DESCRIPTION OF THE PUPA OF *TOXORHYNCHITES (LYNCHIELLA) RUTILUS RUTILUS* (DIPTERA: CULICIDAE)[1]

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ABSTRACT

The pupa of *Toxorhynchites* (*Lynchiella*) *rutilus rutilus* (Coquillett) is described and illustrated for the first time. A table lists the range, mode, and mean number of branches of each pupal hair. Notes on the biology of the larvae and pupae are given.

The adults of *Toxorhynchites rutilus rutilus* were first described by Coquillett (1896). Complete descriptions of the male, male terminalia, female, and larva are given by Carpenter and La Casse (1955). In the present paper a detailed taxonomic description and illustration (Fig. 1-3) of the pupa is presented for the first time. The range, mode, and mean number of branches for each pupal hair are listed in Table 1. Chaetotaxy and morphological nomenclature follow Belkin (1962).

Toxorhynchites (*Lynchiella*) *rutilus rutilus* (Coquillett)

Cephalothorax (Fig. 1). Hair C-1 extra long and barbed, C-2-5, 9 moderately long, C-6 short, C-7-8 long, C-1, 4 single, C-2 usually single, C-3, 9 usually single or double, C-5 usually with 4-5 branches, C-6, 8 usually double or triple, C-7 double.

Respiratory trumpet (Fig. 2). Darkly pigmented, lighter distad; index 3.44-4.58.

Metanotum (Fig. 3). Hairs C-10, 12 moderately long, C-11 long, C-10 usually with 2-4 branches, C-11 usually double or triple, C-12 usually with 3-4 branches.

Abdomen (Fig. 3). Hair 0-II-VIII minute, single; 1-I-III long and stellate, 1-IV long, 1-V-VII, X moderately long, 1-I with 18-36 branches on basal one half, 1-II usually with 3-5 branches on basal one half, 1-III, VI usually double or triple, 1-IV usually single or double, 1-V usually with 3-5 branches, 1-VII usually with 3-4 branches, 1-X usually with 4-5 branches; 2-I-VII short, 2-I usually single or double, 2-II, IV-VII single, 2-III usually single; 3-I-III long and barbed, 3-IV-VII moderately long, 3-I-III single, 3-IV usually with 5-8 branches, 3-V usually with 5-7 branches, 3-VI usually with 2-4 branches, 3-VII usually with 3-4 branches; 4-I-II, V-VIII moderately long, 4-III-IV short, 4-I usually with 8-10 branches, 4-II usually with 7-9 branches, 4-III usually with 4-6 branches, 4-IV usually with 3-5 branches, 4-V usually with 5-8 branches, 4-VI usually with 4-5 branches, 4-VII-VIII single; 5-I short, 5-II long and barbed,

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TABLE 1. RECORD OF THE BRANCHING OF THE SETAE ON THE PUPAE OF *Toxorhynchites rutilus rutilus*

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Cephalothorax				Abdomen III (Cont.)		
1	1	1	1	5	1	1	1
2	1–2	1	1.3	6	1–4	1	1.5
3	1–4	1	2.1	7	1–4	3	2.9
4	1	1	1	8	1	1	1
5	4–7	3	4.7	9	1	1	1
6	2–4	3	2.9	10	2–6	3	2.5
7	2	2	2	11	1–2	1	1.2
8	1–3	2	1.9				
9	1–3	1	1.5		Abdomen IV		
				0	1	1	1
	Metanotum			1	1–3	1	1.5
				2	1	1	1
10	2–5	2	3.1	3	5–10	6	7.6
11	2–4	2	2.4	4	3–7	4	4.1
12	2–5	4	3.6	5	1	1	1
				6	1–3	2	1.7
	Abdomen I			7	2–4	3	2.6
1	18–36	24	26.6	8	1	1	1
2	1–3	2	1.7	9	1	1	1
3	1	1	1	10	3–4	3	3.3
4	4–10	9	8.1	11	1	1	1
5	3–6	5	4.9				
6	2–6	3	3.4		Abdomen V		
7	3–5	3	3.7	0	1	1	1
				1	3–6	5	4.2
	Abdomen II			2	1	1	1
				3	3–9	5	5.9
0	1	1	1	4	5-10	7	6.4
1	2–7	5	4.9	5	1	1	1
2	1	1	1	6	1–4	1	2.1
3	1	1	1	7	3–4	4	3.6
4	6–12	8	8.8	8	1	1	1
5	1	1	1	9	1	1	1
6	1–3	1	1.4	10	2–4	3	3.2
7	1–3	2	2.3	11	1–2	1	1.1
8	1–3	1	1.2				
9	1	1	1		Abdomen VI		
11	1–3	1	1.3	0	1	1	1
				1	2–4	2	2.7
	Abdomen III			2	1	1	1
				3	1–4	4	2.9
0	1	1	1	4	2–5	4	3.9
1	1–5	2	2.4	5	1	1	1
2	1–2	1	1.1	6	1	1	1
3	1	1	1	7	3–6	4	4.3
4	3–6	5	4.5				

TABLE 1. CONTINUED

Hair	Range	Mode	Mean	Hair	Range	Mode	Mean
	Abdomen VI (Cont.)				Abdomen VII (Cont.)		
8	5–10	6	6.6	8	6–11	9	8.8
9	1	1	1	9	1	1	1
10	1–2	1	1.2	10	1–2	1	1.1
11	1	1	1	11	1	1	1
	Abdomen VII			14	1	1	1
0	1	1	1				
1	2–4	4	3.9		Abdomen VIII		
2	1	1	1	0	1	1	1
3	3–6	4	4.3	4	1	1	1
4	1	1	1	9	1	1	1
5	1	1	1				
6	5–10	5	6.9		Abdomen X		
7	2–5	4	3.4	1	4–10	4	4.8

5-III-VI extra long and barbed, 5-VII moderately long, 5-I usually with 4-5 branches, 5-II-VII single; 6-I-V, VII moderately long, 6-VI extra long and barbed, 6-I usually double or triple, 6-II-IV usually single or double, 6-V usually single to triple, 6-VI single, 6-VII usually with 5-8 branches; 7-I-II, IV-VII moderately long, 7-III short, 7-I, III, VII usually with 3-4 branches, 7-II, IV usually double or triple, 7-V with 3-4 branches, 7-VI usually with 3-5 branches; 8-II-VII short, 8-II usually single, 8-III-V single, 8-VI usually with 5-7 branches, 8-VII usually with 8-10 branches; 9-II-VII short, 9-VIII moderately long, 9-II-VIII single; 10-III-VII moderately long, 10-III usually with 3-4 branches, 10-IV with 3-4 branches, 10-V usually double or triple, 10-VI-VII usually single; 11-II short, 11-III-VII moderately long, 11-II-III, V usually single, 11-IV, VI-VII single; 14-VII minute, single.

Paddle (Fig. 3). Relatively broad with a distinct apical emargination; midrib does not reach apex and divides paddle unevenly, outer part wider than inner; distal 0.17 of outer and 0.75 of inner margins with small spicules; index 1.26-1.48.

The following material collected by the author at Gainesville, Alachua County, Florida was examined: 2 females, 19 June 1969; 1 female, 18 July 1969; 4 females, 9 April 1970; 1 male and 2 females, 11 April 1970; 1 male and 3 females, 19 April 1970; 2 males and 2 females, 23 April 1970; 1 female, 11 May 1970; 2 females, 21 May 1970; 10 males and 13 females, 31 May 1970; 4 males and 3 females, 6 June 1970; 2 females, 17 June 1970; 3 males, 28 June 1970; 1 female, 5 July 1970; 1 female, 12 July 1970; and 1 male, 15 July 1970. Two females from Vero Beach, Indian River County, Florida, 18 April 1970, were also examined. The above description is based only on the pupal skins of the males. No significant difference was found in the chaetotaxy of the two sexes.

Biology: All the material from Gainesville was collected as larvae from treeholes and rotholes in oak trees and individually reared in the labora-

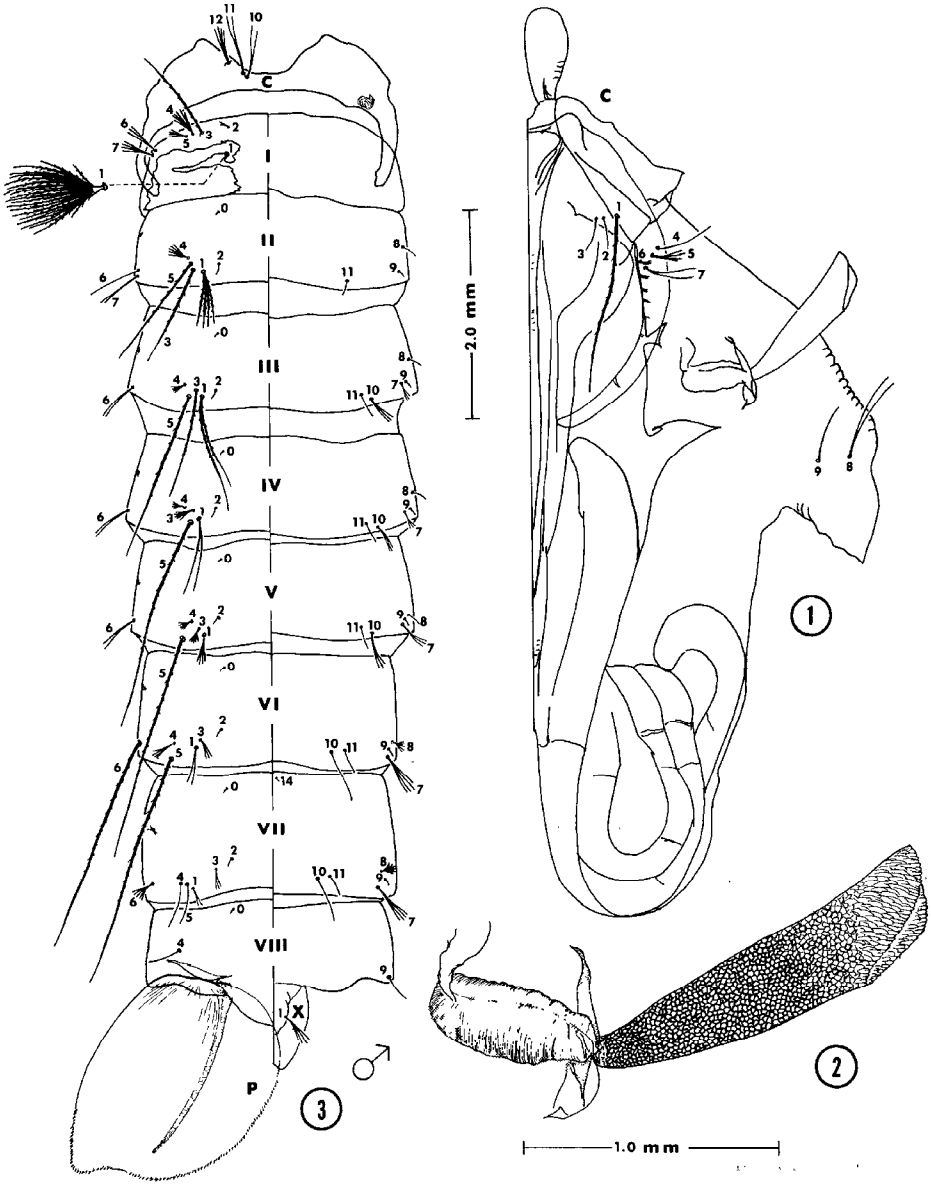

Fig. 1-3. Pupa of *Toxorhynchites rutilus rutilus* (Coquillett). 1) Cephalothorax. 2) Respiratory trumpet. 3) Metanotum and abdomen. C = cephalothorax; I-VIII, X = abdominal segments 1 through 8 and 10; P = paddle.

tory. A number of larvae were collected from a single treehole on several occasions. On 31 May 1970 a total of 19 fourth and 4 third instar larvae were collected from a large rothole in an oak tree. These larvae were associated with and feeding on larvae of *Aedes triseriatus* and *Orthopodomyia signifera*. Ten male and 13 female *Toxorhynchites rutilus rutilus* adults were reared from this collection. The 2 females from Vero Beach were collected from water at the base of leaves of epiphytic Bro-

meliaceae and were associated with *Wyeomyia vanduzeei* and *Wyeomyia mitchellii.*

The length of time spent in the pupal stage ranged from 4 days to 5 days 11 hours for females and from 4 days to 5 days 1 hour for males. The average time for females was 4 days 19 hours and 4 days 18 hours for males. Basham, Mulrennan, and Obermuller (1947) observed that the pupal stage required 4 to 5 days.

Additional information on the biology of this species is given by Jenkins and Carpenter (1946), Olinger (1957), Jenner and McCrary (1964), and McCrary and Jenner (1965).

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