

**BIOLOGICAL NOTES ON *NEOERYTHROMMA GLADIOLATUM*
WILLIAMSON & WILLIAMSON, 1930
WITH DESCRIPTION OF ITS FEMALE
(ZYGOPTERA: COENAGRIONIDAE)**

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The ♀ is described and compared with that of *N. cultellatum* (Hagen in Selys, 1876). A key to separate the ♀♀ of both sp. and notes on the taxonomy, biology and distribution of *N. gladiolatum* are provided.

INTRODUCTION

The genus *Neoerythromma* was erected by Kennedy, 1920 with *N. cultellatum* (Hagen in Selys, 1876) as the type-species. In 1930, a second species, *N. gladiolatum* Williamson & Williamson 1930 was described (WILLIAMSON & WILLIAMSON, 1930). *N. gladiolatum* is an endemic species of western Mexico; it is distributed along the Pacific slope from Sinaloa south to Guerrero states (GONZÁLEZ & NOVELO, 1996); and it probably also occurs in coastal lentic habitats of other southwestern states.

In this paper we describe the hitherto unknown female of *N. gladiolatum*. We also present notes on reproductive biology and distribution of the species.

***NEOERYTHROMMA GLADIOLATUM* Williamson & Williamson, 1930**

Figures 1-7

Material (5 ♀) – MEXICO: Jalisco, Arroyo Chamela, 21-X-1995, 1-VI-1996, 1-XI-2001 and 21-X-2002, E. González-Soriano leg. (1 in tandem with ♂); – Nayarit, El Limón, 13-III-1981, E. González-Soriano & R. López leg. (in tandem with ♂).

Head. – Dorsum black with pale blue transversely elongated postocular spots,

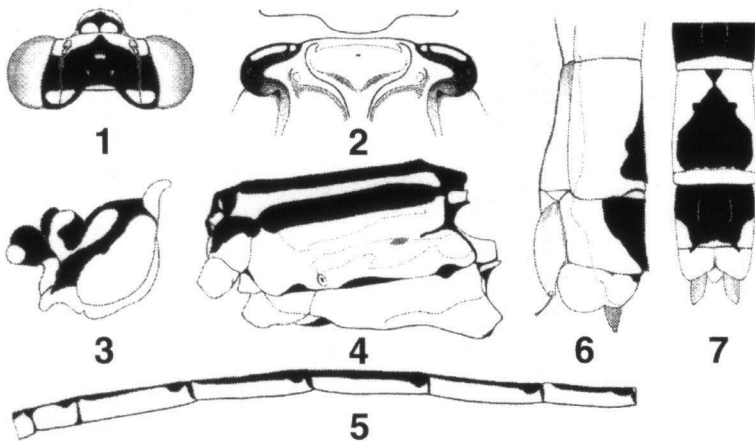
occipital bar of same color (Fig. 1). Frons, genae, anteclypeus and labrum blue, postclypeus dark brown, with a pair of small lateromedial blue spots and corners of the same color; antennae: scape blue, rest pale brown.

T h o r a x . — Prothorax black, anterior lobe blue, median lobe with a pair of tear-like dorsolateral blue spots, lateral corners of same color (Fig. 3); posterior lobe erect, pale blue laterally. Pterothorax blue, ivory-white ventrally; black middorsal stripe wide, slightly more than two times as wide as pale antehumeral stripe, humeral stripe black, complete, almost 0.5 as wide as middorsal stripe, remainder of thorax blue with small black spots near the origin of interpleural suture; black markings on metapleural fossa, metapleural suture near spiracle and a narrow line at the end of interpleural suture (Fig. 4). Mesostigmal plates slightly curved anteriorly (Fig. 2). Legs ivory-white, external surfaces of tibiae black.

A b d o m e n . — Pale with black as follows (Figs 5-7), dorsum of 1 (excepting by a small posteromedial pale spot); a continuous dorsal stripe on segments 2-7, subapically expanded on 2-7 and with basal annuli on 4-6; a wide inverted subtriangular spot on most of dorsum of segment 8; dorsal stripe on 9 narrowing apically; segment 10 blue excepting for a pair of tiny subbasal dark spots. Cerci medium brown, vulvar spine lacking; ovipositor short, tips of valves not reaching apical margin of segment 10 (Figs 6-7)

M e a s u r e m e n t s (in mm). — total length: 29.4-31.2; — abdomen: 23-24.8; — hindwing: 15.8-17.1; — cerci 1.12

DISTRIBUTION. — Mexico: Sinaloa, Nayarit, Jalisco, Colima and Guerrero states.



Figs 1-7. Female of *Neoerythromma gladiolatum* Wllmsn & Wllmsn 1930: (1) head; — (2) mesostigmal plates and hind margin of pronotum; — (3) prothorax; — (4) pterothorax; — (5) abdominal segments 1-7; — (6) abdominal segments 8-10 and ovipositor, lateral view; — (7) abdominal segments 8-10 and cerci, dorsal view.

KEY TO FEMALES OF *NEOERYTHROMMA*

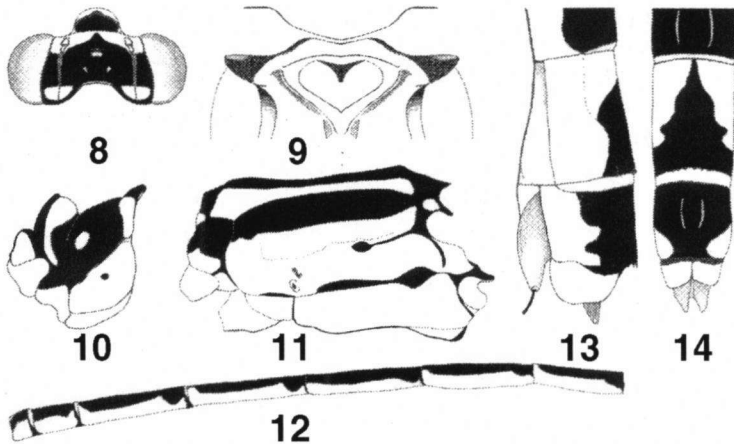
- 1 Mesostigmal plate narrow, subtriangular, anterior margins straight; median lobe with small dorsolateral blue spots not confluent anteriorly with blue coloration of anterior lobe; postclypeus entirely or partially black but with not definite blue spots; western Mexico (Figs 8-14) *cultellatum*
 – Mesostigmal plate wider, laterally rounded and with anterior margin slightly convex, median lobe with dorsolateral blue spots confluent anteriorly with blue coloration of anterior lobe; postclypeus black with two distinct oval blue spots; eastern Mexico *gladiolatum*

BIOLOGY

Adult *Neoerythromma* are usually associated with lentic habitats (ponds and lakes) with floating or barely submerged vegetation; they also occur in backwaters along rivers. They are very common in coastal habitats both of the Gulf and Pacific slopes in Mexico; *N. gladiolatum* is an endemic species of eastern Mexico while the closely related *N. cultellatum* is more extensively distributed along the Gulf and Caribbean coasts in eastern Mexico from Tamaulipas to Quintana Roo (GONZÁLEZ & NOVELO, 1996). The latter species also occurs in southern Florida (USA), Antilles (Cuba, Dom. Rep., Haití, Jamaica and P. R.), south to Venezuela (WESTFALL & MAY, 1996).

Males *gladiolatum* do not defend territories, they have only brief encounters with conspecific males when they fly from one perch site to another. Males commonly use floating vegetation as perching sites and they preferably flying more over open water than along the shore of the pond.

A complete copulation was observed once; sperm translocation lasted 8.8 sec and



Figs 8-14. Female of *Neoerythromma cultellatum* (Hagen in Selys, 1876) (Veracruz: Cuichapa 6-VI-1980, P. Villeda leg.): (8) head; – (9) mesostigmal plates and hind margin of pronotum; – (10) prothorax; – (11) thorax; – (12) abdominal segments 1-7; – (13) abdominal segments 8-10 and ovipositor, lateral view; – (14) abdominal segments 8-10 and cerci, dorsal view.

copulation 4.49 min. We also observed 3 incomplete copulations which lasted 1.24 min, 1.38 min and 4.35 min, respectively. One pair also formed the wheel position and translocated sperm (6.41 sec.) but they were disturbed and flew away without actual copulation. Oviposition occurred in tandem; males remained leaned forward and rested on the horizontal substrate while females oviposited in a variety of plants. During 2002 most ovipositions occurred above water surface, with females only partially submerged. During the 1997 season one of us (GLH) observed submerged oviposition on two occasions. In one of these both male and female submerged for about 15 sec, then the male resurfaced while the female continued ovipositing alone underwater.

Between 20-VI-1997 and 20-VII-1997 GLH observed 16 females on 55 occasions ovipositing in or on a variety of plants. They oviposited 32 times on an unidentified plant (a grass plant like "bermuda"). 13 ovipositions occurred in *Najas guadalupensis* (Spreng.) Magnus var. *guadalupensis* (Najadaceae); four ovipositions occurred on *Ludwigia* sp. (Onagraceae) and one oviposition on roots of water lettuce *Pistia stratiotes* L. (Araceae). The site is inhabited by many other dragonfly species. However, *Enallagma semicirculare* Sel., *Telebasis salva* Hag. and a few *Ischnura ramburii* Ramb. co-occurred at the same microhabitat with *N. gladiolatum*.

DISCUSSION

The genus *Neoerythromma* was only briefly described by KENNEDY (1920): "Penis character as in *Neoerythromma*, but male appendages resembling those in *Enallagma signatum*". In fact *N. cultellatum* was originally placed within the genus *Enallagma* (SELYS, 1876) and several authors followed this status for some time (e. g. CALVERT, 1907). More recently, WESTFALL & MAY (1996) broadened the definition of the genus and recognized its relationship with *Enallagma*. Although the origin and relationships of *Neoerythromma* remains enigmatic, its behavior seems to relate this genus with *Enallagma*. For example in *Enallagma* adults combine "typical" flights with "stationary" flights above water; this behavior is also present in both *N. cultellatum* and *N. gladiolatum*. Submerged oviposition of some species of *Enallagma* has been also observed in both species of *Neoerythromma* (this paper and unpublished observations of EGS). However the fragmented geographic distribution of *N. cultellatum* and *N. gladiolatum* in America deserves close attention.

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