

103800-2-1.

**THE LARVA OF PSOROPHORA (JANTHINOSOMA) COFFINI  
DYAR AND KNAB AND A KEY TO THE PSOROPHORA LARVAE  
OF THE UNITED STATES AND THE GREATER ANTILLES  
(Diptera, Culicidae)**

By HARRY D. PRATT, *U. S. Public Health Service*

*Psorophora coffini* Dyar and Knab was described in 1906 from female specimens collected on June 22 and 23, 1903 at Nassau, Bahamas by T. H. Coffin. On Nov. 5, 1920 Dr. E. Pederson collected the larvae of this species in pools following heavy rains at St. Thomas, Virgin Islands, and reared two males and four females which were sent to the late Dr. H. G. Dyar of the U. S. National Museum. Dr. Dyar described this male in 1921 (1) and keyed and figured the male in 1928 (2).

The female is a rather small mosquito, 1.5 mm long, with the toothed claws and beautiful, blue-violet, iridescent color typical of the subgenus *Janthinosoma*. The proboscis is entirely black; the occiput is black, clothed with black setae and whitish scales of two types, some flat and depressed, others erect and forked. The mesonotum has many small, yellowish scales, thickest at the margins, but none of the black scales centrally as in *Psorophora varipes* (Coquillett) of southeastern United States. Abdomen with apical, lateral, yellow or whitish, triangular spots. Legs black with violaceous reflections, basal three-fourths of hind femora whitish, fourth segment of hind tarsus white. Wings with dark narrow scales only.

This species is most closely allied to *Psorophora (Janthinosoma) johnstonii* Grabham originally described from Jamaica and its synonym *P. schwarzii* Dyar and Knab from Cuba. *Coffini* has the "hind femur indistinctly white-tipped," while *johnstonii* is separated by Dyar (2) by having the "hind femur distinctly white-tipped." The writer has in his collection specimens which were collected by G. A. Thompson, Jr., at Portland Ridge, Jamaica, B.W.I. some forty miles west of the type locality of *johnstonii*, one female from Ponce, P. R., collected by J. Maldonado Capriles, and a series of females from Culebrita, P. R. These are considerably larger and stouter mosquitoes, 3 mm. long, with the more distinctly white tip on the hind femur characteristic of *johnstonii*. Moreover, they all were collected within a mile of coastal mangrove-pickleweed swamps. The *coffini* larvae and females described in this paper from St. Croix, and compared with the type series of *coffini* in the U. S. National Museum by Dr. Alan Stone, are noticeably smaller and were collected three miles inland under quite different ecological conditions. Until larvae and males of both species are known from the type localities, it seems wisest to call the present species *coffini* following the usage of Dr. Dyar for the St. Thomas specimens (1). If the two species are later found to be synonymous, the correct name is *johnstonii* Grabham which was described in 1905 whereas *coffini* Dyar and Knab dates from 1906.

The hitherto unknown larvae of this species is now described from specimens reared in St. Croix, Virgin Islands. Notes on the biology are added with a key to the larvae of *Psorophora* known from the United States and the Greater Antilles.

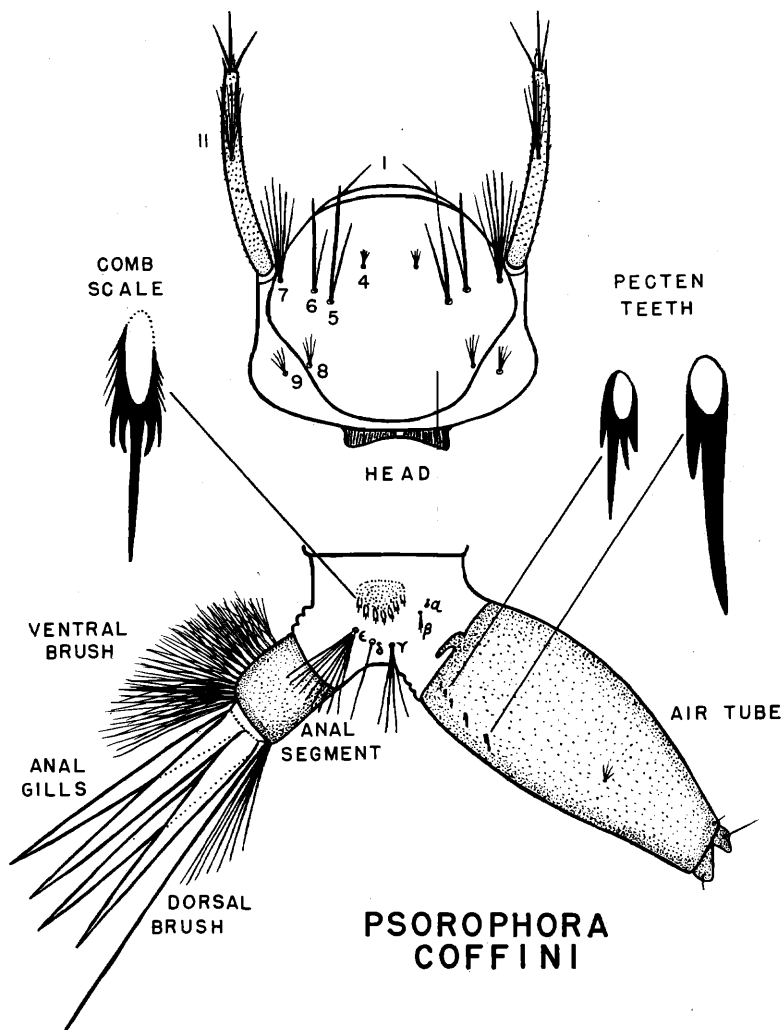
#### BIOLOGY

On Dec. 18 and 19, 1945, H. D. Pratt collected 8 larvae and reared seven females from a collection made in the Upper Love section of Fredericksted, St. Croix, Virgin Islands. The pool was located in a depression in a dry valley, densely shaded by a thick growth of *Ficus*-like trees with long aerial roots trailing almost to the ground and overgrown with the spiny leguminous vine *Guilandia crista* (L) Small. The pool itself was absolutely devoid of vegetation, full of cattle hoof prints, and grossly polluted. Associated mosquito larvae were *Psorophora confinis* (L.A.), *Culex nigripalpus* Theobald, *Aedes tortilis* (Theobald), and *Anopheles grabhamii* Theobald. No larvae were found in sunlit pools 25 feet away, which suggests that *coffini* larvae, like other *Psorophora (Janthinosoma)* larvae, are found most frequently in densely shaded places. Third and fourth larval stages were each completed in a day or two and the pupal stage in 36 to 48 hours. This suggests

six to ten days are required from hatching of the egg to emergence of the adults under optimum conditions.

DESCRIPTION OF LARVA

The larva of *Psorophora (Janthinosoma) coffini* is very similar to the larva of *Psorophora (Janthinosoma) horrida* (Dyar and Knab) as redescribed and figured by Roth (5).



Head broader than long. Antenna eight or nine-tenths as long as the median length of head, spinulate throughout, slightly curved, antennal tuft (No. 11) slightly beyond middle, 6- to 12-branched; postclypeal hairs (No. 4) small, fine, multiple; upper head hairs (No. 5) double, lower head hairs (No. 6) double or triple, both with inner branches shorter than the outer branches; anteaantennal tuft (No. 7) multiple.

Integument smooth. Lateral abdominal hairs composed of two large, multiple tufts on segments I and II, on segments III to VI, the lateral hairs vary from single to multiple, usually multiple, with a large, single hair on segment VII. Eighth abdominal segment with 6 or 7 comb scales arranged in an arc at the posterior and of a weakly sclerotized plate. Each scale has a long central spine flanked on each side by one or two smaller teeth and several progressively smaller denticles. Pentad group of hairs behind comb scales present, the *alpha* and *beta* hairs very small and inconspicuous, between comb scales and air tube, *gamma* and *epsilon* hairs large and multiple-branched; *delta* hair long and single.

Air tube inflated, 2.5 to 3.5 times as long as basal width, usually about 2.8 times as long as basal width, with 3 to 8 short pecten teeth. These may have one to several basal denticles on one or both sides as in Roth's (5) illustrations of these structures in larvae of *Psorophora horrida* and *longipalpis*. A minute multiple ventral tuft, whose branches are usually shorter than the length of the apical pecten tooth arises ventro-laterally on the apical third of the air tube. Dorsal preapical spine about half as long as last pecten tooth, and one-third as long as dorsal apical hair.

Anal segment slightly longer than wide, ringed by sclerotized plate, ventral brush consisting of 13 to 14 hair tufts which perforate the plate along the mid-ventral line; dorsal brush a long, stout hair and shorter multiple tuft on each side; saddle hair small and multiple, branched a short distance from the base. Four tapering anal gills two to four times as long as anal segment.

The length of the upper and lower head hairs (Nos. 5 and 6), which Roth (5) used as a primary character in separating *horrida* and *longipalpis* larvae, vary considerably in *coffini* larvae. Whole larval mounts show these hairs to extending to the clypeus, as drawn in Plate I, while larval skins show these same hairs extending barely to the preclypeus as in Roth's (5) drawing of *horrida* larvae. The difference apparently is due to the convexity of the head in whole mounts and flattening of the preparations in cast larval skin mounts.

The larvae of *Psorophora (Janthinosoma)* are separated by rather fine characters. In order to show the relationship of the previously undescribed larva of *coffini* to the other species, and to Roth's (5) recently described *longipalpis*, the following key has been constructed for the species of *Psorophora* known

from the United States and the Greater Antilles. This key is adapted from those of Dyar (2), King, Bradley and McNeel (3) and Matheson (4).

KEY TO LARVAE OF PSOROPHORA IN THE UNITED STATES AND THE GREATER ANTILLES

1. Pecten of air tube with numerous teeth (20 or more) which are prolonged into hairs; mouth brushes prehensile, consisting of stout hairs hooked at tip and with a row of comb-like teeth along the side; tuft of air tube a single long hair..... 2  
 Pecten of few teeth (less than 10) which are not prolonged into hairs; mouth brushes not prehensile, consisting of long hairs only; tuft of air tube never a single long hair..... 3
2. Lateral hair of anal segment 3- or 4-branched; pecten reaching about the middle of air tube..... *ciliata* (Fabricius)  
 Lateral hair of anal segment single or forked some distance from base; pecten not reaching middle of air tube  
*howardii* Coquillett
3. Antenna very large, inflated apically, two long bristles at outer third in addition to central hair tuft; air tube short, not inflated, with large, multiple tuft..... *discolor* (Coquillett)  
 Antenna not as described above; air tube strongly inflated, the tuft small or obsolete..... 4
4. Both upper and lower head hairs multiple..... 5  
 Upper and lower head hairs not both multiple..... 6
5. Upper and lower head hairs usually with 5 or more branches; anal gills always longer than wide..... *confinnis* (L.A.)  
 Upper and lower head hairs usually 3-branched; anal gills bud-like, about as long as wide..... *insularius* (Dyar and Knab)
6. Upper and lower head hairs single..... 7  
 Upper head hairs double or triple..... 9
7. Air tube with a pair of long hairs at tip (dorsal apical hair)  
 3 to 8 times as long as distal pecten tooth..... 8  
 Air tube with these hairs 1 to 3 times as long as distal pecten tooth..... *pygmaea* (Theobald)
8. Antennal and preantennal hair tufts multiple, conspicuously feathered; tip of antenna with three short apical spines and two longer subapical spines; six to eight comb scales  
*signipennis* (Coquillett)  
 Antennal and preantennal hair tufts with two or three branches, some of which may be secondarily divided, sparsely feathered; antenna with 3 or 4 stout spines arising at tip; three or four comb scales..... *cyanescens* (Coquillett)
9. Antenna distinctly longer than median length of head..... 10  
 Antenna shorter than, or rarely as long as, median length of head..... 11

10. Long lateral hairs on abdominal segments IV, V, and VI multiple ..... *longipalpis* Roth  
 Long lateral hairs on abdominal segments IV double, on V and VI single ..... *ferox* (Humboldt)
11. Eighth abdominal segment with four or five comb scales  
       *varipes* (Coquillett)  
 Eighth abdominal segment with five or eight comb scales ..... 12
12. Upper and lower head hairs extending anteriorly to about base of antenna, never beyond preclypeous; air tube usually more than three times as long as basal width (Eastern United States) ..... *horrida* (Dyar and Knab)  
 Upper and lower head hairs extending anteriorly to beyond base of antenna, often beyond preclypeus; air tube usually 2.5 to 3 times as long as basal width (Bahamas, Greater Antilles, Virgin Islands) ..... *coffini* (Dyar and Knab)

## ACKNOWLEDGMENTS

The writer wishes to acknowledge the assistance of Dr. Robert Matheson of Cornell University, Sr. Assistant Sanitar-ians H. C. Knutson, Roy F. Fritz and C. E. Bickley of the U. S. Public Health Service and the officials of the Fourth Service Command Laboratory of the U. S. Army who kindly loaned specimens of other species of *Psorophora* larvae for comparison with *coffini* larvae. Sr. Entomologist (R) G. H. Bradley and Sanitary Engineer (R) Porter A. Stephens have made constructive criticisms during the preparation of the paper. Special acknowledgment is made to Dr. Alan Stone of the National Museum for checking the determination of the reared specimen from St. Croix and supplying data on the *coffini* material in the U. S. National Museum. A reared specimen and a slide with associated larval and pupil skins and one additional larval slide have been deposited in the U. S. National Museum, Washington, D. C.

## LITERATURE CITED

- (1) DYAR, H. G. 1921. The male of *Psorophora coffini* Dyar and Knab. Insector Insectiae Menstruus, 9:31.
- (2) DYAR, H. G. 1928. The mosquitoes of the Americas, Carnegie Inst. Wash. Publ. 387, 616 pp., illustr.
- (3) KING, W. V., BRADLEY, G. H., and MCNEEL, T. E. 1944. The mosquitoes of the southeastern States. U.S.D.A. Misc. Publ. 336, second edit.
- (4) MATHESON, R. 1944. The Mosquitoes of North America. Comstock Publishing Co., Ithaca, New York. I-VIII, 314 pp., illustr.
- (5) ROTH, L. M. 1945. The male and larva of *Psorophora (Janthinosoma) horrida* Dyar and Knab, and a new species of *Psorophora* from the United States (Diptera, Culicidae). Proc. Ent. Soc. Wash., 47 (1): 1-23, illustr.