

scale patterns. Abnormal representatives of this species, recently taken with considerable frequency, display an increase in abdominal pale scales, generally concentrated as a dorsal median line (Fig. 2). When viewed without the aid of

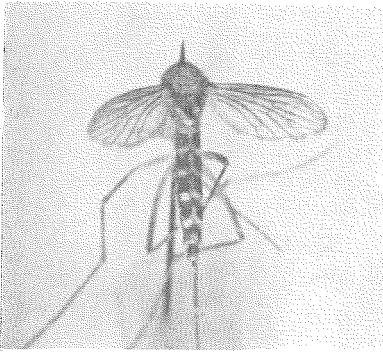


FIG. 2.—Moderately striped Adult Female *Aedes vexans*.

magnification, these scales present a clear dorsal median abdominal stripe. The extent of abdominal scaling appears to vary considerably. Occasionally, specimens may be found with white scales so heavily concentrated that the indentations associated with the abdominal bands are all but obliterated (Fig. 3).

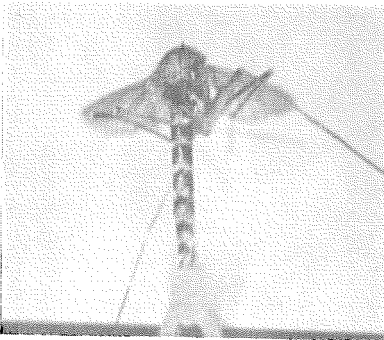


FIG. 3.—Heavily striped Adult Female *Aedes vexans*.

The increased number of pale scales is apparently not restricted to the abdomen. Many specimens displaying a median stripe exhibit wider bands on the tarsal segments. With some variation, the extent of median striping appears to be associated with the width of the tarsal bands.

Since 1966, approximately forty such specimens have been pinned and examined from New Jersey. These specimens show varying degrees of abdom-

inal striping. Trap records show that abnormal specimens have been taken from May through September. Although the majority of specimens taken thus far have come from the southern and western districts, recent traplines established in other areas have revealed a complement of abnormal individuals.

Prior to 1966, very few abnormal *Aedes vexans* were noted in routine light trap collections. Verbal reports from New Jersey mosquito investigators and those outside of the state, however, indicated that occasional specimens had been collected. Specimens have been received from Mr. Bruce Brockway of the Toledo Area Sanitary District in Ohio. Mr. Robert Lake of the University of Delaware attests finding four New Jersey specimens and three from Delaware in the University collection, which demonstrate a median stripe.

The possibility that variations in scale patterns might be connected with variations in habits has not been explored. All specimens thus far collected have represented isolated individuals, with no concentrations of striped specimens from one particular location. The possible association of this morphological variation with that of a separate race is, therefore, open to considerable question.

A FEEDING ASSOCIATION BETWEEN *Hippelates* (DIPTERA: CHLOROPIDAE) AND Tabanidae ON CATTLE: ITS POSSIBLE ROLE IN TRANSMISSION OF ANAPLASMOSIS<sup>1</sup>

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In a previous paper (Roberts, 1965), I reported that four species of the eye gnat (*Hippelates pusio* Loew, *H. pallipes* (Loew), *H. bishoppi* Sabrosky, and *H. plebejus* Loew) were collected from a steer-baited insect trap. In that initial study and in subsequent collections, I found specimens of these species that contained a reddish fluid in their digestive tracts. The source of this fluid was found to be blood ingested from wounds made by horse flies (Tabanidae). The observation that indicated the source was made when engorged horse flies were being collected for oviposition studies. Since this relationship between eye gnats and horse flies had not been reported, continued observations were made on the activity of eye gnats on a tethered bait animal. The present paper is a summary of the notes that were obtained.

When the bait animal was first tethered in the field for the observations, eye gnats could be found scattered over the body surface. However, when horse flies landed on the animal, the gnats clustered around and even on the fly as it began to

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feed. Gnats were not observed in close association with horse flies that were not attempting to feed. Also, many times gnats actively burrowed down next to the mouth parts of the fly as they were penetrating the skin. During blood flow, the gnats fed on excess blood around the mouth parts of the horse fly, and after the fly left, they fed on the blood that oozed from the wound. Although the gnats were associated with all species of tabanids, greater numbers were attracted to such larger species as *T. proximus* Walker, *T. atratus* F., *T. americanus* Forster, and *T. abdominalis* F. than to smaller species, *T. lineola* F., *T. fuscicostatus* Hine, and *T. subsimilis* Bellardi. The difference may have been the result of the bigger wounds made by the larger species.

Gnats were also associated with feeding stable flies (*Stomoxys calcitrans* (L.)), a relationship previously reported by Jay (1962), but in lesser numbers. The gnats were attracted also to the scabby areas on the animal's belly where large numbers of horn flies, [*Haematobia irritans* (L.)], had previously fed. Gnats were not observed near feeding mosquitoes, and it was established that the gnats were not attracted to the other insects either but to the wounds made by these insects. When superficial wounds were made on the animal's skin, the gnats clustered around and fed on the blood from such wounds.

*Hippelates* are known for their habit of feeding on the mucous membranes of animals and man, but only one report, that of Herms (1926), mentioned that these flies also feed on drops of blood on the skin and in open wounds or sores. No reports were found that indicated an association between *Hippelates* and Tabanidae.

Although *Hippelates* cannot be considered primary blood feeders, the association with Tabanidae is important to their potential for disease transmission. *Hippelates* flies are proved or suspected vectors of diseases such as conjunctivitis, yaws, and bovine mastitis (Sanders, 1940; Dawson, 1960). Recent work by Dimopoulos and his co-workers (1967) indicates that the role of these flies in the transmission of anaplasmosis in cattle should be investigated. Their study on routes of inoculation showed that it was possible to transmit anaplasmosis by the intraocular route. Two out of three splenectomized calves inoculated by flooding the ocular membranes with *Anaplasma*-infected blood contracted the disease. Thus, *Hippelates* that fed on blood from wounds caused by tabanids on cattle carrying anaplasmosis could be mechanical vectors of anaplasmosis when they later fed on the mucous membranes of the eyes of cattle susceptible to anaplasmosis. The possibility that a biological cycle might occur in the gnats should not be overlooked.

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#### THE SOUTH COOK COUNTY MOSQUITO ABATEMENT DISTRICT RIGHT HAND DRIVE IN SERVICE

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During its first years of operation the South Cook County Mosquito Abatement District used three-wheel motorcycles for catch basin spraying. Several methods of pressurizing the spray solution were used, but all were impractical and were a constant maintenance problem. The first method used was a fuel pump and pressure tank, but this did not have enough capacity. Next, independent gasoline engines and gear pumps were tried. This was more satisfactory, but required the extra engine which was an additional source of trouble. Another method tried was simply a glass-lined well system pressure tank that can be purchased readily and is inexpensive. The tank was filled at the depot and pressurized to 70 lbs. with the tire inflation system, but had the drawback in that the initial pressure was not quite enough for a full tank of solution and the operator was required to stop at filling stations for a recharge of air.

Probably the most annoying and time-consuming problem in using motorcycles was the motorcycles themselves. Inexperienced operators had trouble



FIG. 1.—Catch basin wand spraying basin. During travel the wand is carried in the tube mounted on the side of the vehicle.