(Reprinted from the Proceedings of the Entomological Society of Washington, Vol. 38, No. 4
April, 1936.) pp. 57-70

AN ANNOTATED LIST OF THE MOSQUITOES FOUND IN THE VICINITY OF AN ENDEMIC FOCUS OF YELLOW FEVER IN THE REPUBLIC OF COLOMBIA.[1]

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During the summer of 1935 the writer made a mosquito survey of the area around Restrepo, in the Intendencia (province) of Meta, some 20 kilometers to the north of Villavicencio, the capital of that Intendencia, in the Republic of Colombia.

Yellow fever had appeared there in 1934 (1), and one case so diagnosed on the basis of a positive liver examination occurred in the vicinity during the writer's stay. Comparatively little was known of the mosquito fauna of the region, and as the disease is transmitted chiefly by mosquitoes, a knowledge of the species present was urgently required.

Restrepo is a small town lying at the base of the foothills of the eastern slope of the Andes, at an elevation of approximately 1800 feet. The climate, in spite of the elevation, is tropical, with abundant rainfall, apparently distributed so that there are two wet seasons, one in the fall, and another in May and June. However, these wet seasons are really times of more abundant rainfall, as during the writer's stay rain fell nearly every day, and even during late September, before the advent of the fall rains, there was only one period of three successive days in which no rain fell. Temperatures were relatively high, reaching 85° and 90° F. during the day; humidity was likewise apparently high, but became progressively less as the summer advanced.

The region around Restrepo is almost ideally located to provide good collecting ground for insects of all kinds. To the west, easily accessible from the town, lie the rather steep slopes of the foothills of the Andes. To the east lie the great llanos or plains, stretching out in a nearly unbroken expanse to the

[1] The studies and observations on which this paper is based were conducted with the support and under the auspices of the International Health Division of The Rockefeller Foundation, in cooperation with the U. S. Public Health Service and the Departmento Nacional de Higiene of the Republic of Colombia.

Atlantic Ocean. The slopes of the foothills are clothed with dense rain-forest, with many rapid mountain streams; in the forest are dense stands of large bamboo, which provide shelter and breeding-places for many mosquito species indigenous to this plant. Many sorts of water-bearing plants abound, including wild banana (*Heliconia* spp.), *Calathea*, aroids, bromeliads, and various palms, whose fallen spathes hold water, and form excellent breeding-places for many sorts of Culicid larvae. Besides these plants, rot-holes in the large jungle trees provide breeding-places for several species of *Haemagogus*, *Aedes* and *Dendromyia*. Along the base of the foothills, in the jungle, there are many leafy pools which harbor *Aedes* larvae, and in the open grassy pools of the roadsides and the plains species of *Psorophora*, *Mansonia*, *Culex* and *Anopheles* are found.

An attempt was made to obtain the larvae of as many species as possible, to associate them with their adults, to discover any hitherto unknown larvae, and to obtain specific data regarding their breeding-places. In this the writer was quite successful, as in a very large percentage of the species present he was able to associate reared adults with their larvae, and also obtained material of a number of undescribed larval forms.

The writer reached Restrepo on July 8, 1935, and remained there continuously until September 23d, with the exception of the first 13 days in August. His first collection, made with a sweep-net on July 10th, contained the greatest number of species and of specimens taken in any collection during his stay. There was a gradual, progesssive diminution in numbers of all sorts of mosquitoes, with the exception of the common species of domestic *Culex*, as the summer advanced and the rains decreased. In all, nearly 80 species were collected during the survey. Several species, not taken by the writer, were found and identified among material collected before his arrival. The greater number of the species were already known to the writer, as the mosquito fauna of the region was surprisingly like that of Panama, where the writer has spent the last five years. The species found are listed below in the order in which they appear in Dyar's "The Mosquitoes of the Americas."

Tribe **SABETHINI**, Genus **Sabethes** Robineau-Desvoidy.

1. *Sabethes goeldii* H. D. & K. Several females were found in the collections made during the writer's stay.
2. *Sabethes schausi* D. & K. One female in poor condition. Retiro, near Restrepo, Aug. 23, '35.
3. *Sabethes cyaneus* Fabr. Larvae were taken on several occasions from the dark brown water deep in the slender stumps of a species of "fish-tail" palm. Shannon (2) has described and figured the larva. The writer

does not believe that the larva is predaceous, as several were taken in one tree-hole at a time; they paid no attention to small Culex larvae placed with them in cultures, but fed upon protozoal scum furnished them, and came to maturity on this food. The writer was bitten once by a female, in dense jungle. The bite was not very painful, and the insect was easily scared off.

4. *Sabethes albiprivus* Theobald. Several female specimens corresponding to the description of this species were taken at various times, in deep jungle. Because of their rarity and shyness, none of the species of this genus are likely to be concerned in the transmission of yellow fever.

Genus **Sabethoides** Theobald.

5. *Sabethoides serratoria* Dyar and Nunez T. Two female specimens from Retiro, near Restrepo. Other species of the genus should occur in the region, the larvae in bamboo.

Genus **Limatus** Theobald.

6. *Limatus durhamii* Theobald. This was one of the commonest species of the region. The larvae were found many times in the water in fallen palm-spathes, and in other fallen leaves. The adults came to bite, but were not aggressive.
7. *Limatus asulleptus* Theobald. This species was nearly as common as the preceding, and had the same habits. Females may be distinguished from those of *durhamii* by the abdominal coloration. In *asulleptus* the light under side is separated from the dark dorsum in a straight line. In *durhamii* the light color of the under side cuts into the dark upper side in a series of wedge-shaped marks.

Genus **Wyeomyia** Theobald.

8. *Wyeomyia celaenocephala* D. & K. The larvae of this species were taken several times from the water between pineapple leaves. No adults were taken in collections.
9. *Wyeomyia flavifacies* Edwards. Several specimens corresponding to the description of this species were taken in September near the Guacavía River, about a 3-hour journey from Restrepo. They were taken attempting to bite.
10. *Wyeomyia aphobema* Dyar. Adults were bred from larvae commonly found in Bromeliads, both terrestrial and arboreal. No adults were taken in hand collections.

Genus **Dendromyia** Theobald.

11. *Dendromyia complosa* Dyar. The larvae were taken on several occasions in the water in a small Bromeliad. Adults were taken by sweeping with a net near the same locality, but were not aggressive biters.
12. *Dendromyia aporonoma* D. & K. The larvae were taken on several occasions from the clear dark-brown water in tree-stumps. Adults occasionally came to bite, but were not aggressive.

13. *Dendromyia melanocephala* D. & K. The larvae were found in the water at the base of the leaves of "elephant-ears," *Colocasia*. The slow-flying adults were sometimes seen hovering in the shade of these plants, but never attacked.
14. *Dendromyia eloisa* H. D. & K. Several small adults were bred from larvae taken from the flower-bracts of plants of the genus *Calathea*, growing in dense jungle. The species is apparently rare.

Genus **Goeldia** Theobald.

15. *Goeldia longipes* Fabr. Adults were fairly common in hand-catches early in the season (July). Larvae were taken on one occasion from water in the leaf-bases of *Colocasia*, where they were feeding on other larvae.
16. *Goeldia pallidiventer* Theobald. The larvae were taken in the water in cut bamboo, feeding on other larvae. da Costa Lima (3) gives a photograph, but no description of the larva. No adults were taken in hand-catches.
17. *Goeldia* n. sp. A single larva, probably from water in the flower of a species of *Heliconia* (it was brought into the laboratory without data), produced a female specimen. The larva is unlike any figured by Dyar. A description of this larva will be made in a forthcoming publication.

Genus **Joblotia** Blanchard (*Trichoprosopon* Theobald).

18. *Joblotia digitata* Rondani. This was the only species taken in the region. The fat white larva was common in cut bamboo, and the adults were fairly numerous in the jungle near their breeding-places. They are very conspicuous with their slow, undulating flight, with out-spread white-tipped legs. The bite was severe, but the adults were easily scared off.

Tribe **CULICINI**, Genus **Psorophora** Robineau-Desvoidy.

19. *Psorophora ciliata* Fabr. A single larva was taken in a road-side pool, from which a male emerged. As noted by Shannon (2), specimens from the tropics are usually much darker than those from temperate climates. Dyar's statement, "Not found in tropical lowlands," is obviously incorrect. The very large larva is predaceous.
20. *Psorophora ferox* Humboldt. This was the commonest species of the genus found in the region. It was present throughout the whole time of the writer's stay, although less numerous towards the latter part. It is an aggressive biter, and was found in open jungle far from the type of temporary pools in which it normally breeds. It bites by day, and has been shown capable of transmitting the virus of yellow fever. It should be regarded with suspicion as a vector wherever it is found. In the writer's opinion, it is far more potentially dangerous than any species of *Haemagogus* with which he is familiar, either in Panama or Colombia. Larvae were found in ground-pools.
21. *Psorophora lutzii* Theobald. This species is much like the preceding, but with yellowish scales on the sides of the thorax on each side of a broad central longitudinal dark line. The larvae were not found, but adults were taken several times in hand-catches.
22. *Psorophora cyanescens* Coq. No larvae were found, but a single female