Notes on the Mosquito Fauna of the Canary Islands (Diptera: Culicidae)

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ABSTRACT. The Culicidae fauna of the Canary Islands comprises a total of 11 species: *Aedes (Och.) caspius* (Pallas), *Aedes (Fin.) eatoni* (Edwards), *Anopheles (Cel.) hispaniola* (Theobald), *Anopheles (Cel.) multicolor* Cambouliu, *Anopheles (Cel.) sergentii* (Theobald), *Culiseta (All.) longiareolata* (Macquart), *Culex (Mai.) arbieeni* Salem, *Culex (Mai.) hortensis* Ficalbi, *Culex (Cux.) laticinctus* Edwards, *Culex (Cux.) pipiens* Linn., and *Culex (Cux.) theileri* Theobald.

The records for two species are considered to be doubtful, namely, *Aedes (Och.) detritus* (Haliday) and *Culiseta (Cus.) annulata* (Schrank), while *Aedes (Stg.) aegypti* (L.) has been eradicated.

The Canary Archipelago lying in the eastern Atlantic Ocean between the latitudes of 27-30° N and the longitudes of 13-19° W is composed of seven main islands: Tenerife (T)*, Gran Canaria (C), La Palma (P), La Gomera (G), El Hierro (H), Fuerteventura (F) and Lanzarote (L) (Figure 2). The western group of islands (T, C, P, G, H) are quite humid on their northern sides and, during winter and spring, water runs in the numerous gorges of their steep relief thereby forming a great number of small ponds which are an ideal habitat for mosquitoes. In addition, a large part of the surface of these islands is cultivated and this has resulted in the construction of numerous irrigation tanks for the storage of water for agricultural use.

The eastern islands (F, L) on the other hand, are very dry, with very little annual precipitation and have a reduced culicid fauna that is restricted to reservoirs, irrigation tanks and small ponds that form as a result of filtration.

The reason for the differing climates of these two groups of islands, a western humid one and an eastern dry one, is due to the altitude of the islands. The eastern islands are very low (maximum altitude on Fuerteventura is 807 m) and consequently the clouds that are brought in with the northeastern trade winds ("los Alisios") at a height of 900-1500 m, pass directly over the islands without being obstructed in their movement. In the western islands, however, the

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* The initials are those as used in the text and in figure 2.

high altitudes (maximum altitude on Tenerife is 3,717 m) detain the clouds and favor water condensation on the latter (see Figure 1).

Since the first contribution to the study of the culicid fauna of the Canary Islands (Macquart, 1839), numerous works on the same subject have appeared, although the majority of them only touch on partial aspects of this fauna or simply include it, without any special treatment, in general monographs of this group. These works, in chronological order, are: Theobald (1903), Becker (1908), Seguy (1921), Edwards (1921), Christophers (1929), Senevet (1935), Frey (1936), Clavero and Romeo Viamonte (1945), Garcia Sastre (1945), Romeo Viamonte (1946), Clavero and Romeo Viamonte (1946), Clavero (1946, 1947), Fernandez (1946, 1947), Romeo Viamonte (1950), Fernandez (1951), Robayna (1952), Fernandez (1955), Mattingly (1955), Senevet and Andarelli (1959), Fernandez (1963, 1966) and Fernandez and Sierra (1973).

We now proceed to present a list of the Culicidae of the Canary Islands with the synonyms for each species together with the corresponding references in the bibliography mentioned previously.

Aedes (Stegomyia) aegypti (Linnaeus, 1762)
Fernandez, 1947:24; 1951:2; 1955:33. Fernandez and Sierra, 1973.

Culex calopus Blanchard; Macquart, 1938:99

Culex angustealatus Becker; Becker, 1908:79

Culex albopalposus Becker; Becker, 1908:80

Stegomyia fasciata Fabricius; Becker, 1908:81

Aedes argenteus Poiret; Seguy, 1921:291

Aedes fasciatus Fabricius; Frey, 1936:20

Insular Distribution: All islands originally, although it has since been eradicated (Fernandez and Sierra, 1973)

Aedes (Ochlerotatus) caspius (Pallas, 1771)
Christophers, 1929:525. Frey, 1936:20

Aedes punctatus Meigen; Seguy, 1921:292

Insular Distribution: C

Aedes (Finlaya) eatoni (Edwards, 1916)
Clavero, 1946:20; 1947. Fernandez, 1947:25; 1955:33

Insular Distribution: T, P*

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*New record for the islands marked with an asterisk

Anopheles (Cellia) hispaniola (Theobald, 1903)
Theobald, 1903:50. Christophers, 1929:521. Clavero and Romeo Viamonte, 1945:290. Fernandez, 1946:20; 1947:26; 1951. Robayna, 1952:4. Fernandez, 1955:33. Garcia Sastre, 1945:269. Romeo Viamonte, 1946; 1950:245, 271.

Insular Distribution: T, P, C, F*, G*

Anopheles (Cellia) multicolor Cambouliu, 1902
Edwards, 1921:280. Christophers, 1929:519. Senevet, 1935:191. Clavero and Romeo Viamonte, 1946:1009. Robayna, 1952:5.

Insular Distribution: T, F*

Anopheles (Cellia) sergentii (Theobald, 1907)
Christophers, 1929:523. Garcia Sastre, 1945:269. Romeo Viamonte, 1946. Fernandez, 1946:21; 1947:27. Romeo Viamonte, 1950:245, 274. Robayna, 1952:6. Fernandez, 1955:33.

Insular Distribution: T, C

Culiseta (Allotheobaldia) longiareolata (Macquart, 1838)
Macquart, 1838:99 - *Culex*. Becker, 1908:78 - *Culex*. Christophers, 1929:524 - *Theobaldia*. Frey, 1936:19 - *Theobaldia*. Fernandez, 1951:2 - *Theobaldia;* 1955:32 - *Theobaldia*. Senevet and Andarelli, 1959:356 - *Theobaldia*.

Culex serratipes Becker; Becker, 1908:78

Insular Distribution: T, C, P, H*, G*, F*, L*

Culex (Maillotia) arbieeni Salem, 1938
Fernandez, 1963:15; 1966:66

Culex apicalis Adams; Christophers, 1929:526. Mattingly, 1955:381. Senevet and Andarelli, 1959:357. Fernandez, 1966:66.

Insular Distribution: T, G, P*

Culex (Maillotia) hortensis Ficalbi, 1889
Seguy, 1921:291. Christophers, 1929:525. Frey, 1936:20. Senevet and Andarelli, 1959:356

Insular Distribution: C

Culex (Culex) laticinctus Edwards, 1913
Seguy, 1921:291. Christophers, 1929:526. Frey, 1936:20. Fernandez, 1936:2. Senevet and Andarelli, 1959:356-357.

Insular Distribution: T, C, P, H*, G*

Culex (Culex) pipiens Linnaeus, 1758
Macquart, 1838:99. Becker, 1908:80. Seguy, 1921:291. Christophers, 1929:526. Frey, 1936:20. Fernandez, 1947:23; 1951:2; 1955:32. Senevet and Andarelli, 1959:356-357.

Insular Distribution: T, C, P, G, L*, H*, F*

Culex (Culex) theileri Theobald, 1903
Christophers, 1929:526. Fernandez, 1947:23. Senevet and Andarelli, 1959: 357.

Insular Distribution: T, C, G*

Species of doubtful occurrence: *Culiseta (Cus.) annulata* and *Aedes (Och.) detritus* were recorded in the Canary Islands for the first time by Seguy (1921), but they have never been captured again. The later references of these two species given by other authors only duplicate the records of Seguy.

During the course of our extensive field work in all the islands, we have never found the above mentioned species, and we presume that the records are erroneous, probably being confused with related species present in the islands, namely, *Culiseta (All.) longiareolata* and *Aedes (Och.) caspius*.

The references for these species are the following:

Aedes (Ochlerotatus) detritus (Haliday, 1883)
Seguy, 1921:292. Christophers, 1929:525. Frey, 1936:20.

Insular Distribution: C

Culiseta (Culiseta) annulata (Schrank, 1776)
Seguy, 1921:292 - *Theobaldia*. Frey, 1936:19 - *Theobaldia*. Senevet and Andarelli, 1959 - *Theobaldia*.

Insular Distribution: C

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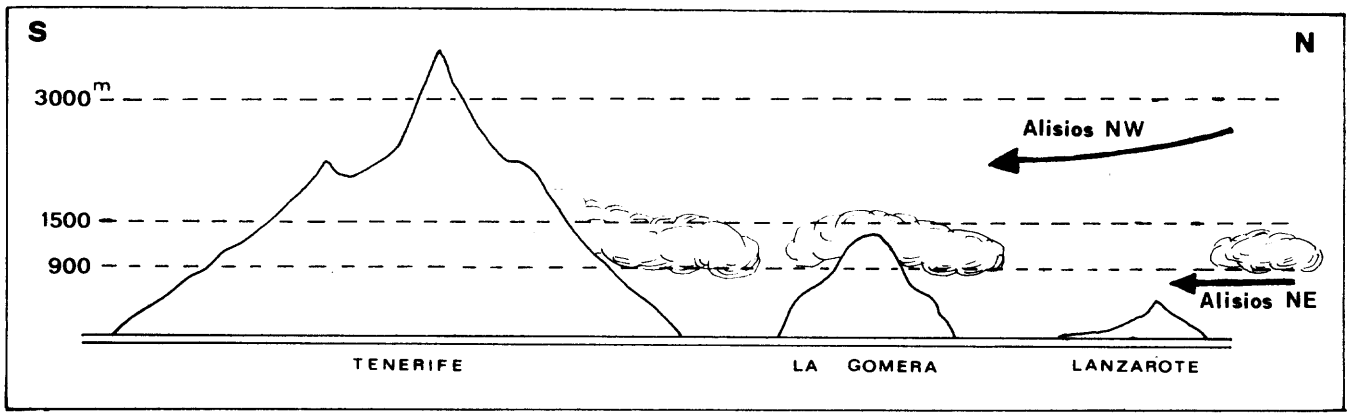

Figure 1. Scheme of the prevailing winds and cloud condensation (after Huetz de Lemps, 1969, slightly modified)

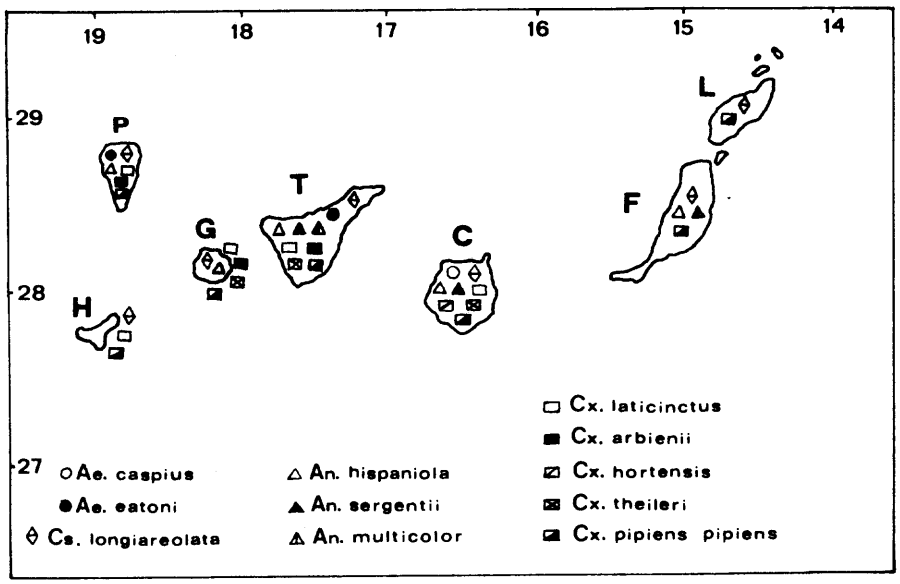

Figure 2. Distribution of the Culicidae in the Canarian Archipelago

Ae = *Aedes*, An = *Anopheles*, Cs = *Culiseta*, Cx = *Culex*