

Influence of biotic and abiotic factors on adult Odonata (Insecta) in Amazon streams

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Supplementary material

Supplementary Tables with lists of species of Zygoptera, Anisoptera, Ephemeroptera, Plecoptera, Trichoptera, macrophytes, fishes (diurnal omnivore surface pickers and invertivorous diurnal backwater drifter feeders) and abiotic variables (HII — Habitat Integrity Index).

Table S1. List of streams with biotic (species richness) and abiotic (HII) variables. Z (S): Zygoptera species richness; A (S): Anisoptera species richness; Mac. (S): macrophyte species richness; EPT (S): Ephemeroptera, Plecoptera and Trichoptera richness; DOSP (S): diurnal omnivore surface picker species richness; IDBD (S): invertivorous diurnal backwater drifter feeder species richness; HII: Habitat Integrity Index.

Streams	Z (S)	A (S)	Mac. (S)	EPT (S)	DOSP (S)	IDBD	HII
HYQ03	5	2	5	5	2	4	0.515
HYS12	6	1	2	7	4	8	0.588
HYI09	3	4	16	3	2	3	0.482
HYP13	9	1	1	7	1	6	0.710
HYO05	4	1	9	5	5	11	0.392
HYL16	8	1	6	0	0	4	0.550
HYA10	5	2	4	7	2	6	0.561
HYG04	8	2	14	17	4	7	0.496
HYP13-1	6	1	2	11	1	5	0.589
HYJ04	4	8	10	2	4	8	0.429
HYP15	8	3	3	2	1	5	0.613
HYI06-1	2	2	5	3	1	4	0.547
HYH09	2	1	11	0	5	7	0.551
HYL009	4	2	8	15	2	3	0.485
HYH12	1	1	4	0	2	5	0.544
HYI10	1	2	0	1	2	6	0.526

Table S2. List of streams with biotic (abundance) and abiotic (HII) variables. Z (A): Zygoptera abundance; A (A): Anisoptera abundance; Mac. (S): macrophyte species richness; EPT (A): Ephemeroptera, Plecoptera and Trichoptera abundance; DOSP (A): diurnal omnivore surface picker abundance; IDBD (A): invertivorous diurnal backwater drifter feeder abundance; HII: Habitat Integrity Index.

Streams	Z (A)	A (A)	Mac. (S)	EPT (A)	DOSP (A)	IDBD (A)	HII
HYQ03	15	15	5	14	13	176	0.515
HYS12	35	1	2	48	35	560	0.588
HYI09	10	27	16	96	2	100	0.482
HYP13	30	1	1	45	15	105	0.710
HYO05	26	6	9	38	27	245	0.392
HYL16	14	6	6	0	0	434	0.550
HYA10	11	3	4	38	25	50	0.561
HYG04	15	4	14	94	17	215	0.496
HYP13-1	11	1	2	119	31	20	0.589
HYJ04	9	14	10	7	8	165	0.429
HYP15	18	16	3	14	2	136	0.613
HYI06-1	4	5	5	14	6	10	0.547
HYH09	5	4	11	0	13	61	0.551
HYL009	11	2	8	204	2	42	0.485
HYH12	2	1	4	0	7	63	0.544
HYI10	1	9	0	2	3	109	0.526

Table S3. List of Odonata species composed of both suborders and their respective abundances.

Zygoptera	N	Anisoptera	N
<i>Acanthagrion aepiolum</i> Tennessen, 2004	8	<i>Erythrodiplax basalis</i> (Kirby, 1897)	19
<i>Acanthagrion kennedii</i> Williamson, 1916	3	<i>Erythrodiplax castanea</i> (Burmeister, 1839)	1
<i>Acanthallagma luteum</i> Williamson & Williamson, 1924	1	<i>Erythrodiplax fusca</i> (Rambur, 1842)	9
<i>Argia collata</i> Selys, 1865	18	<i>Fylgia amazonica</i> Kirby, 1889	36
<i>Argia indicatrix</i> Calvert, 1902	21	<i>Oligoclada abbreviata</i> (Rambur, 1842)	15
<i>Argia infumata</i> Selys, 1865	2	<i>Oligoclada walkeri</i> Geijskes, 1931	6
<i>Argia reclusa</i> Selys, 1865	1	<i>Perithemis lais</i> (Perty, 1833)	21
<i>Argia</i> sp.3	4	<i>Perithemis thais</i> Kirby, 1889	3
<i>Argia</i> sp2.	4	<i>Rhodopygia cardinalis</i> (Erichson in Schomburgk, 1848)	1
<i>Argia tinctipennis</i> Selys, 1865	14	<i>Zenithoptera lanei</i> Santos, 1941	1
<i>Epipleoneura kaxuriana</i> Machado, 1985	3	<i>Zonophora batesi</i> Selys, 1869	1
<i>Epipleoneura metallica</i> Rácenis, 1955	50		
<i>Hetaerina rosea</i> Selys, 1853	2		
<i>Heteragrion icterops</i> Selys, 1862	1		
<i>Heteragrion silvarum</i> Sjöstedt, 1918	8		
<i>Micrathyria pseudeximia</i> Westfall, 1992	1		
<i>Mnesarete aenea</i> (Selys, 1853)	7		
<i>Mnesarete williamsoni</i> Garrison, 2006	4		
<i>Neoneura luzmarina</i> De Marmels, 1989	26		
<i>Nephepeltia phryne</i> (Perty, 1833)	1		
<i>Oxystigma petiolatum</i> (Selys, 1862)	4		
<i>Perilestes solutus</i> Williamson & Williamson, 1924	1		
<i>Phasmoneura exigua</i> (Selys, 1886)	2		
<i>Protoneura tenuis</i> Selys, 1860	17		
<i>Psaironeura tenuissima</i> (Selys, 1886)	15		

Table S4. List of Ephemeroptera, Plecoptera and Trichoptera (EPT) and their respective abundances.

Ephemeroptera	N	Plecoptera	N	Trichoptera	N
Baetidae		Perlidae		Helicopsychidae	
<i>Americabaetis</i> Kluge, 1992	1	<i>Anacroneuria</i> Klapálek, 1909	1	<i>Helicopsyche</i> Siebold, 1856	2
<i>Callibaetis</i> Eaton, 1881	3	<i>Macrogynoplax</i> Enderlein, 1909	5	Hydropsychidae	
<i>Cloeodes</i> Traver, 1938	9			<i>Leptonema</i> Guérin, 1843	9
<i>Zelusia</i> Lugo-Ortiz & McCafferty, 1998	3			<i>Macronema</i> Pictet, 1836	6
Caenidae				<i>Macrostemum</i> Kolenati, 1859	101
<i>Brasilocaenis</i> Puthz, 1975	18			<i>Smicridea</i> McLachlan, 1871	6
<i>Caenis</i> Stephens, 1835	3			Leptoceridae	
Euthyplociidae				<i>Oecetis</i> McLachlan, 1877	2
<i>Campylocia</i> Needham & Murphy, 1924	175			<i>Triplectides</i> Kolenati, 1859	3
Leptophlebiidae				Odontoceridae	
<i>Farrodes</i> Peters, 1971	1			<i>Marilia</i> Müller, 1880	1
<i>Hagenulopsis</i> Ulmer, 1920	2			Polycentropodidae	
<i>Miroculis</i> Edmunds, 1963	191			<i>Cernotina</i> Ross, 1938	18
<i>Simothraulopsis</i> Demoulin, 1966	1			<i>Polycentropus</i> Curtis, 1835	24
<i>Ulmeritoides</i> Traver, 1959	139			<i>Polyplectropus</i> Ulmer, 1905	1
<i>Ulmeritus</i> Traver, 1956	3			Philopotamidae	
Polymitarcyidae				<i>Chimarra</i> Stephens, 1829	2
<i>Campsurus</i> Eaton, 1868	3				

Table S5. List of aquatic macrophytes by family.

Family/Species	Family/Species
Asteraceae	Lindsaeaceae
<i>Rolandra argentea</i> Rottb.	<i>Lindsaea lancea</i> (L.) Bedd
Blechnaceae	Nymphaeaceae
<i>Blechnum serrulatum</i> Richard	<i>Nymphaea rudgeana</i> G.Mey.
Cyperaceae	Ochnaceae
<i>Calyptracarya glomerulata</i> (Brongn.)	<i>Sauvagesia erecta</i> Gilli
<i>Cyperus haspan</i> L.	Onagraceae
<i>Cyperus odoratus</i> L.	<i>Ludwigia leptocarpa</i> (Nutt.)
<i>Diplacrum capitatum</i> (Willd.)	Poaceae
<i>Eleocharis interstincta</i> (Vahl)	<i>Homolepis aturensis</i> (Kunth)
<i>Eleocharis plicarhachis</i> (Griseb.) Svenson	<i>Leersia hexandra</i> Swartz
<i>Fuirena umbellata</i> Rottb	<i>Orthoclada laxa</i> (Rich.)
<i>Rhynchospora ciliata</i> (G.Mey.)	<i>Urochloa arrecta</i>
<i>Rhynchospora corymbosa</i> (L.) Britton.	Pteridaceae
<i>Scleria microcarpa</i> Nees ex Kunth	<i>Adiantum</i> cf. <i>humile</i> Kunze
Eriocaulaceae	<i>Adiantum tomentosum</i> Klotzsch
<i>Tonina fluviatilis</i> Aubl.	<i>Ceratopteris</i> sp.
Hydrocharitaceae	Tectariaceae
<i>Apalanthe granatensis</i> (Humb. & Bonpl.)	<i>Triplophyllum</i> sp.
Hymenophyllaceae	Thelypteridaceae
<i>Trichomanes hostmannianum</i> (Klotzsch)	<i>Thelypteris interrupta</i> (Willdenow) K.Iwatsuki
Lentibulariaceae	Xyridaceae
<i>Utricularia</i> sp.	<i>Xyris jupicai</i> Rich.

Table S6. Abundance (*N*) and classification of functional trophic groups of fish in invertivorous diurnal backwater drift feeders and diurnal omnivore surface pickers sampled in streams.

TÁXON/AUTHORITY			
Invertivorous diurnal backwater drift feeder	<i>N</i>	Diurnal omnivore surface picker	<i>N</i>
Characiformes		Characiformes	
<i>Carnegiella strigata</i> (Günther, 1864)	13	<i>Bario steindachneri</i> (Eigenmann, 1893)	3
<i>Copella arnoldi</i> (Regan, 1912)	235	<i>Crenuchus spilurus</i> Günther, 1863	11
<i>Hemigrammus bellottii</i> (Steindachner, 1882)	827	<i>Iguanodectes rachovii</i> Regan, 1912	101
<i>Hemigrammus ocellifer</i> (Steindachner, 1882)	189	<i>Moenkhausia collettii</i> (Steindachner, 1882)	37
<i>Nannostomus trifasciatus</i> Steindachner, 1876	50	<i>Moenkhausia comma</i> Eigenmann, 1908	4
<i>Pyrrhulina</i> sp.	178	<i>Moenkhausia oligolepis</i> (Günther, 1864)	20
<i>Microcharacidium weitzmani</i> Buckup, 1993s	47	<i>Nannostomus nitidus</i> Weitzman, 1978	5
<i>Bryconops</i> sp.	130	Cichliformes	
<i>Characidium</i> sp.	10	<i>Aequidens tetramerus</i> (Heckel, 1840)	17
<i>Hemigrammus levis</i> Durbin, 1908	2	<i>Heros</i> sp.	1
<i>Hemigrammus rodwayi</i> Durbin, 1909	95	Cyprinodontiformes	
<i>Hyphessobrycon heterorhabdus</i> (Ulrey, 1894)	659	<i>Melanorivulus</i> sp.	7
<i>Phenacogaster</i> gr. <i>pectinatus</i>	3		
Cyprinodontiformes			
<i>Anablepsoides urophthalmus</i> (Günther, 1866)	53		