Checklist of the Type Specimens of Mosquitoes (Diptera: Culicidae) in the Medical Entomology Collections of the Pasteur Institute in Paris

F. Rodhain and A. Boutonnier
Arbovirus Laboratory, Viral Ecology Unit
Institut Pasteur, 25, Rue du Dr. Roux
75724 - Paris Cédex 15, France

ABSTRACT. After uniting the entomological collections of the Faculty of Medicine of Paris with those of the Pasteur Institute in Paris, an inventory was made of the type specimens of 20 nominal species of mosquitoes now housed in the Pasteur Institute. Information is provided for this material.

In 1980, the entomological collections originally kept in the laboratory of parasitology (Pr. M. Larivière) of the Faculty of Medicine in Paris were transferred to the Pasteur Institute. This Institute now possesses type material for 20 nominal species of Culicidae. These include the following:

Genus *Anopheles:* *An. vincenti* Laveran 1901c; *An. farauti* Laveran 1902b; *An. martini* Laveran 1902a; *An. pursati* Laveran 1902a; *Nyssorhynchus bozasi* Neveu-Lemaire 1905b; *An. azaniae* Bailly-Choumara 1960; *An. maliensis* Bailly-Choumara and Adam 1959; *An. hamoni* Adam 1962.

Genus *Aedes:* *Stegomyia lamberti* Ventrillon 1904; *Stegomyia brumpti* Neveu-Lemaire 1905a; *Ae. chaussieri* Edwards 1923; *Ae. coulangesi* Rodhain and Boutonnier 1982; *Ae. ambreensis* Rodhain and Boutonnier 1983.

Genus *Mansonia:* *Panoplites seguini* Laveran 1901b.

Genus *Culex:* *Cx. kermorganti* Laveran 1901a; *Lophoceratomyia roubaudi* Borel 1926; *Cx. punctiscapularis* Floch and Abonnenc 1946a; *Cx. rabanicolus* Floch and Abonnenc 1946b.

Genus *Uranotaenia:* *Ur. caliginosa* Philip 1931.

Genus *Wyeomyia:* *Wy. antillarum* Floch and Abonnenc 1945.

Senevet's material, said by Belkin (1968) to be provisionally kept in the collections of the Faculty of Medicine, was not present there when we took them in charge; therefore, this material is not included in the Pasteur Institute collections. Otherwise, the material designated by Belkin (1968) as "Collection Theobald," and which, as said by this author, could contain Lutz's original material, is actually in the Pasteur Institute. As mentioned by Harbach (1983),

the types of the following taxa could not be found in the Pasteur Institute: *Culex pipiens autogenicus* Roubaud 1935; *Cx. pipiens berbericus* Roubaud 1935; *Cx. pipiens sternopallidus* Roubaud 1945; *Cx. pipiens sternopunctatus* Roubaud 1945.

Anopheles vincenti Laveran 1901c

The type material consists of 5 *Anopheles* females (in relatively good condition) mounted in Canada balsam on a microscope slide. These specimens represent 2 different species. Three specimens are *An. minimus* Theobald 1901 and 2 are *An. jeyporiensis* James 1902. The upper surface of the slide has 2 labels: one written with a lead pencil bears "*A. vincenti*, Ht. Tonkin, Van Linh;" the other, ink written, bears "*Anopheles vincenti*, Laveran 1901, Type material, J. Reid. det. X-46." On the underside of the slide, a third label specifies: "Provisionally determined as: *A. minimus* 3♀, *A. jeyporiensis* 2♀ (latter indicated by the black arrows), J. Reid, X-46." The 2 specimens of *jeyporiensis* are indicated by arrows drawn on the cover slip.

Reid (1947) studied this slide and concluded that "the majority (three-fifths) of the specimens are *minimus*,... and *A. vincenti* Laveran 1901, is a synonym of *minimus* Theobald 1901, which has priority by one week." However, Reid did not designate a lectotype. A mistake concerning the sex of the specimens in Knight and Stone (1977) is corrected in the supplement (Knight 1978).

Anopheles farauti Laveran 1902b

The type material is mounted in Canada balsam on 3 microscope slides. Each slide contains 2 females in relatively good condition (some without legs). Each slide has a lead pencil written label indicating "*A. farauti*, Faureville, Ile Vaté, Nelles Hebrides, Janv. 02" and a second ink written label with "*Anopheles farauti*, Laveran 1902, Type material, J. Reid. det. X-46." One of these slides shows, on the underside, a label bearing "*A. farauti* = valid species or sub-species within *A. punctulatus* complex, J. Reid, X-46."

Anopheles farauti was considered a synonym of *An. punctulatus* before specific status was reestablished by Rozeboom and Knight (1946) and Reid (1947). Recently, the concept of *An. farauti* was shown to be a complex of 3 sibling species.

Anopheles martini Laveran 1902a

The type material is mounted in Canada balsam on 2 microscope slides. One slide has a complete specimen; the other has only 2 incomplete legs. Each slide bears 3 labels: on the upper surface, one lead pencil written label with "*A. martini*, Montagnes de Pensat, Cambodge, février 1902," one ink written with

Anopheles martini Laveran 1902, Type material, J. Reid. det. X-46;" and on the underside, the third label indicates, " = *A. barbirostris* v. d. Wulp 1884, J. Reid. det. X-46."

Anopheles martini was synonymized with *An. barbirostris* by Reid (1947).

Anopheles pursati Laveran 1902a

The type material consists of 2 females mounted in Canada balsam on a single microscope slide. The specimens are in very poor condition (the hind legs are missing on both specimens). Two labels are glued on the upper surface: one in lead pencil with "*A. pensati*, Montagnes de Pensat, Cambodge, février 1902;" the other ink written with "*Anopheles pursati* Laveran 1902, Type material, J. Reid. det. X-46." An additional label on the underside bears " = *A. hyrcanus* variety non det. J. Reid, X-46."

Anopheles pursati was considered as a synonym of *An. hyrcanus* var. *nigerrimus* by Reid (1947, 1953). Specific status was reestablished by Reid (1963).

Nyssorhynchus bozasi Neveu-Lemaire 1905b

One of the type specimens is a pinned female in perfect condition except the left foreleg is missing. The identification label bears "*Nyssorhynchus bazasi* N.L. 1905 ♀" and a location label is inscribed with "Doufilé, 10 Octobre 1902, Brumpt." This specimen probably contributed significantly to the description of the species. Another syntype, in very poor condition, is also present in our collections. We found no trace of 2 other specimens mentioned by Neveu-Lemaire. *Nyssorhynchus bozasi* is listed by Stone et al. (1959), as a synonym of *Anopheles pharoensis*.

Anopheles azaniae Bailly-Choumara 1960

The type material consists of 3 pinned paratypes, one female and 2 males, in good condition. The female has 4 labels, the first with "Bihen-Gaha. Somaliland. 8-8-59," the second with "E 201 H.B.C.," the third with "*Anopheles azaniae*" and the fourth, a yellow label, bears the letter "P." The 2 males also have 4 labels: those of the first male bear "Bihen-Gaha, Somaliland, R. Choumara Rec. 8-8-59," "E 235 H.B.C." and "*Anopheles azaniae*" (the fourth is a blank yellow label) and those of the second bear "Bihen-Gaha, Somaliland, R. Choumara Rec," "E 233 H.B.C." and "*Anopheles azaniae*" (the fourth is a blank yellow label).

The original description of *azaniae* was based on specimens deposited in the "Office de la Recherche Scientifique et Technique Outre-Mer" (ORSTOM), the "Malaria Institute," Amani, Tanzania, the British Museum (Nat. Hist.), London, and the Pasteur Institute in Paris. Those deposited in the Pasteur Institute are mentioned here.

Anopheles maliensis Bailly-Choumara and Adam 1959

The type material consists of 2 pinned specimens. A female paratype, in perfect condition, has a location label with "Guinée, 17/4/58/02, Cercle Mali, A.O.F., J.P.A., ORSTOM. Rec," an identification label with "*A. maliensis* ♀, 28, H. B-Ch, J. P. Adam ORSTOM. Dét," and a yellow label with "Paratype." A male paratype, in good condition except the right foreleg is missing, bears labels with the following: "Guinée, 17/4/58/02, Cercle Mali, A.O.F., J.P.A. ORSTOM Réc," "*A. maliensis* ♂, 8 H. B-Ch, J. P. Adam, ORSTOM. Dét." and "Paratype" (a yellow label).

Bailly-Choumara and Adam (1960) indicate that they deposited the holotype, allotype and paedotypes in the ORSTOM collections, some paratypes (♂, ♀, larval and pupal exuviae) in the British Museum (Nat. Hist.) in London, and paratypes with immature exuviae in the Pasteur Institute in Paris. We were not able to locate the larval and pupal exuviae, and they are not recorded in the catalog of the Pasteur Institute. The "rest of the material used for the study of variability" (6 males, 4 females) is also present in our collections.

Anopheles hamoni Adam 1962

The type material consists of 8 adults, a larval exuviae and a pupa. The adults, 4 males and 4 females, all pinned, bear the same labels (except dates between 22 and 31 July 1961). The labels include a location label with "Rép. du Congo, Grotte Meya-N'Zouari; cercle Mayama, J. P. Adam ORSTOM Réc.," an identification label with "*Anopheles hamoni*, ♂ or ♀, J. P. Adam ORSTOM Dét," and a yellow label with "P." The specimens are in good condition except one or several legs are missing; 2 females are recently engorged. The larval exuviae and the pupa are mounted on separate slides. The larval exuviae, probably chloral balsam mounted, is in good condition in spite of some crystallization of the medium. Directly written in ink on the left side of this slide is: "*A. hamoni*, 94," and on the right side, a label bears "Congo, grotte de Meya, Préfecture de Mayama, 31 juillet 1961, dét. J. P. Adam." The pupa is in poor condition since the medium is crystallized. Directly written in ink on the left side of this slide is "*A. hamoni*, 86," and the label bears "Congo, grotte de Meya, Préfecture de Mayama, 31 juillet 1961, 61.07.31.03, dét. J. P. Adam."

Adam (1962) stated that the holotype, allotype and paedotypes (larva and pupa) were deposited in the ORSTOM collections, and that paratypes were deposited in the British Museum (Nat. Hist.), London, in the "Musée Royal du Congo Belge," Tervuren, and in the Pasteur Institute in Paris. The adults present in the Pasteur Institute do not bear numbers, and it is not possible to know if the female ("n°19") and the male ("n°23") (Adam 1962) are among them. The pupa shows effectively the "n°86" but the larva is numbered "94" and not "n°95" as indicated in the Adam's paper.

Stegomyia lamberti Ventrillon 1904

The type material consists of 2 pinned females in good condition, originally deposited in the collections of the Faculty of Medicine of Paris. One of the specimens has a bristol-board label with "*Stegomyia lamberti* Ventrillon Type!," and in the box, another label indicates "*Stegomyia lamberti* Ventrillon, Madagascar, Type!." Unquestionably, both are *Aedes aegypti* L. Ventrillon (1904) points out the presence of a "median line of white fusiform scales" on the scutum, but does not mention the characteristic lyre-shaped markings of *Ae. aegypti*. This is probably the reason why *lamberti* is considered by Knight and Stone (1977) as a synonym of *Ae. albopictus* (Skuse). To our knowledge, no other collection possesses "types" of *lamberti*. We think that it is necessary to emend this synonymy and consider *lamberti* as a synonym of *Ae. aegypti* (Linnaeus).

Stegomyia brumpti Neveu-Lemaire 1905a

The type specimen is a pinned female in excellent condition (except the left foreleg is missing). It bears 2 ink written labels. The first label bears *Stegomyia brumpti* ♀ type;" the second bears "Harrar, Brumpt, 26 avril 1901 (élevage)." Two males of this species, in fairly good condition, collected in the same place and dated April 1901, are kept with the type. They are probably the specimens obtained from larvae collected in Harrar on April 26, 1900, that Neveu-Lemaire mentioned in his paper.

Stegomyia brumpti is listed by Stone et al. (1959) as a synonym of *Aedes vittatus* (Bigot). These authors indicate the type as "non existent."

Aedes chaussieri Edwards 1923

The collection contains a single cotype female, glued on a bristol card and in poor condition, with 2 ink written labels. The first label, with a yellow border, is labelled "cotype" and bears "*Aedes (Stegomyia) chaussieri*, Edw." The second label bears "Belgian Congo, Sandoa, Dr. Chaussier 1922, 257." This specimen could be one of the 4 cotypes presented by Langeron to the British Museum in London since it came from the collection of the Faculty of Medicine of Paris where Langeron was working in Brumpt's laboratory.

Aedes coulangesi Rodhain and Boutonnier 1982

Type material consists of 2 pinned females. The holotype is in perfect condition and bears an ink written label with "Ampijoroa, MD 1480, 27.4.1980 F. Rodhain Réc," a second red label with "Holotype ♀ *Ae. coulangesi*" and a third label with "F. Rodhain et A. Boutonnier Det." The paratype bears a label with "Region de Majunga, Madagascar MD.1071,1979, F. Rodhain Réc.," a yellow label with "Paratype *Ae. coulangesi*" and a third label with "F. Rodhain et A. Boutonnier Dét." The paratype is in very good condition except the left foreleg and left hindleg are missing.

Aedes ambreensis Rodhain and Boutonnier 1983

The type material consists of 29 females. The holotype, in perfect condition, is pinned and bears 3 labels. The first label bears "Madagascar MD.580, Montagne d'Ambre, F. Rodhain Réc. 16.3.77," the second one is red and bears "Holotype *Ae. ambreensis*" and the third one bears "F. Rodhain et A. Boutonnier Dét." Twenty-six paratypes have the same location label as the holotype, except the dates and collection numbers are different: 7 are numbered MD.573 and dated 16.3.77, 17 are MD.580 dated 16.3.77, one is MD.1365 dated 19.4.80 and 1 is MD.1383 dated 20.4.80. All of these specimens bear a yellow label with "Paratype *Ae. ambreensis*" and a third label with "F. Rodhain et A. Boutonnier Dét." In addition, 2 paratypes are in the Pasteur Institute in Madagascar.

Panoplites seguini Laveran 1901b

Type material is mounted on 3 microscope slides, probably in Canada balsam. One slide carries a well preserved female and bears a label (lead pencil written) with "Mansonia Seguini, Hanoi, Hop. m^{re}, salle de garde, 4 sept. 01," and a second label (ink written) with "*Panoplites seguini* Laveran 1901, Type material, J. Reid det. X.46." Another slide carries 2 females in fairly good condition and bears 2 labels with "P. seguini, Hanoi, Sept^{re} 01; chambre du Dr. Seguin" and "*Panoplites seguini* Laveran 1901, Type material, J. Reid det. X.46." The third slide has a male *Culex*, a female culicine (genus undetermined but not *Mansonia*) and a male (genitalia unobservable) which could belong to the genus *Mansonia*. This last slide is labelled "*Culex* (2 espèces), 1 *P. Seguini* ♂, chambre du Dr. Seguin, Hanoi, Tonkin, 4 Sept. 01;" "*Panoplites seguini* 1 ♂, Type material, J. Reid det. X.46 and Laveran 1901" (written vertically).

Edwards (1932) synonymized *seguini* with *Mansonia annulifera* Theobald. This species was treated by Reid (1947).

Culex kermorganti Laveran 1901a

Type material is mounted on 2 microscope slides, probably in Canada balsam. One slide contains the head and abdomen of a female and has 2 labels, one has the heading "Institut Pasteur" with "Nelle Calédonie, Nouméa, 17 mars 01, C. Kermorganti, tête, abdomen" written in lead pencil; the other one, ink written, bears "Culex kermorganti, Laveran 1901, Type material, J. Reid det. X.46." The second slide contains 6 legs and 2 wings and has 2 labels with "Nelle Calédonie, Nouméa, Mars 01, C. Kermorganti" and "*Culex kermorganti* Laveran 1901, type material, J. Reid det. X.46."

Culex kermorganti was transferred to *Aedes* by Edwards (1932). The species was treated by Reid (1947) under the name of *Aedes (Mucidus) kermorganti*. The deposition of the types was confirmed by Knight (1947). Synonymy with *Ae. (Mucidus) alternans* Westwood was established by Rageau and Hamon (1957).

Lophoceratomyia roubaudi Borel 1926

The type material is mounted in Canada balsam on 3 slides. One slide bears an ink written label with "Lophoceratomyia Roubaudi sp.n." and contains a male (in good condition) without genitalia. The genitalia of this specimen are mounted laterally on another slide which bears a label with "Lophoc. Roubaudi, org. gén. ♂." The third slide contains 2 larvae and is labeled "Lophocerat. Roubaudi larve." Each slide has a type written label with "Borel écrit. série type ? Indochine 1926."

Lophoceratomyia roubaudi was synonymized with *Cx. quadripalpis* (Edwards) (see Sone et al. 1959). Detailed information on these specimens is given by Harrison (1973) (the third slide, however, contains only 2 larvae and not 3 as stated by Harrison). According to this author, Borel's description was based on these specimens.

Culex punctiscapularis Floch and Abonnenc 1946a

The type is a male. Its genitalia are mounted in Canada balsam on one slide and the rest of the body is dry preserved under a concave cover slip on another slide. The slide bearing the body has "C. punctiscapularis ♂, n° 748 bis, TYPE, Crique Anguille 18.6.45" written in ink directly on the glass. The specimen is in perfect condition.

This nominal species was synonymized with *Cx. (Melanoconion) nigrimacula* Lane and Whitman (Lane 1951), then considered again as a valid species by Duret (1969) who redescripted it. Harrison (1973) and Degallier and Claustre (1980) gave detailed information about this type. These authors point out the presence of a probable paratype in the collections of the Pasteur Institute of French Guyana. A male paratype (n° 748) is said by Duret (1969) to be deposited in the United States National Museum, Washington, D. C.

Culex rabanicola Floch and Abonnenc 1946b

The type is a male. Its genitalia are mounted in Canada balsam. The rest of the specimen, in good condition, is dry preserved under a concave cover slip on another slide. Directly ink written on the slide, one can read "Ex. type, n° 696, C. rabanicolus, 5.8.43."

The original description by Floch and Abonnenc (1946b) is based on this specimen. Harrison (1973) and Degallier and Claustre (1980) also provide information on the specimen. The species name was corrected to *C. rabanicola* by Knight and Stone (1977).

Uranotaenia caliginosa Philip 1931

Type material in the Pasteur Institute consists of an engorged pinned paratype (in good condition) with 2 labels. The first label, ink written,

indicates "Lagos, Nig. ♀, n° 466. C. B. Philip;" the second label bears *Uranotaenia caliginosa* Phil., Det. Philip. 29" and "Paratype" written in red. This specimen was previously kept in the collection of the Faculty of Medicine of Paris.

This species was described by Philip (1931) and the male and female types deposited by him in the British Museum (Nat. Hist.) in London. In his paper, Philip mentions the existence of paratypes, one of them collected in Lagos could be the specimen present in our collection.

Wyeomyia antillarum Floch and Abonnenc 1945

Type material is represented by a female (gynetype) and a male (androtype). The female is dry preserved, in poor condition, in a glass tube, with a label bearing "N°56-I, *Wyeomyia antillarum* ♀ TYPE." This tube is fixed on a microscope slide containing the associated larval and pupal exuviae (in good condition). The slide is labeled "N°56(1) *Wyeomyia antillarum* ♀ TYPE (voir tube)." The male is borne on 2 slides. The first slide bears the genitalia mounted in Canada balsam. The body (in good condition, except the head) is dry preserved under a concave cover slip on another slide. Written in ink on this slide is "N°63(2) *Wyeomyia antillarum* Type ♂." This slide also has 2 labels: one with "Lectotype W. antillarum F. et A. 1945 by Belkin (1968);" the other (a red half-rounded label) with "Lectotype Belkin 66." The larval and pupal exuviae of the male (in poor condition) are preserved in Canada balsam on yet another slide. The latter bears the same information as the slide holding the body of the adult.

ACKNOWLEDGMENTS

We wish to thank the entomologists who ensured the preservation of the collections kept in the Faculty of Medicine of Paris and in the Pasteur Institute in Paris. We particularly thank Pr. M. Larivière who permitted the integration of the 2 collections in order to facilitate their preservation and study, and R. E. Harbach who kindly read our manuscript and corrected many errors.

REFERENCES CITED

Adam, J. P. 1961. *Anopheles caroni* n. sp. (Diptera: Culicidae). Anophèle cavernicole nouveau de la République du Congo. Bull. Soc. Path. Exot. 54:714-717.

_____. 1962. Un anophele cavernicole nouveau de la République du Congo (Brazzaville): *Anopheles (Neomyzomyia) hamoni* n. sp. (Diptera: Culicidae). Bull. Soc. Path. Exot. 55:153-165.

Bailly-Choumara, H. 1960. Une espèce nouvelle d'*Anopheles* du golfe d'Aden, *Anopheles (Myzomyia) azaniae* (Diptera: Culicidae); notes morphologiques, systématiques et écologiques. Bull. Soc. Path. Exot. 53:531-542.

Bailly-Choumara, H. and J. P. Adam. 1959. *Anopheles maliensis* n. sp. (Diptera: Culicidae), une espèce nouvelle d'Anophelinés du Fouta-Djalon (République de Guinée). C. R. Acad. Sci. Paris 248:3742-3743.

_____. 1960. Notes complémentaires sur la morphologie, la position systématique et la biologie d'*Anopheles (Neomyzomyia) maliensis*. Bull. Soc. Path. Exot. 53:110-119.

Belkin, J. N. 1968. Mosquito studies (Diptera: Culicidae) IX. The type specimens of New World mosquitoes in European museums. Contrib. Amer. Ent. Inst. 3:1-69.

Borel, E. 1926. Les moustiques de la Cochinchine et du Sud-Annam (I). Arch Inst. Pasteur. Indocine 7:75-106.

Degallier, N. and J. Claustre. 1980. *Culicidae* (Diptera: Nematocera) de Guyane Française: Notes faunistiques et taxonomiques. Rev. Fr. Entom. 2:138-145.

Duret, J. P. 1969. Estudio sobre *Culex (Melanoconion) ocellatus* y sus especies afines (Diptera: Culicidae). Physis 29(78):113-129.

Edwards, F. W. 1923. Four new African Mosquitoes. Bull. Ent. Res. 13:397-399.

Floch, H. and E. Abonnenc. 1945. Les moustiques de la Guadeloupe (II). Les genres *Megarhinus*, *Aedes*, *Culex*, *Deinocerites*, *Mansonia* et *Wyeomyia*. Public. Inst. Pasteur Guyane Territ. Inini. 110:2-8.

_____. 1946a. Description de *Culex* nouveaux de la Guyane Française (IV). *Culex (Melanoconion) punctiscapularis* n. sp. Public. Inst. Pasteur Guyane Territ. Inini. 122:1-3.

_____. 1946b. Description de *Culex* nouveaux de la Guyane Française (III). *Culex (Melanoconion) rabanicolus* n. sp. *Culex (Melanoconion) rorotaensis* n. sp. Public. Inst. Pasteur Guyane Territ. Inini. 120:1-4.

Harbach, R. E. 1983. Notes on some types of *Culex (Culex)* (Diptera, Culicidae) deposited in England and France. Mosq. Syst. 15:98-110.

Harrison, B. A. 1973. Notes on some mosquito types deposited in France. Mosq. Syst. 5:1-13.

James, S. P. 1902. Malaria in India. Sci. Mem. Med. Sanit. Dept. India 2:1-106.

Knight, K. L. 1947. The *Aedes (Mucidus)* mosquitoes of the Pacific (Diptera: Culicidae). J. Wash. Acad. Scienc. 37:315-325.

_____. 1978. Supplement to a catalog of the mosquitoes of the world. Thomas Say Found. 6(Suppl.):1-107.

Knight, K. and A. Stone. 1977. A catalog of the mosquitoes of the world. Thomas Say Found. 6:1-611.

Lane, J. 1951. Synonymy of Neotropical Culicidae. Proc. Ent. Soc. Wash. 53: 333-336.

Laveran, A. 1901a. Au sujet de Culicides recueillis à Djibouti et à la Nouvelle-Calédonie. C. R. Soc. Biol. Paris 53:567-569.

_____. 1901b. Sur des Culicides provenant de Hanoi (Tonkin). C. R. Soc. Biol. Paris 53:991-993.

_____. 1901c. Sur des Culicides provenant du Haut-Tonkin. C. R. Soc. Biol. Paris 53:993-994.

_____. 1902a. Sur des Culicides du Cambodge. C. R. Soc. Biol. Paris 54:906-908.

_____. 1902b. Sur des Culicides des Nouvelles Hébrides. C. R. Soc. Biol. Paris 54:908-909.

Neveu-Lemaire, M. 1905a. Mission du Bourg de Bozas. Description d'une mouvelle espèce de *Stegomyia* recueillie par le Dr. Brumpt à Harrar. Bull. Soc. Zool. Fr. 30:8-11.

_____. 1905b. Sur un nouveau moustique appartenant à la sous-famille des *Anophelinae* (*Nyssorhynchus bozasi* nov. sp.). C. R. Soc. Biol. Paris 59: 32-33.

Pajot, F. X. and J. P. Adam. 1964. Notes morphologiques sur *Anopheles caroni* Adam, 1961 (Diptera: Culicidae). Bull. Soc. Path. Exot. 57:626-637.

Philip, C. B. 1931. Two new species of *Uranotaenia (Culicidae)* from Nigeria with notes on the genus in the Ethiopian region. Bull. Ent. Res. 22:183-193.

Rageau, J. and J. Hamon. 1957. *Aedes* (Diptera: Culicidae) appartenant au sous-genre *Mucidus* en Nouvelle-Calédonie. Bull. Soc. Path. Exot. 50: 372-378.

Reid, J. A. 1947. Type specimens of *Culicidae* described by Laveran (Diptera: Culicidae). Trans. R. Ent. Soc. Lond.(B)16:86-91.

_____. 1953. The *Anopheles hyrcanus* group in South East Asia. Bull. Ent. Res. 44:5-76.

_____. 1963. Notes on *Anophelinae* mosquitoes from Malaya, with descriptions of three new species. Ann. Trop. Med. Parasit. 57:97-116.

Rodhain, F. and A. Boutonnier. 1982. Description d'un nouvel *Aedes* endémique de Madagascar: *Ae. (Diceromyia) coulangesi* nova species. Arch. Inst. Pasteur Madagascar 49:193-196.

_____. 1983. Description d'un nouvel *Aedes* du sous-genre *Ochlerotatus* (Diptera: Culicidae) de Madagascar: *Aedes ambreensis* nova species et considérations générales sur les femelles du sous-genre *Ochlerotatus* dans la région Afrotropicale. Bull. Soc. Path. Exot. 76:825-833.

Roubaud, M. 1935. La microstructure du flotteur de l'oeuf dans les races biologiques de *Culex pipiens* L. Bull. Soc. Path. Exot. 28:443-445.

_____. 1945. Le Problème de l'espèce chez le moustique commun *Culex pipiens* L. Bull. Soc. Path. Exot. 38:47-60.

Stone, A., K. L. Knight and H. Starcke. 1959. A synoptic catalog of the mosquitoes of the world (Diptera: Culicidae). Thomas Say Found. 6:1-358.

Theobald, F. V. 1901. A monograph of the Culicidae or mosquitoes. Vol. 1, London. 424 pp.

Ventrillon, M. E. 1904. Description de Culicides à Madagascar. Bull. Mus. Nat. Hist. Nat. Paris 8:550-553.