AMERICAN TRYPANOSOMIASIS SURVEY OF FLORIDA *TRIATOMA* SPECIES[1]

ERNEST M. IRONS, JR.[2] AND JERRY F. BUTLER

Department of Entomology and Nematology, University of Florida, Gainesville, Florida 32611

ABSTRACT

A survey was conducted in Florida to determine the incidence of American trypanosomiasis in its *Triatoma* vectors. *Triatoma spp.* were collected and fed on uninfected laboratory animals. Insect fecal deposits were collected, stained, and studied under phase microscopy for the presence of the metacyclic (trypomastigote) stage of the trypanosome. No field collected triatomas were found to be naturally infected with *Trypanosoma cruzi* –like organisms.

American trypanosomiasis is an important disease in Central and South America. The presence of the vectors and the disease in the United States is known but information on the disease potential in Florida is limited. Thurman et al. (1948) recorded the distribution of *Triatoma* spp. in Florida as virtually state-wide. Usinger (1944) reported 2 species in Florida, each with a subspecies. These are: *Triatoma sanguisuga* (LeConte), *Triatoma sanguisuga ambigua* (Neiva), *Triatoma lectularia* (Stål), and *Triatoma lectularia floridana* Usinger. Usinger (1944) provided a complete biology and description of the species. Thurman et al. (1948) recorded no natural infections with *Trypanosoma cruzi* for the Florida species; Packchanian (1940), however, reported that Florida species have been infected with *T. cruzi* under laboratory conditions and are potential vectors. Mead (1965) reported that nymphs and adults of *T. sanguisuga* may be found at almost any time of the year in Florida. The objective of this survey was to determine the incidence of *T. cruzi* in *Triatoma* species collected in Florida.

MATERIAL AND METHODS

INSECT COLLECTION

The authors collected triatomas at a total 15 sites in 5 counties in Florida. Triatomas were collected from November 1969 through May 1971. The habitats discussed by other authors were checked for the presence of triatomas. The insects were carefully handled to prevent injury and were maintained in 2 qt plastic containers with snap-on lids until returned to the laboratory at Gainesville.

Fecal smears were taken on all surviving field collected triatomas as they fed to repletion on laboratory animals free of trypanosomiasis. The smears were fixed on a microscope slide that had been lightly coated with Mayer's albumen. The fecal deposit was smeared as thin as practical, dried

[1]Fla. Agricultural Experiment Stations Journal Series No. 609.

[2]Present Address: United States Army Health Services Command, Fort Sam Houston, Texas 78234.

for 24 hr, and then treated with 1% formalin solution for approximately 3 min. The formalin solution was removed and the slide air-dried until subsequent staining with Giemsa at pH 7.2. Stained slides were scanned with a phase microscope for the characteristic metacyclic trypomastigote stage.

Triatoma COLONIZATION

Rearing procedures were modified from Ryckman (1952, 1954), Usinger (1944), and Wood (1941). Collected triatomas were maintained in clear plastic cylinders, 5 × 9 cm, closed at one end by a snap cap and at the other by 18 mesh screen. Insects from each locality and collection were separately maintained until checked for trypanosomes. The individual insect containers were maintained in large bell jars at 80% relative humidity controlled by a saturated salt solution of ammonium sulphate (Winston and Bates 1960). Temperature was maintained at 25°C in constant temperature cabinets.

The insects were allowed to feed through the screened end of the cylinder. Absorbent paper was used in the cylinder to absorb any fecal deposits. Paper toweling was cut and folded for a resting perch which contacted both ends of the cylinder, providing a means for the triatoma to climb to the screened end to feed.

Stained fecal smears from 45 insects were thoroughly scanned with the aid of a phase microscope to determine if *Trypanosoma cruzi* organisms were present. Fecal smears were secured from insects collected from the following areas:

Gainesville	Alachua Co.	16 insects
Gulf Hammock	Levy Co.	7 insects
Burch Grove (vic. Lake John)	Orange Co.	3 insects
Magnolia Park	Orange Co.	9 insects
Camp WeWa	Orange Co.	4 insects
Tall Timbers Research Station	Leon Co.	6 insects

Since the triatomas were kept at all times in the small containers, a feeding rack was constructed to hold both the container and host for feeding. A mature white laboratory rat served as the blood source.

RESULTS AND DISCUSSION

All (specimens) belonged to the *T. sanguisuga* complex. The collected and reared adult triatomas were identified by the authors, using the keys of Thurman et al. (1948) and Usinger (1944). Based upon size differences (Usinger 1944), 22 *T. sanguisuga sanguisuga* and 10 *T. sanguisuga ambigua* were identified from the collections. No specimens of *T. lectularia* were collected.

Collections were made in Alachua County with 36 specimens taken from November 1969 to May 1971. Nine specimens were taken from Leon Co. in December and August 1970; 4 specimens were taken from Leon Co. in September; 2 specimens from Hardee Co. in July 1970, and 28 specimens were taken from Orange Co. in August 1970.

Many of the collected nymphs were buff in color. After feeding on a laboratory animal, they darkened as a result of the blood meal. The nymphs were frequently found in company with the wood-roach *Eurycotis floridana* (F. Walker).

During the winter months, the immature triatomas were found under

loose bark of oak and pine trees, in hollow stumps, trees or logs, and in brush piles in the immediate area of animal runs. A majority of the immature triatomas found under bark during the winter months were located just above a demarcation line between moist and dry portions of the log or stump.

No positive smears were found from the fecal samples. These results support surveys made by Thurman et al. (1948) who reported no natural infections of *T. cruzi* in triatomas in Florida.

LITERATURE CITED

MEAD, F. W. 1965. The blood-sucking conenose (Hemiptera:Reduviidae). Ent. Circ. 33. Fla. Dep. of Agr. Div. of Plant Industry, 2p.

PACKCHANIAN, A. 1940. Experimental transmission of *Trypanosoma cruzi* infection in animals by *Triatoma sanguisuga*. Pub. Health Rep. 55: 1526-32.

RYCKMAN, R. E. 1952. Laboratory culture of Triatominae with observations on behaviour and a new feeding device. J. Parasitol. 38:210-4.

RYCKMAN, R. E. 1954. A method of collecting large quantities of feces from Triatominae infected with *Trypanosoma cruzi*. J. Econ. Ent. 47:170-1.

THURMAN, D. C., JR., J. A. MULRENNEN, ERNESTINE BASHAM AND D. J. TAYLOR. 1948. Key to Florida Triatoma with additional distribution records for the species. Fla. Ent. 31:58-62.

USINGER, R. L. 1944. The Triatominae of North and Central America and the West Indies and their public health significance. Pub. Health Bull. No. 288, 83p.

WINSTON, P. W., AND D. H. BATES. 1960. Saturated solutions for the control of humidity and biological research. Ecology 41(1):232-7.

WOOD, S. F. 1941. Notes on the distribution and habits of reduviid vectors of Chagas' Disease in the Southern United States, Pan Pacific Ent. 17:85-94.