NOTES ON HIPPELATES FLIES (DIPTERA, CHLOROPIDAE) IN TRINIDAD

by D.C.J. BASSETT

(Central Public Health Laboratory, London, N.W. 9).

These very small flies (1 — 2 mm. length) seem to have no name in general use in Trinidad, being commonly confused with fruit flies. In the United States they have earned the name "eye gnats", but this would seem less appropriate in Trinidad, as is suggested below. One Trinidadian offered the name "sore-foot fly"; this is very suitable, but is, I believe, an improvisation rather than a true common name.

Medical Importance

Certain members of the genus **Hippelates,** found in Trinidad and elsewhere, are strongly attracted to blood, serum or pus from cuts, scratches or sores, whether on human or animal skin. As they feed repeatedly at such sites, it is clear that they are very likely to transmit bacterial infection in this way. Kumm (1936) incriminated **Hippelates** in the transmission of yaws in Jamaica, Taplin and his colleagues (1965) attributed certain staphylococcal infections of the skin to them and Sanders (1940) showed the transmission of mastitis amongst cattle. The "eczemas" so commonly seen on the skins of Trinidadian children are caused by streptococci transmitted, among other ways, by **Hippelates** (Bassett, 1967).

In parts of the United States, **Hippelates** flies are notorious as eye gnats, being pests not only because of the spread of disease from eye to eye, but also because of the very great nuisance that they cause. Even a small number of flies can be very irritating if they are paying persistent attention to the eyes : the effect of a large number must be extremely unpleasant. In Trinidad, I found such behaviour by **Hippelates** flies rarely amounted to more than a mild inconvenience. Possibly this is due to the exposed skin being moister in a humid tropical climate and therefore more attractive to the flies, competing with the moistness of the eyes. On the other hand, the species in Trinidad, as well as contributing to the prevalence of skin infection, may have their behaviour adapted to take advantage of this food source.

Collection

The first specimens considered here were collected by Mr. R. Martinez, who caught them with a fine-mesh hand net around

some school children. Cultures of streptococci were obtained from a number of these flies. Other specimens were collected, at different times, by Dr. T. H. G. Aitken and by Dr. Elisha Tikasingh (as indicated on the list). Needing mechanical aid, and copying from Mr. John Davies, I adapted a battery-operated hand vacuum cleaner as a catching device. By this means I caught specimens around human or animal (dog) bait or simply from the inside of the windscreen or rear window of a parked car. Quite large numbers of flies can be collected in this last way, but it is important to remember the possibility of transferring insects inadvertently from one locality to the next in the car, and then attributing them to the second locality.

This propensity for riding in vehicles can take a fly very far away from the original breeding ground. One single **Hippelates** fly was seen to travel for nine miles inside a car windscreen, although the side windows were open. Another single fly was seen in the passenger compartment of a plane airborne between two of the Caribbean islands.

Collecting by any method was most successful on calm days; **Hippelates** are not usually observed when the wind is at all strong.

Identification

Dr. C.W. Sabrosky, of the U.S. Department of Agriculture, Washington, kindly examined the first collections. He determined the species and returned specimens to the entomology collection at the Trinidad Regional Virus Laboratory. Most later specimens could be identified by comparison with these, but unfamiliar species were still referred to Dr. Sabrosky.

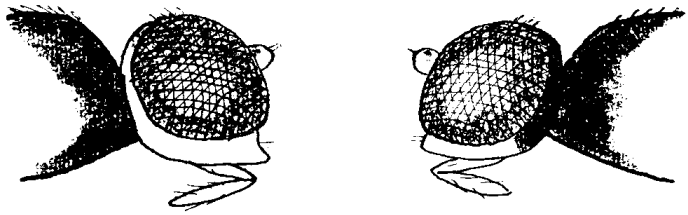
One characteristic of **Hippelates** which is useful, though not unique, is the presence of a conspicuous, curved spine or spur towards the distal end of hind tibia. A rather similar genus, **Goniopsita,** is represented in Trinidad by a fly which appears to be attracted to human bait in forested areas, but which lacks the hind tibial spur.

It is not proposed to compile a key to the species in Trinidad on the basis of a collection which is sure to prove incomplete. Instead, I will give merely a few notes on the characteristics of the species, together with a list of the places and dates where specimens were taken.

The majority of the flies caught fell into a group characterised by a shiny black thorax (mesonotum) : there are small hairs present on the shiny black area, numbers and arrangements varying with species, but they do not obscure the glossy surface. In this group, **H.flavipes** Loew and **H.peruanus** Becker have uniformly yellow legs, while **H.currani** Aldrich, **H.apicatus** Malloch and **H.tibialis** Duda all have distinctive bandings on the hind legs, as

HIND LEGS

H. tibialis **H. currani** **H. apicatus**



LATERAL VIEW OF HEADS

H. peruanus **H. flavipes**

illustrated. **H.flavipes** and **H.peruanus** are most easily distinguished from each other by considering the heads from the side view. The "cheeks" (genae) differ as shown, being wide and yellow in **H.peruanus**, while in **H.flavipes** they are black posteriorly, very narrow and rather silvery anteriorly. (In this same group, **H.pusio** Loew is on record in Trinidad (Legner and others, 1966), but I have failed to collect any specimens. There are, as the list below shows, large areas of Trinidad which I did not visit to collect **Hippelates.** In **H.pusio** the cheeks should be dark throughout and the hind femur dark banded, but not the tibia.)

The remaining three **Hippelates** species, all collected near beaches, all have the back of the thorax covered with a metallic-looking dusting (pollinose) : **H.proboscideus** Williston, and a single specimen which Dr. Sabrosky listed as **Hippelates** species near **pruinosus** Duda. The last one, again a single specimen, may possibly be a new species : this is one of a group of very small **Hippelates** with generally yellowish colouration, in contrast to the basically dark colour of the thorax found in all the species mentioned above. This Dr. Sabrosky referred to as **Hippelates** species near **saundersi** Kumm.

I have made no observations on the way the various species of **Hippelates** breed in Trinidad. In general, **Hippelates** breed in the soil. A series of catches made at Maracas St. Joseph showed that the population of **Hippelates** was markedly reduced during the dry season.

Acknowledgements

I am greatly indebted to Dr. C. W. Sabrosky, and to the entomologists of the Trinidad Regional Virus Laboratory, Dr. T H. G. Aitken, Dr. Elisha Tikasingh and Mr. John Davies, for all their help and advice.

REFERENCES

BASSETT, D.C.J. (1967) "**Hippelates** flies and acute nephritis" (letter) Lancet, i, 503.

KUMM, H.W. (1936) "The natural infection of **Hippelates pallipes** Loew with the spirochaetes of Yaws" Transactions of the Royal Society of Tropical Medicine and Hygiene **29,** 265.

LEGNER, E.F., BAY, E.C., and FARR, T.H. (1966) "Parasitic and predacious agents affecting the **Hippelates pusio** complex in Jamaica and Trinidad" Canadian Entomologist **98**, 28.

SANDERS, D.A. (1940) **"Hippelates** flies as vectors of bovine mastitis" Journal of the American Veterinary Medicine Association **97** ,306.

TAPLIN, D., ZAIAS, N. and REBELL, G. (1965) "Environmental influences on the microbiology of the skin" Archives of Environmental Health **11,** 546.

HIPPELATES CAPTURES

Species	Location	Dates	Total number
Hippelates flavipes Loew			**903**
	Cyril Bay	19/5/68	
	Maracas Bay	7/7/68	
	Tyrico Bay	21/10/67	
	Las Cuevas	3/12/67; 18/2/68; 18/5/68	
	Rincon Trace	7/7/68	
	Maracas Valley		
	— Maracas St. Joseph C.M. School	Oct. '67 -- June '68	
	— foot of El Tucuche	9/12/67	
	Fort Read **(T.H.G.A.)**	1/7/66	
	Heights of Guanapo	12/5/68	
	Scott Quarry (Blanchisseuse Road)	23/6/68	
	Matura Forest Reserve	5/5/68	
	Rampanalgas (Toco Rd.)	6/5/68	
	Naparima-Mayaro Rd., 3½m.p. **(E.T.)**	25/6/68	
	Mayaro Forest	20/2/68	
	Guayaguayare	30/6/68	
	Cedros	25/9/67	
	Icacos	25/9/67; 5/11/67	

50

Hippelates currani Aldrich			**1,481**
	Las Cuevas	18/2/68; 18/5/68	
	Maraval (Brieves Rd.) various dates,	1966 — '68	
	Port-of-Spain (C.I.C.)	10/5/68	
	Maracas St. Joseph (C.M. School)	Oct. '67 — June '68	
	St. Joseph (C.M. School) (R.M.)	22/6/66	
	Rampanalgas	6/5/68	
	Mayaro Beach	22/7/67	
	Guayaguayare	30/6/68	
	Cedros	25/9/67	
	Icacos	25/9/67; 5/11/67	
Hippelates peruanus Becker			**145**
	Cyril Bay	19/5/68	
	Las Cuevas	18/5/68	
	Maracas St. Joseph (C.M. School)	Oct. '67 — June '68	
	St. Joseph (C.M. School) **(R.M.)**	22/6/66	
	Matura Forest Reserve	5/5/68	
	Rampanalgas	6/5/68	
	Mayaro Beach	22/7/67	
	Fort Read **(T.H.G.A.)**	1/6/66	
	Guayaguayare	28/6/68 : 30/6/68	
	Cedros	25/9/67	
	Icacos	25/9/67 ; 5/11/67	

51

Hippelates apicatus Malloch		**7**
Maracas Bay	7/7/68	
Mayaro Beach	22/7/67	
Guayaguayare	30/6/68	
Icacos	25/9/67	
Hippelates tibialis Duda		**3**
Tyrico Bay	21/10/67	
Hippelates proboscideus Williston		**2**
Manzanilla (North end of Cocal)	15/6/68	
Guayaguayare	30/6/68	
Unnamed species (see text)		**2** (different)
Icacos	25/9/67 ; 5/11/67	

N.B. The numbers are influenced by the repeated collections made at Maracas St. Joseph, and should not be taken to be applicable to the whole island. However, the first three species listed accounted for most of the Hippelates in most of the areas visited.