasis survey conducted in Jefferson Parish during the summer of 1971, meaningful peripheral data concerning the feeding habits of 14 mosquito species were collected. A profile of host blood sources was constructed for several important species and a general feeding pattern for mosquito species locally abundant in the summer was also noted. The area under study has a mosquito fauna of approximately 46 species, a human population of ca. 350,000, a horse population of 3,318, and a dog population of ca. 40,000. These facts, when correlated with such bionomic data as those collected in this investigation, can be beneficial as background information for epidemiological and epizootiological surveys and mosquito control practices.

MATERIALS AND METHODS. Blooded mosquitoes were collected daily from 20 regularly operated New Jersey light traps as well as 3 portable dog-baited traps. The light traps used are normally used year round and are strategically placed in the Parish to obtain collections in those areas having the densest human population. Dog-baited traps similar to those described by Villavaso and Steelman (1970) were used to sample in the vicinity of the stationary light traps. Twenty-seven sites were sampled by the dog-baited traps during this 3-month period of peak mosquito activity. Each trap was baited with an average-size dog for 5 successive nights. Mosquitoes attracted to the bait were easily trapped in two louvered screened ends. Both ends containing the captured mosquitoes were then placed in a plywood box that was used to temporarily knock down the mosquitoes for easy collection. A hose was attached to the exhaust of an automobile for approximately 5–6 minutes. This amount of time was sufficient to knock down the mosquitoes for collection from the bottom of the screened sections. The mosquitoes were collected with a portable vacuum. The survivors, numbering 90–95 percent of the original catch, were transported to the laboratory in moist styrofoam boxes.

Identification of host bloodmeal sources was made using the capillary precipitin test as described by Tempelis and Lofy (1963). Following species identification of the blooded mosquito, the expanded abdomen was removed, crushed in 1 ml. of chilled phosphate-buffered saline, then centrifuged at 2,000 rpm. The supernatant, about .7 ml., was recovered and placed with known antisera in a capillary tube to undergo the precipitin antibody-antigen reaction. Two broadly reacting reference antisera, avian and mammalian, were used for initial screening. While no further avian tests were made, those bloodmeals reacting positively with mammalian antisera were reacted with more specific antisera to human, horse, and dog sera.

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A negative control consisting of the antisera plus the buffered saline was run routinely as were positive controls which consisted of known homologous mammalian sera or known bloodmeals taken from laboratory reared mosquitoes. In all, 1,327 blooded mosquitoes were tested.

RESULTS AND DISCUSSION. A total of 349 bloodmeals were categorized from mosquitoes gathered in light traps during the 3-month collection period. Typical nuisance mosquitoes such as *Aedes vexans, Anopheles crucians, Psorophora confinnis,* and *Culex salinarius* were well represented in these collections (Table 1). The latter species was particularly abundant and exhibited a broad pattern of avian and mammalian host preference. *Aedes vexans,* a floodwater mosquito, demonstrated a strong preference for mammalian hosts, particularly human and canine, with occasional feeding on horses. Tempelis *et al.,* (1967) noted a high incidence of bovine and equine feeding by this species in Colorado. This pattern of feeding on large mammals was also detected in Kansas (Edman and Downe, 1964) and Florida (Edman, 1971). The lack of availability of these larger mammalian hosts appears to have been compensated for with the presence of human and canine hosts in a largely urban environment. Also, *Aedes vexans* occasionally took blood from avian sources.

Blooded mosquitoes captured in the dog-baited trap consisted of 16 species representing 5 genera (Table 2). A total of 978 bloodmeals were categorized. *Culex salinarius* and *Culex quinquefasciatus* comprised the bulk of the collection while saltmarsh species such as *Aedes sollicitans* and *Aedes taeniorhynchus* were fairly numerous. All of these species exhibited a variety of host preferences but it is interesting to note the relatively high rate of canine bloodmeals identified from *Culex salinarius* and *Culex quinquefasciatus. Mansonia perturbans* exhibited a usual preference for mammalian hosts. *Anopheles atropos,* a saltmarsh species, was fairly numerous and preferred mammalian hosts, particularly human and dog. The information concerning *Culex pilosus* is also of interest since little is known of this mosquito's feeding habits. In an urban-suburban environment, it appears that this *Melaniconion* is fairly non-specific with respect to both mammalian and avian

The feeding patterns of the mosquitoes collected during this investigation therefore shed some light on the interaction of these species within the urban-suburban milieu of hosts that typifies most mosquito control districts. Additionally, insight can

TABLE 1.—Identification of bloodmeal sources from mosquitoes collected in New Jersey-type light traps.

Mosquito species	Host				
	Avian	Mammalian			
		Human	Horse	Dog	Unident.
1. *Aedes sollicitans*	1	3	2	2	2
2. *Ae. vexans*	10	31	14	32	38
3. *Anopheles atropos*	0	0	0	0	1
4. *An. crucians*	8	12	13	8	27
5. *An. quadrimaculatus*	2	6	4	1	4
6. *Culex erraticus*	0	0	0	0	1
7. *Cu. quinquefasciatus*	4	1	0	3	1
8. *Cu. salinarius*	12	12	18	24	24
9. *Cu. (Mel.)* spp.	0	0	0	0	2
10. *Mansonia perturbans*	0	1	2	3	2
11. *Psorophora confinnis*	8	3	2	0	4
12. *Uranotaenia sapphirina*	1	0	0	0	0

TABLE 2.—Identification of bloodmeal sources from mosquitoes collected in dog-baited traps.

Mosquito species	Host				
	Avian	Mammalian			Unident.
		Human	Horse	Dog	
1. *Aedes atlanticus*	1	0	0	0	0
2. *Ae. infirmatus*	2	0	0	0	3
3. *Ae. sollicitans*	40	42	9	22	9
4. *Ae. taeniorhynchus*	16	5	5	10	1
5. *Ae. vexans*	1	2	1	0	0
6. *Anopheles atropos*	7	13	4	9	0
7. *An. crucians*	5	2	2	4	12
8. *An. quadrimaculatus*	5	5	11	5	1
9. *Culex erraticus*	1	2	2	2	7
10. *Cu. pilosus*	19	15	24	15	21
11. *Cu. quinquefasciatus*	25	38	34	46	44
12. *Cu. salinarius*	76	107	50	89	0
13. *Cu. (Mel.)* spp.	5	2	1	1	3
14. *Mansonia perturbans*	0	23	20	27	10
15. *Psorophora confinnis*	2	3	0	5	4
16. *P. howardii*	0	0	0	1	0

be gained into the real and potential transmission dynamics of such human and veterinary diseases as arboviral encephalitides and canine dirofilariasis.

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