

The Type-Specimens of *Toxorhynchites* (Diptera: Culicidae)
at the National Museum of Natural History¹

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ABSTRACT. Data associated with 20 type-specimens of *Toxorhynchites* in the U. S. National Museum of Natural History are listed. A lectotype is designated for *Toxorhynchites herrickii* (Theobald), a synonym of *Toxorhynchites rutilus septentrionalis* (Dyar & Knab).

INTRODUCTION

The type-specimens of *Toxorhynchites* deposited in the National Museum of Natural History (USNM) were studied by the author during the summers of 1976 and 1978. The type-specimens of mosquitoes are maintained in separate cases in individual unit trays and are arranged alphabetically by species name. These specimens, plus other mosquitoes in the National Museum collection, are curated by the staff of the Medical Entomology Project (MEP).

The catalog of the mosquitoes of the world (Knight & Stone 1977), with its supplement (Knight 1978), and the publications by Belkin (1968) and Belkin et al. (1965, 1966, 1968) were of considerable aid for these type studies. I am especially indebted to the late John N. Belkin, whose friendship and many outstanding contributions to the field of mosquito systematics inspired me and many other mosquito systematists. The assistance provided by Ronald A. Ward and the staff of MEP is especially acknowledged. The staff associated with the *Toxorhynchites* project are gratefully acknowledged for their assistance, including Deborah Manning who assembled all of the original descriptions, Lawrence Mark Thomas who prepared the outline drawings, Neal L. Evenhuis who assisted in the selection of characters and design of the outline drawings, and Dorothy Hoxie and Reidun Johansen-Khan who typed and proofread the various drafts of the manuscript.

METHODS

All types examined were photographed with a Minolta SRT 101 using a 100 mm Auto Bellows lens and the 1:1 extension. The light source was a Capro

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RL80 ring flash. The 35 mm color slides provided a very useful record of color patterns, banding patterns, and other gross morphological features. All photographs were taken at a constant 1:1 ratio and could subsequently be used for verification of some morphometric details. Each type was examined for 32 male or 31 female characters. Additionally, banding patterns on the legs, abdomen, thorax, and mouthparts were illustrated on 2 pages of outline drawings. Complete label data from each examined specimen were also recorded. This multiple approach to examination of type-specimens provided very comprehensive descriptions.

The format used generally follows Belkin (1968). The specific names are arranged alphabetically. Generic and subgeneric names are abbreviated according to Reinert (1975). The source of type-material and type-localities of all nominal taxa of *Toxorhynchites* are discussed in Steffan (1977). General information on the type-series follows the condensed bibliographic citation for the original description. Detailed information from the labels follows. Labels are numbered consecutively from top to bottom. Each line on the label is separated by an oblique (/). Information between quotation marks ("") is handwritten, other label data are printed. The type depository (in brackets []) follows the label data. Additional comments on the type-series follows.

LIST OF NOMINAL TAXA

Genus *Toxorhynchites* Theobald

Subgenus *Lynchiella* Lahille

Tx. (Lyn.) gerbergi Belkin 1977:329-332. Described from a series of 2 ♂♂ and 2 ♀♀ with associated larval and pupal exuviae and 2 larvae from Grenada. HOLOTYPE ♀, with associated larval and pupal exuviae on slide. Labels: 1. GR "51-103"/Grenada 1963/T. H. G. Aitken; 2. HOLOTYPE/"Tox gerbergi"/Belkin 77"; 3. Type/No." "/U.S.N.M. [USNM]. The original description (Belkin 1977:329) cites the following collection information: Industry Village, Union, St. Mark, Grenada, elev. 30 m, saxicolous bromeliad in partial forest, 16 Oct 1963, Raymond Martinez.

Tx. (Lyn.) guadaloupensis (Dyar & Knab 1906:254-255; *Megarhinus*). Described from a ♂ and ♀ reared from larvae, collected in bromeliads. HOLOTYPE ♀ [see Stone & Knight 1957:199]. Labels: 1. "79.1"; 2. Guadeloupe/"July" W.I.; 3. Aug. Busck/Collector; 4. Type/No. "9956"/U.S.N.M. [red label]; 5. "Megarhinus/guadeloupen-/sis D&K" [USNM]. Belkin, Schick & Heinemann (1965:27) list additional locality data: La Soufriere, Guadeloupe, elev. 3000 ft., 30 July 1905.

Tx. (Lyn.) haitiensis (Dyar & Knab 1906:253-254; *Megarhinus*). Described from a series of 3 ♂♂ and 1 ♀ reared from larvae collected in treeholes. HOLOTYPE ♀ [see Stone & Knight 1957:199]. Labels: 1. "134.1"; 2. S. Frncsco Mts/St. Domingo/"Sept. 05 W I; 3. Aug. Busck/Collector; 4. Type/No. "9955"/

U.S.N.M. [red label]; 5. "Megarhinus/haitiensis/D&K" [USNM]. Belkin, Schick & Heinemann (1965:17) add some additional notes on the type series. "Type from larva in 'hollow tree,' others in type series from 'hollow palm trunk' (123.1), hollow immortelle tree (139.1), hollow tree (144.1, 144.2)."

Tx. (Lyn.) herrickii (Theobald 1906:241; *Megarhinus*). The description of this species by Theobald was based on Herrick's (1905:281-282) description of *Megarhinus portoricensis* collected at Agricultural College, Mississippi, 1905. Herrick based his comments on *M. portoricensis* on 3 adult males reared from larvae collected in "the cup-like bottom of a massive iron post supporting one corner of a large water tank." He discussed differences between these specimens and Theobald's description of *M. portoricensis* (Theobald 1901:232), and illustrated the larva and portions of the pupa and adult. Theobald (1906) based his description of *M. herrickii* on these published comments and apparently did not see the specimens (Belkin 1968:33). Belkin (1968) suggested that a lectotype should be designated from specimens in the National Museum collection. LECTOTYPE ♂ by present designation. Labels: 1. W. V. Reed/"A.C." Miss./"9-26-" 190 "5"; 2. "S493"; 3. "493/Megarhinus portoricensis/Agri. Coll. Miss./9-26-05/W.V. Reed/See card 493" [on folded microscope slide label]; 4. "383/Uranotaenia/sapharina/A.C. 9-11-05/W.V. Reed/383" [on folded microscope slide label]; 5. Type/No. "76798"/U.S.N.M. [red label] [USNM].

Tx. (Lyn.) hypoptes (Knab 1907:50-51; *Megarhinus*). Described from a unique HOLOTYPE ♂ collected in Nicaragua, with genitalia on slide. Labels: 1. "16"; 2. Bluefields/Nicar [Nicaragua]; 3. WF Thornton/Collector; 4. Type/No. "10146"/U.S.N.M. [red label]; 5. "Megarhinus/hypoptes/Knab/Type:" [USNM].

Tx. (Lyn.) iris (Knab 1913:35-36; *Megarhinus*). Described from unique HOLOTYPE ♀ reared from a larva collected in an epiphytic bromeliad. Labels: 1. Trinidad/WI; 2. FW Urich; 3. "33.1"; 4. Type/No. "15603"/U.S.N.M. [red label]; 5. "Megarhinus/iris/D&K" [USNM].

Tx. (Lyn.) moctezuma (Dyar & Knab 1906:251-252; *Megarhinus*). Described from a series of 16 ♂♂ and 2 ♀♀ from El Salvador, Costa Rica and Guatemala. HOLOTYPE ♂, with genitalia on slide [see Stone & Knight 1957:199]. Labels: 1. No. "338^a"/see F. Knab's/Entom. notes.; 2. R Aranjuez/Puntarenas CR [Costa Rica]; 3. Type/No. "9953"/U.S.N.M. [red label]; 4. "Megarhinus/moctezuma/D&K" [U.S.N.M.].

Tx. (Lyn.) rutilus (Coquillett 1896:44; *Megarhinus*). Described from a series of 3 ♂♂ and 5 ♀♀ from North Carolina and Florida in the USNM collection. LECTOTYPE ♂, with genitalia on slide, designated by Stone & Knight 1957:199. Labels: 1. Fla. [abdomen glued to label]; 2. Type/No. "903"/U.S.N.M. [red label]; 3. "Megarhinus/rutila/Coq."; 4. "Lectotype/Stone-Knight/1957" [USNM]. Stone & Knight (1957) infer that Georgiana, Florida is the type-locality. This is accepted by Belkin, Schick & Heinemann (1966:6).

Tx. (Lyn.) septentrionalis (Dyar & Knab 1906:249-251; *Megarhinus*). Described from a series of 13 ♂♂ and 11 ♀♀ from Virginia, West Virginia, Maryland, North Carolina, Mississippi, Missouri and "India Territory.": HOLOTYPE ♂, with

genitalia on slide [see Stone & Knight 1957:199]. Labels: 1. Woodstock/"iss. 24 Aug 04" VA; 2. F.C. Pratt/Collector; 3. Type/No. "9952"/U.S.N.M. [red label]; 4. "Megarhinus/septentrionalis/D.&K." [USNM]. A slide-mounted pupal skin was found in the slide collection at the USNM with the following label and is presumed to be the associated skin of the holotype: "Megarhinus/SEPT. ♂/pupated Aug. 20'04/issued Aug. 24'04/Woodstock, Va/in Tree Stump (Pratt)." This pupal skin is illustrated by Steffan & Evenhuis (1980).

Tx. (Lyn.) superbus (Dyar & Knab 1906:255-256, 258; *Megarhinus*). Described from a series of 2 ♂♂ bred from larvae collected in bromeliads in Trinidad and 1 ♀ collected in Mexico. HOLOTYPE ♂, genitalia mounted on slide [see Stone & Knight 1957:200]. Labels: 1. Trinidad/WI; 2. FW Urich/Collector; 3. "16-19"; 4. Type/No. "9957"/U.S.N.M. [red label]; 5. "Megarhinus/superbus/D&K" [USNM]. Belkin, Schick & Heinemann (1965:67) list the type locality as Sangre Grande (St. Andrew).

Tx. (Lyn.) trinidadensis (Dyar & Knab 1906:252-253; *Megarhinus*). Described from a series of 2 ♂♂ and 3 ♀♀ collected in Trinidad. HOLOTYPE ♀ [see Stone & Knight 1957:200]. Labels: 1. Trinidad/WI; 2. FW Urich/Collector; 3. "B 3.2"; 4. "Megarhinus/trinidadensis/D&K"; 5. Type/No. "9954"/U.S.N.M. [red label] [USNM]. Belkin, Schick & Heinemann (1965:67) list Sangre Grande (St. Andrew) or San Juan (St. George) as possible type-localities.

Subgenus *Toxorhynchites* Theobald

Tx. (Tox.) argenteotarsis Ludlow 1906:367-368. Described from a series of 5 ♀♀ collected on Mindanao in the Philippines. LECTOTYPE ♀, designated by Stone & Knight 1957:199. Labels: 1. Type No./"76797"/U.S.N.M. [red label]; 2. "Toxorhynchites argenteotarsis Ludl./Margosatubig, Mindanao, P.I. [Philippines] June & July. Type C.S.L./1906" [on folded label]; 3. "Lectotype/Stone-Knight/1957" [USNM].

Tx. (Tox.) bickleyi Thurman 1959:14-15. Described from a unique HOLOTYPE ♂ collected from the side of a tree. Labels: 1. "near temple"/Doi Sutep/Chiangmai Prv./Thailand/"7 Feb. 1953"; 2. D.C. ThurmanJr/Collr. "486"; 3. Type/No./"64218"/U.S.N.M. [red label]; 4. "Toxorhynchites/bickleyi"/det/ETHrnm 195 "8"/"Holotype" [USNM]. The single ♂ was collected at 3000 ft. elevation.

Tx. (Tox.) gigantulus (Dyar & Shannon 1925:67-68; *Megarhinus*). Described from unique HOLOTYPE ♂ collected on Luzon in the Philippines. Labels: 1. "Limay/Bataan Pr. P.I." [Philippines]; 2. "R.C. McGregor/Nov. 1924"; 3. Type No./"28096"/U.S.N.M. [red label] [USNM].

Tx. (Tox.) grata (Banks 1906:780-782; *Worcesteria*). Described from a series of 20 specimens collected on Negros Occidental and Cebu Islands. LECTOTYPE ♂, designated by Stone & Knight 1957:199. Labels: 1. Acc. No. "6071"/Lot "Co-type"/Govt. Lab. Coll.; 2. Type No. "10255"/U.S.N.M. [red label]; 3. "Worcesteria/grata/Banks"; 4. "Lectotype/Stone-Knight/1957" [USNM]. Only the foreleg is still attached to the body, other legs or fragments are glued to the cork stage. Steffan (1977:64) restricts the type-locality to Bago, Hacienda "Louisiana," Mailum, Negros Occidental, Negros Island, Philippines.

Tox. (Tox.) lewaldii (Ludlow 1904:233-234; *Megarhinus*). Described from unique HOLOTYPE ♂. Labels: 1. Type No./"27784"/U.S.N.M.; 2. "Toxorhynchites/lewaldii/Lud./Fort Mills/Corregidor/Dec." [USNM]. The label data disagree with the published data, which give the type locality as Salog [Guimaras Island], Philippines. Dr. Ronald A. Ward (pers. commun.) suggested that the specimen may have been incorrectly labeled by Shannon. Dyar & Shannon (1925: 67) discuss Ludlow's types and apparently labeled some of the types.

Tox. (Tox.) manopi Thurman 1959:16-17. Described from a unique HOLOTYPE ♂ collected on the east slope of Doi Sutep from a tree trunk. Labels: 1. "Bunker Road"/Doi Sutep/Chiengmai prv/Thailand/"26 Mar. 1953"; 2. D. C. Thurman, Jr./Collr. "645"; 3. Type No./"64217"/U.S.N.M. [red label]; 4. "Toxorhynchites/manopi"/det/Ethrmn 195"8"/"Holotype"/[USNM]. The single ♂ was collected at an elevation of 1500 ft.

Tox. (Tox.) nepenthis (Dyar & Shannon 1925:66-67; *Megarhinus*). Described from unique HOLOTYPE ♀ collected at Los Banos. Labels: 1. Los Banos, P.I. [Luzon, Philippines]/"15-II"-1915; 2. "From/Nepenthes"; 3. Type No./"28095"/U.S.N.M. [USNM].

Tox. (Tox.) sunthorni Thurman 1959:19-20. Described from a unique HOLOTYPE ♂, resting on a tree trunk. Labels: 1. "Doi Chom Cheng"/Chieng Mai Prv/Thailand/"4. April 1952"; 2. "Ernestine B &"/DCThurmanJr/Collr. "182"; 3. Type No./"64219"/U.S.N.M. [red label]; 3. "Toxorhynchites/sunthorni"/det/ETHRMAN 195"8"/"Holotype"[U.S.N.M.]. All legs are off the specimen; only the hindleg is intact and mounted on a card below the specimens, fragments of other legs are also mounted on the card. The specimen was collected at an elevation of 3000 feet.

Tox. (Tox.) yaeyamae Bohart 1956:29-32. Described from ♂, 2 ♀♀ and one larva collected in treeholes on Ishigaki and Iriomote Islands in the southern Ryukyus. HOLOTYPE ♂, genitalia on slide 55.4.46, associated larval and pupal skins on slide 51.11.23a. Labels: 1. "51.11.23a" [blue label]; 2. "55.4.46" [yellow label]; 3. "Treehole/#10"; 4. E. Fork of/Nakara River; 5. Iriomote I.;Ryukyu Is/XI-17-1951; 6. R.M. Bohart/collector; 7. "Holotype/Toxorhynchites/yaeyamae/.Bohart" [red label]; 8. Type/No. "76799"/U.S.N.M. [red label].

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