ODONATA FROM THE NORTHERN MOUNTAIN RANGE OF HIDALGO STATE, MEXICO

R. NOVELO-GUTIERREZ [1] and J. PEÑA-OLMEDO [2]

[1] Instituto de Ecología, A.C., km 2.5 antigua carretera a Coatepec, Apartado Postal 63, MX-91000 Xalapa, Veracruz, Mexico

[2] Insectario, DPAA-DCBS, Universidad Autónoma Metropolitana-Xochimilco, Apartado Postal 23-181, MX 04960 México, D.F., Mexico

Abstract 70 spp. are recorded, of which 69 are cited for the first time for Hidalgo State. The study was conducted in an altitudinal gradient of 740-2050 m a sl, comprising 17 localities. *Archilestes regalis*, *Argia calida*, *A. rhoadsi*, *A. medullaris*, *Argia* new spp. and *Oplonaeschna armata* are discussed in greater detail.

Introduction

Studies on the regional distribution of Odonata based upon systematic collections in Mexico are scarce, the study of NOVELO et al. (1988) being the only one. Nevertheless, the excellent contributions of CALVERT (1895, 1899, 1901-1908), WILLIAMSON (1936) and PAULSON (1982, 1984) do give an acceptable general knowledge for the odonates of Mexico. Up to this time, the state of Hidalgo remained practically without published records of Odonata, except for that of *Hetaerina vulnerata* collected at "Dublán" and cited by CALVERT (1901) in B.C.A. Our purpose here is to list the species we have collected from this interesting portion of Hidalgo.

The study area was the Northern Mountain Range of Hidalgo (NMRH) (Zacualtipán-Tlanchinol) localized between 20°30' — 21°58'N and 98°30' — 99°45'W. The windward slope faces the gulf of Mexico, the leeward one toward the Mexican Plateau. This mountain range is covered mainly by pine-oak forest at high altitudes, mountain cloud forest at median altitudes and by tropical forests at lower altitudes. Collections were made every month over 27 months (November 1983 to November 1985 and February and July 1986) at 17 localities, comprising an altitudinal gradient of 740-2050 m.

Localities

Localities are listed by municipalities from South to North; numbers in Table I correspond with numbered localities listed below. Altitudes (m) follow each locality.

Municipality of Metzquititlán: (1) Metzquititlán (1590); (2) Tuzanapa (2050); — Municipality of Zacualtipán: (3) Cacala (2000); (4) Soyatla (1800); (5) Tepeoco (1750); (6) Hueyatlapa (1830); — Municipality of Molango: (7) Molango (1700); (8) Atezca (1450); (9) Río Zacuala Pemuxtitla (1000); (10) Tetzintla (900-1150); — Municipality of Calnali: (11) Calnali (1350); (12) San Cristóbal Ajacayac (1990); — Municipality of Lolotla: (13) Naopa (1000); (14) Río Tlaltepingo, Otongo (740); (15) Otongo (1090-1190); — Municipality of Tlanchinol: Tlanchinol (1500); — Municipality of Tehuetlán: (17) Ecuatitla (1000).

Results and Discussion

A total of 1894 individuals were captured (1504 ♂, 198 ♀, and 96 tandems), belonging to 70 species included in 34 genera and 11 families (Tab. I).

Table I — List of species recorded — [C = from collections; — L = from literature]

Species	Records
CALOPTERYGIDAE	
Hetaerina americana (Fabr.)	17C
H. capitalis Sel.	8, 9, 11, 16
H. cruentata (Ramb.)	3, 5, 8, 9, 11, 14, 16
H. infecta Calv.	9, 11, 12, 16
H. occisa Hag.	17C
H. vulnerata Hag.	2, 3, 5, 6, L
LESTIDAE	
Archilestes grandis (Ramb.)	3, 8, 11, 15, 16,
A. regalis Gloyd	9
Lestes alacer Hag.	3
MEGAPODAGRIONIDAE	
Heteragrion tricellulare Calv.	8, 11
Paraphlebia zoe Sel.	10
PSEUDOSTIGMATIDAE	
Mecistogaster modesta Sel.	16C
PLATYSTICTIDAE	
Palaemnema paulitoyaca Calv.	11
PROTONEURIDAE	
Protoneura cupida Calv.	11
COENAGRIONIDAE	
Acanthagrion quadratum Sel.	7, 16
Apanisagrion lais (Sel.)	2, 4, 8, 10, 16
Argia calida (Hag.)	11
A. cuprea (Hag.)	9, 11, 13, 16
A. eliptica Sel.	9, 10, 15
A. extranea (Hag.)	1, 2, 8, 9, 10, 11, 15, 16
A. fissa Sel.	8, 9, 11, 13, 15, 16
A. funcki (Sel.)	9, 11
A. immunda (Hag.)	13
A. lacrimans (Hag.)	3, 5, 16
A. medullaris Hag.	10
A. nahuana Calv.	2
A. oenea Hag.	9, 13, 15, 16
A. plana Calv.	16
A. rhoadsi Calv.	8, 11
A. translata Hag.	8, 13, 15
A. ulmeca Calv.	8, 9, 11, 15
Argia sp. n. 1	16
Argia sp. n. 2	11
Enallagma civile (Hag.)	8
E. novaehispaniae Calv.	8
E. praevarum (Hag.)	2, 8, 11, 16
E. semicirculare Sel.	16
Hesperagrion heterodoxum (Sel.)	2, 3
Ischnura demorsa (Hag.)	8
I. denticollis (Burm.)	2
I. posita atezca Novelo & Peña	8
Telebasis salva (Hag.)	8, 13, 16
AESHNIDAE	
Aeshna jalapensis Wllmsn	2, 3, 8, 16
A. multicolor Hag.	13, 16
A. psilus Calv.	16
Anax amazili (Burm.)	8
A. junius (Dru.)	8
Oplonaeschna armata (Hag.)	3, 5
GOMPHIDAE	
Erpetogomphus elaps Sel.	3, 9
CORDULEGASTRIDAE	
Cordulegaster godmani McL.	3, 5
LIBELLULIDAE	
Brachymesia furcata (Hag.)	7
Brechmorhoga nubecula (Ramb.)	9
B. vivax Calv.	7, 9, 11, 14
Cannaphila vibex (Hag.)	8, 9, 11, 16
Dythemis multipunctata Kirby	14
D. nigrescens Calv.	8, 12
D. sterilis Hag.	8
Erythrodiplax fusca (Ramb.)	11, 13, 14, 16
E. umbrata (L.)	11
Libellula croceipennis Sel.	8, 13
L. saturata Uhler	3, 16
Macrothemis pseudimitans Calv.	9, 14
Miathyria marcella (Sel.)	8
Micrathyria didyma Sel.	11, 13, 16
Orthemis ferruginea (Fabr.)	11, 13
Pantala flavescens (Fabr.)	16
Perithemis domitia (Dru.)	16
P. mooma Kirby	8
Sympetrum illotum (Hag.)	2, 3, 11, 16
Tramea onusta Hag.	2, 7

A total of 69 species are cited for the first time with specified localities for the state of Hidalgo, and new localities are added for *Hetaerina vulnerata*, the only species cited previously for this state (Calvert, 1901). Records of *Hetaerina infecta*, *Argia medullaris*, *Cordulegaster godmani*, *Brechmorhoga nubecula* and *B. vivax* are the northernmost published for Mexico.

The Northern Mountain Range of Hidalgo supports an interesting odonate fauna that exhibits a mixture of elements with tropical and temperate affinities and a few endemics. *Hetaerina*, *Archilestes*, *Heteragrion*, *Paraphlebia*, *Mecistogaster*, *Palaemnema*, *Protoneura*, *Acanthagrion*, *Argia*, *Telebasis*, *Brachymesia*, *Brechmorhoga*, *Cannaphila*, *Dythemis*, *Erythrodiplax*, *Macrothemis*, *Miathyria*, *Micrathyria*, *Orthemis*, *Pantala*, *Perithemis* and *Tramea* are genera with clearly tropical affinities, although several of them have species extending well into the United States and even Canada. Genera of temperate origin whose species have presumably colonized Mexico

from the North include *Cordulegaster*, *Libellula* and *Sympetrum*. Finally, *Lestes*, *Enallagma*, *Ischnura*, *Aeshna* and *Anax* are wide-ranging genera that are difficult to allocate to tropical or temperate zones, although by their great diversities in boreal zones (except *Aeshna*, which shows a great diversity in both tropical and temperate zones), we can suppose a temperate origin, with some species originated at and adapted to tropical conditions (v. gr.: *Enallagma novaehispaniae*), following, in this manner, the Palaeoamerican dispersal pattern proposed by HALFFTER (1976) for the Mexican Transition Zone.

Likewise, from our data and reports in the literature, mainly from CALVERT (1901-1908) and PAULSON (1982), we believe the genera *Hesperagrion*, *Oplonaeschna*, and *Erpetogomphus* and the species *Hetaerina vulnerata*, *Lestes alacer*, and *Argia funcki* have their centers of origin on the Mexican Plateau, following in this way the dispersal pattern on the Plateau proposed by HALFFTER (1976).

On the other hand, based upon the available data *Archilestes regalis*, *Argia calida*, and *A. rhoadsi* seem to be endemic to northeastern Mexico, the first two are rare and the third more abundant.

Argia medullaris is very similar to *A. variabilis*, the former recorded only from Guatemala, Costa Rica and Colombia (R.W. Garrison, pers. comm.), although PAULSON (1982) listed it from "Mexico". Thus our records are the first from a specific locality in this country.

According to Dr R.W. Garrison (pers. comm.) *Argia* sp. n. 1 and 2 belong to the *extranea-vivida* group, both with inferior abdominal appendages bilobed with the branches subequal.

We found in *Oplonaeschna armata* that size distribution is strongly bimodal, a peculiar and as yet inexplicable variation. At the same stream (Cacala, 2000 m) and time of year (November-December, 1984 and 1985) the population was composed, in part, of large individuals (total length 74-77 mm; HW 53-56 mm), and of smaller individuals (62.5-64 mm and 45-47 mm respectively). We found no individuals with intermediate measurements although all specimens appear to be morphologically identical.

Acknowledgements — We are grateful to Dr R.W. GARRISON (Azusa, USA) for identifying some Argias and Drs R.W. Garrison and D.R. PAULSON (Tacoma, USA) for helpful criticism and corrections to the English version during preparation of the final manuscript. We thank Biol. V. GARCIA and Mr G. HERNANDEZ for their invaluable help during collectings.

References — CALVERT, P.P., 1895, *Proc. Calif. Acad. Sci.* 2(4): 463-588; — 1899, *ibid.* 3(1): 371-418; — 1901-1908, *Biologia cent.-am.* 50: 17-420, pls 2-10 excl.; — HALFFTER, G., 1976, *Folia ent. mex.* 35: 1-64; — NOVELO-G., R., O. CANUL-G & J.F. CAMAL-M., 1988, *ibid.* 74: 13-68; — PAULSON, D.R., 1982, *in:* S.H. Hurlbert & A. Villalobos-Figueroa, [Eds], Aquatic biota of Mexico, Central America and the West Indies, pp. 249-277, San Diego St. Univ., San Diego; — 1984, *Notul. odonatol.* 2(3): 33-37; — WILLIAMSON, E.B., 1936, *Publs Carnegie Instn Wash.* 457: 139-143.

Received June 18, 1990