birds, reptiles, and bats, and is continuing
taxonomic studies, which have been under way for a number of years.

Species of *Anopheles* in Venezuela.—
The principal vectors of malaria in Ven-zeuila are *Anopheles albimanus* Wied. on
the coast and *A. darlingi* Root in the inte-
rior. The other anophelines, according to
Dr. Pablo Cova-García, are *A. argyritarsis*,
R.-D.; *A. pseudopunctipennis* Theob., *A.
punctimacula* D. and K., *A. macroglossens-*
isi L. and N., *A. eiseni* Coq., *A. albivaris*
L., *A. stroeci* Root, *A. bellator* D. and
ostauroi* Perry, *A. pisoni* G. and L., *A.
boliviensis* Theob., *A. nimbus* (Theob.), *A.
macironchi* Gab., *A. benavochi* G. and C.-G.,
romuatus* Komp., *A. purus* (Chagas),

*A. thomasi* Shan., *A. mediopunctatus*
Theob., *A. opinaculata* D. and K., *A.
crinita* D. and K., *A. trinoclirrhus* dunnii P.
and S., and *Chagasia batunana* (Dyar).

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**ADDITIONAL STUDIES ON THE LARVAE OF Uranotaenia syntheta DYAR AND SHANNON (DIPTERA: CULICIDAE)**

**OSMOND P. BRELAND**

The adult of this mosquito was described
in 1934 from a female specimen reared
from a larva collected at Mission, Texas
(Dyar and Shannon 1934). Dampt (1943)
described the male, and published observa-
tions relative to the biology and distribu-
tion of the species in Mexico. In 1946 the
larva was described from a specimen col-
lected at Fort Worth, Texas (Porter
1946).

During the past two years, the writer
and his associates have collected many
larvae of *Uranotaenia syntheta*, and have
reared some to adults, thereby correlating
adult and larval stages. A few notes rela-
tive to the status of *U. syntheta* have
recently been published (Breland 1948).

The original larval description was
made from a single specimen, and conse-
quently it was not possible to note individ-
ual variations that might occur in a series
of larvae. For this reason, it has seemed
advisable to study many larvae so that
these variations may be noted. The follow-
ing description is based upon a study of
several dozen larvae collected over a period
of two years from Palmetto State Park.
near Luling, Texas, as well as a study of the larva from which the original description was made. The terminology used is that of Carpenter, Middlekauff and Chamberlain (1941).

**Description of Larva of Uranotaenia syntheta**

**Head** only slightly longer than wide, not obviously so, as in some other species of *Uranotaenia*; darkly pigmented except in region of the eyes. Antenna about ¾ length of head with a few coarse spines on the shaft, and several papillae at the tip. Antennal hair single, small, inserted medially near basal third of shaft. **Hair**; **Preantennal** multiple, sparsely barbed, about same length as antenna; **Lower** single, coarse, sparsely barbed, longer than antenna; **Upper** usually double, coarse, shorter than lower; single and forked near tip in an occasional specimen. **Postclypeal** 4 to 5-branched, shorter than upper and lower. **Scutal** usually single and forked near middle, sometimes single or single and forked near tip. **Transcultural** multiple and long.

**Dorsal submedian prothoracic hair group** composed of two long single barbed hairs extending beyond the bases of upper head hairs, and a multiple tuft of 5 to 6 slightly shorter hairs also barbed.

**Abdomen**: **Upper lateral abdominal hairs** double on segments 1 and 2; **Lower** single on segment 1 and a short multiple tuft on segment 2. **Comb of 8th segment** composed of 7 to 10 scales on the posterior margin of a large sclerotized plate. Individual scale thorn-shaped, with small lateral spinules visible under high-power on basal half to two-thirds. Groups of small spinules on plate near bases of comb scales. Part of plate to which comb scales are attached frequently projecting more posteriorly than remainder of plate. **Siphonal hair** multiple, smooth, attached to a small sclerotic area; a single smooth hair between siphonal and sub-siphonal attached to same plate as siphonal. **Subsiphonal hair** multiple, sparsely barbed, attached to a small sclerotic plate; a single smooth hair between subsiphonal and anal hair, not arising from a sclerotic area. **Anal hair** multiple, smooth, no sclerotic area occurring at base. **Siphon** about 4½ to 5 times as long as basal width. **Pecten** of numerous evenly spaced teeth reaching near middle of siphon. Individual pecten tooth broad, fringed with fine spinules visible under high-power. **Subventral tuft** multiple, barbed, inserted at or slightly beyond end of pecten. **Dorsal brush** of a long lower double tuft, and a shorter upper tuft with usually 3 hairs on each side. **Ventral brush** rather sparse, some of the posterior hairs 4- or 5-branched. **Anal segment** longer than wide, completely ringed by plate. **Posterior edge** of plate set with small spinules. **Lateral hair** multiple. **Gills** 4, slightly pointed, usually somewhat shorter than anal segment.

In most generic keys now in use for larvae of mosquitoes in the United States, larvae of the genus *Uranotaenia* are distinguished from other larvae by the structure of the head hairs and the shape of the head. *Uranotaenia sapphirina* (Osten Sacken), *U. lowii* Theobald and *U. syntheta* Dyar and Shannon are the only species of *Uranotaenia* known to occur in the southwestern United States. In the two former species, both the upper and lower head hairs are single and spinelike, while the head is longer than wide. In most other culicine larvae, the head hairs are hair-like, frequently branched and the head is not obviously longer than wide. Consequently, the head hairs and the shape of the head are sufficient to distinguish *U. sapphirina* and *U. lowii* from the larvae of other culicine genera. In the larvae of *U. syntheta*, however, the head hairs are not obviously spinelike, the upper head hairs are usually double and in most specimens the head is not noticeably longer than wide.

It is thus proposed that future generic larval keys for mosquitoes of the southwestern United States, or for the United States as a whole, be modified to include distinguishing features of *U. syntheta*. At
Fig. 1.—Head of fourth instar larva of *Uranotarsus syntheta* Dyar and Shannon.

Fig. 2.—Terminal segments of fourth instar larva of *Uranotarsus syntheta* Dyar and Shannon.
this writing, *U. synthesa* has been collected in the United States only from Texas, but further collections may reveal that the species occurs in adjacent states. In the larvae of the genus *Uranotaenia* known to occur in the United States, the comb scales on each side are attached to the posterior edge of a large chitinous plate. The comb scales of most other culicine larvae in this region occur as a row or patch of individual scales. The larvae of some species of *Psorophora* are exceptions in that their comb scales are attached to a small plate. This plate in these *Psorophora* larvae, however, is quite small, and it covers much less than one half of the lateral surface of the segment. In the larvae of *Uranotaenia*, the plate is large and conspicuous; it covers more than half the lateral segmental surface and sometimes extends dorsally to the upper side of the segment. It appears, therefore, that the differences in the comb scales are better key characteristics than the shape of the head and the structure of the head hairs.

Once the larvae of *U. synthesa* are determined to genus, they may be distinguished easily from other larvae of *Uranotaenia* known to occur in the same area. In *U. sapphirea* and *U. lowii* the upper and lower head hairs are large, single and spine-like. These hairs are much smaller in *U. synthesa* and the upper head hairs are double or forked on one or both sides.

The larvae of *U. synthesa* are apparently very similar to those of *U. anhydor* Dyar, a rare species known only from the vicinity of San Diego, California. At the present state of our knowledge it is not possible to give morphological features that will distinguish the larvae of the two species. However, in view of the distance now known to separate the two mosquitoes, it does not appear probable that the ranges overlap. Distinctions may thus be made on the basis of distribution.

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