


## New records for the Chimalapas-Uxpanapa Region, Mexico (Odonata: Calopterygidae, Heteragrionidae, Polythoridae, Thaumato-neuridae, Coenagrionidae, Gomphidae, Libellulidae)

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**Abstract.** During a collecting trip to five tropical rainforest sites in the Chimalapas-Uxpanapa region in an altitudinal gradient of 155–499 m a.s.l., a total of sixteen species of odonates new to the region were recorded. Poorly studied species such as *Erpetogomphus ophibolus* Calvert, 1905, *Hetaerina infecta* Calvert, 1901, *Heteragrion alienum* Williamson, 1919, and *Heteragrion tricellulare* Calvert, 1901, were recorded. *Ischnura demorsa* Hagen, 1861, and *Paraphlebia* sp. are discussed in greater detail. These records add to the knowledge of odonate distribution from Oaxaca and Veracruz.

Further key words. Dragonfly, damselfly, Anisoptera, Zygoptera, conservation, Neotropical realm

### Introduction

According to the most recent published revision of the biodiversity of Mexican odonate species, and the sample-based and coverage-based rarefaction curves calculated by CUEVAS-YAÑEZ et al. (2017), there are 356 species of Odonata (205 Anisoptera and 151 Zygoptera) in Mexico, of which 137 species occur in the state of Oaxaca and 222 in Veracruz (GONZÁLEZ-SORIANO & NOVELO GUTIÉRREZ 2014). Between Veracruz and Oaxaca is the Chimalapas-Uxpanapa (CU) region, a priority area for conservation in Mexico. Although it represents only 0.57% of the country's total area, is considered to be a highly important global centre of biodiversity (ARRIAGA et al. 2000; CONABIO 2010). This high diversity results from its altitudinal range of 100 to 2700 m a.s.l., its intermingling ecosystems dominated by tropical rainforest (56%), and climatic influences from both the Pacific and the Gulf of Mexico (ARRIAGA et al. 2000; PETERSON et al. 2003). Although new species of Coleoptera and Lepidoptera have recently been described from the CU region (e.g., ARIZA-MARÍN et al. 2019; CALLAGHAN et al. 2013), of the 250 species of Odonata present in Oaxaca and Veracruz, to date none has been recorded from the CU region, and for most species recorded from both states, overall distribution

and population trends are unknown (IUCN 2019). The challenging topography of the area hinders fieldwork and may explain this lack of data (ARRIAGA et al. 2000; LIRA-TORRES & BRIONES-SALAS 2012). This note presents preliminary data from a project aiming to describe the distribution of dragonflies and damselflies of the Mexican Neotropical zone.

### Material and methods

Data were collected from 09-x-12-x-2018 in the municipalities of Uxpanapa, Veracruz and Santa María Chimalapa, Oaxaca, along a transect extending approximately 13 kilometres. Five sites between 155 and 499 m a.s.l. with tropical rainforest vegetation were examined. The climate of the region is warm, with an annual precipitation *ca* 1 000 mm (ARRIAGA et al. 2000). Sampling was between 12 pm and 4 pm (CST; UTC -6 h), always when the air temperature was greater than 18°C. Adult odonates were collected with an aerial net and preserved in 70% ethanol. Specimens were identified under a stereoscopic microscope (Nikon DS-Fi3), with reference to the keys by WILLIAMSON (1919), LEONARD (1977), GARRISON (1984, 1990, 1994), PEÑA-OLMEDO (1989), BICK & BICK (1990), WESTFALL (1992), GARRISON et al. (2006, 2010), HECKMAN (2008), PAULSON (2009), and MEURGEY (2016). Collections were made by AICM; specimens are deposited in the Colección Entomológica de la Universidad de las Américas Puebla (UDLAP).

### List of collecting sites

(1) Municipality of Uxpanapa, Veracruz (17°10'23.567" N, 94°28'18.289" W, 155 m a.s.l.), 09-x-2018. Slow running river next to a wooden house with scattered patches of shrubs and large-leaved plants, relatively well conserved. (2) Municipality of Santa María Chimalapas, Oaxaca (17°7'58.436" N, 94°27'34.455" W, 499 m a.s.l.), 11-x-2018. Fast running river with some cascades and patches of slow water stream with very large-leaved plants, relatively well conserved. (3) Municipality of Uxpanapa, Veracruz (17°10'37.736" N, 94°28'42.761" W, 159 m a.s.l.), 12-x-2018. Next to a shed along a rocky shore with slow running water and covered by tree shadows. (4) Municipality of Uxpanapa, Veracruz (17°11'49.132" N, 94°28'43.316" W, 358 m a.s.l.), 12-x-2018. Tiny slow running streams along a disturbed pathway opened with a backhoe several years ago. (5) Municipality of Uxpanapa, Veracruz (17°12'12.373" N, 94°28'55.246" W, 194 m a.s.l.), 12-x-2018. Slow wide turbid river in a disturbed site with cattle.

### Results

Sixteen species new for the CU region are listed below. Taxa new to Oaxaca and Veracruz are not reported here. The topographic position of the localities is provided in Figure 1. Numbers in bold in parentheses correspond with the list of collecting sites.

### Family Calopterygidae

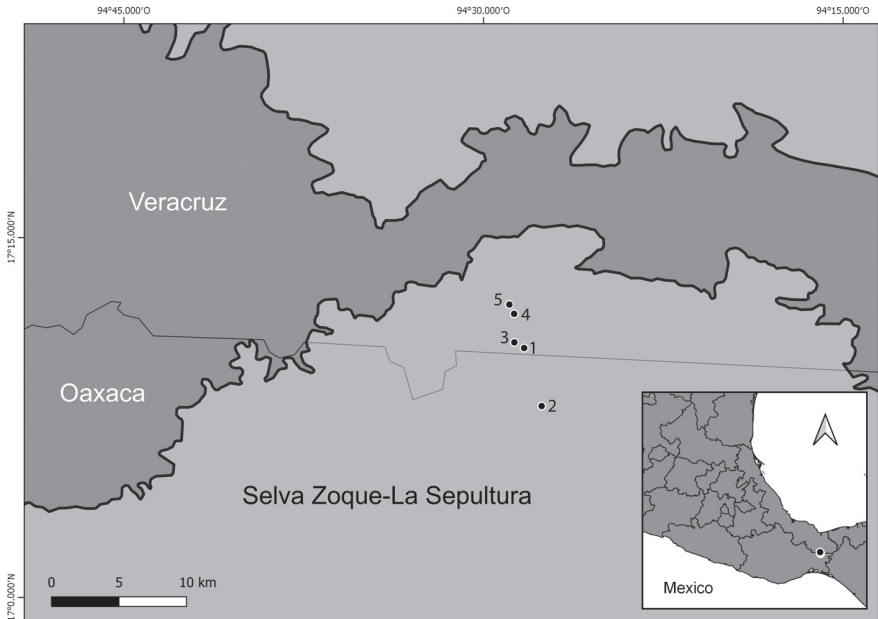
1. *Hetaerina infecta* Calvert, 1901  
(2,3) 8♂ 11-12-x-2018.
2. *Hetaerina occisa* Hagen, 1853  
(1,3,4,5) 9♂1♀ 9-12-x-2018.
3. *Hetaerina sempronia* Hagen, 1853  
(5) 1♂ 12-x-2018.

### Family Heteragrionidae

4. *Heteragrion alienum* Williamson, 1919  
(3,5) 10♂1♀ 12-x-2018.
5. *Heteragrion tricellulare* Calvert, 1901  
(2) 1♂ 11-x-2018.

### Family Polythoridae

6. *Cora marina* Selys, 1868  
(4) 2♂ 12-x-2018.



**Fig. 1.** Topographic position of the collecting sites of the sixteen species newly recorded for the Chimalapas-Uxpanapa (CU) region. Light grey: Selva Zoque-La Sepultura on the CU region. Detailed information of each site is stated in the main text.

### Family *Thaumatoneuridae*

#### 7. *Paraphlebia* sp.

(2) 1♀ 11-x-2018.

### Family *Coenagrionidae*

#### 8. *Acanthagrion quadratum* Selys, 1876

(1) 2♂ 09-x-2018.

#### 9. *Argia pulla* Hagen, 1865

(1) 3♂ 09-x-2018.

#### 10. *Argia cuprea* Hagen, 1861

(3,4) 4♂ 12-x-2018.

#### 11. *Enallagma novaehispaniae* Calvert, 1907

(3) 1♂ 12-x-2018.

#### 12. *Ischnura demorsa* Hagen, 1861

(1) 1♀ 09-x-2018.

### Family *Gomphidae*

#### 13. *Erpetogomphus ophibolus* Calvert, 1905

(4) 1♂ 12-x-2018.

### Family *Libellulidae*

#### 14. *Brechmorhoga vivax* Calvert, 1906

(3) 1♂ 12-x-2018.

#### 15. *Micrathyria dictynna* Ris, 1919

(3) 1♂ 12-x-2018.

#### 16. *Micrathyria ocellata* Martin, 1897

(3) 1♂ 12-x-2018.

### Discussion

Most of the recorded odonates in this study have a widespread distribution. However, we highlight the presence of *Erpetogomphus ophibolus*, *Hetaerina infecta*, *Heteragrion alienum*, *H. tricellulare* and *Paraphlebia* sp. in the Chimalapas-Uxpanapa region, because, although they are within their restricted expected range, these records increase the scarce distributional information of these species. At sites 1, 2, 3 and 5, 38.5 % of families, 13.4 % of genera and 6.3 % of species of Odonata known from Veracruz are represented, and at site 4, 30.8 % of families, 7.1 % of genera but only the 2.8 % of the species from Oaxaca are represented.

It is important to mention that the specimen of *Ischnura demorsa* had similar coloration to the male, so we consider it an androchromatypic female (PAULSON 2009). The female of *Paraphlebia* sp. could not be identified at the species level because there are no identification keys for females of this genus (R. Novelo Gu-

tiérrez pers. comm.). Although the collection site for this specimen is within the estimated distribution range for *P. quinta* (CUEVAS-YAÑEZ et al. 2015), we decided not to record it as belonging to this species. A recent master's thesis was published in the National Autonomous University of Mexico (UNAM) digital library, which based on molecular data, describes ten new species of *Paraphlebia* in the Neotropical region (ORTEGA-SALAS 2017). This thesis contains only an identification key for the males of this genus, so it was impossible for us to determine the species of the female collected. In addition, the female possessed a pattern of thoracic coloration similar to *Paraphlebia* sp. nov. 5 as described by the same author in his taxonomic review. Therefore, with the colour pattern, coupled with the recent discovery of new *Paraphlebia* species, we suggest that the specimen collected should be considered as undetermined for now. More odonatological surveys are needed at the site in order to determine the taxonomic status of this likely new species.

Most of the odonatological records in the state of Oaxaca and Veracruz have been from places near the coast such as Santa María Huatulco, Catemaco, La Tinaja and the Reserva de la Biosfera Los Tuxtlas (GARRISON & GONZÁLEZ-SORIANO 1988; ANDERSON & GREYER 2009; NOVELO GUTIÉRREZ 2009; SALAS-ARCOS 2010). For this reason the odonatological records reported in this note are relevant not only because they reveal the presence of these species but also because they suggest that the CU region could be a potential dispersal corridor for odonates within Neotropical Mexico (GUEVARA 1995).

Although the Neotropics is one of the most diverse regions in the country, there are still areas such as the CU region that, due to its complex topography, have not been well explored (VON ELLENRIEDER 2009). The CU region consists largely of threatened cloud forest that, due to anthropogenic pressures, is in danger of disappearing (WILLIAMS-LINERA et al. 2002), thus reducing the distribution of poorly studied genera such as *Paraphlebia* (CUEVAS-YAÑEZ et al. 2015). The fact that we found an unidentified female of that genus provides strong justification for protecting this area, not only for its potential biodiversity but for its unknown ethodiversity (CORDERO-RIVERA 2017). Hence, it is considered that the CU region is an area in urgent need of further odonatological surveys.

**Acknowledgements.** We are indebted to Dr Carlos H. Vergara for giving us access to the facilities of the Universidad de las Américas Puebla and for allowing us to store the collected specimens in the Colección Entomológica UDLAP. We are grateful to Dr Víctor H. Reynoso-Rosales for organizing the field work and for giving us logistical support. We would like to thank Dr Omar Hernández-Ordoñez for helping during the field work. We thank the two reviewers who provided us key comments to a previous version. We also thank Dr Rodolfo Novelo-Gutiérrez for his comments on the genus *Paraphlebia*. We also would like to thank Dr Alejandro Arias del Razo for helping in the production of the topographic map, and finally, we appreciate Dr Martín A. Serrano-Meneses for supporting this project. This study constitutes a partial fulfilment of the Honors' Undergraduate Program in Biology (Programa de Honores en Biología) of the Universidad de las Américas Puebla (UDLAP) for O. García-Miranda.

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Received 5<sup>th</sup> December 2019