

Checklist and Distribution of the Nigerian Culicidae (Diptera)

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SUMMARY

A checklist is given of all the mosquitoes recorded from Nigeria and the Cameroons, together with an alphabetical list of both checked and unchecked locality records for each species. In addition, where possible, latitudes and longitudes of the place-names cited in the species distribution lists are tabulated. Finally a table is presented to show the relation between the distribution of the species and the various vegetation belts of the country.

INTRODUCTION

THIS paper presents for the first time a checklist and the distribution of the Culicidae in Nigeria and the area formerly known as the Southern Cameroons under United Kingdom Trusteeship. Locality records have been gathered from published and unpublished papers and reports, from data labels on specimens in the collections of the British Museum (Natural History), London School of Hygiene and Tropical Medicine, Malaria Service in Lagos, West African Council for Medical Research in Lagos, Malaria Unit in Kaduna, University College, Ibadan, and from the author's own wide collecting experience in all parts of Nigeria.

The classification and systematic arrangement of the Culicidae as given by Stone, Knight, and Starcke (1959) and Stone (1961) has been followed, but with the following minor alterations: *Anopheles domicolus* Edwards is considered to represent a variety of the East African *Anopheles longipalpis* (Theobald), *vide* Adam, Bruce-Chwatt and Hamon (1956): *Anopheles brohieri* Edwards is given as a variety of *Anopheles hancocki* Edwards (Adam, Hamon, Rickenbach, and Lips 1956): Mattingly (1957) split *Aedes aegypti* (Linnaeus) into three distinct forms, viz. *Aedes aegypti* (Linnaeus), *Aedes aegypti* ssp. *formosus* Walker, and *Aedes aegypti* var. *queenslandensis* (Theobald), and this arrangement has been followed here: the mosquito *Culex perexiguus* Theobald, which has been considered a synonym of *Culex univittatus* Theobald, has been placed as a variety of this species (Mattingly and Knight, 1956): since the publication of Stone (1961), a new mosquito, *Anopheles rufipes* var. *brucechwatti* Hamon, Taufflieb and Dyemkouma, has been described by Hamon, Taufflieb, and Dyemkouma (1961), and this is included in the present paper at the varietal status originally designated: finally there are three named varieties which Stone *et al.* (1959) give as being synonymous with their respective type forms, but since they are still treated as distinct varieties by many workers and as their status is debatable they have in the present paper retained their varietal status, viz. *Ficalbia mimomyiaformis* var. *pincerna* Graham, *Aedes cumminsi* var. *mediopunctata* Theobald, and *Aedes carteri* var. *maculicosta* Edwards.

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THE COUNTRY AND CLIMATE

Nigeria constitutes the largest country in the West African sub-region, occupying an area of 372,674 square miles. In general the country slopes from the north down to the coast in the south, most of the northern region being over 2,000 feet above sea level, some areas attaining a height of 4,000 to 6,000 feet. The land adjacent to the rivers Niger and Benue, however, is only about 600 to 800 feet above sea-level. With the exception of the Cameroons where there are areas rising to nearly 8,000 feet, and the Cameroons Mountain which is 13,320 feet high, most of the land in the south lies below 800 feet.

The mean annual rainfall varies greatly from 356 inches at Debundscha in the extreme south-east to a meagre 15 inches at Geidam west of Lake Chad. More important to mosquito ecology and distribution than the total annual rainfall is the number of dry months per year. For example, both Abeokuta (07.11 N, 03.20 E) situated in the rain forest and Kontagora (10.22 N, 05.29 E) in the Northern Guinea Savannah have a mean annual precipitation of 47 inches but whereas the former locality only has two dry months per year, Kontagora has five such months (Nash 1948). Map 1 gives the rainfall, while map 2 gives the indications of the number of dry months in different latitudes.

As to be expected with such diversity of rainfall there are correspondingly many well-defined distinct vegetation zones which have been well described by Rosevear (1953) and Keay (1953). Map 3 illustrates these zones as mapped by Keay (1953).

LOCALITY RECORDS

The lists of localities following the species are arranged in alphabetical order to facilitate easy reference, and are divided into two series. The first unbracketed list refers to localities from which the author has personally been able to examine specimens, the bracketed series constitutes localities from which specimens have not been seen. References are cited in the second series only when a locality is of some considerable interest as it appears to be outside the normal distribution of the species, and this is not represented in the checked list of localities.

Place-names and spellings have been checked with the official *Gazetteer of Place-Names on the Map of Nigeria* (1949); nevertheless there remain a few names which cannot be checked as they are not contained in the gazetteer.

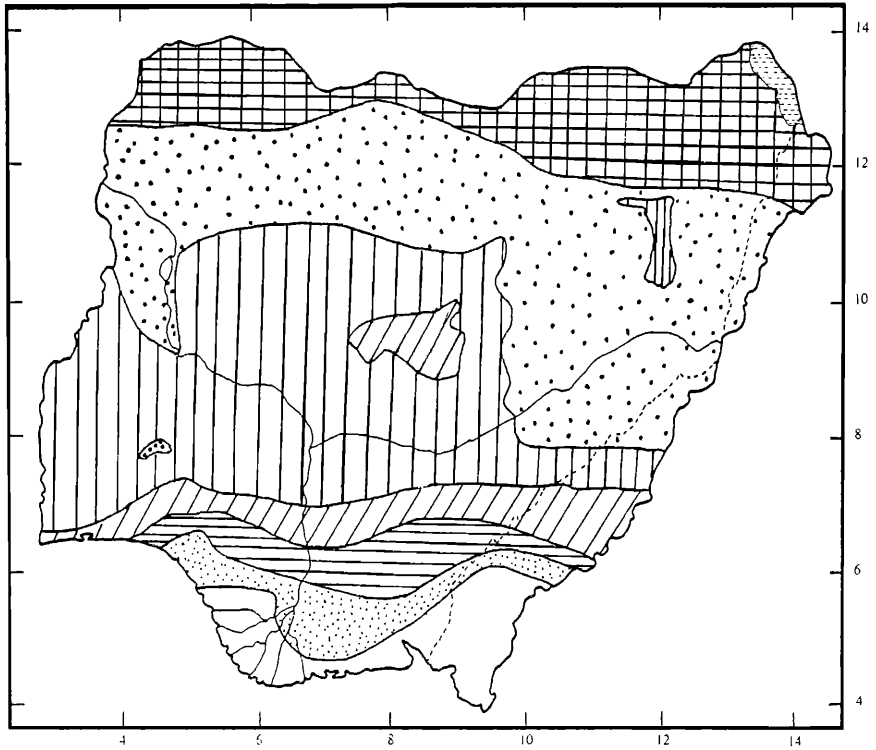
In the following lists Lagos has not been divided up into its suburbs, e.g. Yaba, Ikoyi, Ebute Metta, etc., all such localities being placed under the heading Lagos.

Subfamily ANOPHELINAE
Genus ANOPHELES Meigen

Subgenus *Anopheles*.

coustani Laveran. Anchau, Birnin Kebbi, Kaduna, Lagos.

coustani var. *ziemanni* Grünberg. Abuja, Birnin Kebbi, Ibadan, Ikeja, Ilesha, Kaduna, Kano, Lagos, Lokoja, Maiduguri, Oloibiri, Onitsha, Oshogbo, Wulgo. [Calabar, Gusau,



Over 105 inches

90-105 inches

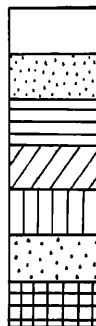
75- 90 inches

60- 75 inches

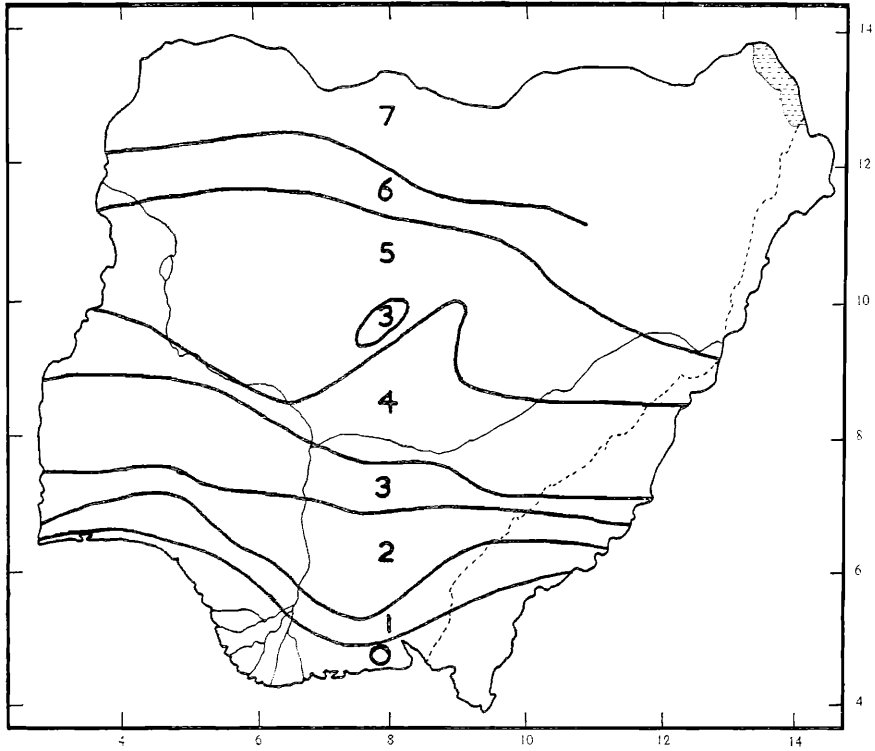
45- 60 inches

30- 45 inches

Below 30 inches



Map 1. Showing the mean annual rainfall zones, based on Nash (1948)



Map 2. Showing the duration of the dry months. The figures between the transverse lines represent the number of months per year with less than 1 inch precipitation. Based on Nash (1948)

coustani s.l. Abeokuta, Abuja, Anchau, Badeggi, Bama, Bamenda, Bansa, Bauchi, Dutsan Wai, Ekpoma, Enugu, Epe, Gadau, Ibadan, Ijebu-Ode, Ikeja, Ikom, Ilesha, Jos, Kabba, Kaduna, Kano, Katagum, Katsina, Kontagora, Lokoja, Maiduguri, Oloibiri, Oshogbo, Rigachikun, Santa, Victoria, Wulgo, Zaria. [Abinsi, Aboh, Baro, Calabar, Gusau, Ilorin, Keffi, Makurdi, Minna, Mokwa, Onitsha, Port Harcourt, Sapele, Zunguru.]

implexus (Theobald). Kaduna, Oku.

obscurus (Grünberg). Both the type form and variety *nowlini* Evans occur in Nigeria, but the variety is rare and localized, and it seems likely, therefore, that although many of the following localities refer to *obscurus* s.l. they can be interpreted as referring to the type form. Abeokuta, Badeggi, Enugu, Forcados, Ibadan, Ijebu-Ode, Ikeja, Ilaro, Kano, Kumba, Lagos, Lokoja, Mamfe, Oloibiri, Onitsha, Port Harcourt, Tinto, Victoria. [Bida, Birnin Kebbi, Itowolo, Oyo.]

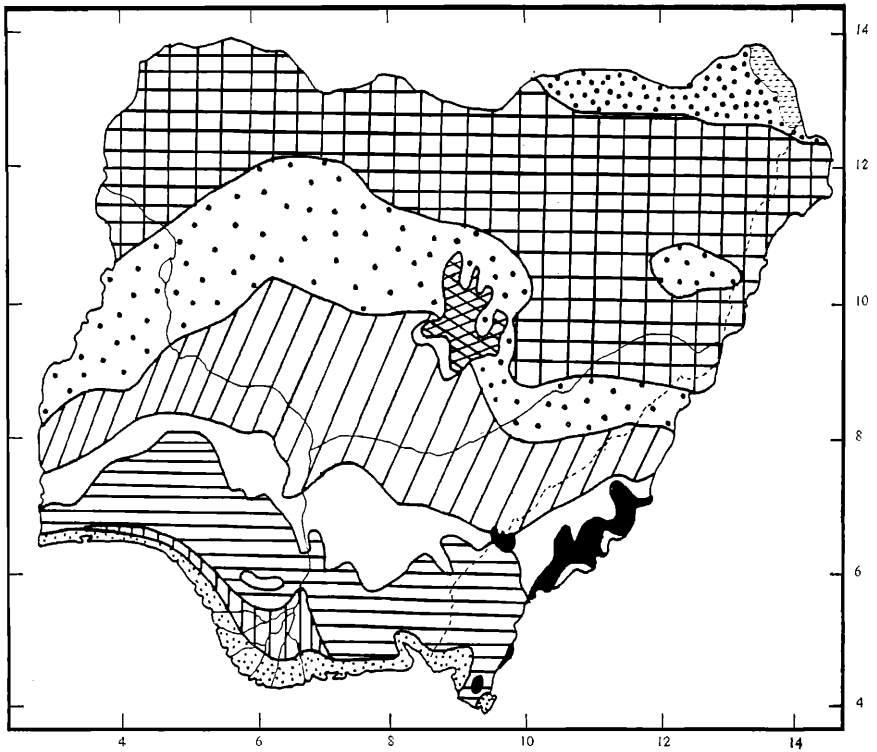
obscurus var. *nowlini* Evans. Ekpoma, Ijebu-Ode.

paludis Theobald. Aboh, Ikeja, Ilaro, Ilorin, Lagos, Lokoja, Okene, Oloibiri. [Baro, Itowolo, Minna, Mokwa, Oshogbo, Port Harcourt.]

Subgenus *Cellia*.

barbavellus Evans. Enugu, Iketobo, Jos, Lokoja, Oloibiri, Numan. [Mokwa, Port Harcourt.]

brucei Service. Lokoja



Mangrove Forest and Coastal Vegetation

Freshwater Swamps

Lowland Rain Forest

Derived Savannah, with relict Forest

Montane

Southern Guinea Savannah

Northern Guinea Savannah

Bauchi Plateau Savannah

Sahel Savannah

Sudan Savannah



Map 3. Vegetation map, showing the various zones, based on Keay (1953)

- brunnipes* (Theobald). Enugu, Kaduna, Lokoja, Rigachikun.
- buxtoni* Service. Oku.
- cinctus* (Newstead and Carter). Ikeja, Ilaro, Jamieson River near Sapele, Lagos. [Ijebu-Ode, Sapele, Sapoba.]
- flavicosta* Edwards. Baro, Birnin Kebbi, Enugu, Kaduna, Lokoja, Numan, Rigachikun, Zunguru. [Katagum, Makurdi, Mokwa.]
- freetownensis* Evans. Abeokuta, Ikeja, Jos, Lagos, Lokoja, Mamfe, Okene, Onitsha.
- funestus* Giles. Ubiquitous throughout Nigeria.
- gambiae* Giles. Ubiquitous throughout Nigeria.
- gambiae* var. *melas* (Theobald). All along coastal regions (*vide* Bruce-Chwatt and Service 1959 on aberrant form).
- hancocki* Edwards. Buea, Enugu, Ilaro, Ilorin, Itchi, Kaduna, Lokoja, Onitsha, Oshogbo, Rigachikun, Tiko. [Calabar, Oji.]
- hancocki* var. *gilroyi* Service. Itchi.
- hancocki* var. *brohieri* (Edwards). Kaduna, Lokoja.
- hargreavesi* Evans. Abeokuta, Badeggi, Buea, Ekpoma, Enugu, Ibadan, Iketobo, Ilaro, Jebba, Lagos, Mamfe, Oloibiri, Sapele, Sapoba, Tiko. [Bida, Calabar, Ijebu-Ode, Itwolo, Ogbomoshosho, Oshogbo, Owerri, Port Harcourt, Warri.]
- jebudensis* Froud. Ikeja, Ijebu-Ode.
- leesoni* Evans. Ibadan, Kaduna, Lokoja. [Erinle River near Oshogbo, Oshogbo.]
- longipalpis* var. *domicolus* (Edwards). Birnin Kebbi, Ibi, Ilorin, Jos, Kaduna, Kontagora, Lokoja, Noma, Numan, Okene, Rigachikun, Zunguru. [Keffi, Ogbomoshosho, Oshogbo.]
- maculipalpis* Giles. Abuja, Anchau, Birnin Kebbi, Enugu, Ilorin, Jos, Kaduna, Keffi, Lokoja, Rigachikun, Sokoto, Yola. [Gogwoda, Ijebu-Ode, Makurdi, Zunguru.]
- marshalli* (Theobald). Abeokuta, Enugu. [Ibadan, Lokoja, Mokwa, Zaria (Beeuwkes, Kerr, Weathersbee, and Taylor 1933) .]
- marshalli* var. *mousinhoi* De Meillon and Pereira. Mamfe.
- marshalli* var. *pitchfordi* (Giles). [Aba (Simpson 1912, Yellow Fever Commission 1913), Siluko (Yellow Fever Commission 1913).] These are most probably based upon misidentifications.
- moucheti* Evans. Birnin Kebbi, Enugu, Kaduna, Lagos, Rigachikun, Tiko. [Abeokuta, Ikeja, Mokwa, Port Harcourt, Sapele.]
- moucheti* var. *nigeriensis* Evans. Ishiri, Lagos. [Abeokuta, Calabar, Enugu, Ikeja, Itwolo, Port Harcourt, Tiko.]
- nili* (Theobald). Abinsi, Arua, Birnin Kebbi, Buea, Gadau, Ikeja, Ilaro, Kaduna, Kan gimi, Kano, Lokoja, Maiduguri, Onitsha, Rigachikun, Tiko, Victoria. [Abeokuta, Badeggi, Enugu, Gusau, Ibadan, Ilorin, Ilesha, Itwolo, Lagos, Oshogbo, Mokwa, Zunguru.]
- pharoensis* Theobald. Abinsi, Anchau, Argungu, Bama, Birnin Kebbi, Gadau, Hadejia, Ibadan, Ikeja, Ilorin, Ilesha, Jos, Kaduna, Kano, Kumba, Lagos, Lokoja, Maiduguri, Rigachikun, Sapele, Wulgo, Yola, Zaria, Zunguru. [Abeokuta, Awba, Badeggi, Birnin Lafia, Baro, Bida, Geidam, Gusau, Itwolo, Jigaje, Katagum, Katsina, Makurdi, Minna, Mokwa, Wallidazene, Wobe.]
- pretoriensis* (Theobald). Abuja, Birnin Kebbi, Enugu, Ilorin, Jos, Kaduna, Lagos, Lokoja, Mamfe, Okene, Rigachikun, Yola, Zunguru. [Ginijar, Gogwoda, Zaria.]
- rhodesiensis* Theobald. Akure, Bamenda, Bansa, Birnin Kebbi, Idanre, Ilesha, Lokoja, Mamfe, Okene. [Ilorin, Jos, Kontagora.]
- rivulorum* Leeson. Birnin Kebbi, Gusau, Lokoja. [Awba, Badeggi, Erinle River near Oshogbo, Gadau, Oshogbo.]
- rufipes* (Gough). Abuja, Bauchi, Birnin Kebbi, Kaduna, Kano, Lagos, Lokoja, Maiduguri, Yola. [Katagum, Makurdi.]

- rufipes* var. *ingrami* Edwards. Abuja, Anchau, Birnin Kebbi, Gadau, Jos, Kabba (larvae seen only, so determination cannot be truly verified), Kaduna, Lagos, Yola, Zunguru. [Gusau, Lokoja, Maiduguri, Makurdi.]
- rufipes* var. *brucechwatti* Hamon, Taufflieb and Dyekouma. Kaduna. [Birnin Kebbi ?, *vide* Hamon *et al.* 1961.]
- rufipes* s.l. Anchau, Argungu, Bama, Bauchi, Enugu, Gadau, Jos, Kabba, Kano, Katagum, Kumba, Maiduguri, Rigachikun, Yola. [Gusau, Hadejia, Katsina, Minna, Noma, Ogbomosh, Oshogbo, Wallidazene.]
- smithi* Theobald. Zunguru.
- squamosus* Theobald. Abeokuta, Birnin Kebbi, Gadau, Ibadan, Jos, Kaduna, Kano, Lagos, Lokoja, Maiduguri, Rigachikun, Yola, Zaria. [Afuga, Anchau, Baro, Katagum, Katsina, Makurdi, Mokwa, Onitsha, Zunguru.]
- theileri* Edwards. Kaduna, Rigachikun. (Onitsha is on data labels of adults in the collection of the London School of Hygiene and Tropical Medicine, but examination shows they are in fact *hamcocki* Edwards.) [Ikom, an old record seen in undated files and possibly a misidentification, Afuga (Philip 1931).]
- wellcomei* Theobald. Bamenda, Baro, Birnin Kebbi, Kaduna, Lokoja, Maiduguri, Rigachikun. [Anchau, Mokwa, Numan.]

Subfamily TOXORHYNCHITINAE

Genus TOXORHYNCHITES Theobald

Subgenus *Toxorhynchites* Theobald.

- aeneus* (Evans). [Lagos (Philip 1931, Kumm 1931).]
- brevipalpis* ssp. *conradti* Grünberg. Afikpo, Abuja, Ekpoma, Enugu, Enugu Ezike, Gadau, Ibadan, Ikeja, Ilaro, Ilesha, Ilobi, Ilorin, Kaduna, Katabu, Lagos, Lokoja, Nsukka. [Udi, Zunguru.]
- erythrurus* (Edwards). Ibadan, Idanre, Ilobi, Lagos.
- viridibasis* (Edwards). Afikpo, Kaduna, Katabu, Lagos, Lokoja. [Malumfashi.]

Subfamily CULICINAE

Genus MALAYA Leicester

- farquharsoni* (Edwards). Ibadan, Lagos. [N. Nigeria (Surtees 1961).]
- taeniarostris* (Theobald). Kagerko, Kumba, Victoria. [Abinsi, Afikpo, Bamenda, Enugu Ezike, Ikeja, Ikorodu, Ilaro, Ilobi, Lagos, Orlu, N. Nigeria (Surtees 1961).]
- trichorostris* (Theobald). [According to duplicated notes by Dr. B. McMillan a larva of this genus and not of the above two species found in the Gwaga forest could possibly refer to this species.]

Genus FICALBIA Theobald

Subgenus *Ficalbia* Theobald.

- malfeyti* (Newstead). Ibadan, Ikorodu, Lagos, Oloibiri. [Ashiri, Sapele, and according to Mattingly and Hamon 1955 the following localities could refer to this or *uniformis* (Theobald)—Ikeja, Itowolo, Oshogbo.]
- nigra* (Theobald). Calabar, Degema, Lagos.
- uniformis* (Theobald). Bota, Kaduna. [Gadau, Owerri, but according to Mattingly and Hamon 1955 this could refer to *circumtestacea* (Theobald)]: and see notes above on *malfeyti* (Newstead).
- flavopicta* Edwards. [Zaria Province (Hanney 1960).]
- hispida* (Theobald). Ikorodu, Kaduna. [Itowolo, Lagos.]
- lacustris* Edwards. Ikorodu. [Lagos, Kano (Bruce-Chwatt in Malaria Service files,

mimomyiaformis (Newstead). Ibadan, Ikeja, Ikorodu, Kaduna, Lagos, Maiduguri, Mamfe, Oloibiri, Sapele, Zaria. [Bakebe, Derri, Gadau, Itowolo, Kano, Keffi, Oshogbo, Port Harcourt, Seri.]

mimomyiaformis var. *pincerna* Graham. Lagos, Sapele.

pallida (Edwards). Ikorodu, Lagos, Oloibiri. [Itowolo.]

plumosa (Theobald). Bonny, Ikorodu, Ilaro, Kaduna, Katabu, Lagos, Maiduguri, Oloibiri. [Agege, Gadau, Port Harcourt.]

splendens (Theobald). Ikeja, Kaduna, Lagos, Oloibiri, Zaria. [Abeokuta, Kanchia, Kankiya, Kano, Katsina, Wukari.]

Subgenus *Etoleptomyia* Theobald.

mediolineata (Theobald). Akure, Lagos.

Genus MANSONIA Blanchard

Subgenus *Coquillittidia* Dyar.

annetti (Theobald). Akassa, Ilobi, Kaduna, Onitsha, Warri. [Aro, Calabar, Degema, Forcados, Ikorodu, Itowolo, Lagos, Otta, and possibly Katagum and Zunguru (Johnson 1918).]

aurites (Theobald). Ilobi, Lagos, Oloibiri, Onitsha. [Bonny, Ikorodu, Itowolo, Niger River (Yellow Fever Commission 1913).]

cristata (Theobald). Kaduna. [Abinsi, Enugu, Sokoto (Yellow Fever Commission 1913).]

maculipennis (Theobald). Kaduna, Kau Kanke, Zaria.

metallica (Theobald). Agbor, Ikorodu, Ilobi, Lagos, Onitsha, Wulgo. [Bonny, Itowolo, Otta.]

pseudoconopas (Theobald). [S. Cameroons (Surtees 1961).]

Subgenus *Mansonioides* Theobald.

africana (Theobald). Badagry, Baro, Bauchi, Bende, Birnin Kebbi, Ibadan, Ibi, Ikorodu, Ikpe, Ikom, Ilaro, Ilobi, Itowolo, Jos, Kaduna, Kan Gimi, Kano, Lagos, Lokoja, Maiduguri, Obubra, Okiti Pupa, Onitsha, Oloibiri, Oshogbo, Rigachikun, Siluko, Tiko, Wulgo, Yelwa, Yola, Zaria. [Abinsi, Aro, Arochuku, Asaba, Calabar, Dan Jaba, Derri, Ere, Katsina, Minna, Mokwa, Port Harcourt, Zunguru.]

uniformis (Theobald). Afikpo, Asaba, Badagry, Bende, Bida, Birnin Kebbi, Calabar, Enugu, Ikom, Ikorodu, Ilaro, Ilobi, Kaduna, Kan Gimi, Kano, Kotonkerip, Lafia, Lagos, Lokoja, Maiduguri, Mama, Minna, Mokwa, Rigachikun, Wulgo, Yola, Zaria. [Abinsi, Amara, Aro, Arochuku, Baro, Bakori, Derri, Ere, Gadau, Ikpe, Ilaro, Itowolo, Katagum, Konoko, Obubra, Onitsha, Oshogbo, Siluko, Umuahia, Zunguru, between Shongo and Konko.]

Genus URANOETANIA Lynch Arribalzaga

alba Theobald. Bamenda. [Ikorodu, Ikeja, Lagos.]

alboabdominalis Theobald. Enugu, Ikeja, Kaduna, Oloibiri. [Ikorodu, Ilesha, Ishiri, Lagos.]

annulata Theobald. Ibadan, Ikorodu, Kaduna, Lagos. [Bonny, Ikom, Ilobi, Itowolo.]

annulata var. *apicotaeniata* Theobald. Kaduna.

balfourii Theobald. Ikeja, Ikorodu, Ilaro, Kano, Kumba, Nsukka, Lagos, Maiduguri, Oloibiri, Zaria. [Akure, Ishiri, Oshogbo, Port Harcourt.]

bilineata Theobald. Ikeja, Kaduna. [Enugu, Lagos.]

bilineata var. *fraseri* Edwards. [Lagos (Dalziel 1920, Brown 1929).]

bilineata var. *connali* Edwards. Abuja. (Kaduna, Katabu.)

calignosa Philip. Lagos.

chorleyi Edwards. Bafut, Bansa, Bamenda, Ikeja, Ikorodu, Kaduna, Kujama district, Lagos. [Ilaro, Port Harcourt.]

fusca Theobald. Abuja. Lagos. Lokoja. [Jos, Gurara Falls, Oshogbo.]

- hopkinsi* Edwards. [Ilaro (Bruce-Chwatt in Malaria Service files, Lagos).]
mashonaensis Theobald. Besongabang, Enugu, Ibadan, Ikorodu, Itchi, Kaduna, Katabu, Kujama, Lagos, Mamfe, Nsukka, Okiti Pupa, Oloibiri, Onitsha. [Oshogbo.]
mayeri Edwards. Oshogbo.
nigripes (Theobald). Akure. [Abeokuta.]
nigromaculata Edwards. Oloibiri, Lagos. [Otta, S. Cameroons.]
nivipous Theobald. Ikeja, Ikorodu, Lagos.
ornata Theobald. Bamenda, Besongabang, Ikorodu, Ilobi, Kaduna, Kumba, Lagos. [Afikpo, Gwaga forest, Itowolo, Port Harcourt.]
pallidocephala Theobald. [Ikeja, Ikorodu, Ilaro, Itowolo, Lagos, Port Harcourt, N. Nigeria (Surtees 1961).]
philomuxia Philip. Lagos. [Bonny, Ikorodu, Itowolo.]
*shillitoni*s Edwards. [S. Cameroons (Surtees 1961).]
caeruleocephala Theobald. Lagos. [Bonny, Calabar, Ikeja, and possibly Kaduna, Katagum, and Zunguru (Johnson 1918).]

Genus HODGESIA Theobald

- cyptopus* Theobald. Ikeja. [Lagos.]
nigeriae Edwards. Calabar, Ikeja, Lagos. [Badagry, Enugu, Ilaro.]
sanguinae Theobald. [Onitsha (adults in collection of the London School of Hygiene and Tropical Medicine, but as all are males identification cannot be verified), Calabar (Simpson 1912, Yellow Fever Commission 1913), Lagos (Dalziel 1920, Wigglesworth 1929, Philip 1931, but Edwards 1930 considers these Lagos records refer to *nigeriae* Edwards).] It is most probable that all these records are based upon misidentifications, the species involved being *nigeriae* Edwards.

Genus AEDOMYIA Theobald

- africana* Nevu-Lemaire. Abinsi, Lagos, Lokoja, Onitsha. [Afikpo, Baro, Bende, Ibadan, Ibi, Ikorodu, Itowolo, Kaduna, Mokwa, Oshogbo, Sokoto (Yellow Fever Commission 1913), Wukari, Zaria.]
furfurea (Ednerlain). [Mao Godi (Edwards 1941).]

Genus ERETMAPODITES Theobald

- argyrurus* Edwards. Lagos, Oloibiri. [Port Harcourt.]
chrysogaster Graham. Afikpo, Benin, Enugu-Ezike, Epi, Ibadan, Idanre, Ikeja, Ilobi, Kaduna, Katabu, Kumba, Lagos, Oloibiri, Tali. [Missellele, Port Harcourt.]
dracaenae Edwards. Afikpo, Enugu Ezike, Kaduna, Rigachikun. [Daudawa, Gwaga forest, Port Harcourt, Udi.]
grahmai Edwards. Kumba, Lagos. [Birnin Kebbi (Bruce-Chwatt 1955).]
inornatus Newstead. Ilesha, Lagos, Oloibiri. [Port Harcourt.]
leucopous Graham. [Bende (Edwards 1912, Simpson 1912).]
oedipodeios Graham. Ilobi, Oloibiri. [Port Harcourt.]
pencillatus Edwards. Ilesha, Ilobi.
quinquevittatus Theobald. Afikpo, Ilesha, Ilobi, Lagos. [Calabar, Oshogbo.]
semisimplicipes Edwards. Epi, Ilobi. [Ikeja.]
silvestris Ingram and De Meillon. [Ilobi (Surtees 1959).]

Genus Aedes Meigen

Subgenus *Mucidus* Theobald.

- grahami* (Theobald). Ibadan, Ikorodu, Lagos. [Asaba, Bonny, Calabar, Ilobi, Itwolo, Missellele.]
mucidus (Karsch). Ikorodu, Ilesha, Kaduna, Lagos, Lokoja. [Asaba, Calabar, Degema.]

Subgenus *Finlaya* Theobald.

- ingrami* Edwards. Kaduna, Katabu, Lagos. [Ikorodu, Itowolo, Otta, Oshogbo.]
longipalpis (Grünberg). Enugu Ezike, Ibadan, Ikeja, Ikorodu, Kaduna, Katabu, Lagos, Oloibiri, Tiko. [Ilorin, Itowolo, Malumfashi, Missellele.]
wellmani (Theobald). [Lagos (Dunn 1927a, 1927b), possibly Kaduna, Katagum, and Zunguru (Johnson 1918).]

Subgenus *Stegomyia* Theobald.

- aegypti* (Linnaeus). Kaduna, Rigachikun. [Ilobi (Surtees 1960).]
aegypti ssp. *formosus* Walker. Ibadan, Kaduna, Katabu.
aegypti var. *queenslandensis* Theobald. Kaduna, Lokoja.
aegypti s.l. Mattingly 1957 advocated recognizing the three above forms of *aegypti*, previous to this, and in some instances afterwards, the species was recorded in Nigeria just as *aegypti* s.l., and as such is widespread in its distribution throughout the country.
africanus (Theobald). Akure, Boa, Bota, Brass, Enugu, Enugu Ezike, Gbohun-Gbohun, Kaduna, Kittiya, Kumba, Lagos, Mamfe, Oloibiri, Onigbongbo, Sapele, Tiko, Tinto. [Several of the following records probably refer to *pseudoafricanus* Chwatt (*vide* Chwatt 1949). Aba, Abuja, Afaka, Afikpo, Bakebe, Bende, Bonny, Calabar, Duke Town, Forcados, Ikeja, Ikom, Itowolo, Katari (Yellow Fever Commission 1913, Edwards 1941), Mokwa, Ogbomosho, Oshogbo, Orlu, Port Harcourt, Sokoto (Yellow Fever Commission 1913, Bruce-Chwatt in Malaria Service files, Lagos), Ubassa, Uburu.]
apicoargenteus (Theobald). Agbor, Enugu-Ezike, Ibadan, Idanre, Ikeja, Ilesha, Ikorodu, Ilobi, Kaduna, Katabu, Lagos, Oloibiri. [Aba, Bende, Gbohun-Gbohun, Itowolo, Missellele, Oshogbo, and possibly Katagum and Zunguru (Johnson 1918).]
calceatus Edwards. [N. Cameroons (Surtees 1961).]
dendrophilus Edwards. Ibadan, Lagos. [Ilobi.]
fraseri (Edwards). Lagos, Oshogbo.
luteocephalus (Newstead). Abuja, Birnin Kebbi, Enugu Ezike, Gadau, Ibadan, Ikeja, Kaduna, Kano, Katabu, Kitikwa, Kumba, Lagos, Lokoja, Malumfashi, Ogbomosho. [Adun, Bende, Gbohun-Gbohun, Gurara Falls, Ibi, Ilobi, Kankiya, Kitikuri, Oshogbo.]
metallicus (Edwards). Gadau, Kano. [Batsari, Ceranci, Gurara Falls, Kaduna, Kankiya, Karfi, Maiduguri, Malumfashi, Yashi.]
pseudoafricanus Chwatt. Boa, Gbohun-Gbohun, Lagos, Onigbongbo, Tiko. See note on *africanus* (Theobald).
schwetzi Edwards. [N. Cameroons (Surtees 1961).]
simpsoni (Theobald). Abuja, Afikpo, Bamenda, Birnin Kebbi, Enugu, Enugu Ezike, Gadau, Ibadan, Ikeja, Ilobi, Jos, Kaduna, Katabu, Kumba, Lagos, Ogbomosho, Oloibiri, Yola. [Afaka, Babango, Daudawa, Kankiya, Katsina, Kudsema, Malumfashi, Oshogbo, Port Harcourt, Shaki, Shao.]
unilineatus (Theobald). Kaduna, Katabu. [Baro, Gadau, Ibadan (Philip 1931), Lokoja, Ogbomosho, and possibly Katagum and Zunguru (Johnson 1918).]
sp. indet. near *unilineatus* (Theobald). Lokoja (Service 1961).
vittatus Bigot. Abeokuta, Abuja, Akure, Birnin Kebbi, Bota, Ekpoma, Enugu, Ibadan, Idanre, Ilesha, Jos, Kaduna, Kakuri, Kan Gimi, Kano, Katabu, Katagum, Katsina, Lagos, Lokoja, Maiduguri, Myanko Falls, Okene, Oshogbo, Vom, Yola, Zaria. [Abinsi, Baro, Ceranci, Funtua, Gadau, Ibi, Kafinsoli, Ogbomosho, Shaki, and possibly Zunguru (Johnson 1918).]

Subgenus *Aedimorphus* Theobald.

- abnormalis* (Theobald). Sapele.
albocephalus (Theobald). Ikorodu, Kumba, Lagos. [Itowolo.]
apicoannulatus (Edwards). Lagos. [Ibadan.]
argenteopunctatus (Theobald). Bali, Bama, Gadau, Idanre, Ikeja, Kaduna, Katagum, Lagos, Tali, Yola. [Tebu-Ode, Ilobi, Ialingo, Lau, Lokoja.]

- boneti* ssp. *kumbae* Chwatt. Kumba.
calignosus (Graham). Lagos.
centropunctatus (Theobald). Ibadan, Kaduna.
cumminsi (Theobald). Ibadan. [Kaduna (Johnson 1918), Lagos.]
cumminsi var. *mediopunctata* Theobald. Kaduna, Kan Gimi.
dalzieli (Theobald). Kaduna, Kan Gimi. [Gadau, Kano, Katagum, Maiduguri, Zaria.]
(dentatus) (Theobald). Adults in the collection of the London School of Hygiene and Tropical Medicine marked as this species from Gadau are in fact *quasimivittatus* (Theobald).
domesticus (Theobald). Ikorodu, Lagos, Oloibiri, Onitsha. [Calabar, Degema, Ilobi, Itowolo.]
filicis Ingram and De Meillon. [Ilaro, Kumba (Bruce-Chwatt gives both these localities in Malaria Service files, Lagos).]
fowleri (Charmoy). Ekpoma, Gadau, Ilesha, Kaduna, Kano, Katagum, Zaria. [Oshogbo.]
haworthi Edwards. [Kumba (Bruce-Chwatt in Malaria Service files, Lagos, but quite possibly a misidentification as the specimen marked by Bruce-Chwatt as *haworthi* Edwards from Ilaro and deposited in the collection of the British Museum (Nat. Hist.) is in fact *stokesi* Evans).]
hirsutus (Theobald). Gadau, Kaduna, Kano, Katsina.
hopkinsi Edwards. [Kumba (Bruce-Chwatt in Malaria Service files, Lagos).]
irritans (Theobald). Boa, Bonny, Ikorodu, Lagos, Onitsha. [Itowolo, Gbohun-Gbohun.]
leptolabis Edwards. Oloibiri.
lokojensis Service. Lokoja.
marshalli (Theobald). Katabu. [Lagos (Wesché 1910).]
minutus (Theobald). Kaduna. [Abinsi, Ilorin, Kan Gimi.]
nigricephalus (Theobald). Bonny, Forcados, Ikorodu, Lagos, Onigbongbo. [Buguma, Degema, Itowolo, N. Nigeria (Surtees 1961).]
ochraceus (Theobald). Gadau, Kaduna, Katabu, Katagum. [Lagos (Dalziel 1920).]
phyllobasis Edwards. Buea.
punctothoracis (Theobald). Ikorodu, Itowolo, Kaduna, Lagos. [Possibly Katagum and Zunguru (Johnson 1918).]
quasimivittatus (Theobald). Gadau (adults in London School of Hygiene and Tropical Medicine collection marked incorrectly as *dentatus* (Theobald)). [Possibly Kaduna, Katagum, and Zunguru (Johnson 1918).]
rickenbachi Hamon and Adam. [Ikeja (Hamon, personal communication).]
simulans (Newstead and Carter). Ibadan, Lagos. [Ilobi.]
stokesi Evans. Agbor, Ibadan, Kaduna, Katabu, Lagos, Onigbongbo, Oshogbo. [Abuja, Gbohun-Gbohun.]
tarsalis (Newstead). Ikeja, Ikorodu, Kaduna, Katabu. [Ilorin, Itowolo, S. Cameroons.]
tricholabis spp. *bwamba* Someren. Lokoja.
wendyae Service. Ikorodu, Katabu.
wigglesworthi Edwards. Lagos, Sapele.
yangambiensis De Meillon and Lavoipierre. Oloibiri.

Subgenus *Neomelaniconion* Newstead.

- albothorax* (Theobald). [Sokoto (Yellow Fever Commission 1913).]
carteri Edwards. Lagos.
circumhuteolus (Theobald). Ikorodu, Ilobi. [Akure, Ibi, Itowolo, Kano, (Bruce-Chwatt in Malaria Service files Lagos) Lagos, Olokemeji, Otta.]

lineatopennis (Ludlow). Akure, Bama, Ekpoma, Kaduna, Kan Gimi, Lagos, Rigachikun, Zaria. [Gadau, Mokwa.]

luteolateralis (Theobald). [The following records are dubious, since Edwards 1915 pointed out that the type adult series consisted of this species and also *lineatopennis* (Ludlow). Bussa, Derri, Forcados, Lagos (all these localities given by Simpson 1912). Abuni Ravine, Bussa, Derri, Forcados, Ibi, Ilesha, Ilorin, Lagos, Lokoja (all in Yellow Fever Commission 1913).]

monotrichus Edwards. Lagos. (Onitsha.)

palpalis (Newstead). Kaduna, Lagos. [S. Cameroons.]

palpalis var. *maculicosta* Edwards. Lagos.

punctocostalis (Theobald). Lagos. [Ikorodu, Itowolo.]

Subgenus *Diceromyia* Theobald.

flavicollis Edwards. Lagos. [Birnin Kebbi (Bruce-Chwatt 1955), Ikorodu, Itowolo.]

furcifer (Edwards). Kaduna, Kan Gimi, Katabu, Rigachikun. [Ceranci, Gadau, Kano.]

taylori Edwards. Gadau, Kaduna, Katabu, Lagos. [Batsari, Ikorodu, Itowolo, Kankiya, Malumfashi.]

Subgenus *Pseudoarmigers* Stone.

argenteoventralis (Theobald). Ibadan, Idanre, Ikorodu, Lagos, Mamfe, Tali. [Afikpo, Bakebe.]

argenteoventralis var. *dunni* Evans. Ibadan, Ikeja, Lagos.

kummi Edwards. Ibadan, Idanre, Lagos. [Ikeja.]

Genus CULISETA Felt

Subgenus *Theomyia* Edwards.

fraseri (Edwards). Oloibiri. [Ibadan.]

Genus CULEX Linnaeus

Subgenus *Lutzia* Theobald.

tigrripes Grandpep and Charmoy. Bafut, Bama, Bansa, Birnin Kebbi Ekpoma, Enugu, Enugu Ezike, Ibadan, Idanre, Ikeja, Ilaro, Ilesha, Ilobi, Jos, Kaduna, Kano, Kumba, Lagos, Lokoja, Maiduguri, Mamfe, Nsukka, Oku, Oloibiri, Onigbongbo, Tiko, Zaria, Zunguru. [Bakebe, Bende, Bonny, Degema, Forcados, Gadau, Ikot, Ikpene, Jakeri, Kanchia, Katsina, Oshogbo, Port Harcourt, Siluko.]

Subgenus *Neoculex* Dyar.

albiventris Edwards. Ibadan. [Ikeja, Ilobi, Lagos, Orlu.]

andreamus Edwards. Lagos, Onitsha. [Degema, Itowolo.]

calabarensis Edwards. Calabar, Forcados.

galliardi Edwards. Forcados, Onitsha.

horridus Edwards. Ibadan, Ikeja, Kaduna, Kan Gimi, Katabu, Lagos. [Batsari, Calabar, Ekona, S. Cameroons.]

insignis (Carter). Lokoja. [Calabar, Forcados, Ikorodu, Ikot Ikpene, Itowolo, Kaduna, Lagos, Onitsha.]

kingianus Edwards. [Degema, Lagos (both localities cited by Edwards 1922 but not given in Edwards 1941; the latter locality is also cited by Beeuwkes *et al.* 1933).]

sp. indet. near *kingianus* Edwards. Oloibiri (Boorman and Service 1960).

rima Theobald. Forcados, Ibadan, Ikeja, Ikorodu, Lagos, Onitsha, Tiko. [Bida, Calabar, Itowolo.]

rubinotus Theobald. Ilaro, Kaduna.

salisburyensis Theobald. [Katabu (Boorman, personal communication), Lagos (Dalziel 1920). Beeuwkes *et al.* 1933.]

- subrima* Edwards. Ikorodu, Onitsha. (Itowolo.)
 sp. indet. near *subrima* Edwards. Bamenda (Service 1959).
sunyaniensis Edwards. Ikorodu, Kaduna. [Itowolo, Lagos, Onitsha.]
wigglesworthi Edwards. Ikorodu. [Itowolo.]

Subgenus *Mochthogenes* Edwards.

- inconspicuus* (Theobald). Akure, Bali, Bamenda, Ekpoma, Idanre, Ikeja, Ilaro, Kaduna, Katabu, Lagos. [Itowolo, Oshogbo.]

Subgenus *Culicomylia* Theobald.

- cinerellus* Edwards. Ikom, Kaduna, Katabu, Lagos, Onigbongbo, Rigachikun, Zaria. [Ilaro, Oshogbo, Port Harcourt, S. Cameroons.]
cinereus Edwards. Enugu, Enugu Ezike, Ikeja, Ilaro, Ilobi, Kaduna, Kano, Lagos, Lokoja, Zaria. [Aba, Gadau, Kanchia, Kankiya, Minna, Oshogbo, S. Cameroons.]
macfieii Knight and Hurlburt. Bamenda, Gadau, Kaduna, Katabu. [Abuja, Batsari, Kafinsoli, Kankiya, Karfi, Malumfashi, Port Harcourt, S. Cameroons.]
nebulosus Theobald. Agbor, Bama, Bamenda, Benin, Birnin Kebbi, Enugu Ezike, Ibadan, Ikeja, Ilaro, Ilesha, Ilobi, Ilorin, Kaduna, Kano, Kumba, Lagos, Lokoja, Mbonge, Nsukka, Oloibiri, Onigbongbo, Oshogbo. [Aba, Abinsi, Afikpo, Baro, Bende, Calabar, Ceranci, Chumbele, Daudawa, Degema, Eket, Enugu, Forcados, Gadau, Ikot Ikpenne, Kafinsoli, Kankiya, Karfi, Katsina, Malumfashi, Missellele, Onitsha, Opobo, Port Harcourt, Tago, Yashi, Zunguru, on launch between Bonny and Opobo.]
nebulosus ssp. *pseudocinereus* Theobald. [Nigeria (Stone *et al.* 1959).]

Subgenus *Culex* Linnaeus.

- annulioris* Theobald. Ekpoma, Enugu Ezike, Gadau, Ibadan, Ikeja, Jos, Kaduna, Kumba, Lagos, Maiduguri, Oloibiri. [Enugu, Ikorodu, Ilaro, and possibly Katagum and Zunguru (Johnson 1918).]
annulioris ssp. *consimilis* Newstead. Besongabang, Ibadan, Lagos.
antennatus (Becker). Ikorodu, Ilaro, Kaduna, Lagos, possibly Oloibiri (Boorman and Service 1960, Orlu. [Ibi, Onitsha, S. Cameroons.]
argenteopunctatus ssp. *kingi* (Theobald). Kaduna, Katabu, Zaria.
bitaeniorhynchus Giles. Bafut, Besongabang, Birnin Kebbi, Donga, Idanre, Ikeja, Ikorodu, Ilaro, Ilesha, Kaduna, Kano, Kumba, Lagos, Maiduguri, possibly Oloibiri (Boorman and Service 1960), Rigachikun. [Akure, Mokwa.]
decens Theobald. Abuja, Bafut, Bama, Bamenda, Bansa, Besongabang, Bida, Birnin Kebbi, Bota, Ekpoma, Enugu, Enugu Ezike, Ibadan, Idanre, Ikeja, Ikorodu, Ilesha, Kaduna, Kano, Katabu, Katagum, Kumba, Lagos, Lokoja, Maiduguri, Mamfe, Nsukka, possibly Oloibiri (Boorman and Service 1960), Onitsha, Oshogbo, Shao, Tiko, Wulgo, Yola, Zaria, Zunguru. [Abinsi, Baro, Bende, Bonny, Forcados, Gadau, Ilorin, Itowolo, Kanchia, Kankiya, Katsina, Minna, Oshin, Port Harcourt, Sokoto, Udi, Wallidanzenne.]
duttoni Theobald. Bamenda, Bonny, Bota, Ekpoma, Enugu, Enugu Ezike, Ibadan, Ikeja, Ikot Ikpenne, Ilaro, Ilesha, Ilobi, Ilorin, Jos, Kaduna, Kan Gimi, Lagos, Lokoja, Maiduguri, Nsukka, Okene, Oloibiri, Rigachikun, Zunguru. See notes on *watti* Edwards. [Aba, Abinsi, Arekou, Bali, Bende, Benin, Degema, Duke Town, Gogwoda, Ibi, Ikpe, Kano, Oshogbo, Port Harcourt, Sapele, Udi.]
ethiopicus Edwards. Ilaro, Kaduna, Maiduguri, possibly Oloibiri (Boorman and Service 1960). [Gadua, Kano.]
grahami Theobald. Besongabang, Gadau, Ikeja, Ilaro, Ilesha, Kaduna, Katabu, Lagos, Lokoja, Onitsha. [Abinsi, Abuni Ravine, Afikpo, Ikot Ikpenne, Katagum, Oshogbo.]
grahami var. *farakoensis* Hamon. Anara, Katabu.
guivarti Blanchard. Ibadan, Ikeja, Ikorodu, Ilaro, Ilesha, Kaduna, Lagos, Lokoja, Maiduguri, Oloibiri, Oshogbo. [Gaidam, Itowolo, Kano, Opobo, between Bonny and

- guiarti* var. *sudanicus* Edwards. Gadau.
- ingrami* Edwards. Bansa, Ikeja, Ilaro, Lagos, Nsukka, Tinto. [Ikorodu, Ilobi, Itowolo, Oshogbo.] Atypical forms have been reported from Bamenda (Service 1959) and from [Oshogbo (Mattingly 1947)].
- invidiosus* Theobald. Ibadan, Ikeja, Ilaro, Lagos, Lokoja, Nsukka, Oloibiri. [Bonny, Degema, Derri, Forcados, Katagum, Katsina, Mokwa, Onitsha, Zunguru.]
- invidiosus* var. *vexillatus* Edwards. (Ibadan (Edwards 1941).]
- mirificus* Edwards. [Ilaro (Bruce-Chwatt in Malaria Service files, Lagos, but as pointed out by Mattingly (personal communication) this is a most unlikely record.]
- moucheti* Evans. Enugu, Enugu Ezike, Ibadan, Nsukka, Oloibiri, Oshodi, Tiko.
- musarum* Edwards. [Nsukka (Bruce-Chwatt in Malaria Service files, Lagos).]
- ornathoracis* Theobald. [S. Nigeria (Edwards 1911), but not mentioned in Edwards 1941.]
- perfidiosus* Edwards. Enugu, Ikeja, Ikorodu, Ilaro, Ilesha, Kaduna, Lagos, Lokoja, Onitsha. [Itowolo, Kano, Oshogbo, Port Harcourt.]
- perfuscus* Edwards. Ibi, Ilaro, Kaduna. [Ikorodu, Itowolo, Jos, Kano, Port Harcourt, Zunguru.]
- philipi* Edwards. Ikorodu, Lagos. [Itowolo.]
- pipiens* var. *fatigans* Wiedemann. Bama, Bamenda, Bauchi, Bida, Birnin Kebbi, Enugu Ezike, Ilaro, Jos, Kaduna, Kakuri, Kano, Katabu, Lagos, Lokoja, Maiduguri, Mokwa, Oloibiri. [Azare, Oshogbo.]
- poicilipes* (Theobald). Baro, Ibadan, Ikorodu, Ilesha, Kaduna, Kan Gimi, Lagos, Lokoja, Maiduguri, Mokwa, Oloibiri, Rigachikun. [Abinsi, Bonny, Itowolo, Lake Chad area, Oshogbo, Sokoto, Zunguru.]
- pruina* Theobald. Bamenda, Ibadan, Idanre, Ikeja, Lagos, Oloibiri. [Agmuni, Missellele, Orlu, Oshogbo.]
- pruina* var. *eschirasi* Galliard. Bafut, Kumba, Lagos. [Ikeja, Ilesha, Oshogbo.]
- simpsoni* Theobald. [Jos (Bruce-Chwatt in Malaria Service files, Lagos), Zaria (Yellow Fever Commission 1913).]
- simaticus* Kirkpatrick. [Kano (Bruce-Chwatt in Malaria Service files, Lagos).]
- tarsalis* Coquillett. [Lagos (Bruce-Chwatt 1957).]
- telesilla* De Meillon and Lavoipierre. Kaduna.
- thalassius* Theobald. Abakaliki, Forcados, Lagos. [Ikorodu, Itowolo, Uburu, Zaria (Beuwkes *et al.* 1933).]
- theileri* Theobald. Yola.
- toroensis* Edwards and Gibbins. Bansa, Besongabang.
- trifilatus* Edwards. Bali.
- trifoliatus* Edwards. Kaduna, Katabu. [S. Cameroons (Surtees 1961).]
- tritaeniorhynchus* Giles. Enugu Ezike, Lagos. [Enugu, Nsukka, Udi.]
- uniovittatus* Theobald. Birnin Kebbi, Enugu Ezike, Gadau, Ibi, Idanre, Ilorin, Kaduna, Kano, Kujama, Lagos, possibly Oloibiri (Boorman and Service 1960), Yola, Zaria, Zunguru. [Abinsi, Argungu, Donga, Forcados, Geidam, Jigaje, Katsina, Lau, Minna, Sokoto, Wukari.]
- uniovittatus* var. *perexiguus* Theobald. [Zaria (Mattingly and Knight 1956).]
- watti* Edwards. As the larvae are inseparable from those of *duttoni* Theobald and since the adults can only be distinguished on dissection of the male terminalia, it is possible that some of the records attributed to *duttoni* Theobald refer to this species. There is, however, no known record of this species from Nigeria although it occurs elsewhere in West Africa.
- weschei* Edwards. Gadau. [Katabu, Zaria.]
- zombaensis* Theobald. [Oshogbo (Maver 1912).]

sp. indet. near *laticinctus* Edwards. Besongabang (Service 1959).

Aedes niger. This mosquito is cited by Beeuwkes *et al.* (1933) in Table D, page 436, as occurring in Lagos. It can be seen from their table that the trivial name *niger*. has a period after it denoting that it represents an abbreviation. It would seem, therefore, that this could refer to either *Aedes nigerrimus* (Theobald), which is mainly East African in its distribution, or more probably *Ochlerotatus nigeriensis* Edwards which is a junior synonym for *Aedes fowleri* (Charmoy).

It is seen from the above distribution list that the presence of 244 mosquitoes are recorded from Nigeria and the Cameroons, but four of these are classified as sp. indet. and as such have no taxonomic status; the presence of *Culex watti* Edwards in this area, although suspected, has yet to be demonstrated; and finally the identification of *Aedes niger*. is obscure. Of the remaining 238 species, subspecies, and varieties recorded from Nigeria, 205 have been seen and checked by the author.

DISTRIBUTION IN RELATION TO VEGETATION

With the aid of the locality list given below and Keay's map (1953) of the Nigerian vegetation, the distribution of the species in relation to the vegetation has been compiled and is presented in Table 1.

Where the presence of a species is denoted only by a broad generalisation, e.g. N. Cameroons, it is excluded from the table, as there is no indication from which vegetational zone it occurs. An interrogation mark indicates that the presence of a particular species in that zone is based solely on unchecked locality records.

It must be borne in mind when trying to interpret the facts presented in this table that in certain areas there has been more intensive collection than in others, and the apparent absence of a species from a zone may well reflect the paucity of collecting rather than its non-existence. The presence of the Malaria Service in Lagos has resulted in intensive collecting in both the Mangrove Swamp and Lowland Rain Forest areas. Similarly the Malaria Unit in Kaduna is responsible for the detailed information of the mosquitoes present in the Northern Guinea Savannah, and the Mass Malaria Campaign in Birnin Kebbi has provided valuable data on the Anophelines to be found in the Sudan Savannah (though little attention, however, has been paid by this unit to Culicines).

LIST OF LOCALITIES WITH THEIR GEOGRAPHICAL POSITIONS (See page 106)

Latitudes and longitudes have been obtained for many localities from the Monthly Rainfall Summaries and Monthly Weather Reports issued by the Meteorological Service in Lagos. Those which are not contained in these reports are bracketed and have been read off as accurately as possible from the Political Map of the Colony and Protectorate of Nigeria (1953), compiled by the Survey Department, Lagos (scale of 1 : 500,000). There has been no differentiation of Lagos into its various suburbs; records from

TABLE I
TABLE SHOWING THE DISTRIBUTION OF THE NIGERIAN CULICIDAE IN RELATION TO THE VEGETATION ZONES

Species	Mangrove	Fresh-water		Montane	Derived Savannah	S. Guinea Savannah	N. Guinea Savannah	Bauchi Plateau	Sudan Savannah	Sahel Savannah
		Swamp	Rain Forest							
<i>Anopheles constanti</i> s.s.	X	.	.	.	.	.	X	.	X	.
<i>constanti</i> var. <i>ziemannii</i>	X	X	X	.	.	X	X	.	X	X
<i>constanti</i> s.l.	X	X	X	X	X	X	X	X	X	X
<i>implexus</i> . . . . .	.	.	.	X	.	.	X	.	.	.
<i>obscurus</i> s.s.	X	.	X	.	X	X	.	.	X	.
<i>obscurus</i> var. <i>noelimi</i> . . . . .	.	.	X	.	.	.	.	.	.	.
<i>paludis</i>	X	X	X	.	X	X	.	.	.	.
<i>barbarellus</i> . . . . .	.	X	?	.	X	X	.	X	X	.
<i>brucei</i> . . . . .	.	.	.	.	.	X	.	.	.	.
<i>brunnipes</i> . . . . .	.	.	.	.	X	X	X	.	.	.
<i>buxtoni</i> . . . . .	.	.	.	X	.	.	.	.	.	.
<i>cinclus</i>	X	.	X	.	.	.	.	.	.	.
<i>flavicoستا</i> . . . . .	.	.	.	.	X	X	X	.	X	.
<i>fredericommensis</i> . . . . .	.	.	X	.	X	X	.	X	.	.
<i>funesus</i>	X	X	X	X	X	X	X	X	X	X
<i>gambiae</i> s.s.	X	X	X	X	X	X	X	X	X	X
<i>gambiae</i> var. <i>mcLas</i>	X	.	.	.	.	.	.	.	.	.
<i>hancocki</i> s.s.	X	.	X	.	X	X	X	.	.	.
<i>hancocki</i> var. <i>gitroyi</i> . . . . .	.	.	.	.	X	.	.	.	.	.
<i>hancocki</i> var. <i>brothieri</i> . . . . .	.	.	.	.	.	X	X	.	.	.

TABLE 1—continued

Species	Mangrove Swamp	Fresh-water	Lowland		Montane Forest	Derived Savannah	S. Guinea Savannah	N. Guinea Savannah	Bauchi Plateau	Sudan Savannah	Sahel Savannah
			Rain Forest	Forest							
<i>opheltes hargreavesi</i> ..	X	X	X	X	.	X	X	.	.	.	.
<i>jebudensis</i> ..	.	.	X	X	.	.	.	.	.	.	.
<i>lesoni</i> ..	.	.	X	X	.	X	X	.	.	.	.
<i>longipalpis</i> var. <i>domicolus</i> ..	.	.	.	.	.	X	X	X	X	X	.
<i>maculipalpis</i> ..	.	.	?	?	.	X	X	X	X	X	.
<i>marshalli</i> ..	.	.	X	X	.	X	?	?	.	.	.
<i>marshalli</i> var. <i>mousinhoi</i> ..	.	.	X	X	.	.	.	.	.	.	.
<i>marshalli</i> var. <i>pitchefordi</i> ..	.	.	?	?	.	.	.	.	.	.	.
<i>moucheti</i> s.s. ..	X	.	X	X	.	X	.	X	.	.	.
<i>moucheti</i> var. <i>nigeriensis</i> ..	X	.	?	?	.	?	.	.	.	.	.
<i>nili</i> ..	?	X	X	X	.	?	X	X	.	X	.
<i>pharoensis</i> ..	X	.	X	X	.	.	X	X	X	X	X
<i>pretoriensis</i> ..	X	.	X	X	.	X	X	X	X	X	.
<i>rhodesiensis</i> ..	.	.	X	X	X	X	X	?	?	X	.
<i>rivulorum</i> ..	.	.	?	?	.	.	X	X	.	X	.
<i>rufipes</i> s.s. ..	X	.	.	.	.	X	X	.	.	X	.
<i>rufipes</i> var. <i>ingrami</i> ..	X	.	.	.	.	?	X	X	X	X	.
<i>rufipes</i> var. <i>brucekwalti</i> ..	.	.	.	.	.	.	.	X	.	.	.
<i>rufipes</i> s.l. ..	X	.	X	X	.	X	?	X	X	X	.
<i>smithi</i> ..	.	.	.	.	.	.	X	.	.	.	.

TABLE I—continued

Species	Fresh-water		Lowland Rain Forest	Montane	Derived Savannah	S. Guinea Savannah	N. Guinea Savannah	Bauchi Plateau	Sudan Savannah	Sahel Savannah
	Mangrove	Swamp								
<i>monsonia annethi</i>	X	.	X	.	.	.	X	.	?	.
<i>aurites</i>	X	X	X	.	.	.	X	.	.	.
<i>cristata</i>	.	.	.	.	?	.	X	.	?	.
<i>maculipennis</i>	.	.	.	.	.	.	X	.	.	.
<i>metallica</i>	X	.	X	.	.	.	.	.	.	X
<i>africana</i>	X	X	X	X	.	X	X	X	X	X
<i>uniformis</i>	X	.	X	.	X	X	X	.	X	X
<i>amoltenia alba</i>	X	.	?	X	.	.	?	.	.	.
<i>alboabdominalis</i>	?	X	X	.	X	.	X	.	.	.
<i>annulata</i> s.s.	X	.	X	.	.	.	X	.	.	.
<i>annulata</i> var.	.	.	.	.	.	.	.	.	.	.
<i>apicolaciniata</i>	.	.	.	.	.	X	.	.	.	.
<i>batfouri</i>	X	X	X	.	X	.	X	.	X	.
<i>bilineata</i> s.s.	?	.	X	.	?	.	X	.	.	.
<i>bilineata</i> var.	.	.	.	.	.	.	.	.	.	.
<i>fraseri</i>	?	.	.	.	.	.	.	.	.	.
<i>bilineata</i> var.	.	.	.	.	.	.	.	.	.	.
<i>connahi</i>	.	.	.	.	.	X	?	.	.	.
<i>calignosa</i>	X	.	.	.	.	.	.	.	.	.
<i>chorleyi</i>	.	.	X	X	.	.	X	.	.	.
<i>fusca</i>	X	.	?	.	.	X	?	.	.	.
<i>hopkinsi</i>	.	.	?	.	.	.	.	.	.	.
<i>mashonaensis</i>	X	X	X	.	X	.	X	.	.	.
<i>mayeri</i>	.	.	X	.	.	.	.	.	.	.
<i>nigrripes</i>	.	.	X	.	.	.	.	.	.	.

TABLE 1—continued

Species	Mangrove	Fresh-water Swamp	Lowland Rain Forest	Montane	Derived Savannah	S. Guinea Savannah	N. Guinea Savannah	Bauchi Plateau	Sudan Savannah	Sahel Savannah
<i>triamaculata</i>	X	X	.	.	.	.	.	.	.	.
<i>nivipous</i>	X	.	X	.	.	.	.	.	.	.
<i>ornata</i>	X	.	X	X	.	?	X	.	.	.
<i>pallidocephala</i>	X	.	X	.	.	.	.	.	.	.
<i>philoxenia</i>	X	.	.	.	.	.	.	.	.	.
<i>caeruleocephala</i>	X	.	.	.	.	.	?	.	?	.
<i>colgisia cyptopus</i>	.	.	X	.	.	.	.	.	.	.
<i>nigeriac</i>	X	.	X	.	.	.	.	.	.	.
<i>sanguinea</i>	?	.	?	.	.	.	.	.	.	.
<i>edomyia africana</i>	X	.	X	.	?	X	X	.	?	.
<i>fuertura</i>	.	.	.	.	.	.	.	.	?	.
<i>retmapodites argyrurus</i>	X	X	.	.	.	.	.	.	.	.
<i>chrysogaster</i>	X	X	X	.	X	.	X	.	.	.
<i>ibracenae</i>	.	.	.	.	X	?	X	.	?	.
<i>grahami</i>	X	.	X	.	.	.	.	.	?	.
<i>inornatus</i>	X	X	X	.	.	.	.	.	.	.
<i>leucopous</i>	.	.	?	.	.	.	.	.	.	.
<i>oedi-podiceps</i>	.	X	X	.	.	.	.	.	.	.
<i>pencallatus</i>	.	.	X	.	.	.	.	.	.	.
<i>quinquevitatus</i>	X	.	X	.	X	.	.	.	.	.
<i>semisimplicipes</i>	.	.	X	.	.	.	.	.	.	.
<i>silvestris</i>	.	.	?	.	.	.	.	.	.	.

TABLE 1—continued

Species	Mangrove	Fresh-water Swamp	Lowland Rain Forest	Montane	Derived Savannah	S. Guinea Savannah	N. Guinea Savannah	Pauchi Plateau	Sudan Savannah	Sahel Savannah
<i>Aedes albocephalus</i>	X	.	X	.	.	.	.	.	.	.
<i>apicoannulatus</i>	X	.	.	.	.	.	.	.	.	.
<i>argenteopunctatus</i>	X	.	X	.	X	?	X	.	X	.
<i>boneti</i> ssp. <i>kumbae</i>	.	.	X	.	.	.	.	.	.	.
<i>caliginosus</i>	X	.	.	.	.	.	.	.	.	.
<i>centropunctatus</i>	.	.	X	.	.	.	X	.	.	.
<i>cammisi</i> s.s.	?	.	X	.	.	.	?	.	.	.
<i>cammisi</i> var. <i>mediopunctata</i>	.	.	.	.	.	.	X	.	.	.
<i>dalzeichi</i>	.	.	.	.	.	.	X	.	?	.
<i>domesticus</i>	X	X	X	.	.	.	.	.	.	.
<i>filicis</i>	.	.	?	.	.	.	.	.	.	.
<i>foveleri</i>	.	.	X	.	.	.	X	.	X	.
<i>havorthi</i>	.	.	?	.	.	.	.	.	.	.
<i>harsulius</i>	.	.	.	.	.	.	X	.	X	.
<i>hopkinsi</i>	.	.	?	.	.	.	.	.	.	.
<i>irritans</i>	X	.	X	.	.	.	.	.	.	.
<i>leptolabis</i>	.	X	.	.	.	.	.	.	.	.
<i>lokojensis</i>	.	.	.	.	.	X	.	.	.	.
<i>marshallsi</i>	.	.	.	.	.	.	X	.	.	.
<i>minutus</i>	.	.	.	.	.	.	X	.	.	.
<i>nigricephalus</i>	X	X	.	.	.	.	.	.	.	.
<i>ochraceus</i>	?	.	.	.	.	.	X	.	.	.
<i>phyllobius</i>	.	.	X	.	.	.	.	.	.	.

TABLE 1—continued

Species	Mangrove	Fresh-water Swamp	Lowland Rain Forest	Montane	Derived Savannah	S. Guinea Savannah	N. Guinea Savannah	Bauchi Plateau	Sudan Savannah	Sahel Savannah
<i>Iles punctohoracis</i> ..	X	.	X	.	.	.	X	.	?	.
<i>quasiaminiellatus</i> ..	.	.	.	.	.	.	.	.	X	.
<i>rickenbachii</i> ..	.	.	?	.	.	.	.	.	.	.
<i>simulans</i> ..	X	.	X	.	.	.	.	.	.	.
<i>stokesi</i> ..	X	.	X	.	.	?	X	.	.	.
<i>tarsalis</i> ..	.	.	X	.	.	?	X	.	.	.
<i>tricholabis</i> ssp.										
<i>bwamba</i> ..	.	.	.	.	.	X	.	.	.	.
<i>wendyae</i> ..	X	.	.	.	.	.	X	.	.	.
<i>wigglesworthi</i> ..	X	.	X	.	.	.	.	.	.	.
<i>yangambiensis</i> ..	.	X	.	.	.	.	.	.	.	.
<i>albohorax</i> ..	.	.	.	.	.	.	.	.	?	.
<i>carteri</i> ..	X	.	.	.	.	.	.	.	.	.
<i>circumluteolus</i> ..	.	.	X	.	.	.	.	.	?	.
<i>fuscineris</i> ..	X	.	.	.	.	.	.	.	.	.
<i>lineatopennis</i> ..	X	.	X	.	.	?	X	.	X	.
<i>luteolateralis</i> ..	X	.	X	.	.	X	X	.	X	.
<i>monotrichus</i> ..	X	.	?	.	.	.	.	.	.	.
<i>palpalis</i> s.s. ..	X	.	.	.	.	.	.	.	.	.
<i>palpalis</i> var.										
<i>maculicosta</i> ..	X	.	.	.	.	.	.	.	.	.
<i>punctocostalis</i> ..	X	.	?	.	.	.	.	.	.	.
<i>flavicollis</i> ..	X	.	?	.	.	.	.	.	.	.
<i>furcifer</i> ..	.	.	.	.	.	.	X	.	?	.

TABLE 1—continued

Species	Mangrove	Fresh-water Swamp	Lowland Rain Forest	Montane	Derived Savannah	S. Guinea Savannah	N. Guinea Savannah	Ikauchi Plateau	Sudan Savannah	Sahel Savannah
<i>Ilex cinerellus</i>	..	X	X	.	.	.	X	.	.	.
<i>cinerus</i>	..	X	X	.	X	.	X	.	X	.
<i>macfiei</i>	..	?	.	X	.	?	X	.	X	.
<i>nebulosus</i>	..	X	X	X	X	X	X	.	X	.
<i>annulioris</i> s.s.	..	X	X	.	X	X	X	X	X	.
<i>annulioris</i> ssp. <i>consimilis</i>	..	X	X	.	.	.	.	.	.	.
<i>antennatus</i>	..	X	X	.	.	.	X	.	.	.
<i>argenteopunctatus</i> ssp. <i>kingi</i>	X	.	.	.
<i>bitacniorhynchus</i>	..	X	X	.	.	.	X	.	X	.
<i>decens</i>	..	X	X	X	X	X	X	.	X	X
<i>duttoni</i>	..	X	X	X	X	X	X	X	X	.
<i>ethiopicus</i>	..	.	X	.	.	X	X	.	.	.
<i>grahami</i> s.s.	..	X	X	.	?	X	X	.	.	.
<i>grahami</i> var. <i>farakoensis</i>	X	.	.	.
<i>guaiarti</i> s.s.	..	X	X	.	.	X	X	.	X	?
<i>guaiarti</i> var. <i>sudanicus</i>	X	.	.	.
<i>ingrami</i>	..	X	X	X	X	.	.	.	.	.
<i>invidiosus</i> s.s.	..	X	X	.	X	X	X	.	?	.
<i>invidiosus</i> var. <i>vexillatus</i>	..	.	?
<i>mirificus</i>	..	.	?

TABLE 2

LIST OF LOCALITIES WITH THEIR GEOGRAPHIC LOCATIONS

Locality.	Latitude		Longitude		Locality	Latitude		Longitude	
	N	E	N	E		N	E		
Aba	05.07	07.22	Boa	04.26	08.55				
Abakaliki ..	06.19	08.06	Bokari	(09.26)	(05.12)				
Abeokuta ..	07.11	03.20	Bonny	04.28	07.10				
Abinsi	(07.44)	(08.44)	Bota	09.10	04.01				
Aboh	05.33	06.32	Brass	04.19	06.14				
Abuja	09.10	07.10	Buea	04.09	09.14				
Abuni Ravine ..	N. Nigeria ?		Buguma	04.44	06.52				
Adun	05.59	08.09	Bussa	10.14	04.35				
Afaka	(10.41)	(07.23)	Calabar	04.59	08.21				
Afikpo	05.53	07.56	Ceranci	N. Nigeria					
Afuga	?	?	Chumbele =						
Agege	06.38	03.20	Chum ? ..	(09.38)	(11.40)				
Agbor	06.16	06.14	Dan Jaba ..	(10.49)	(08.38)				
Agmuni	?	?	Daudawa ..	11.38	07.09				
Akassa	04.20	06.04	Degema	04.45	06.46				
Akure	07.17	05.14	Derri	(11.08)	(03.58)				
Amara	(08.00)	(07.23)	Donga	(07.43)	(10.06)				
Anara	(10.44)	(07.34)	Duke Town ..	(04.55)	(08.19)				
Anchau	(10.57)	(08.22)	Dutsan Wai ..	(10.50)	(08.14)				
Anehou	N. Nigeria		Eket	(04.36)	(07.57)				
Argungu	12.45	04.31	Ekona	04.15	09.20				
Arikou*	?	?	Ekpoma	06.45	06.09				
Aro	07.07	03.13	Enugu	06.27	07.33				
Arochoku ..	05.23	07.55	Enugu Ezike ..	06.59	07.27				
Arua	(05.11)	(06.07)	Epe	06.35	03.59				
Asaba	(06.43)	(06.59)	Epi = Epe ? ..	See Epe					
Ashiri	?	?	Ere	{ (07.43)	(04.47)				
Awba	07.02	03.21		{ (06.32)	(02.54)				
Azare	11.40	10.10	Erinle River ..	?	?				
Babango	(06.20)	(10.30)	Erri = *Eri ? ..	?	?				
Badagry	06.24	02.53	Forcados	05.21	05.26				
Badeggi	09.05	06.07	Funtua	11.24	07.19				
Bafut	(06.04)	(10.06)	Gadua	11.50	10.12				
Bakari	12.46	07.11	Gbohun-Gbohun	See Lagos					
Bakebe	(05.34)	(09.32)	Geidam	12.53	11.56				
Bali	05.53	10.01	Ginijar	Near Sokoto					
Bama	11.31	13.42	Gogwoda	N. Nigeria					
Bamenda	05.58	10.09	Gusau	12.10	06.42				
Banso	06.12	10.40	Gwaga Forest ..	Abuja area					
Baro	08.35	06.23	Gurara Falls ..	(09.22)	(07.00)				
Batsari	(12.45)	(07.11)	Hadejia	12.27	10.04				
Bauchi	10.17	09.49	Ibadan	07.26	03.54				
Bende	05.32	07.36	Ibi	08.11	09.45				
Benin	06.19	05.36	Idanre	(07.52)	(05.00)				
Besongabang ..	(05.46)	(09.17)							
Bida	09.06	06.01							
Birnin Kebbi ..	12.28	04.11							
Birnin Lafia =									
Birnin Lafiya ?	(12.34)	(04.15)							

* Although listed in the *Gazetteer of Place-Names on the Map of Nigeria* (1949) this locality

TABLE 2—continued

Locality	Latitude		Longitude		Locality	Latitude		Longitude	
	N	E	N	E		N	E		
Ijebu Ode ..	06.49	03.56			Lau	09.12	11.17		
Ikeja	06.35	03.20			Lokoja	07.48	06.44		
Iketobo ..	Calabar Province ?								
Ikom	05.58	08.42			Maiduguri ..	11.51	13.05		
Ikot Ekpene ..	05.11	07.43			Makurdi	07.41	08.37		
Ikpe	Near Bende				Malumfashi ..	11.47	07.38		
Ilaro	06.54	03.01			Mama	(09.04)	(08.42)		
Ilesha	07.38	04.45			Mamfe	05.43	09.17		
Ilobi	(06.44)	(03.02)			Mao Godi ..	N. Cameroons			
Ilorin	08.29	04.35			Mbonge	04.33	09.05		
Ishiri	See Ikeja				Minna	09.37	06.32		
Itchi	(06.58)	(07.22)			Missellele ..	04.07	09.27		
Itowolo	(06.28)	(03.17)			Mokwa	09.18	05.04		
					Myanko Falls ..	See Abuja			
Jamieson River ..	Near Sapele				Noma	(10.44)	(04.03)		
Jakeri	06.06	10.35			Nsukka	06.52	07.23		
Jalingo	08.51	11.20			Numan	09.28	12.93		
Jebba	09.08	04.49							
Jigaje	N. Nigeria				Obubra	06.06	08.20		
Jos	09.52	08.54			Ogbomoshu ..	08.08	04.14		
					Oji	06.13	07.18		
Kabba	07.50	06.04			Okene	07.34	06.13		
Kaduna	10.30	07.27			Okiti Pupa ..	06.31	04.47		
Kafinsoli ..	12.32	07.45			Oku	(06.10)	(10.24)		
Kagerko =					Oloibiri	(04.41)	(06.22)		
Kagarko ? ..	09.32	07.37			Olokemeji ..	07.25	03.32		
Kakuri	10.28	07.24			Onigbongbo ..	See Lagos			
Kanchia	?	?			Onitsha	06.10	06.47		
Kan Gimi	(10.44)	(07.36)			Opobo	04.34	07.33		
Kankiya	12.33	07.50			Orlu	(05.47)	(07.02)		
Kano	12.03	08.32			Oshin	(07.21)	(06.05)		
Karfi	(11.44)	(07.32)			Oshodi	(06.33)	(02.54)		
Katabu	(10.43)	(07.32)			Oshogbo	07.47	04.29		
Katagum	12.18	10.20			Otta	06.42	03.14		
Katari = Kateri ?	(09.37)	(07.25)			Owerri	05.30	07.01		
Katsina	13.01	07.41			Oyo	07.50	03.57		
Kau Kanke ..	Zaria Province								
Keffi	08.50	07.52			Port Harcourt ..	04.51	07.01		
Kitikwa	(09.25)	(07.03)							
Kitikuri	(10.46)	(07.18)			Rigachikun	(10.38)	(07.29)		
Kittiwa	?	?							
Konko =					Santa	05.47	10.12		
Konkon ? ..	(13.02)	(10.37)			Sapele	05.54	05.42		
Konoko	(09.34)	(06.04)			Sapoba	06.04	05.52		
Kontagora	10.22	05.29			Seri	(09.24)	(09.42)		
Koton Kerip =					Shaki	08.40	03.23		
Koton Kerifi ?	(08.05)	(06.47)			Shao	(08.35)	(04.35)		
Kudsema	(10.23)	(07.33)			Shongo	N. Nigeria			
Kujama	(10.17)	(07.46)			Siluko	(06.33)	(05.11)		
Kumba	04.38	09.25			Sokoto	13.01	05.15		
Lafia	08.30	08.30			Tago				
Lagos	06.27	03.24				(12.46)	(04.13)		
Lake Chad ..	North-western					05.24	09.17		

TABLE 2—continued

Locality	Latitude		Longitude		Locality	Latitude		Longitude	
	N	E	N	E		N	E		
Tiko	04.06	09.21	Wallidazene ..	05.31	Near Gadau				
Tinto	(05.32)	(09.36)	Warri	(09.11)	05.44			(03.14)	
			Wobe = Wobi ?	07.52	09.47				
Ubassa	(10.35)	(07.20)	Wukari	12.34	14.10				
	(06.44)	(07.12)	Wulgo						
Uburu	{ (06.02)	(07.45)	Yashi	(12.22)	(07.56)				
Udi	(06.18)	(11.24)	Yelwa	10.53	04.45				
Umaisha	08.00	07.14	Yola	09.14	12.29				
Victoria	04.01	09.12	Zaria	11.05	07.43				
Vom	09.44	08.47	Zunguru	09.49	06.10				

ACKNOWLEDGEMENTS

The author wishes to express his thanks to Mr. P. F. Mattingly, British Museum (Natural History), for allowing him to examine the British Museum collection, and to Dr. B. R. Laurence, London School of Hygiene and Tropical Medicine, for permission to search through the School's collection. Thanks are due to Dr. L. J. Bruce-Chwatt and to Mr. J. P. T. Boorman for their very considerable help in checking and supplying information on non-published records. Finally the author wishes to thank the Permanent Secretary, Ministry of Health, Northern Nigeria, for permission to publish this paper.

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