DRAGONFLIES (ODONATA: ANISOPTERA) OF THE COLLECTION OF THE INSTITUTO DE CIENCIAS NATURALES, UNIVERSIDAD NACIONAL DE COLOMBIA

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RESUMEN

Se provee un listado de los géneros y especies de Anisoptera (Insecta: Odonata) depositados en la colección entomológica del Instituto de Ciencias Naturales de la Universidad Nacional de Colombia, sede Bogotá. Esta colección posee 2900 especímenes de Odonata recolectados desde 1940 en 27 departamentos del país. El 53% de los especímenes pertenece al suborden Anisoptera, representado por tres familias, Aeshnidae, Gomphidae y Libellulidae, 38 géneros y 91 especies; que constituyen el 80% de géneros y especies reportadas para el suborden en Colombia. Los géneros mejor representados en la colección son *Erythrodiplax* (37%), *Uracis* (15%) y *Erythemis* (8%). Se confirma la presencia en Colombia de *Uracis siemensi* Kirby, 1897, *U. infumata* (Rambur, 1842) y *Zenithoptera viola* Ris, 1910.

Palabras clave: Odonata, libélula, Anisoptera, Neotrópico.

SUMMARY

A list of genera and species of Anisoptera (Insecta: Odonata) deposited in the entomology collection of the Instituto de Ciencias Naturales, Universidad Nacional de Colombia in Bogotá is given. This collection holds 2900 specimens of Odonata which have been collected since 1940 across 27 departments of the country. More than a half of the specimens are Anisoptera (53%) and these are represented by three families Aeshnidae, Gomphidae, and Libellulidae, 38 genera and 91 species. These numbers constitute 80% of the genera and species of the suborder reported from Colombia. The more abundant genera are *Erythrodiplax* (37%), *Uracis* (15%), and *Erythemis* (8%). The presence of *Uracis siemensi* Kirby, 1897, *U. infumata* (Rambur, 1842), and *Zenithoptera viola* Ris, 1910, in Colombia, is confirmed.

Key words: Odonata, dragonfly, Anisoptera, Neotropics.

INTRODUCTION

Dragonflies are popular insects that attract the attention of the general public due to several characteristics such as size, wide array of color patterns, large eyes, flying capabilities, reproductive strategies, and predatory behavior. The order Odonata is composed by 34 families, 600 genera and more than 5680 species worldwide, being 1636 of these found in the neotropics (Kalkman et al. 2008). A total of 14 families with 251 species have been reported for Colombia (Paulson 2009, Rojas & Sánchez 2009), from which 109 belong to the Anisoptera.

MATERIALS AND METHODS

Specimens of Anisoptera deposited in the collection of the Instituto de Ciencias Naturales of the Universidad Nacional de Colombia were identified following the keys of Borror (1942), Costa & Santos (1997), Förster (1999), De Marmels (2001), von Ellenrieder (2003), Paulson (2003), and Garrison et al. (2006). The original descriptions of Rambur (1842), Kirby (1897), and Ris (1910) were used.

RESULTS

Fifty-three percent of the 2,900 specimens deposited in the collection belong to the Anisoptera (Insecta: Odonata). A total of 1645 individuals were identified (Table 1). These belong to three families, 38 genera, and 91 species which represent three out of the four families, 80% of genera and species registered by Paulson (2009) for the country.

There are samples collected from sea level, (i.e. *Erythrodiplax berenice* Drury, 1773), up to 3450 m.a.s.l., (i.e. *Rhionaeschna marchali* (Rambur, 1842)). The genera with more records are *Erythrodiplax* (37%), *Uracis* (15%), and *Erythemis* (8%), and best represented family is Libellulidae (81% of specimens). The largest series of specimens came from the departments of Meta, Boyacá, Cundinamarca, Amazonas, and Tolima. These data are clearly related to the facilities to conduct field trips rather than to the actual abundance or richness of the group in these areas. Data of altitude are presented from 694 specimens; 85% of the specimens are distributed below 1000 m.a.s.l. The maximum recorded altitude is 3450 m.a.s.l.

The presence of *Uracis infumata* (Rambur, 1842), *U. siemensi* Kirby, 1897 and *Zenithoptera viola* Ris, 1910 is confirmed. These records were expected to be found in Colombia given their known continental distribution. Exact collecting data are provided for these new records. Catalogue numbers (ICN) are indicated within square brackets. Additional information for the other exemplars can be consulted in the collection´s web page (http://www.biovirtual.unal.edu.co/colecciones/datos/animalia/consultasMammalia.jsp?clase=4#).

***Uracis infumata* Rambur, 1842**
Specimens examined: 1 male. Colombia, Amazonas, Soratama, i. 1952, l. Richter [041519]. 7 males. Colombia, Amazonas, Leticia, vía Tarapacá, 07-09.xi.2001, 12.xi.2001, E. Flórez & Sist. Animal UN [ICN 033310 - 033314, ICN 041521, ICN 041522]. 1 male. Colombia, Amazonas, Leticia, vía Tarapacá, 27.x.2002, Sist. Animal UN [ICN 41520]. 1 male. Colombia, Amazonas, Leticia, Río Tacana, 11.xi.1946 [ICN 024932]. 1 male. Colombia, Amazonas, Leticia, Río Tacana, 08.iv.1946 [ICN 024318]. 1 male. Colombia, Amazonas, Leticia, 182 m.a.s.l., 23.iv.1946 [ICN 024319]. 1 male. Colombia, Amazonas, Leticia, 17.iv.1946 [ICN 024320]. 1 male. Colombia, Amazonas, Leticia, vía Tarapacá, 01.x.1996 [ICN 024321]. 1 male. Colombia, Amazonas, Leticia, 180 m.a.s.l., 23.iv.1946, L. Richter [ICN 41518]. 1 male. Colombia, Amazonas, Río Loreto Yacú, 180m., 21.ix.1946, L. Richter [ICN 41514]. 5 males. Colombia, Amazonas, Río Tacana, 01.xi.1946, 06.xi.1946, 11.xi.1946, L. Richter [ICN 041512, ICN 041515 - 041517, ICN 033315]. 1 male. Colombia, Amazonas, Tabatinga, 15.iii.1946 [ICN 024317]. 1 female. Colombia, Amazonas, sin datos, 27.ix.1946, L. Richter [ICN 041513]. 1 male. Colombia, Caquetá, Chiribiquete, 01.v.1993, D.S. [ICN 024322]. This species was previously known from Perú, Bolivia, Venezuela, Guyana, Guyana Francesa, and Brasil (Costa & Santos 1997; Paulson 2009).
Comments: Differences from the original descriptions provided by Rambur (1842) are listed as follows: First appear the differences found in the studied specimens and then Rambur´s original description written within brackets: In the fore wing, there are six cells in the subtriangle in one wing but not both (from three to five cells), the supratriangle is crossed by one or two veins (supratriangle crossed only one vein), there are four to seven cubital cross veins (three to seven cubital veins), there are one or two rows of cells in the anal field (one row of cells in the anal field). The following characters are regularly used in the current literature but not by Rambur; these are: Three to five curved teeth located ventrally on male cerci were observed, triangle in HW is crossed by one or two veins forming two or three cells. Additionally, it is interesting to mention that there were differences in the number of the veins between right and left wings of the same individual.

***Uracis siemensi* Kirby, 1897**
Specimens examined: 1 male. Colombia, Amazonas, Araracuara, 21.viii.1977, R. Restrepo [ICN 040325]. 1 female. Colombia, Putumayo, Puerto Asis, Río Piñuña negro, 22.ix.1987, J. Gaviria, & I. Barrera [ICN 040326]. 1 female. Guainía, Inírida, Comunidad La Ceiba, bosque Laguna Lombriz, 3º38' 11,2" N, 72º 26' 48" W, 103 m.a.s.l., 25.iii.1998, G. Amat [ICN 040327]. Its known distribution included Ecuador, Perú, Venezuela, Surinam, Guyana Francesa and Brasil (Kirby 1897; Paulson 2009).
Comments: Differences from the original descriptions provided by Kirby (1897) are listed as follows: First appear the differences found in the studied specimens and then Kirby´s original description written within brackets: Female. Pterostigma 3-3.5 mm extending over four or five

Table 1. Species list, distribution and number of individuals deposited in the entomological collection of the Instituto de Ciencias Naturales-Universidad Nacional de Colombia. Abbreviations by department are as follows: Amazonas (Am); Atlántico (At); Bolívar (Bo); Boyacá (By); Caldas (Cl); Caquetá (Cq); Casanare (Cn); Cauca (Cc); Cesar (Cs); Córdoba (Co); Cundinamarca (Cu); Chocó (Ch); Guainía (Gu); Guaviare (Gv); Huila (Hu); Meta (Me); Nariño (Na); Norte de Santander (NS); Putumayo (Pt); Risaralda (Ri); San Andrés (SA); Santader (St); Sucre (Sc); Tolima (To); Valle del Cauca (Vl); Vichada (Vc) undefined department within the oriental plains of Colombia (Ll); (My) specimens donated from the Mayaguez region in Puerto Rico.

Family	Specie/Genus	Altitudinal Range m.a.s.l.	No. ind. ♀	No. ind. ♂	Distribution
AESHNIDAE	*Allopetalia pustulosa* Selys, 1873		1	-	By
	Anax amazili (Burmeister, 1839)	2600	5	4	Cl, Cu, To, Vl
	Coryphaeschna sp.	150	-	1	Bo
	Coryphaeshna adnexa (Hagen, 1861)	290	-	5	Bo, By, Me
	Coryphaeschna viriditas Calvert, 1952	150 - 325	3	1	Cu, Me, To
	Gynacantha sp.	210	5	5	Cq, Gu, Me
	Gynacantha membranalis Karsch, 1891	200	1	1	Am, Me
	Gynacantha mexicana Selys, 1868	50 -100	-	2	Ch, Vl
	Gynacantha nervosa Rambur, 1842	580	2	1	Bo, Cu, My
	Remartinia sp.	1750	1	-	St
	Rhionaeschna sp.	900 - 2900	2	6	Cu, Pt, St
	Rhionaeschna cornigera (Brauer, 1865)	729 - 2300	5	3	By, Cu, Hu; NS
	Rhionaeschna intricata (Martin, 1908)	1700 - 1750	2	-	By, St
	Rhionaeschna marchali (Rambur, 1842)	12 - 3100	14	27	By, Cc, Cs, Cu, Ch, Hu, Ma, Me, NS, St, To
	Triacanthagyna sp.	150 - 2800	4	3	By, Cu, Me
	Triacanthagyna septima Selys *in* Sagra, 1857		1	-	Ll, Vc
GOMPHIDAE	*Desmogomphus paucinervis* (Selys, 1873)	103	1	-	Gu
	Epigomphus sp.	100	-	1	Gu
	Phyllocycla sp.	400	-	2	Cu, Me
	Phyllogomphoides sp.	514	1	-	Me
LIBELLULIDAE	*Anatya guttata* (Erichson, 1848)	34 - 320	5	7	Bo, By, Cn, Co, Ch, Me, St, To
	Brachymesia sp.		3	3	Ch, Me, To
	Brachymesia herbida (Gundlach, 1889)	34 - 500	5	2	At, By, Cs, Co, Me
	Brechmorhoga sp.	500 - 1285	4	7	By, Cu, Me, Ri, To
	Cannaphila vibex (Hagen, 1861)	50 - 1600	3	29	By, Cu, Me, Ri, St, To, Vl
	Dasythemis sp.	280 - 400	1	1	Me
	Dasythemis esmeralda Ris, 1910	660 - 770	2	6	Cq, Me
	Diastatops sp.	350 - 1640	7	2	Am, Cq, Cu, Me, Vc, Ll
	Dythemis sp.	980	1	1	Cu, Me
	Dythemis multipunctata Kirby, 1894	380 - 550	5	4	Cn, Cu, Me,
	Dythemis sterilis Hagen, 1861	380 - 729	1	4	Bo, By, Cl, Cu, Na
	Elasmothemis cannacrioides (Calvert, 1906)	380	-	1	By
	Elga leptostyla Ris, 1911	280 - 500	-	1	Cu
	Erythemis sp.	16 - 280	2	1	Co, Gv, Me
	Erythemis credula (Hagen, 1861)	400 - 500	-	2	Am, Me
	Erythemis haematogastra (Burmeister, 1839)	30 - 40	1	3	Cs, Co, Ll, Gv, Me
	Erythemis mithroides (Brauer, 1900)	30 - 33	1	4	Bo, By, Co, Ch
	Erythemis peruviana (Rambur, 1842)	16 - 280	26	18	Am, Bo, By, Cs, Co, Ch, Me, To, Vl
	Erythemis plebeja (Burmeister, 1839)	400	2	6	Bo, Co, Ma, Me
	Erythemis vesiculosa (Fabricius, 1775)	16 - 500	19	38	Am, At, Bo, Cs, Cl, Cn, Co, Cu, Ch, Hu, Ma, Me, SA, Sc, To, Vl
	Erythrodiplax sp.	0 - 3450	163	192	Am, Bo, By, Cl, Cq, Cn, Co, Cu, Ch, Gu, Hu, Ma, Me, St, Sc, To, Vl
	Erythrodiplax abjecta (Rambur, 1842)	84 -2300	-	18	By, Hu, Me, St, Vl
	Erythrodiplax attenuata (Kirby, 1889)	180 - 230	-	3	Am, Me
	Erythrodiplax berenice (Drury, 1773)	0	5	-	Bo

Table 1. Cont.

Family	Specie/Genus	Altitudinal Range m.a.s.l.	No. ind. ♀	No. ind. ♂	Distribution
LIBELLULIDAE	*Erythrodiplax castanea* (Burmeister, 1839)	100 - 160	2	-	Bo
	Erythrodiplax fervida (Erichson, 1848)	18 - 152	1	16	By, Cq, Cs, Co, Sc
	Erythrodiplax funerea (Hagen, 1861)	2	-	1	Na
	Erythrodiplax fusca (Rambur, 1842)	35 - 1150	-	24	Am, By, Cu, Me, Ma, St, To
	Erythrodiplax kimminsi Borror, 1942	160 - 500	2	3	By, Co, Me, St
	Erythrodiplax umbrata (Linnaeus, 1758)	16 - 1340	62	85	Am, At, Bo, Cl, Cq, Cn, Cs, Co, Cu, Ch, Me, Na, St, Sc, To, Vl, Vc, My
	Erythrodiplax unimaculata (De Geer, 1773)	300 - 500	-	6	Cq, Me
	Libellula herculea Karsch, 1889	880 - 1150	-	5	By, Ri, Vl
	Macrothemis sp.	103 - 1600	16	6	By, Cn, Cu, Gu, Me, Vl
	Miathyria marcella (Selys *in* Sagra, 1857)	16 - 40	38	41	At, Bo, Cs, Co, Sc, Vl
	Miathyria simplex (Rambur, 1842)	0	1	-	Bo
	Micrathyria sp. 1	100 - 1200	4	14	Am, By, Cq, Cn, Ll, Gv, Me, Pt, To, Vl
	Micrathyria sp. 2	210	-	1	St
	Micrathyria sp. 3	0 - 210	-	2	Bo, St
	Micrathyria sp. 4	0	-	1	Bo
	Micrathyria sp. 5	210	-	1	St
	Micrathyria sp. 6	34 - 40	-	1	Cs
	Micrathyria tibialis Kirby, 1897	300	8	7	Bo, By, Cs, Co, Me
	Nephepeltia sp.	210	1	-	Me
	Nephepeltia flavifrons (Karsch, 1889)	18 - 220	9	11	Bo, By, Cq, Co, Me, St, Sc
	Oligoclada sp.	180	2	4	Am, Cq, Me, Gv, Vc
	Oligoclada umbricola Borror, 1931	100 - 500	-	1	St
	Orthemis sp.	80 - 900	37	48	Am, Bo, By, Cq, Cn, Co, Cu, Hu, Me, St, To, Vl, My
	Orthemis biolleyi Calvert, 1906	0	-	3	Bo, Me
	Orthemis cultriformis Calvert, 1899	80 - 550	-	6	Am, Me, St
	Orthemis discolor (Burmeister, 1839)	103 - 1150	1	17	Am, By, Cu, Gu, Me, Ri, St, To
	Pantala flavescens (Fabricius, 1798)	225 - 510	17	20	At, Cn, Cs, Cu, Me, NS, St , To, Vl, Vc
	Pantala hymenaea (Say, 1839)	2640	4	4	Bo, Cu, Ma, Me, To
	Perithemis sp.	250	1	-	Me
	Perithemis lais (Perty, 1834)	250	4	2	Co, Ch, Me
	Perithemis mooma Kirby, 1889	16 - 950	3	20	Bo, By, Co, Cu, Me, Na, To
	Rhodopygia sp.	150 - 66	3	3	Me
	Rhodopygia cardinalis (Erichson, 1848)	150 - 660	1	7	Cq, Me
	Sympetrum sp.		1	-	To
	Sympetrum gilvum (Selys, 1884)	2640 - 3200	-	4	By, Cc, Cu, Vl
	Tauriphila australis (Hagen, 1867)	0	1	4	Bo, Vl
	Tholymis citrina Hagen, 1867	280	3	5	Am, To, Me
	Tramea sp.	230 - 510	8	16	Bo, By, Cl, Cq, Cn, Cu, Hu, Me, SA, Sc
	Tramea calverti Muttkowski, 1910	34 - 950	-	3	Bo, Cu, Na
	Tramea rustica De Marmels & Rácenis, 1982	150 – 280	1	1	Me
	Uracis sp.	103 - 1200	9	7	Am, Cn, Cu, Gu, Me, Ri, Ll
	Uracis fastigiata (Burmeister, 1839)	182 - 900	3	8	Am, Me, Na, St
	Uracis imbuta (Burmeister, 1839)	84 - 660	97	97	Am, Bo, By, Cl, Cq, Cn, Cn, Cu, Gu, Me, Co, Pt, Ri, St, To, Vl
	Uracis infumata (Rambur, 1842)	180	1	22	Am, Cq
	Uracis siemensi Kirby, 1897	103 - 200	1	2	Am, Gu, Pt
	Zenithoptera sp.	400 - 550	3	2	Am, Cq, Me, Vc
	Zenithoptera fasciata (Linnaeus, 1758)	47 - 750	6	7	Cq, Me, St, To
	Zenithoptera viola Ris, 1910	47	1	-	Co

celds (pterostigma 3 mm extending over nearly three cells). Fore wings with 13-14 antenodal cross-veins and 9-12 postnodal cross veins (Fore wings with 12-13 antenodal cross veins and 9-10 postnodal cross veins). Male. Pterostigma 2.9 mm (pterostigma 3 mm), vertex brown (vertex blue-black), mandibles dark brown and sutures of the mentum yellow (mandibles and sutures of the mentum black), pterostigma brown (pterostigma blackish). Fore wings with 11 antenodal cross-veins (Fore wings with 12-13 antenodal cross).

***Zenithoptera viola* Ris, 1910**

Specimens examined: 1 female**.** Colombia, Córdoba, Pueblo Nuevo, corregimiento El Arcial, finca Las Marías, 08°26'46.1"N, 75°18'40.7"O, 47 m.a.s.l., 16.vii.2006, N. Rojas [ICN 019621]. This species was reported from Venezuela, Guyana Francesa, Brasil, and Paraguay (Ris 1910; Paulson 2009).

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LITERATURE CITED

Borror, D. 1942. A revision of the Libellulinae genus *Erythrodiplax* Odonata**.** Contributions in Zoology and Entomology, No. 4. Biological Series. The Ohio State University, USA.

Costa, J. M. & Santos, T. C. 1997. Intra and interspecific variation in the genus *Uracis* Rambur, 1842, with a key to the known species (Anisoptera: Libellulidae). Odonatologica, 26(1):1-7

De Marmels, J. 2001. *Sympetrum paramo* sp. n. (Odonata: Libellulidae) from the Venezuelan high Andes, with a key to the species of *Sympetrum* Newman, 1833 found in Venezuela. Entomotropica, 161:15-19.

Förster, S. 1999. The Dragonflies of Central America exclusive of Mexico and the West Indies. A guide to their identification. Braunschweig, Gunnar Rehfeldt.

Garrison, R., N. von Ellenrieder & J. Louton, 2006. Dragonfly genera of the New World. An illustrated and annotated key to the Anisoptera. The Johns Hopkins University Press, Baltimore.

Kalkman, V. J., V. Clausnitzer, K. D. Dijkstra, A. G. Orr, D. R. Paulson & J. van Tol. 2008. Global diversity of dragonflies (Odonata) in freshwater. Hydrobiologia, 595:351-363.

Kirby, W. F. 1897. List of the Neuroptera collected by Mr. E. E. Austen on the Amazons &c. during the recent expedition of Messrs. Siemsn Bros. Cable S. S. 'Faraday,' with descriptions of several new species of Odonata (dragonflies). Annals and Magazine of Natural History. 19(6):598-617.

Paulson, D. R. 2003. Comments on the *Erythrodiplax connata* (Burmeister, 1839) group, with the elevation of *E. fusca* (Rambur, 1842), *E. minuscula* (Rambur, 1842), and *E. basifusca* (Calvert, 1895) to full species Anisoptera: Libellulidae). Bulletin of American Odonatology, 64:101-110.

Paulson, D. R. 2009. South American Odonata. List of the Odonata of South America, by country. Available from: <http://www.ups.edu/x7039.xml> (Accessed 14/07/ 2009).

Rambur, M. P. 1842. Histoire Naturelle des Insectes Nevropteres. Librairie encyclopedique de Roret, Paris.

Ris, F. 1910. Collections zoologiques du Baron Edm. de Selys Longechamps. Catalogue Systematique et Descriptif. Fascimile IX. Libellulinen.

Rojas, N. & M. Sánchez. 2009. New records of *Acanthagrion* Odonata: (Coenagrionidae) from Colombia. Bulletin of American Odonatology, 11(1):17-19.

Von Ellenrieder, N. 2003. A synopsis of the neotropical species of "*Aeshna*" Fabricius: The genus *Rhionaeschna* Förster (Odonata: Aeshnidae). Tijdschrift voor Entomologie, 146:67-207.