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**BLOODSUCKING MOSQUITOES (DIPTERA, CULICIDAE)  
OF THE CHERNOVITSY REGION**

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In the Western Ukraine and neighboring countries (Czechoslovakia and Rumania) mosquitoes attract attention as the vectors of neurotropic viruses. The information now available indicates that mosquitoes may play a part in the dissemination of certain types of neuroviruses in the Carpathian zone and that some of these viruses are causative agents of disease in man.

The only reference in the literature to the mosquitoes of the Chernovitsy region is a communication by Lobintseva (1953) concerning the discovery of eight mosquito species in the vicinity of Chernovtsy. There are fuller lists for the neighboring administrative regions of Stanislav (Stovbun, 1952, 1956) and Trans-Carpathia (Gutsevich, Podolyan and Yezhova, 1959).

Our studies were made in June-August 1959, at points between the rivers Dniester and Prut and in the wooded locality of the forest-steppe between the Prut and the Carpathian foothills. Regular observations were conducted between the rivers at Stavchany in the Kitsman district where there are many permanent and seasonal stretches of water (ponds, marshy areas around ponds and along ravine beds). Several points in mountain districts at an altitude of 500-600 m were also examined (Vizhnitsa, Beregommet and Krasnoil'sk).

The material was procured by the usual methods (capture of mosquitoes on people, in rooms and among vegetation, collection of larvae and the rearing of mosquitoes from pupae). Particular attention was paid to the collection of mosquitoes in natural biotopes. O. V. Omel'chenio, Yu. S. Yaroslav, A. V. Yevtsikhovich, Ye. I. Kal'chenko and Ye. A. Churkina took part in the work.

The weather was warm and dry during the work; temperature data are given in Table 1. There were not many mosquitoes at most of the points investigated; capture on people yielded 5-15 mosquitoes in a 20-min period during hours of maximum activity. It was only at certain points (the forest near Glyboga and Krasnoil'sk and a water meadow at Stavchany) that mosquitoes were present in moderate or significant numbers (up to 25-40 in a 20-min count).

In all 6139 mosquitoes of 26 species were captured and identified (Table 2). The list is not, of course, exhaustive but it probably includes all species present in any quantity and some of the rarer species. It can be pointed out in comparison that as a result of many years of observation in the Eastern Ukraine (Donets and Lugansk regions) 30 species of mosquitoes have been recorded (Val'kh, 1959).

One of the species discovered was new to the fauna of the USSR (see below). The others have already been recorded in the western regions of the Ukraine. Mention should be made of the discovery of two rare species that are mainly mountain species (*Aedes pullatus* and *Theobaldia glaphyoptera*). *Aedes pullatus* was included among mosquitoes captured when attacking people in the villages of Krasnoil'sk and Glyboka. The glaphyoptera larvae were discovered in a small patch of spring water along the River Cheremosh in the forest to the south of Vizhnitsa at an altitude of approximately 600 m above sea level.

The numerical ratios of the more abundant species differ in different districts of the region. *Aedes* of the common group, especially *A. sticticus*, predominated at the boundary of the mountain zone (Krasnoil'sk). In the larch, hornbeam and hornbeam-beech forests of the foothill belt and the area between the rivers Dniester and Prut the dominant species was either *A. geniculatus* (in forests containing many large trees - Vizhnitsa, Tsetsin, Chernavka) or *A. cantans* (Kamennaya and Glyboka) and *A. vexans* (the forests near Sadgor and Storozhinets). In the water meadows at Stavchany *Culex pipiens*, *Aedes flavescens*, *A. cinereus* and *A. caspius dorsalis* were plentiful throughout the observation period.

Some of the mosquitoes collected (27 groups containing 1601 specimens) were sent for virological examination, as a result of which one neurotropic virus strain was isolated from *A. cantans* and another from *A. diaantaeus* (Gutsevich and Vigovskiy, 1950).

Of the plentiful species *Aedes caspius*, *A. sticticus*, *A. geniculatus*, *A. vexans*, *A. cinereus* and *Culex pipiens* all have a certain additional number of adults produced in the summer, whereas *A. cantans* and *A. communis* only have a single spring generation in May under the conditions of this area. By the middle of July the calendar age of females of these species should be not less than 1-1/2 months.

The digestion period of *A. cantans* at 18° (the average temperature between 20 May and 20 July - Table 1) is six days on average. If the other stages of the gonotrophic cycle (ingestion of blood, oviposition) continued without interruption it could be assumed that a large part of the population of the species would consist by the middle of July of females that had passed through not less than five gonotrophic cycles. However, determination of physiological age by the Polovodova-Detinova method gave different results. Of 20 *A. cantans* females captured on 17 July five

Table 1  
Mean air temperature (°C) from data supplied by the Chernovitsy Meteorological Station, 1959

	April	May	June	July	August
10-day periods { 1 . . . . .	7.9	12.4	16.0	19.5	18.0
{ 2 . . . . .	9.9	15.1	17.2	23.2	17.9
{ 3 . . . . .	7.5	13.4	18.1	22.1	18.2
Mean monthly . . . . .	8.4	13.6	17.1	21.6	18.0

Table 2  
Mosquitoes of the Chernovitsy region

Species	Number of specimens obtained (imagos)
1. <i>Anopheles maculipennis</i> Mg.	27
2. " <i>bifurcatus</i> L.	13
3. " <i>plumbeus</i> Steph.	10
4. <i>Aedes caspius</i> Pall.	251
5. " <i>cantans</i> Mg. ( <i>maculatus</i> Mg.)	373
6. " <i>excrucians</i> Wik.	49
7. " <i>flavescens</i> Müll.	496
8. " <i>communis</i> Deg.	170
9. " <i>punctor</i> Kirby	42
10. " <i>sticticus</i> Mg.	797
11. " <i>diantaeus</i> H. D. K.	104
12. " <i>intrudens</i> Dyar.	3
13. " <i>pullatus</i> Coq.	5
14. " <i>cataphylla</i> Dyar.	2
15. " <i>vezans</i> Mg.	1074
16. " <i>geniculatus</i> Ol.	699
17. " <i>cinereus</i> Mg.	678
18. <i>Mansonia richiardii</i> Fic.	32
19. " <i>buxtoni</i> Edw.	3
20. <i>Theobaldia alaskaensis</i> Ludl.	3
21. " <i>annulata</i> Schrk.	4
22. " <i>glaphyoptera</i> Schin.	Larvae only
23. " <i>morsitans</i> Theo.	5
24. <i>Culex modestus</i> Fic.	275
25. " <i>pipiens</i> L.	985
26. " <i>apicalis</i> Ad.	1

had not laid any eggs, 14 had laid eggs only once and one only had three widenings of the egg tubes.

It is clear that in certain *Aedes* species, and especially *A. cantans*, the periods of the gonotrophic cycle immediately preceding the blood meal and oviposition are extremely retarded, possibly owing to difficulty in finding prey in these localities which are thinly populated and not pasturing areas.

One interesting find was the little-studied *Mansonia buxtoni*. This species was described by Edwards (1923) from material from Palestine (the female only); in the marshes of the Jordan valley mosquitoes of this species are active in attacking human beings after sunset and their bites produce a high rate of infection (Buxton, 1924). *Mansonia buxtoni* was later found in Syria and its larvae and pupae were distinguished from those of *M. richiardii* by Parr (1943). Aitken (1954) described the genitalia of *M. buxtoni* and reported that the insect had been found on Sardinia and Corsica. The genitalia of both species are very similar and differ only in the shape of the gonostyle (the second segment of the valve). There are great differences in coloration between the two species.

We give below a description of the female of *Mansonia buxtoni*.

Head covered with light appressed and dark erect scales. Proboscis and palpi covered with unicolorous brown scales, partly erect in places. Proboscis approximately equal in length to the fore femur. Scutum: chitin brownish, scales golden.

Spiracular and postspiracular bristles absent, lower intraepimeral bristles present, 5-6 in number. Wings covered with unicolorous dark scales that are noticeably broader than in *Culex* but narrower than in *Mansonia richiardii*. Wing approximately 4 mm long, petioles of radial and medial veins almost identical in length. Legs: femora and tibiae with dark scales apically interspersed with a few light dull scales forming indistinct longitudinal bands. Whitish apical scales on femore and tibiae. Tarsi dark brown without light scales. Hind tibia clearly longer than 1st tarsal segment. Claws simple without pulvilli. Abdominal tergites covered with dark brown scales but with distinct whitish-cream lateral spots; on some segments the spots are merged into narrow band at the anterior margins of the tergites. Sternites with light bands basally. Cerci nonprojecting.

In all, three *M. buxtoni* females were obtained, all of them when attacking human beings: a) in a forest glade at Novaya Zhuchka 10 km to the north of Chernovitsy on 9 July 1959; b) at the same spot on 20 July 1959; c) in a forest on a steep slope at Vizhnitsa 50 km to the west of Chernovitsy on 14 July 1959.

The discovery of *M. buxtoni* in Ciscarpathia leads to the assumption that it can be found elsewhere in the south of the USSR but has not yet been recognized, possibly because it is similar in external appearance to *Culex pipiens*.

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