

The pupae of Spanish *Ochlerotatus* I. *Ochlerotatus quasirusticus* (Diptera: Culicidae)

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Abstract

The pupa of *Ochlerotatus quasirusticus* is redescribed and illustrated. A table lists the range and modal number of branches of each pupal seta. Notes on the biology of the larva and pupa are given.

Introduction

Ochlerotatus quasirusticus has been recorded in Europe only in Spain (Eritja *et al.*, 2000; Melero & Salom, 2002) and Algeria (Brunhes, 2000). Torres Cañameres (1951) first described *Oc. quasirusticus* from “las Majadas” (Cuenca, Spain). A complete description accompanied by illustrations of the larva, female, male (including male genitalia) was given by Encinas Grandes (1982) based on specimens from Salamanca. Eritja *et al.* (1999) compared different aspects of the morphology of larvae and adults of Spanish species within the subgenus *Rusticooides*, based on material collected by the authors in Cuenca (Spain). Senevet & Anderelli (1958) first described the pupa from one specimen, which is deposited in The Natural History Museum, London.

During mosquito surveys in Madrid, pupae of species of *Ochlerotatus* were collected. As a result of these studies Melero & Salom (2003) described the pupa of *Ochlerotatus cantans* (Meigen, 1818). In the present paper the pupa of *Oc. quasirusticus* is completely described and illustrated (Figures 1-3). The range and modal number of branches of each pupal seta are given in Table 1. Chaetotaxy and morphological terminology follow Knight (1971) and Harbach & Knight (1980).

***Ochlerotatus quasirusticus* (Torres Cañameres, 1951)**

Cephalothorax (Figure 1): **Setae 1-5-C** and **7-9-C** long, usually double; **6-C** short, usually single; **7-C** usually double; **8-C** usually single or double; **9-C** usually double.

Trumpet (Figure 2): Strongly pigmented; index 3.3-4.2 (mode 3.5).

Metanotum (Figure 3): **Setae 10-12-C** long; **10-C** multi-branched; **11-C** usually single; **12-C** usually with 2-3 branches.

Abdomen (Figure 3): **Seta 0-II-VIII** minute, single; **Seta 1-I** dendritic; I-II, III moderately long; 1-IV-VII long; 1-IV usually with 2-3 branches; 1-V, VII usually single; 1-VI usually double; **Seta 2-I-VII** short, single; **Seta 3-II** usually with 3 branches; 3-III, V, VI, VII usually double; 3-IV short, usually with 3-4 branches; 3-VI, VII long; **Seta 4-I-V** short; 4-VI moderately long; 4-VII, VIII long; 4-I usually with 3-4 branches; 4-II usually with 4-5 branches; 4-III, V usually with 4 branches; 4-IV, VI usually with 2-3 branches; 4-VII, VIII single; **Seta 5-I** short, usually with 4 or 5 branches; 5-II moderately short, usually with 3-4 branches; 5-III, IV moderately short, usually with with 3-4 branches; 5-IV, V, VI very long; 5-VII long; **Seta 6-I-VII** long; 6-I, II, III, V, VI usually single; 6-IV, VII usually with 2-4 branches; **Seta 7-I, II, VI, VII** long, usually single or double; 7-III-V short, usually with 3-6 branches; **Seta 8-III-VII** short; 8-III usually with 4-5 branches; 8-IV, V, VI with 2-3 branches; 8-VII with 3-5 branches; **Seta 9-I** short; 9-II-VI minute; 9-VII, VIII moderately long; 9-VII usually double; 9-VIII with up to 9 subdivided branches; **Seta 10-III-VII** long; 10-III, IV usually double; 10-V-VII usually single; **Seta 11-III-VII** short, single; **Seta 14-III-VIII** minute, single.

Paddle (Figure 3): Spiculate margin of paddle interrupted posteriorly on each side of insertion of seta 1-P; 1-P moderately long, single, sometime bifurcate. Index 1.5-1.9 (mode 1.7).

Material examined

The above description is based on the following material collected by the author in San Mamés, (Madrid; Spain): 20 males, 6 females; 13 April 2003 and 7 females; 1 May 2003. All pupae (less 5 that died) have associated adults.

Table 1. Branching of the setae on pupae of *Ochlerotatus quasirusticus*

Seta	Cephalothorax	Abdominal segments								Paddle
	CT	I	II	III	IV	V	VI	VII	VIII	Pa
0	—		1	1	1	1	1	1	1	—
1	1,2(2)	37-44(39)	4-7(5)	3-6(5)	1-4(2)	1,2(1)	1-4(1)	1,2(1)	—	1,2(1)
2	1,2(2)	1	1	1	1	1	1	1	—	—
3	1,2(2)	2,3(2)	2-5(3)	1-3(2)	3-6(3)	2,3(2)	1,2(2)	1,2(2)	—	—
4	2,3(2)	3-5(3)	3-6(5)	3-5(4)	2-4(3)	3-5(4)	2,3(3)	1	1	—
5	2,3(2)	4-6(4)	3-5(3)	3-5(4)	2	2	2	1,2(1)	—	—
6	1,2(1)	1,2(1)	1,2(1)	1,2(1)	2-5(3)	1	1	1-4(4)	—	—
7	2,3(2)	1,2(1)	1-3(1)	4-6(5)	3-4(3)	3-6(4)	1	1	—	—
8	1-3(2)	—	—	3-6(4)	2,3(2)	1-3(3)	2-5(2)	3-5(4)	—	—
9	1,2(2)	1	1	1	1	1	1	2,3(2)	4-9(8)	—
10	6-10(8)	—	—	2,3(2)	1-3(2)	1,2(1)	1	1	—	—
11	1,2(1)	—	—	1	1	1	1	1	—	—
12	1-3(2)	—	—	—	—	—	—	—	—	—
13	—	—	—	—	—	—	—	—	—	—
14	—	—	—	1	1	1	1	1	1	—

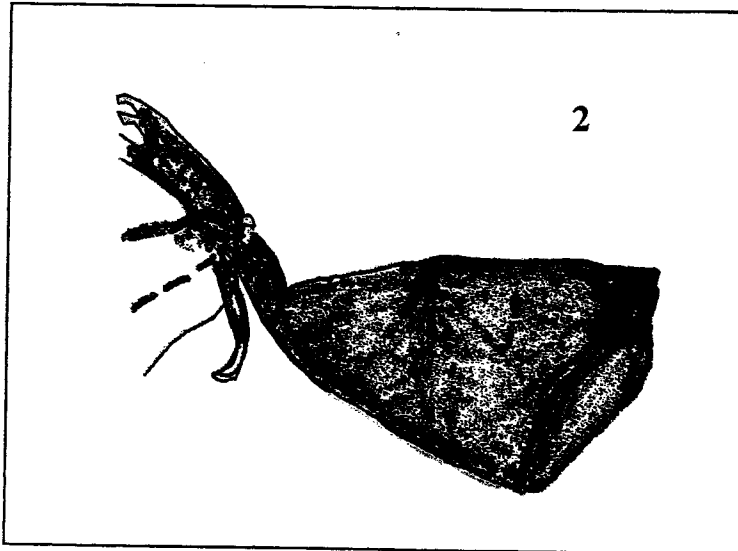
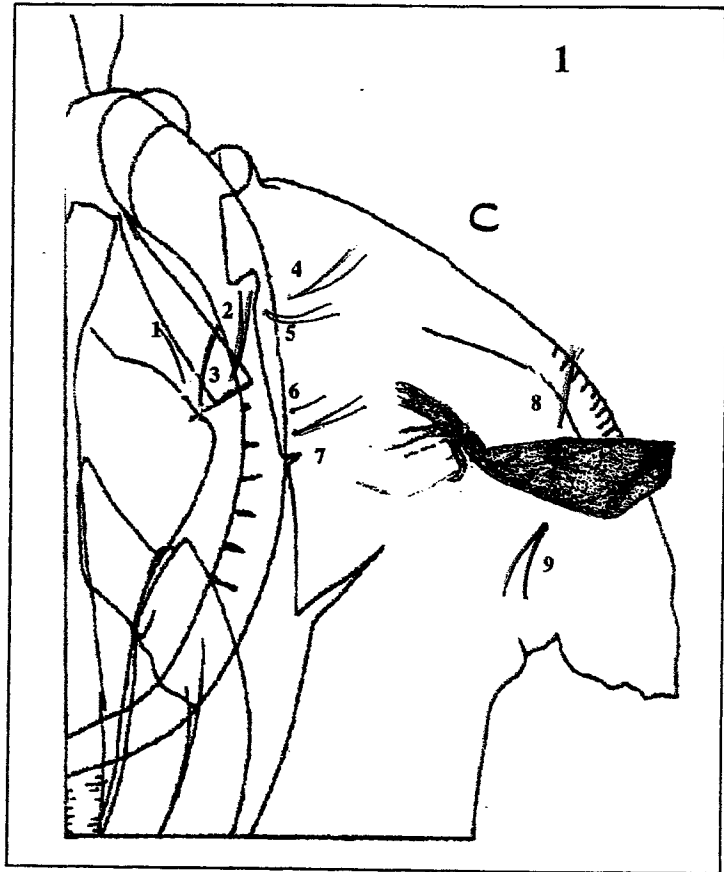
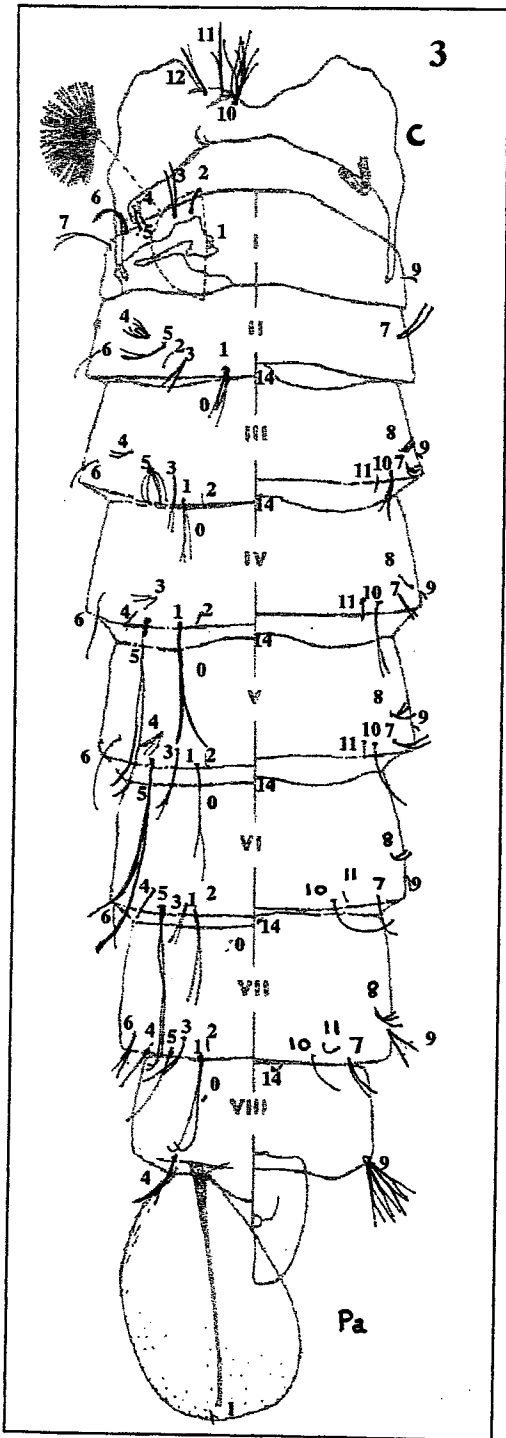
Biology

The specimens were collected as larvae and pupae and individually reared in the laboratory. Larvae, pupae and adults of *Oc. quasirusticus* were captured in a seasonally flooded meadow at San Mamés on the region's mountainous border north of the city of Madrid. *Ochlerotatus quasirusticus* over-winters in the larval stage. The larvae develop from December to May, even below ice. This species is univoltine. The first pupae were captured in middle April, the specimens were 14 males and 3 females (Table 2). The larvae and pupae were captured in association with larva of *Oc. rusticus* and *Culiseta fumipennis*.

	16/02/2003	02/03/2003	16/03/2003	1/04/2003	14/04/2003	1/05/2003
Larvae (L4)	21	22	16	20	25	0
Pupae ♂					14	0
Pupae ♀					3	7

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Figures 1-3: Pupa of *Ochlerotatus quasirusticus*;
 1. Cephalothorax. 2. Trumpet. 3. Metanotum, abdomen and paddle. C = cephalothorax; Pa = paddle; I-VIII = abdominal segments.