

THE MOSQUITOES OF TURKEY

DALE W. PARRISH¹

1st Lieutenant, USAF (MSC)

duplicate

A survey of arthropods of public health significance occurring in Turkey was begun in April 1958 by the Entomology Service of the United States Air Force's Fourth Epidemiological Flight. This survey was conducted over a period of thirteen (13) months. Included in the survey were mosquitoes, sand flies, deer flies, horse flies, stable flies and ticks. It is the purpose of this paper to present information on the species of mosquitoes found in Turkey and their topographical distribution.

Turkey is situated between 36° and 42° north latitude, and between 26° and 55° east longitude. It is bounded by the Black Sea on the north, by the Russian Caucasus on the northeast, by Iran on the east, by Iraq, Syria and the Mediterranean Sea on the south, by Greece and the Aegean Sea on the west and by Bulgaria on the northwest. There are 4,429 miles of coastline, deeply indented and fringed with islands along the Aegean Sea. The area of Turkey is 296,503 square miles, 96.88 percent of which lies in Asia and the remaining 3.12 percent in Europe. Turkey-in-Europe is divided from Turkey-in-Asia by the Dardanelles, the Sea of Marmara and the Bosphorus. The European portion of Turkey is about the size of New Hampshire, while the Asiatic portion is somewhat larger than the combined areas of Pennsylvania, Virginia, West Virginia, Ohio, Indiana and Illinois.

Topographically Turkey is divided into four areas—Coastal Plain, Anatolia, Eastern Anatolia and Southeast Anatolia (Figure 1). The approximate altitudes for

the respective areas are as follows: 0-656 feet, 1640-5000 feet, 5000-16,696 feet and 656-3281 feet. The coastal plain area comprises approximately 10 percent of the land area of Turkey. Along the Black Sea portion of this plain the rainfall is ample and the temperature is cool, while the Mediterranean area is semi-tropical and humid. Along the Marmara, Aegean and Mediterranean coastal plains there is little rainfall in the summer, fall and winter. The Anatolia area comprises more than half of the land area of Turkey and is made up of saucer-shaped plateau ranges from 1,640 to 5,000 feet high with scattered minor groups of mountains in the interior. This area is similar to the arid plateaus east of the Rocky Mountains in the United States. The winters are cold and the summers are hot with cool breezy nights. There is practically no rainfall in this area during the summer. There are numerous brackish marshes and lakes present which provide breeding areas for mosquitoes during this period. Eastern Anatolia consists of one mountain range after another with Mt. Ararat soaring to 16,696 feet. The winters are very cold in this area with considerable snowfall. Annual precipitation ranges around 19 inches. The Southeast Anatolia area comprises a foothill region where the mountains of eastern Anatolia fall off to the south to the rolling hill country of Syria, Iraq and Iran. The summers are extremely hot and dry.

This survey was accomplished by the author, one Preventive Medicine Supervisor and two Preventive Medicine Specialists, respectively. The services of a Veterinary Technician were available on a part-time basis. Either a jeep or weapons carrier was used for transportation. Equipment contained in the Entomological Survey Set, Federal Stock Number 6545-919-5600 and a New Jersey mosquito light

¹ Chief, Entomology Service, Fourth Epidemiological Flight, United States Air Force Medical Service. Presently Entomologist with the 3790th Epidemiological Laboratory, Lackland Air Force Base, Texas. The opinions and assertions herein are the private ones of the author and are not to be construed as official or reflecting the views of the U. S. Air Force.

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE DEC 1959		2. REPORT TYPE		3. DATES COVERED 00-00-1959 to 00-00-1959	
4. TITLE AND SUBTITLE The Mosquitoes of Turkey				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) AF Medical Service,Fourth Epidemiological Flight,Entomology Service,Fort McPherson,GA,30310				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

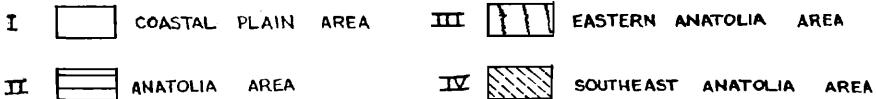
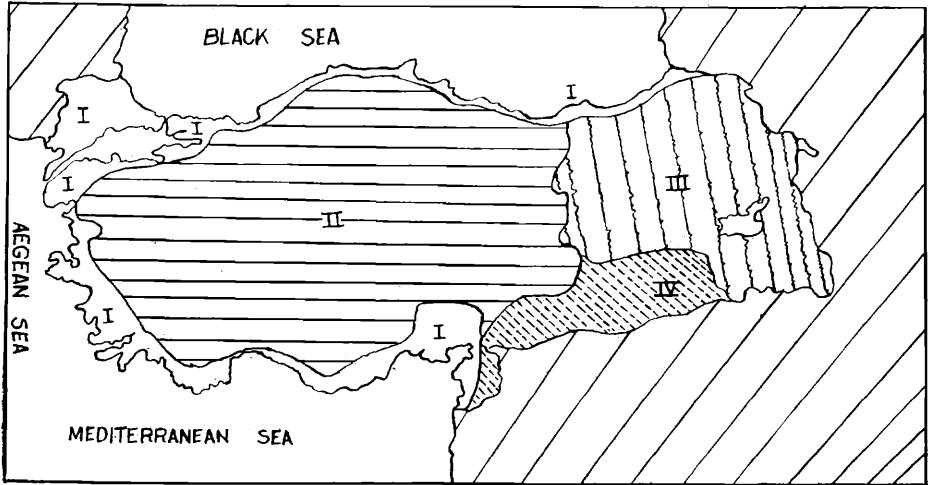


FIG. 1.—Map of Turkey showing the four topographical areas.

trap were utilized in conducting the survey. The facilities of the Regional Malaria Control Offices, Turkish Ministry of Health and Social Assistance,² located in the Izmir, Bursa, Seyhan (Adana), Diyarbakir and Antalya Provinces were also utilized in conducting this survey.

Adult specimens were collected in natural resting sites including dwellings in native villages, parked and moving vehicles, light traps and by net sweepings. The employment of light traps in this survey marks the first time this collection

technique has been reported used in Turkey. Larval specimens were collected in permanent streams of water and lakes as well as temporary breeding places including irrigation ditches, marshes, artificial containers and tree holes.

Following is a list of the species and infraspecific forms collected and their distribution in the four topographical areas of Turkey. I—denotes Coastal Plain Area, II—Anatolia Area, III—Eastern Anatolia Area and IV—Southeast Anatolia Area. A total of 55 species are recorded, representing 7 genera.

Genus *Anopheles* Meigen

- 1. *Anopheles (Anopheles) algeriensis* Theobald I-II-III-IV
- 2. *Anopheles (Anopheles) claviger* (Meigen) I-II-III-IV
- 3. *Anopheles (Anopheles) hyrcanus* (Pallas) I-II-III
- 4. *Anopheles (Anopheles) maculipennis* Meigen I-II-III-IV

²The author is indebted to Dr. Alan Stone, United States Department of Agriculture, Agricultural Research Service, Entomology Research Division, U. S. National Museum, to Dr. Mahmut Akalin, former Director of the Malaria Institute, Turkish Ministry of Health and Social Assistance, Adana, Turkey for verification of identification of species, to Dr. Sevket Ogen, General Director of Malaria Control, Turkish Ministry of Health and Social Assistance who authorized the Regional Malaria Control Directors to make their facilities available to the survey team, and to T/Sergeant William D. Phelps, USAF, who assisted the author in conducting this survey.

- ↓ 5. *Anopheles (Anopheles) maculipennis* → 31. *Aedes (Ochlerotatus) rusticus* (Rossi)
melanoon Hackett I-II-III-IV I-II
 → 6. *Anopheles (Anopheles) maculipennis* → 32. *Aedes (Ochlerotatus) communis* (De-
messeae Falleroni I-II-III-IV Geer) I
 ◦ 7. *Anopheles (Anopheles) marteri* Senevet
 and Prunelle I-II Genus *Culex* Linnaeus
 ◦ 8. *Anopheles (Cellia) multicolor* Cam- ◦ 33. *Culex (Neoculex) apicalis* Adams I
bouliou I ◦ 34. *Culex (Neoculex) hortensis* Ficalbi
 ↓ 9. *Anopheles (Anopheles) plumbeus*
 Stephens I-II-III I-II-III
 ↓ 10. *Anopheles (Anopheles) sacharovi* ◦ 35. *Culex (Culex) laticinctus* Edwards I
 (Favb) I-II-III-IV ◦ 36. *Culex (Culex) mimeticus* Noe I-II
 ◦ 11. *Anopheles (Cellia) sergenti* (Theo- ◦ 37. *Culex (Barraudius) modestus* Ficalbi
 bald) I I-II
 → 12. *Anopheles (Anopheles) sinensis* Wiede- ◦ 38. *Culex (Culex) pipiens* Linnaeus I-II-
 mann I-II-III III-IV
 ◦ 13. *Anopheles (Cellia) superpictus* Grassi ◦ 39. *Culex (Neoculex) martinii* Medjid I
 I-II-III-IV ◦ 40. *Culex (Lasiosiphon) adairi* Kirkpatrick
 I
 ↓ 41. *Culex (Barraudius) pusillus* Macquart
 I
 Genus *Aedes* Meigen 42. *Culex (Culex) quinquefasciatus* Say I
 ◦ 14. *Aedes (Stegomyia) aegypti* (Lin- ◦ 43. *Culex (Culex) univittatus* Theobald
 naeus) I I-II
 → 15. *Aedes (Ochlerotatus) annulipes* (Mei- ◦ 44. *Culex (Neoculex) deserticola* Kirk-
 gen) I patrick I
 ◦ 16. *Aedes (Ochlerotatus) caspius* (Pallas) ◦ 45. *Culex (Culex) theileri* Theobald I-II
 I-II ◦ 46. *Culex (Culex) vagans* Wiedemann
 I-II-III-IV
 → 17. *Aedes (Aedes) cinereus* Meigen I
 ◦ 18. *Aedes (Ochlerotatus) detritus* (Hali- ◦ 47. *Culex (Culex) torrentium* Martini I
 day) I ↓ 48. *Culex (Culex) tritaeniorhynchus* Giles
 → 19. *Aedes (Ochlerotatus) dorsalis* (Meigen)
 II I-II-IV
 ↓ 20. *Aedes (Finlaya) echinus* (Edwards)
 I-II-III Genus *Culiseta* Felt
 → 21. *Aedes (Ochlerotatus) excrucians* (Wal- ◦ 49. *Culiseta (Culiseta) annulata* (Schrank)
 ker) II I-II-III
 ↓ 22. *Aedes (Ochlerotatus) lepidonotus* Ed- → 50. *Culiseta (Culicella) fumipennis* (Steph-
 wards I-II ens) I
 ◦ 23. *Aedes (Ochlerotatus) mariae* (Sergent
 and Sergent) I ◦ 51. *Culiseta (Allotheobaldia) longiarreolata*
 (Macquart) I-II-III-IV
 ↓ 24. *Aedes (Ochlerotatus) nigrocanus* Mar- ◦ 52. *Culiseta (Culicella) morsitans* (Theo-
 tini I bald) I-IV
 ◦ 25. *Aedes (Finlaya) geniculatus* (Oliver)
 I-II Genus *Mansonia* Blanchard
 ◦ 26. *Aedes (Ochlerotatus) pulchritarsis*
 (Rondani) I-II ◦ 53. *Mansonia (Coquillettidia) richardii*
 (Ficalbi) I-II
 ↓ 27. *Aedes (Ochlerotatus) refiki* Medjid I Genus *Orthopodomyia* Theobald
 ↓ 28. *Aedes (Ochlerotatus) rusticus* var
subtrichurus Martini I ↓ 54. *Orthopodomyia pulchripalpis* (Ron-
 dani) I
 → 29. *Aedes (Ochlerotatus) flavescens* (Muel-
 ler) I-II Genus *Uranotaenia* Lynch and Arribalzaga
 ◦ 30. *Aedes (Aedimorphus) vexans* (Mei- ↓ 55. *Uranotaenia unguiculata* Edwards I-II-
 gen) I-II-III III-IV