

## A BRIEF NOTE ON BREEDING PLACES OF *CULICOIDES* IN SÃO VICENTE, BRAZIL

O. P. FORATTINI, E. X. RABELLO AND D. PATTOLI

School of Hygiene and Public Health, University of São Paulo, Brazil

There has been little research on breeding places of *Culicoides* in the neotropical region. We know only the work of Lutz (1912) in Brazil, and that of Carpenter (1951) and Woke (1954) in Central America. No other extensive investigation was made. Therefore, our observations on the subject may be of interest.

We have been studying the biology of these Diptera since August 1955, in the vicinity of São Vicente on the south coast of Brazil. Special attention was given to the search for breeding places. That city, which is adjacent to Santos, is surrounded by tidal marshes, with a few elevated areas containing low vegetation. Several channels cross these marshes and communicate directly with the ocean.

The sampling method we used was essentially the same as that used by Carpenter (1951). Mud samples of about 500 c.c. volume were collected in the edges as well as in the shallow bottom of several water accumulations. They were put in enameled vessels in the laboratory, flooded with tap water and allowed to stand overnight. The next day they were examined for larvae and pupae. Immature stages were collected at the edges of the vessels where the larvae, swimming with serpentine movements, could be seen easily. In this way we collected and examined 189 samples, of which 56 had immature forms of *Culicoides*.

We have found *Culicoides maruim*, *C. insignis*, *C. guyanensis* and *C. reticulatus*. The collections were made in several locations and the results may give some knowledge about the preferred larval habitat. *C. maruim* was found in mud of tidal marsh and edges of channels (Figs. 1 and 2), containing decomposed organic matter. It was very difficult to detect, and not

many were found. *C. insignis* was taken from ditches whether or not they were flooded by salt water at high tide (Figs. 3 and 4), but it was seldom collected in the mud around mangrove roots (*Rhizophora*). This species was taken also from crab holes of *Oedipleura*.

*C. guyanensis* was recovered from several ditches (Fig. 5) with poor vegetation and in places fully exposed to the sun throughout the day. Some of these ditches were in contact with salt-water. *C. reticulatus* was found only in the mud collected at bottom of crab holes of *Cardisoma guanhumi* (Fig. 6), as was already described by Lutz (1912).

Such findings suggest that *C. maruim* and *C. reticulatus* have more or less well defined breeding places: the first in the tidal marshes and the second in crab holes of *Cardisoma*. On the other hand, these observations lead us to suppose that *C. insignis* and *C. guyanensis* endure great variations in the composition of water and mud of their breeding places.

**SUMMARY.** We have presented a brief note on breeding places of *Culicoides* at São Vicente, Brazil. There are few data on this subject in the neotropical region. Immature forms of *C. maruim*, *C. insignis*, *C. guyanensis* and *C. reticulatus* were found. The former and the latter seem to have the more restricted habitat.

### Literature Cited

- CARPENTER, S. J. 1951. Studies of *Culicoides* in the Panama Canal Zone (Diptera, Heleidae). *Mosquito News* 11:202-208.
- LUTZ, A. 1912. Contribuição para o estudo das "Ceratopogoninas" hematofagas encontradas no Brazil. *Mem. Inst. Oswaldo Cruz* 4:1-32.
- WOKE, P. A. 1954. Observations on Central American biting midges. *Am. Ent. Soc. America* 47:61-74.

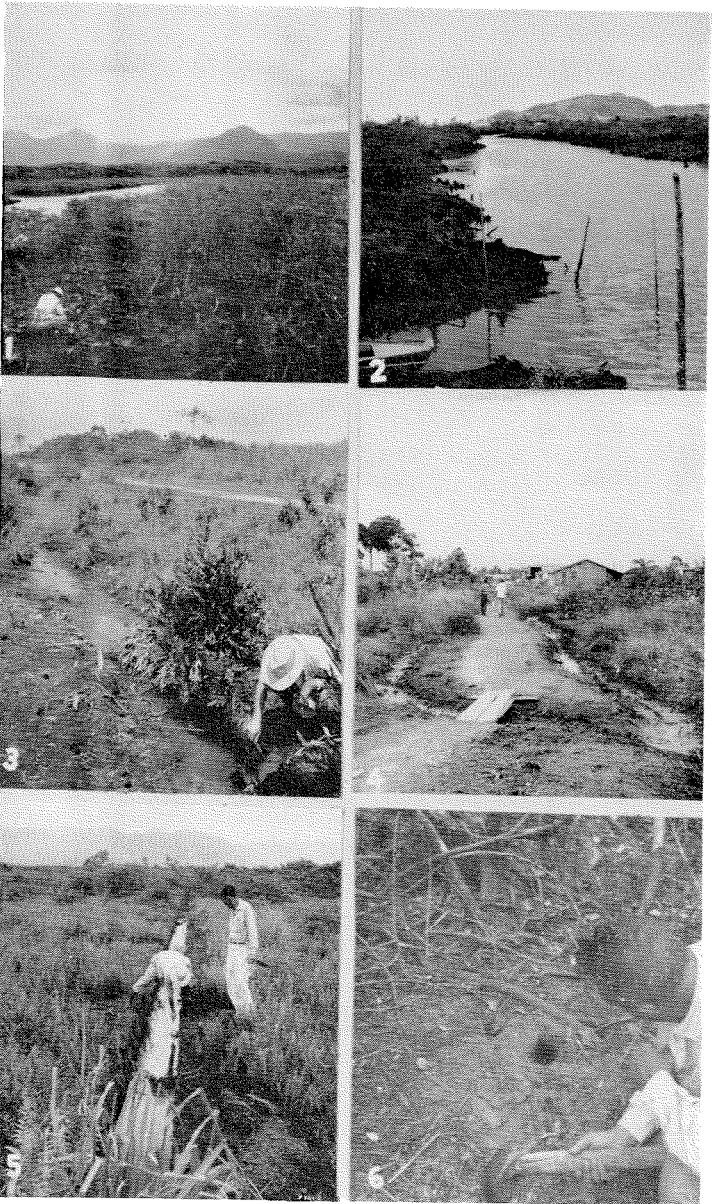


FIG. 1. Tidal marsh where immature *Culicoides maruim* were recovered.

FIG. 2. Channel in the edges of which pupae of *Culicoides maruim* were taken.

FIGS. 3 and 4. Ditches where larvae and pupae of *Culicoides insignis* were found.

FIG. 5. Drainage ditch, habitat of immature *Culicoides guyanensis*.

FIG. 6. Crab hole of *Cardisoma guanhumi* at bottom of which immature stages of *Culicoides reticulatus* were collected.