AMERICAN TRYPANOSOMIASIS SURVEY OF FLORIDA TRIATOMA SPECIES

Ernest M. Irons, Jr. 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 (trypanomastigote) 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 (Le Conte), Triatoma sanguisuga ambiguus (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; Packehanian (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

1Fla. Agricultural Experiment Stations Journal Series No. 699.
2Present 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 separa-
tively maintained until checked for trypanosomes. The individual insect
containers were maintained in large bell jars at 80% relative humidity con-
trolled 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 cylin-
der. 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:

<table>
<thead>
<tr>
<th>Location</th>
<th>County</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gainesville</td>
<td>Alachua Co.</td>
<td>16 insects</td>
</tr>
<tr>
<td>Gulf Hammock</td>
<td>Levy Co.</td>
<td>7 insects</td>
</tr>
<tr>
<td>Burch Grove (vic. Lake John)</td>
<td>Orange Co.</td>
<td>3 insects</td>
</tr>
<tr>
<td>Magnolia Park</td>
<td>Orange Co.</td>
<td>9 insects</td>
</tr>
<tr>
<td>Camp WeWa</td>
<td>Orange Co.</td>
<td>4 insects</td>
</tr>
<tr>
<td>Tall Timbers Research Station</td>
<td>Leon Co.</td>
<td>6 insects</td>
</tr>
</tbody>
</table>

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 Euryctes
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 triatoma 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. (1949) who reported no natural infections of T. cruzi in triatomas in Florida.

LITERATURE CITED


