

Recent data on freshwater cyclopoid copepoda (Cyclopoida: Cyclopidae) from Uruguay.

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Abstract

A recent survey of freshwater bodies of southwestern Uruguay yielded a total of 13 species belonging to the family Cyclopidae, 4 of which had not been previously cited for this country: *Eucyclops agilis* (Koch, 1838), *Ectocyclops phaleratus* (Koch, 1838), *Thermocyclops decipiens* (Kiefer, 1929) and *Homocyclops ater* (Herrick, 1882), this last found at its southernmost locality.

Key words: Copepoda, Cyclopidae, freshwater, Uruguay, new records.

Introduction

The study of the copepod fauna of Uruguayan inland waters has long been neglected. Most of the knowledge available comes from the collection made over seventy years ago by Mr. R. Thomsen, a resident of Montevideo. This material was studied by European specialists who produced a few papers reporting their findings, three of which included members of the order Cyclopoida: those of Brehm (1935) and Kiefer (1935, 1936). In these studies a total of 16 species of Copepoda belonging to the family Cyclopidae, were reported. No new citations have been recorded since then from the available literature, except for a paper dealing with the zooplankton of a freshwater reservoir (Fabián, 1993). The object of the present note is to update the knowledge on the diversity of the Uruguayan freshwater Cyclopidae.

Material and Methods.

A survey of the cyclopoid fauna of streams and ponds located close to the southern coast and the western border of Uruguay, from the eastern outskirts of Montevideo to Salto, was undertaken in 2000 with the object of identifying species adequate for experiments of copepod predation upon larval stages of *Aedes aegypti*. Forty-five localities were sampled, some were visited on more than one date, totalling 61 samples. Zooplankton samples were taken with a 158 μ mesh conical tow-net from the shore and fixed in the field with 5% formalin. Samples were sorted under stereoscopic microscope; adult specimens were placed in a drop of lactic acid in a depression slide and turned belly-up with the help of a coverslip to expose genital segment and fifth legs, and were identified under microscope using Reid's (1985) key. Identified specimens were then washed in 70% ethanol and preserved in 5% formalin for deposit in the copepod collection included in the Colección Entomológica de la Facultad de Ciencias, Universidad de la República, Montevideo, Uruguay.

At each location latitude and longitude were recorded with a Magellan 2000 GPS.

Temperature, conductivity, pH, dissolved oxygen and turbidity were measured *in situ* with a Multiparameter Horiba U10 sensor.

Results and Discussion

A total of thirteen species were identified (Table I), recorded from samples obtained at forty-five localities. Name of the waterbody, location, environmental data and species found in each sample figure in Table II.

Four of the above listed species had not been previously reported for this country. They are: *Eucyclops agilis* (Koch, 1838) considered a synonym of *E. serrulatus* (Fischer, 1851), *Ectocyclops phaleratus* (Koch, 1838), *Homocyclops ater* (Herrick, 1882), and *Thermocyclops decipiens* (Kiefer, 1929). *Mesocyclops longisetus* (Thiébaud, 1912) had already been found in the binational reservoir of Salto Grande, on the Uruguay River (Menu-Marque, 2001), but had not been recorded from other Uruguayan inland water bodies, even if its distribution spans along the American continent from 68°56'N to 35°42'S (Pilati & Menu-Marque, 2002). None of these findings is surprising since all of these species have already been cited for other localities belonging to the Pampean Biogeographic Province and not a single species of the thirteen recorded is an endemic to this province or even a strictly Neotropical species. Two of the new records in fact are cosmopolitan species (*E. agilis* and *E. phaleratus*). *T. decipiens* is a pantropical species found both in America and Africa, while *H. ater* has a wide latitudinal distribution from North to South America (Reid, 1985). The presence of *H. ater* at 34°29' S here recorded, represents the southernmost locality known for this species.

With the species recently found, the ensemble of Cyclopidae known for Uruguay amounts to twenty species, since *Eucyclops silvestrii* (Brian, 1927), *Diacyclops uruguayensis* (Kiefer, 1935), *Mesocyclops meridianus* (Kiefer, 1926), *Metacyclops grandis* (Kiefer, 1935), *Microcyclops alius* (Kiefer, 1935) and *M. anceps* (Richard, 1897) previously recorded (Brehm, 1935; Kiefer, 1935, 1936) were not found during this survey. The species mentioned by Brehm (1935) as *Paracyclops fimbriatus* is most probably *Paracyclops chiltoni* (Thomson, 1882), according to Karaytug & Boxsall (1998) the only truly cosmopolitan species of the group, but specimens of this genus failed to appear in the studied samples.

Table I: Species of Cyclopoida

#	SPECIES NAME
1	<i>Acanthocyclops robustus</i> (Sars, 1863)
2	<i>Ectocyclops phaleratus</i> (Koch, 1838)
3	<i>Eucyclops agilis</i> (Fisher, 1851)
4	<i>Eucyclops neumani</i> (Pesta, 1927)
5	<i>Eucyclops prionophorus</i> (Kiefer, 1931)
6	<i>Homocyclops ater</i> (Herrick, 1882)
7	<i>Macrocyclops albidus</i> (Jurine, 1820)
8	<i>Mesocyclops annulatus</i> (Wierzejski, 1892)
9	<i>Mesocyclops longisetus</i> (Thiébaud, 1914)
10	<i>Metacyclops mendocinus</i> (Kiefer, 1927)
11	<i>Microcyclops ceibaensis</i> (Marsh, 1920)
12	<i>Thermocyclops decipiens</i> (Kiefer, 1929)
13	<i>Tropocyclops prasinus meridionalis</i> (Kiefer, 1931)

Table II: Sampling sites, environmental variables and cyclopid species.

LOCALITY (Department)	DATE	LOCATION		T (°C)	COND (mS.cm-1)	pH	OD (mg/l)	TURB. (NTU)	SPECIES (as in Table 1)
		Latitude S	Longitude W						
Rivera Park (Montevideo)	05-I-00	34°54'	56°07'	-	-	-	-	-	10
Laguna del Cisne (Canelones)	21-I-00	34°17'20"	55°53'41"	-	-	-	-	-	1, 10, 13
Laguna del Cisne (Canelones)	28-I-00	34°17'20"	55°53'41"	26.2	0.18	8.28	10.70	591	1, 10, 13
Laguna Punta Cala (Canelones)	26-I-00	34°36'46"	56°28'62"	27.0	0.24	9.40	-	25	10
"Ronchi" sand pit (Canelones)	26-I-00	34°36'46"	56°28'62"	28.5	0.43	9.50	14.00	23	10
"Ganatasio" sand pit (Canelones)	26-I-00	34°36'46"	56°28'62"	28.3	0.73	9.50	18.17	43	10
"YoZZi" sand pit (Canelones)	26-I-00	34°50'56"	56°00'07"	25.5	0.43	9.82	11.30	27	10
"Ganatasio II" sand pit (Canelones)	26-I-00	34°52'24"	56°01'92"	26.1	0.30	9.33	9.70	11	10
Botanic Garden (Montevideo)	28-I-00	34°51'60"	56°02'12"	25.5	0.37	8.17	-	21	10, 13
Rodó Park quarry (Montevideo)	28-I-00	34°47'20"	55°53'41"	26.9	0.64	9.41	19.90	119	10, 13
"La Paz 1" quarry (Montevideo)	04-II-00	34°45'545"	56°14'61"	26.2	0.53	9.15	11.5	37	1
"La Paz 2" quarry (Montevideo)	04-II-00	34°45'545"	56°14'61"	26.8	0.373	8.95	9.47	12	1
Pereira Stream (San José)	15-II-00	34°29'17"	56°51'70"	24.5	0.92	8.65	8.83	14	1, 3, 9
Pereira Stream (San José)	05-XII-00	34°29'17"	56°51'70"	22.8	0.41	7.64	8.17	4	1, 3, 9
Pereira Stream (San José)	16-V-01	34°29'17"	56°51'70"	13.4	0.457	7.55	-	24	1, 3, 5, 6, 9
Pereira Stream (San José)	30-I-02	34°29'17"	56°51'70"	27.9	0.5	7.2	0.01	9	1, 3, 5, 6, 9
Pavón Stream (San José)	15-II-00	34°29'18"	56°51'53"	21.2	0.57	8.13	2.46	12	1, 10, 13
Pavón Stream (San José)	05-XII-00	34°29'18"	56°51'53"	20.3	0.52	7.62	0.04	8	1, 10
Cufre Stream (San José)	15-II-00	34°21'30"	57°06'40"	27.4	0.42	9.24	19.9	39	10
Cufre Stream (San José)	05-XII-00	34°21'30"	57°06'40"	24.4	0.43	7.93	0.02	12	10
Rosario River (Colonia)	15-II-00	34°20'00"	57°19'53"	24	0.49	8.2	4.7	20	1
Rosario River (Colonia)	05-XII-00	34°20'00"	57°19'53"	26.2	0.22	8.2	0.01	50	1
Bocas del Rosario quarry (Colonia)	15-II-00	34°25'75"	57°21'17"	29	0.12	10.6	15.8	10	1
Bocas del Rosario quarry (Colonia)	05-XII-00	34°25'75"	57°21'17"	25.6	0.12	9.29	0	15	1
Riachuelo Stream (Colonia)	15-II-00	34°26'67"	57°43'71"	25	0.22	8.2	8.4	40	1, 10
Riachuelo Stream (Colonia)	06-XII-00	34°26'67"	57°43'71"	24.9	0.34	7.9	5.5	22	1
Riachuelo Stream (Colonia)	16-V-01	34°25'74"	57° 21'15"	14	0.302	8.35	s.d	24	1
Riachuelo, Australian tank (Colonia)	15-II-00	34°25'74"	57° 21'15"	24.2	1.7	8.57	19.9	33	1, 10, 13
Riachuelo, Australian tank (Colonia)	06-XII-00	34°25'74"	57° 21'15"	24.5	1.68	8.2	6.4	34	1
Riachuelo, Australian tank (Colonia)	16-V-01	34°25'74"	57° 21'15"	14	0.45	10.03	-	40	1
Riachuelo, quarry (Colonia)	06-XII-00	34°25'74"	57° 21'15"	24.2	0.89	8.34	5.76	5	
La Caballada Stream (Colonia)	15-II-00	34°26'65"	57°43'71"	23.2	1.38	8.36	7.5	17	1, 10, 13
San Pedro Stream (Colonia)	16-II-00	34°26'65"	57°43'71"	21.4	0.59	8.36	5.3	36	10
San Juan Stream (Colonia)	16-II-00	34°16'54"	57°59'00"	23.1	0.135	8.35	10.9	40	1, 10
Miguelete Stream (Colonia)	16-II-00	34°11'36"	57°53'27"	20.8	0.548	8.65	0.1	24	13
De las Tunas pool (Colonia)	16-II-00	34°20'90"	57°57'96"	23.6	0.67	8.7	0.06	21	3, 4, 10, 13
De las Vacas Stream (Colonia)	16-II-00	34° 00'22"	58°17'32"	25	0.201	8.4	9.37	55	10
"Roselli 1" quarry (Colonia)	16-II-00	34°14'02"	58°02'57"	24.8	0.13	9.26	12.1	44	10
"Roselli 2" quarry (Colonia)	16-II-00	34°14'02"	58°02'57"	27	0.403	9.55	14.06	20	10
"Roselli 3" quarry (Colonia)	16-II-00	34°14'02"	58°02'57"	27.5	0.14	10.05	13.02	15	10
Solis Pond (Colonia)	16-II-00	33°54'83"	58°24'70"	26.2	0.052	8.85	10.3	20	10
Sauce Stream (Soriano)	16-II-00	33°50'12"	58°22'15"	26	1.96	8.85	15.2	48	10
Agraciada Grande Stream (Soriano)	16-II-00	33°50'12"	58°22'15"	22.2	0.57	8.2	6.9	50	10
Arenal Grande Stream (Soriano)	16-II-00	33°41'29"	58°20'10"	23.4	0.53	10.6	7.6	20	13
San Salvador Stream (Soriano)	16-II-00	33°31'29"	58°12'59"	24.9	0.48	11.9	11.3	23	1, 9
Negro River (Soriano)	17-II-00	33°14'73"	58°01'99"	22.7	0.09	8.9	9.7	20	10

Cont. Table II

LOCALITY (Department)	DATE	LOCATION		T (°C)	COND (mS.cm-1)	pH	OD (mg/l)	TURB. (NTU)	SPECIES (as in Table 1)
		Latitude S	Longitude W						
Palmar Reservoir (Soriano)	17-II-00	33°28'00"	57°51'00"	22	0.39	7.5	10	60	1
Bequeló Stream (Soriano)	17-II-00	33°14'48"	57° 56'48"	21.8	0.45	8.3	8.9	60	1
Cololó Stream (Soriano)	17-II-00	33°12'83"	57°42'07"	22.3	0.02	7.4	8.5	25	10
Vera Stream (Soriano)	17-II-00	33°11'	57°30'	23	0.03	10	9	40	1
Grande Stream (Flores)	17-II-00	33°16'	57°14'	24	0.4	7.8	9	40	1, 10, 13
Tálice pond (Flores)	17-II-00	33°30'53"	56°56'29"	24	0.14	8	10	160	1
Centenario Park pond (Flores)	17-II-00	33°30'55"	56°56'30"	25	0.39	7.4	13.7	40	10
Sauce Stream (Colonia)	06-XII-00	34°23'	57°30'	21.6	0.42	6.43	4	21	1
Santa Lucía River (Canelones)	09-VI-01	34°27'	56°24'	16.1	s.d	s.d	6.23	61,3	2, 3, 7
De las Flores Stream (Río Negro)	28-I-02	32°57'	57°22'	23.9	0.435	9.05	0.02	21	11, 13
Grande Stream (Río Negro)	28-I-02	32°56'	57°21'	25.4	0.335	9.05	0.02	5	13
Don Esteban Stream (Río Negro)	28-I-02	32°50'	57°32'	25.4	0.375	7.98	0.02	9	13
Dayman Stream (Salto)	29-I-02	31°33'	57°57'	32	0.325	10	0.02	5	2, 3, 4
Arapey River (Salto)	29-I-02	30°57'	57°32'	30.4	0.113	8.5	0.01	20	1, 12
Uruguay River (Salto)	30-I-02	31°23'	57°59'	28.3	0.094	9.1	0.01	6	1, 9, 12

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