**Fahrenholzia texana**, New Species, with a Key to the United States Species of *Fahrenholzia* (Anoplura: Hoplopleuridae)

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**ABSTRACT**

This species is described from specimens collected in Cameron County, Texas, from the Texas spiny mouse, *Liomys irroratus texensis* Merriam. Its taxonomic details are illustrated, as are important taxonomic characters of the six species of the genus that are keyed.

The present paper reports a new species of sucking louse from the Texas spiny mouse (*Liomys irroratus texensis* Merriam). The specimens were collected by Dr. Richard B. Eads, H. A. Trevino, and E. G. Campos, of the Medical Entomology Laboratory, U. S. Quarantine Station, U. S. Public Health Service, Brownsville, Texas, at the Noriegas Wildlife Refuge, Cameron County, Texas. There are now six known species of sucking lice in the genus *Fahrenholzia* Kellogg and Ferris in the United States.

**Fahrenholzia texana**, new species

Plate 1

**FEMALE.**—Length about 1.5 mm. Head about as wide as long; thoracic sternal plate longer than wide, definitely wider posteriorly, and anterior margin slightly concave. Abdomen with paratergal plates present on segments 2 to 4; paratergal plate 2 with three long, inflated setae between the dorsal and ventral lobes; paratergal plate 3 bilobed, with its apical angles pointed and with two long, approximately equal setae on the posterior margin; a narrow median, longitudinal, sclerotized plate on dorsum of abdomen between paratergal plates 2; ninth tergite with a transverse plate; female genital plate large, well developed, somewhat truncate posteriorly, with three pairs of minute setae; gonopods set somewhat laterally, with three setae.

**MALE.**—Length about 1.25 mm. Very similar to female. Male genitalia with basal plate uniformly wide throughout its length; parameres with a tooth-like process on inner posterior margin.

**TYPES.**—Holotype female, July 19, 1960, and one female on June 14, 1960. These specimens were found intermixed with specimens of another *Fahrenholzia* species, *F. microcephala* Ferris, on the same host animals. They are, therefore, good examples of sibling parasites competing for the same host animal.

**Comparative Notes.**—There are two distinct groups in the United States species of *Fahrenholzia* (see plate 2). In the *pinnata* group (including *F. pinnata* Kellogg and Ferris, *F. microcephala* Ferris, and *F. texana*, new species) the females have a genital plate, and the males have greatly expanded parameres. In the *tribulosa* group (including *F. tribulosa* Ferris, *F. zacateci Ferris*, and *F. reducta* Ferris) the females lack the genital plate and the male genitalia have slender parameres.

In the *pinnata* group, *pinnata* is easily distinguished by the short sternal plate, which is about as wide as long, and the absence of the median, longitudinal, sclerotized plate on the dorsal surface of the abdomen between the second paratergal plates. Both *microcephala* and *texana* have the thoracic sternal plate longer than wide, and have a narrow, medial, longitudinal, sclerotized plate on the abdominal dorsum between paratergal plates 2. The important differences between *microcephala* and *texana* are tabulated below and are illustrated in part in plate 2.

**KEY TO NORTH AMERICAN SPECIES OF Fahrenholzia**

1. Paratergal plates present only on abdominal segments 2 to 4. **2**
   2. Thoracic sternal plate longer than wide; dorsal surface of abdomen with narrow, median, longitudinal, sclerotized plate between paratergal plates 2. **On *Liomys*; Texas and Mexico**

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Fahrenholzia texana, new species

Plate 1.—Fahrenholzia texana, new species, showing taxonomic details.
Plate 2.—Important taxonomic characters of six species of *Fahrenholzia*.
Thoracic sternal plate about as long as wide; dorsal surface of abdomen without narrow, median, longitudinal, sclerotized plate between paratergal plates.

2. On Perognathus and Dipodomys

3. Thoracic sternal plate concave on anterior margin; three long, inflated setae between dorsal and ventral lobes of paratergal plate 2; dorsal lobe of paratergal plate 3 pointed apically. F. texana n. sp.

Thoracic sternal plate convex on anterior margin; two or more minute setae between dorsal and ventral lobes of paratergal plate 2; dorsal lobe of paratergal plate 3 apically truncate.

F. microcephala Ferris

4. Paratergal plates of abdominal segment 2 with a single pair of setae between dorsal and ventral lobes; male genitalia with parameres greatly expanded; female genital plate present.

F. pinnata Kellogg and Ferris

Paratergal plates of abdominal segment 2 with six to eight long, inflated setae between dorsal and ventral lobes; parameres of male genitalia not expanded; female genital plate absent.

F. reducta Ferris

5. Paratergal plates present on abdominal segments 2 to 6; paratergal plate 3 bilobed.

F. zacatecae Ferris

Paratergal plates present on abdominal segments 2 to 7; paratergal plate 3 not bilobed.

F. tribulosa Ferris

Eichler (1950) described a species Fahrenholzia fahrenholzi from a single female louse collected on Dipodomys deserti in Arizona. The authors have not seen his type, which presumably is in the Fahrenholz collection in Bremen, Germany. However, the writers have examined specimens from this same host, collected in Arizona, through the courtesy of Lt. Col. K. C. Emerson and the authorities of the U. S. National Museum. F. fahrenholzi Eichler appears to be a synonym of Fahrenholzia pinnata Kellogg and Ferris, and is so considered in this paper.

The writers are indebted to Dr. R. Eads and his coworkers, who furnished the series of this new species, and to Lt. Col. K. C. Emerson for the loan of specimens and advice concerning F. texana. Dr. Morris Trager, Chairman, Department of Microbiology, Emory University, and Dr. D. S. Martin, Chief, Training Branch, Communicable Disease Center, Atlanta, Georgia, have continued their active interest in this project.

REFERENCE CITED


The Detoxication Function of Insect Hemocytes

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ABSTRACT

The initial observation that insects are more susceptible to chemical intoxication when the blood specific gravity is high led the author to the observation that this condition usually presages a molt and at this time the blood count is low. Experiments in which the blood count was reduced chemically or physically brought about an increase in the susceptibility of the grey house cricket to parathion. Further investigation indicates that this susceptibility may be related to the amount and activity of nonspecific esterases which appear to be carried by the hemocytes.

The blood or hemolymph of insects is a nearly neutral fluid consisting of a serum fraction in which there are free-floating cells. Wigglesworth (1959) reviewed the functions of these cells and assigned them five roles. These include phagocytosis and immunity, protection from metazoan parasites, coagulation, intermediary metabolism, and connective tissue formation. In 1942, Yeager et al. suggested a sixth function, that of detoxication. The data which are reported verify this function.

This work has been limited to the study of the cells of the American cockroach, Periplaneta americana (L.), the house cricket, Acheta domesticaus (L.), and the greater wax moth, Galleria mellonella (L.). The cricket has received the most attention.

The blood cells as we recognize them are disk-shaped bodies normally more or less elliptical in outline. There are at least two types, based upon morphological characters and staining reactions. These are the free-floating cells; however, as Wigglesworth pointed out, only a fraction of the blood cells are in circulation. The rest of them appear to be loosely adherent to the body wall and to other tissues. The possibility that these may be rendered mobile under certain circumstances seems to be great, and this may well explain some of the phenomena reported here and in the work of others.

EXPERIMENTAL

Early in 1946 Yu Lin, a Chinese special student working in these laboratories, observed that when cockroaches with an abnormally high blood specific gravity were treated with chlorinated hydrocarbons (DDT, chlordane, BHC or lindane, and toxaphene) he experienced a higher rate of kill than when normal roaches were tested. Subsequent investigations showed that blood specific gravity higher than the normal usually presages a molt, and Patton and Flint (1959) demonstrated that the blood count diminishes very significantly during this time. Com-