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The subgenus *Melanoconion* and allied subgenera of *Culex* mosquitoes are large and little known groups of neotropical culicines. Stone and Knight (1959) report the following number of valid species in this group of subgenera: *Melanoconion* 114, *Mochlostyrax* 9, *Microculex* 29, *Eubonnea* 2, *Aedinus* 13 and *Carrollia* 14.

Separation of the various species has been based almost exclusively on differences in the male terminalia. In the subgenera *Melanoconion* and *Mochlostyrax* 51, or 40% of the valid species, are known only from descriptions of the male terminalia. Authors describing new species almost invariably figure in great detail these male structures but treat very lightly, if at all, the external morphology of the adults with phrases such as: "A small brown *Culex*, unmarked in any distinguishing manner" (Komp and Curry 1932, describing *C. haynei*). Modern faunistic studies on neotropical Culicidae, such as Lane (1953), wisely avoid including keys for the separation of females or larvae. Differentiation of the subgenera of *Culex* is also based almost entirely on male terminalia characters, so that identification of females to species or even to subgenus by published keys and descriptions is an almost impossible task. This has caused considerable delay in research on the bionomics and disease-transmission potential of these mosquitoes, since it is necessary to isolate and rear individually each larva obtained in order to associate the different stages and the two sexes.

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Some years ago the Belem and Trinidad laboratories of the Rockefeller Foundation began isolating arboviruses from wild-caught females of *Melanoconion* and *Aedinus*, two closely allied subgenera of *Culex*. This was followed by similar experiences in Panama by Gorgas Memorial Laboratory and the Middle America Research Unit. Entomologists at the first three institutions soon discovered that females of many of the important local species could be separated by external morphological characteristics. However, each of these species had to be tagged with a number instead of a name because of the difficulty in associating segregated females with specifically identified males. In the last two years, workers at the above-mentioned laboratories have begun to unravel some of the complex taxonomic problems and recognition of all stages of a number of important species is now possible. As a consequence some species have been associated with specific viral agents in Panama, Trinidad and Brasil as follows:

Group-A viruses: EEE: *Culex taeniopus* (Trinidad); VEE: *Culex taeniopus* (Trinidad and Panama); *Culex vomerifer* (Panama, Trinidad); *Culex* n. sp. (Trinidad); *Culex mojuensis* (Belem); *Culex accelerans* (Trinidad). *Group-B agents*: SLE: *Culex caudelli* (Trinidad); Ilheus: *Culex vomerifer* (Panama). *Group-C agents*: *Culex* n. sp. (Trinidad); *Culex mojuensis* (Belem); *Culex accelerans* (Trinidad); *Culex spissipes* (Trinidad); *Bunyamwera group agents*: Kairi virus: *Culex spissipes* (Trinidad); *Guama-group agents*: *Culex vomerifer* (Panama); *Culex* n. sp. (Trinidad).

Studies carried out at the Trinidad Regional Virus Laboratory have shown that mosquitoes of this group are highly attracted to rodent bait. Similar experiences were noted at Belem and in Panama. It is then logical to suppose that these mosquitoes are important vectors of those arboviruses which are naturally harbored by rodents. That this may be the case, is shown by data presented in the 1961 Annual Report of the Trinidad Regional Virus Laboratory incriminating *Culex* n. sp. (sp. ♀9) as a vector of a group-C agent active in the sentinel mouse population of the Bush-Bush forest.

In Panama, Gorgas Memorial Laboratory investigators have been carrying out studies for the past two years on two species of *Culex (Melanoconion)* in relation to the ecology of Venezuelan Equine Encephalitis in the vicinity of Almirante. These species are *C. taeniopus* and *C. vomerifer*. While it is impossible at this point to fully discuss findings of these investigations, we hope will serve to emphasize the importance of this group of mosquitoes and to stimulate further work in other areas.

Intensive studies on the arboviruses of the region of Almirante in extreme northwestern Panama have been conducted since September, 1959. While many viral agents were isolated from mosquitoes, humans, wild vertebrates and sentinel mice, no VEE virus was picked up until April, 1961 when one isolation was obtained from a pool of *Culex vomerifer*. From this month until November, 1961 a total of 13 isolations of VEE virus were obtained from mosquitoes, seven were gotten from *Culex taeniopus*, four from *Culex vomerifer* and two from *Culex quinquefasciatus*. These isolations came from 13 out of 238 pools of these three species of *Culex* tested. On the other hand, 268 pools of other species of mosquitoes processed were negative for this virus. At the same time VEE was also isolated from 8 out of 242 sera of wild rodents tested. Seven isolations came from the Cotton Rat (*Sigmodon hispidus*) and one from the Spiny Rat (*Proechimys semispinosus*). In June and July of the same year, four isolations of VEE were obtained from humans suffering from fever of unknown origin. Fifty three other persons gave history of a similar illness at the time. All these persons were inhabitants of two alum sectors of Almirante built against the swamps. Tests for VEE complement-fixing antibodies among 361 residents of the town gave a 30% positive rate. The only mosquito commonly found inside the houses was *Culex quinquefasciatus*, but large numbers of *Culex vomerifer* and *Culex taeniopus* were collected biting human subjects on the open porches of houses during the evening and early night.

Long term studies on host-prefernce of the mosquitoes of Almirante carried out during the past three years revealed

the following facts about *C. taeniopus* and *C. vomerifer*. Out of 75,497 mosquitoes taken in diurnal captures on human bait (9 a.m. to 3 p.m.) only 25 were *C. taeniopus* and 67 *C. vomerifer* or less than 0.2% of the total catch. In nocturnal collections with the same bait a total catch of 185,018 mosquitoes was obtained. *C. vomerifer* was the third commonest species with 18,001 specimens, and *C. taeniopus* with 7,568 females captured was the fourth commonest species. On nocturnal collections with chicken bait, using the Bellamy-Reeves can trap, *C. taeniopus* and *C. vomerifer* were the third and fourth commonest species with 1,515 and 1,104 specimens respectively, out of a total of 47,783 mosquitoes captured. On sentinel mice exposed at night in Lumsden's traps, out of a total catch of 2,378 mosquitoes, 1,003 were *C. taeniopus* and 640 *C. vomerifer*, these two species being by far the commonest of the mosquitoes captured. In recent months, nocturnal captures with the Lumsden trap have been made using wild rodents and birds as bait. On the Coton Rat (*Sigmodon hispidus*) out of a total 1,036 specimens captured, 327 were *C. vomerifer* and 188 were *C. taeniopus*, they being the two commonest species taken. In captures made with the Spiny Rat (*Proechimys semispinosus*) *C. vomerifer* and *C. taeniopus* were again the two commonest species captured with 145 and 97 specimens respectively, out of a total catch of 320 mosquitoes. A number of captures were made suing the Common Saltator (*Saltator maximus*) as bait. Out of 576 specimens taken, 112 were *C. vomerifer* and 100 were *C. taeniopus*, these two species being outnumbered only by *C. nigripalpus* (156) and *Mansonia venezuelensis* (113).

Data presented above seems to indicate a predilection of both *C. vomerifer* and *C. taeniopus* for rodent blood. However, they appear to have a wide range of host selection, with frequent attacks on avian and human hosts. The frequency of VEE virus isolations from these two species of mosquitoes, coupled with the viremias detected in some of their preferred hosts, such as the Cotton Rat, the Spiny Rat and Laboratory white mice exposed in the field, would seem to point to *C. vomerifer* and *C. taeniopus* as the most likely suspects in the

natural transmision of VEE in Almirante. The fact that these mosquitoes feed frequently on man and wild birds, could explain spill-over of the virus from wild rodents to man and even to wild avian hosts, which has recently been detected in our study area.

Much work remains to be done on the biology and ecology of species of *Melanoconion* and allied subgenera. Little is known of their breeding habits and to my knowledge colonization in the laboratory has not been accomplished with any species of this group of *Culex* mosquitoes.

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